

A Report on the Representation of Women in Academic Plastic Surgery Leadership

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Background: The year 2017 marked the first year women comprised a majority of U.S. medical school matriculants. While more women are pursuing surgical training, within plastic surgery, there is a steady attrition of women advancing in leadership roles. The authors report the current status of women in academic plastic surgery, from trainees to chairwomen and national leadership positions.

Methods: The Electronic Residency Applications Service, San Francisco Match, National Resident Matching Program, Association of American Medical Colleges, American Council of Academic Plastic Surgeons, Plastic Surgery Education Network, and professional websites for journals and national societies were accessed for demographic information from 2007 to 2017.

Results: The number of female integrated pathway applicants remained stable (30 percent), with an increased proportion of female residents from 30 percent to 40 percent. There was an increase in female faculty members from 14.6 percent to 22.0 percent, an increase of less than 1 percent per year. Twelve percent of program directors and 8.7 percent of department heads were women. Nationally, major professional societies and administrative boards demonstrated a proportion of female members ranging from 19 percent to 55 percent (average, 27.7 percent). The proportion of female committee leaders ranged from 0 percent to 50 percent (average, 21.5 percent). Only six societies have had female presidents. No major journal had had a female editor-in-chief. The proportion of female editorial board members ranged from 1 percent to 33 percent (average, 16.1 percent).

Conclusions: The authors' study shows a leak in the pipeline at all levels, from trainees to faculty to leadership on the national stage. This report serves as a starting point for investigating reasons for the underrepresentation of talented women in plastic surgery leadership. (*Plast. Reconstr. Surg.* 145: 844, 2020.)

In 2017, medical schools in the United States witnessed an unprecedented female majority (50.7 percent) of matriculants.¹ Likewise, the number of women entering surgical specialties

has continued to increase.² As of 2016, 38 percent of plastic surgery residents are women.³ Overall, women represent 12 percent of all surgical specialties and 15 percent of plastic surgeons.³ Nevertheless, surgery remains a male-dominated field.

Within plastic surgery, women are underrepresented in leadership positions in regional and national organizations, as well as in selection for prestigious awards, even after accounting for the smaller number of women in the field. For example, since its initiation in 1993, the Godina Fellowship was awarded to a female recipient for the first time in 2017.⁴ The American Association of Plastic Surgery Honorary Citation has never been given to a woman.⁵ Since its founding in 1921, only two women (in 2008 and

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Received for publication February 9, 2019; accepted September 30, 2019.

Presented at University of Pittsburgh's Department of Surgery Research Day, May 2, 2018; Department of Plastic Surgery Resident Research Day, June 22, 2018; and Med Ed Day, September 21, 2018; in Pittsburgh, Pennsylvania; the Northeastern Society of Plastic Surgeons 35th Annual Meeting, in Boston, Mass., October 26 through 28, 2018; and the Plastic Surgery Research Council 64th Annual Meeting, in Baltimore, Maryland, May 2 through 5, 2019.

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DOI: 10.1097/PRS.0000000000006562

Disclosure: *The authors have no financial disclosures to report.*

2018) have served as president of the American Association of Plastic Surgeons. Lastly, since its founding in 1931, only two women have served as president of the American Society of Plastic Surgeons.⁶

There are limited data available regarding the proportion of women in plastic surgery who advance to prominent leadership roles in academic surgery, national societies, and editorial boards. We aimed to establish a baseline status and explore strategies for improving gender diversity within plastic surgery leadership.

The research reported in this article conforms to the ethical principles and norms as established by the Declaration of Helsinki.

METHODS

Data regarding the percentage of women in leadership roles at each level of academic plastic surgery were accessed.

Trainees

The Electronic Residency Applications Service maintains a database with current and historical specialty-specific data executed by the Association of American Medical Colleges, and was contacted for residency applicant data. The number and gender of U.S. residents from 2007 to 2017 for both integrated and independent pathways were collected. Demographic data regarding craniofacial, microsurgery, and hand fellowship applicants and trainees were not available.

