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The confidence gap: Findings for women in plastic surgery

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ABSTRACT

Background: In a surgical field, where surgeons are, "sometimes wrong, but never in doubt," lack of confidence can have detrimental effects on career advancement. In other fields there is evidence that a gap exists between women and men in the amount of confidence they display, and that confidence is a proxy for success.
Methods: This study used the General Self Efficacy Scale and Rosenberg Self-Esteem Scale confidence surveys to assess self confidence amongst female trainees and attending plastic surgeons, to search for baseline characteristics associated with higher confidence scores.
Results: Of the 73 participants, protective factors associated with increased female plastic surgeon confidence include age, parity, more advanced academic status, and mentorship.
Conclusions: In order to matriculate into a surgical training program, there must be a measure of confidence and resiliency, but further work needs to be done to identify and address gender gaps in training and early academic careers.

Introduction

Since 2017, women have actually outnumbered men entering medical school. In 2018, 53.4% of students enrolled in medical school were women, the highest proportion ever reported by the American Association of Medical Colleges.[1] Despite their equal representation in medical schools, women continue to be underrepresented in surgical training programs. In general surgery, only 35% of residents are women; this proportion is even lower for many surgical subspecialties.[2]

Despite the increasing presence of women in medicine, women remain underrepresented in plastic surgery. In 2019, women made up only 37% of Plastic Surgery residents and 16% of the membership of the American Society of Plastic Surgeons.[3] While this will likely improve over time with steadily increasing numbers of female trainees, it does raise the question of barriers to recruitment or advancement in the field, including factors such as gender bias and discrimination, institutional attitudes towards pregnancy and childcare, and a lack of female leaders and mentors in academia.[4–9] The presence of overt gender bias has been demonstrated through widespread pay scale inequalities, the lack of women in leadership positions and the higher attrition rates of female surgeons as compared to men.[5,6,10] Implicit gender bias, which may be more insidious and harder to recognize, also exists in all levels of subspecialty surgical training.[4,7,11] This implicit bias likely affects the perception and self-evaluation of female surgical trainees and likely contributes to the confidence gap between women and men.[8,11–14]

This gap in confidence begins as early as medical school; although female and male medical students attain equal scores on objective assessments, female students consistently report lower confidence levels in their skills and higher anxiety compared to their male counterparts.[15,16] This finding of lower self-confidence has been found in female surgical trainees as well.[12,13] While this could be considered an individual or personality flaw, these gender stereotypes may actually be reinforced by instructors, who regularly describe/evaluate female students as "less confident" than male students regardless of actual technical performance.[15] Furthermore, there is evidence that confidence influences

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perceived competence[17–19]; this is problematic when science faculty exhibit bias and perceive women as being less competent at baseline[14] and female residents already have less autonomy in the operating room.[20,21]

In this study, we sought to understand the confidence gap on an individual level by analyzing which traits are associated with higher self-reported confidence scores among female trainee and attending plastic surgeons. By raising awareness of this issue, we hoped to further develop ideas on how to increase confidence in female plastic surgeons.

Methods

Survey selection

A validated survey that explicitly addresses confidence was not available at the time of this study so self-efficacy and self-esteem were used as proxies for confidence. Two related surveys were selected to assess overall confidence in female participants: the General Self Efficacy Scale and the Rosenberg Self-Esteem Scale.[25,26] Both are internationally validated surveys and contain ten items each.

Subject recruitment

After obtaining Institutional Review Board exemption from the University of Utah, emails were sent to United States academic plastic surgery program directors in March 2018, asking them to forward the Research Electronic Data Capture (REDCap, https://projectredcap.org) survey link to their female trainees and faculty members. The total possible participant number was estimated at 445 based on the number of nationwide training programs and percentage of female residents and faculty. Participants were voluntarily asked to complete demographic data, the General Self-Efficacy Scale, and the Rosenberg Self-Esteem Scale in order to establish baseline confidence levels. Completion was incentivized with a $5 Starbucks gift card. The study was closed in September 2018.

Data analysis

Demographic data collected include age, gender, ethnic/racial background, relationship status, number of children, current academic rank or postgraduate training level, plastic surgery training pathway, and current region of the country. Mentorship data collected include the presence of a mentoring relationship, gender of the respondent's primary mentor, and the perceived efficacy of mentorship. Age and number of children were summarized with mean, standard deviation (SD), median, interquartile range (IQR), and range. All other categorical demographic variables were summarized with the number and percent of subjects in each category.

Answers for each question on the General Self Efficacy and Rosenberg Self Esteem surveys were originally collected on a four-point Likert scale; these responses were converted to a cumulative score for the purposes of obtaining a total score for statistical analysis. Scores ranged from 10 to 40 for each survey. There were two types of questions in the Rosenberg Self Esteem survey: positively worded and negatively worded, therefore the questions are presented in two groups. The negatively worded items are highlighted with an asterisk in the Rosenberg Self Esteem results table. These items are scored in a reverse direction, where lower scores actually indicate greater self-esteem. Individual item scores and total survey scores were analyzed as continuous variables and are summarized with mean and SD.

Univariable and multivariable linear regression was used to model baseline survey scores by demographics, academic level, type and region of training, mentor gender, impact of mentorship, and impact of gender and diversity on their program decision. These regression models included all subjects who had a score on the surveys. A two-sample *t*-test was used to compare our mean initial survey results with that of a group not in plastic surgery. R 3.4.1 software was used for all statistical analysis and the Likert package was specifically used for Likert plots.

Results

Demographics

There were 73 initial participants with demographic and partial

Table 1
Demographic summary.

N = 73	Type/Level	Summary
Age	[mean (SD)]	33.4 (7.1)
	[median (IQR)]	32 (29, 35)
	[range]	(23, 60)
Gender	Female	73 (100%)
Ethnic/Racial Background	Caucasian/ White	48 (66%)
	Hispanic	6 (8%)
	Asian	17 (23%)
	Two or More Races	2 (3%)
Relationship status	Single	24 (33%)
	Partnered	10 (14%)
	Married	36 (49%)
	Divorced	0 (0%)
	Other	3 (4%)
Number of children	[mean (SD)]	0.7 (1.1)
	[median (IQR)]	0 (0, 1)
	[range]	(0, 5)
Current academic rank/PGY level	PGY 1	13 (18%)
	PGY 2	7 (10%)
	PGY 3	9 (12%)
	PGY 4	6 (8%)
	PGY 5	5 (7%)
	PGY 6	5 (7%)
	PGY 7	7 (10%)
	PGY 8	2 (3%)
	PGY 9+	3 (4%)
	Fellow	2 (3%)
	Attending	14 (19%)
	Other	0 (0%)
Type of plastic surgery training	Independent	18 (25%)
	Integrated/ Combined	54 (74%)
	Other	1 (1%)
Region	Northeast	16 (22%)
	Midwest	22 (30%)
	South	25 (34%)
	West	9 (12%)
	International	1 (1%)
Mentor Gender	No Mentor	21 (29%)
	Female Mentor	22 (30%)
	Male Mentor	30 (41%)
Has mentorship helped you advance through your career, and increased professional confidence?	No	19 (26%)
	Yes	54 (74%)
When deciding on a residency or fellowship training program, or academic workplace, did gender and diversity of the attendings or residents in your program have an impact on your decision?	No	37 (51%)
	Yes	36 (49%)

*Missing values: Number of children = 10.