Professors

The number and gender of plastic surgery faculty at all U.S. medical schools from 2006 to 2016 were obtained through the Association of American Medical Colleges. The American Council of Academic Plastic Surgeons website was used to determine training programs, and program websites were evaluated for program directors and department chairs. Programs not listing this information on their website were contacted directly.

National Plastic Surgery Societies

National plastic surgery conferences were selected for evaluation. Websites were accessed between September of 2017 and March of 2018, and gender data for committee and leadership members were collected. If this information was not readily available, the society was contacted for this information. Only physician members were included in the assessment.

Journal Editorial Boards

Journals featured by the Plastic Surgery Education Network were selected for evaluation. Journal websites were accessed between September of 2017 and March of 2018, and gender data for editorial board members were collected. If this information was not readily available, the journal was contacted. Only physician members were included.

RESULTS

Trainees

The Electronic Residency Applications Service provided data from 2010 to 2016 regarding plastic surgery trainees. During this time period, the proportion of integrated pathway female applicants remained relatively stable (average, 32.0 percent; range, 27.5 percent to 37.5 percent), while the proportion of female residents has increased, with a corresponding decrease in the proportion of male residents (Fig. 1).

With regard to the independent pathway, the proportion of male applicants demonstrated an initial decline, followed by an increase to approximately 70 percent of the applicant pool in 2015. In contrast, female applicants displayed the inverse trend. At the resident level, the proportion of male to female residents has maintained a steady ratio of three male residents for every one female resident (Fig. 2).

No demographic information was available regarding in-service examination scores, written board examination pass rates, or oral board examination pass rates. The San Francisco Match and National Resident Matching Program were unable to provide demographic data for craniofacial fellowships, microsurgery fellowships, and hand fellowships.

Professors

General demographic data of male versus female plastic surgery faculty were obtained from the Association of American Medical Colleges. Between 2006 and 2016, there was an increase in the proportion of female faculty members within plastic surgery, from 14.6 percent to 22.0 percent. This is an average increase of 0.94 percent per year (Fig. 3).

Demographic data were collected for residency program directors and department heads for all current training programs per the American Council of Academic Plastic Surgeons (website accessed March of 2018). Twelve percent of

Proportions of Applicants and Residents on Integrated Pathway by Sex from 2010 to 2016

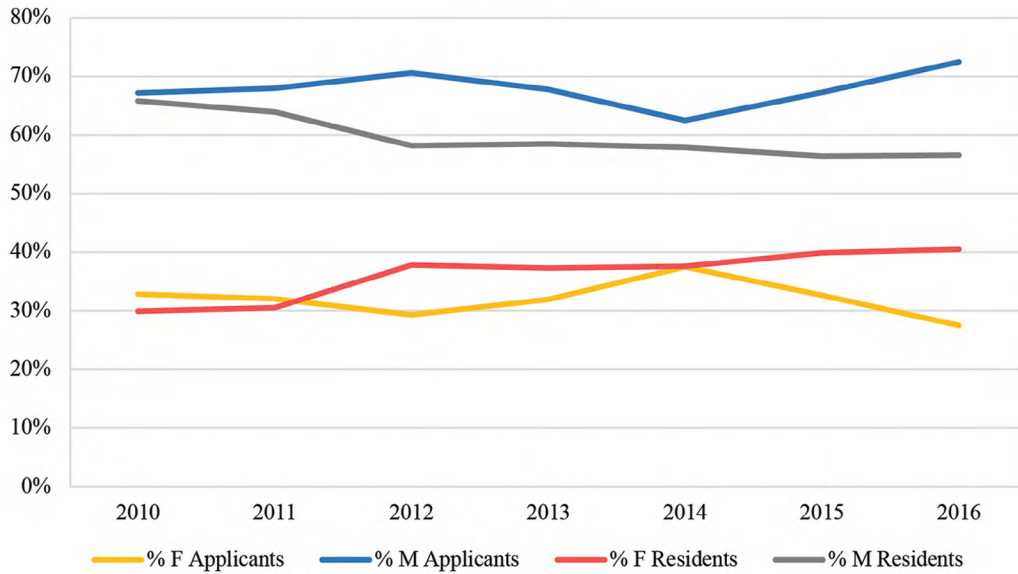


Fig. 1. Trendline: demographics for integrated pathway applicants and residents.

Proportions of Plastic Surgery Applicants and Residents on Independent Pathway by Sex from 2008 to 2016

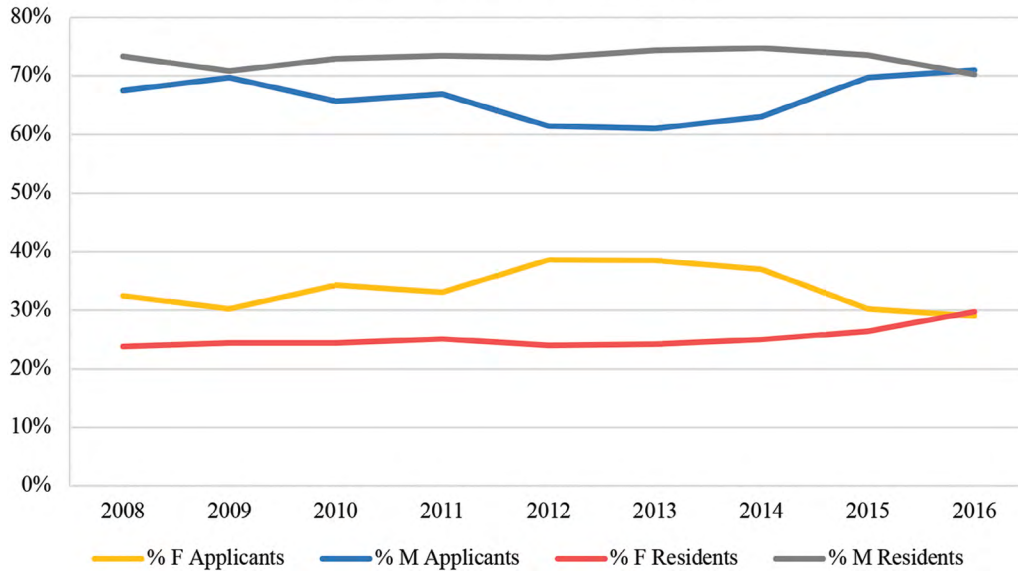


Fig. 2. Trendline: demographics for independent pathway applicants and residents.

residency program directors and 8.7 percent of department heads were women (Table 1).

National Plastic Surgery Societies

Sixteen professional societies were evaluated (Table 2). All physician committee members listed by the respective societies were included in the assessment, including past presidents, presidents elect, and board of trustee members.

The proportion of female members ranged from 19 percent to 55 percent, with an average of 27.7 percent. The American Society for Reconstructive Microsurgery had the highest proportion of women, and the Plastic Surgery Research Council had the lowest proportion of female committee members. However, the American Society for Reconstructive Microsurgery has a Women’s Microsurgery Group that accounts

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Proportion of Full-time Plastic Surgery Faculty by Gender at All U.S. Medical Schools

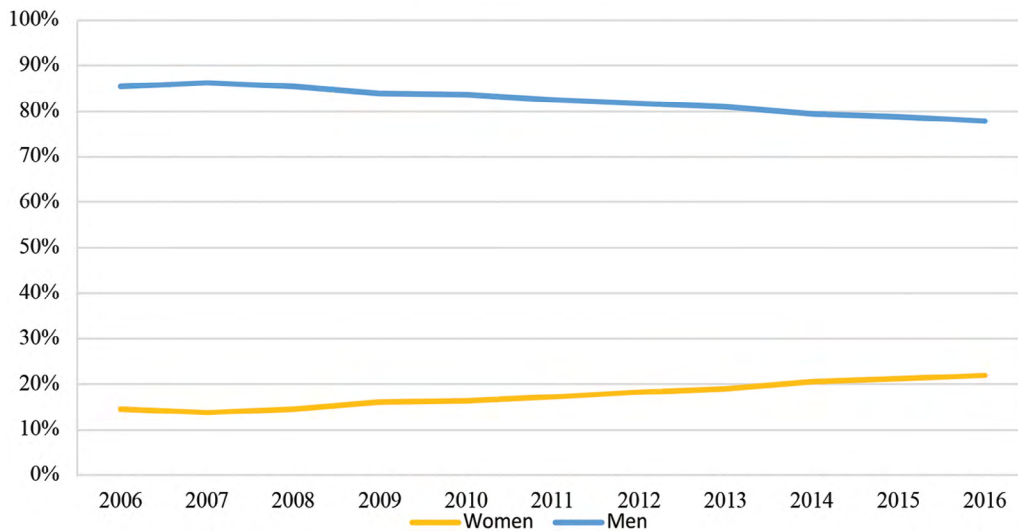


Fig. 3. Trendline: full-time plastic surgery faculty by gender at all U.S. medical schools from 2006 to 2016, per the Association of American Medical Colleges.

Table 1. Demographics of Program Directors and Department Heads

Position	Female	Male	N/A	Total
Program director	11 (12.0%)	78 (84.5%)	3 (3.3%)	92
Program head	8 (8.7%)	77 (83.7%)	7 (7.6%)	92

N/A, no position filled at time data were accessed or information not available.

for one female leader and 10 female committee members.

When specifically assessing committee leaders, the proportion of women ranged from 0 percent to 50 percent, with an average of 21.5 percent. The American Cleft Palate Association committees were noted for the highest proportion of female leaders, while the American Association for Hand Surgeons contained the lowest.

Of the 16 societies investigated, only six had a history of female presidents. Proportions ranged from 0 percent to 16.7 percent, with multiple instances of the same female surgeon leading various societies at different time points (Table 3). Of note, the American Society for Peripheral Nerve had the highest percentage of female presidents.

Journal Editorial Boards

Eleven journals were evaluated (Table 4). Positions of leadership ranged from editor-in-chief to section or associate editors. The proportion of female editorial board members ranged from 1 percent to 33 percent, with an average of 16.1 percent. The *Journal of Reconstructive Microsurgery* had

the highest proportion of female members. None of the journals had a female editor-in-chief.

DISCUSSION

Recent literature has shown patients of female physicians to have better outcomes^{7,8} and even a preference of female patients for female plastic surgeons.⁹ However, when it comes to academic leadership, women lag behind. The reasons for this are being queried and are multifactorial.¹⁰⁻¹⁶ Proposed hypotheses include the “glass ceiling” and the “leaky pipeline.”¹¹ Our results reflect similar findings in plastic surgery leadership.

Trainees

The rate of female applicants to plastic surgery has not increased since 2010 despite the increasing percentage of women graduating from medical school. This indicates that women are preferentially choosing to apply to other specialties.

Silva et al.¹² found that women felt discouraged from pursuing surgical specialties due to a lack of female co-workers, lack of encouragement, insufficient female role models and mentors, gender discrimination and harassment, a perception of surgery as an “old boys’ club,” poor job satisfaction, and reproductive concerns and lifestyle considerations.¹⁷⁻¹⁹ Lillemoe et al.²⁰ surveyed female and male medical students on their surgical rotation and found that 96 percent of female students versus 0 percent of male students viewed surgery as unfavorable toward their gender. In the

Table 2. Proportion of Female Members and Leaders of National Professional Society Committees

Society	Committee Leaders	Female Leaders	%Female Leaders	Committee Members	Female Members	%Female Members
ASPS	126	40	32.0	1084	262	24.0
PSRC	12	2	16.7	148	47	31.8
ACPA	18*	9	50.0	N/A	N/A	N/A
ASAPS	65	14	22.0	74	15	20.0
AAHS	5	0	0.0	N/A	N/A	N/A
ASRM	21	4	19.0	22	12	55.0
ASRM Council	14	3	21.0	N/A	N/A	N/A
ASPN	9	1	11.0	N/A	N/A	N/A
AAPS	30	5	17.0	148	30	20.0
AAPS board	1	0	0.0	13	2	15.4
ACAPS	13	6	46.2	15	8	53.3
ACAPS board of directors	1	0	0.0	12	3	25.0
ABPS board of directors	1	0	0.0	18	3	16.7
PSF	27	4	14.8	386	101	26.2
PSF board of directors	1	0	0.0	28	8	28.6
RRC	2	0	0.0	12	2	16.7
Average	N/A	N/A	17.6	N/A	N/A	27.7

ASPS, American Society of Plastic Surgeons; PSRC, Plastic Surgery Research Council; ACPA, American Cleft Palate Association; ASAPS, American Society for Aesthetic Plastic Surgeons; AAHS, American Association for Hand Surgeons; ASRM, American Society for Reconstructive Microsurgery; ASPN, American Society for Peripheral Nerve; AAPS, American Association of Plastic Surgeons; ACAPS, American Council of Academic Plastic Surgeons; ABPS, American Board of Plastic Surgery; PSF, Plastic Surgery Foundation; RRC, Residence Review Committee; N/A, this information was not available. *M.D. or D.M.D. members.

Table 3. Percentage of Female Presidents in National Plastic Surgery Societies

Society (year founded)	Female Presidents
ASPS (1931)	2†/88 (2.3%*) 2007 Roxanne Guy 2017 Debra Johnson
AAHS (1970)	2/40 (5.0%*) Susan Mackinnon* Kim Lie
ASPN (1990)	4/24 (16.7%*) 1990–1992 Julia Terzis 1995–1996 Susan Mackinnon* 2001–2002 Nancy McKee 2005–2006 Maria Siemionow
ABPS (1937, data from 1991)	2/70 (2.9%*) 2007–2008 Linda Phillips* 2015–2016 Sheri Slezak
PSF (1932)	4/72 (5.6%*) 1995 Mary McGrath* 2007 Carolyn Kerrigan 2008 Linda Phillips* 2018 Andrea Pusic
AAPS (1921)	2/98 (2.0%*) 2008 Susan Mackinnon* 2018 Mary McGrath*
All others	None None

ASPS, American Society of Plastic Surgeons; AAHS, American Association for Hand Surgeons; ASPN, American Society for Peripheral Nerve; ABPS, American Board of Plastic Surgery; PSF, Plastic Surgery Foundation; AAPS, American Association of Plastic Surgeons.

*Members have served as presidents multiple times.

†ASPS had an additional female president, Lynn Jeffers, in 2020, after the data collection for this project was completed.

subsequent decade, studies in general surgery have demonstrated conflicting evidence, with some studies concluding deterrence from surgery^{21–23} and others finding no difference between men and women.^{24,25} Of note, female students' choice of surgery as a career has been found to be strongly associated with a greater number of women surgical role models and higher perceived career satisfaction of women faculty.²⁶ Ongoing evaluation of students is needed to assess evolving factors and perspectives influencing career choice.

Despite the absolute increase in the proportion of female trainees, the trend does not yet match that of female students entering medical school and indicates the first “leak in the pipeline.”

Academia: Retention, Promotions, and Leadership

Upon graduation from residency, women are less likely than their male counterparts to enter academic faculty positions. The percentage of women

Table 4. Plastic Surgery Journals Ranked by Impact Factor*

Journal	Impact Factor	Total No. of Members	Female Members	% Female Members	Female Editors-in-Chief	%Female Editors-in-Chief
<i>Plastic and Reconstructive Surgery</i>	2.993	67	9	13.0	1	16.7
<i>Aesthetic Surgery Journal</i>	2.697	90	8	8.9	0	0.0
<i>Journal of Reconstructive Microsurgery</i>	2.216	9	3	33.0	0	0.0
<i>Microsurgery</i>	2.156	91	7	7.7	0	0.0
<i>Journal of Hand Surgery</i>	2.037	62	12	19.0	0	0.0
<i>Journal of Plastic, Reconstructive, and Aesthetic Surgery</i>	1.983	6	1	17.0†	0	0.0
<i>Annals of Plastic Surgery</i>	1.535	24	1	4.2‡	0	0.0
<i>Aesthetic Plastic Surgery</i>	1.320	18	7	28.0†	0	0.0
<i>Clinics in Plastic Surgery</i>	1.080	N/A§	N/A§	N/A§	N/A	N/A
<i>Hand</i>	0.850	44	6	14.0	0	0.0
<i>Journal of Craniofacial Surgery</i>	0.788	75	12	16.0	0	0.0
Average	1.787	N/A	N/A	16.1	0.1	1.7

N/A, not applicable.

*Impact factors were from 2016.

†Advisory/review board was not included.

‡Associate editors were included; editors were not included.

§*Clinics in Plastic Surgery* declined to provide this information.

who go on to achieve the level of program director and department head is even more disparate.

In a 2004 survey, Schroen et al.²⁷ reported the environment of academic experiences for men and women in general surgery was not equivalent. Due to a constellation of variables, including sense of isolation, harassment, inadequate mentoring, and inadequate career advancement, women do not succeed at the same rate as men and must overcome a “cumulative career disadvantage.” Upward mobility is a challenge. According to 2016 data, women in medicine continue to be paid less than men, with a rising gap, even after adjusting for covariates,^{28,29} and receive less institutional support.³⁰ Women bill and code differently,³¹ and bias against women and minorities has been reported in relation to lower patient satisfaction scores.³² Similar issues may exist in plastic surgery, resulting in a leaky pipeline.

While it is true some lag may exist for women in leadership to “catch up” to men, the disparity cannot fully be explained by time alone. Carr et al.³³ found the concept that increased number of women in medicine will eventually bring gender equality is a notion held by men and not shared by women.

The Association of American Medical Colleges has shown the proportion of men to women at higher academic professional levels has remained essentially unchanged for more than 15 years.³⁴ Sexton et al.³⁵ investigated this aspect of the pipeline for general surgery and found the percentage of female full professors in surgery is increasing at a rate disproportionately slower than the increases in female medical students and surgery residents. Abelson et al.² reported an annual increase from 1994 to 2015 of 0.3 percent to 0.6 percent in general surgery female academic surgical positions.

Based on the demonstrated rates of increase, the study postulated that it would take 49, 57, and 121 years for women to comprise 50 percent of all assistant, associate, and full professors of surgery, respectively. We were unable to obtain data from the Association of American Medical Colleges regarding gender versus plastic surgery assistant, associate, and full professor status, but we did demonstrate a similarly slow growth rate of female faculty, at less than 1 percent per year.

Women have a higher rate of attrition and retention of female faculty is a challenge. At the assistant professor level, women are almost six times more likely than their male colleagues to intend to leave academia within 2 years.^{27,36} In general, visible inequity as well as the lack of women on faculty and in leadership are seen as negative factors and deterrents when institutions try to recruit women.³³

Women who left academic medicine reported influencing factors such as lack of role models for combining career and family responsibilities, frustration with research, struggles with work-life balance, and an institutional environment that was noncollaborative and/or biased in favor of male faculty.³⁷ Seventy-seven percent of early career female faculty report experiencing differential treatment on the basis of gender and 50 percent have experienced gender discrimination.³⁸ Women have more difficulty obtaining research funding due to unconscious bias. Analysis of R01 applications demonstrates that reviewers assign lower scores to female principal investigators compared to their male counterparts despite the use of more positive adjectives, such as “outstanding” or “excellent,” in the critiques of the applications

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submitted by women.³⁹ Even when controlling for specialty, seniority, hours of work per week, and academic productivity, women continue to face a gender disparity in salary compensation that has not improved since 1995.³³

Mayer et al.⁴⁰ analyzed 134 medical schools, including 138,508 full-time faculty members, and found women to be overrepresented in the clinician-educator track and underrepresented in the traditional tenure track. In general surgery, 10 percent of program directors and 3 percent of department chairs are women.⁴¹ This drastically low percentage was also reflected in our results, with a similar percentage of 12 percent for female program directors and 8.7 percent of department heads.

The accumulation of these factors contributes to an overall dissatisfaction of women in academic surgery, a key reason for subsequent attrition.^{14,42} Dissatisfaction can stem from real and perceived barriers to advancement. Cochran et al.³⁸ investigated barriers to advancement for senior residents and early career faculty in academic surgery and identified the following factors: (1) conflict between children and career (28 percent of residents, 12 percent of faculty); (2) difficulties with networking and socialization, specifically a lack of support from superiors (22 percent of residents, 46 percent of faculty); and (3) lack of role models or mentors (19 percent of residents, 46 percent of faculty). Data similar to these have been discussed in plastic surgery, examining the factors that may contribute to female attrition.¹³

National Societies and Editorial Boards

Our results demonstrate that women participate in national society committees and editorial boards at a rate similar to the proportion of female plastic surgeons (15 percent). Women lead 17.6 percent of committees in national societies and make up 16.1 percent of editorial board members. However, no women currently serve as editor-in-chief, and few women have ascended to lead as presidents of national societies.

Female senior authors have been reported to be more likely to take an abstract through to publication than their male colleagues.⁴³ In 2018, Plana et al.¹² found that the academic contributions of female plastic surgeons have increased over the decades, becoming more evenly distributed across subspecialty topics. In 2019, Andry et al.¹⁰ reported female faculty contributions on par with national percentages of female plastic surgeons, but female residents had lower representation. Nonetheless, only 28 percent of National

Institutes of Health–funded plastic surgery investigators are women.⁴⁴ Women hold lower academic ranks, publish less,⁴⁵ and have lower H-indices,⁴⁶ though Therattil et al.⁴⁷ concluded, after controlling for academic rank, residency model, and faculty and departmental status, that men and women in plastic surgery show no differences in H-indices.

The scarcity of women in leadership positions is unlikely to be due to lack of competency to perform these roles. People who work under female managers are more likely to prefer a woman as their boss, outsiders rate female leaders as more effective compared with their male counterparts, and companies with more women in top managerial positions demonstrate superior financial performance.¹⁸ Therefore, the reasons for the underrepresentation of women in leadership positions in plastic surgery needs to be evaluated and further explored.

Future Directions

Female leaders have been shown to possess unique qualities of proactiveness, integrity, honesty, and drive, which contribute to the advancement of plastic surgery, improvement of the overall field, and recruitment of high-quality students.⁴⁸ However, women are also less likely to self-promote and are more likely to place importance on recognition from peers, trainees, and patients than leadership positions, national visibility, and scholarship.^{18,49}

Data suggest that diverse groups find more innovative solutions than homogeneous groups.⁵⁰ Furthermore, the *Harvard Business Review* has argued⁵¹ that more than diversity training and encouraging the reporting of bias, elevating women to positions of power changes workplace culture and reduces harassment. Women leaders are important role models for other women and can help create an organizational climate that is supportive to women.⁵²

There are many steps¹¹ we can take as a professional community to improve gender diversity in plastic surgery leadership, such as the following:

1. Continue to pursue research investigating reasons for the “leaky pipeline,” at each level of attrition.
2. Eliminate sexual discrimination, harassment, misconduct, and inequity: have zero tolerance for gender-based discriminatory behaviors.
 - a. Fairness and transparency with hiring and promotion milestones.

3. Create nonpassive alliances from male colleagues (“He for She”) to promote productive mentorship,⁵³ sponsorship, networking relationships, and frank discussion about gender inequality.
 - a. Awareness that bullying can originate from both male and female co-workers.^{54,55}
4. Be mindful as leaders in changing the climate and culture of academic plastic surgery.¹⁶
 - a. Increasing awareness of unintentional mistakes, errors of omissions or recognition, and persistent (unconscious) gender bias.³³
 - b. Increasing equity and visibility of female faculty and countering attrition.
 - c. Evolving the institution to support families.^{14,15}
5. Show professional societies and peer-reviewed journals that they must encourage and sponsor more women to leadership positions.
6. Promote career development programs⁵⁶: women should receive training to improve self-promotion and negotiation.⁵⁷

CONCLUSIONS

This study establishes a baseline report on the representation of women at various career levels in plastic surgery. Women remain underrepresented in leadership. The reasons for the lack of gender diversity at top positions in plastic surgery are complex and multifactorial. However, increased diversity in leadership will strengthen plastic surgery as a specialty and advance scientific understanding, advocacy, and patient care. The American Society of Plastic Surgeons has made diversity an important goal. Awareness of the current state of gender representation in academic plastic surgery leadership—faculty, national societies, editorial boards, leadership—is a first step in determining next steps toward achieving equity in our professional community.

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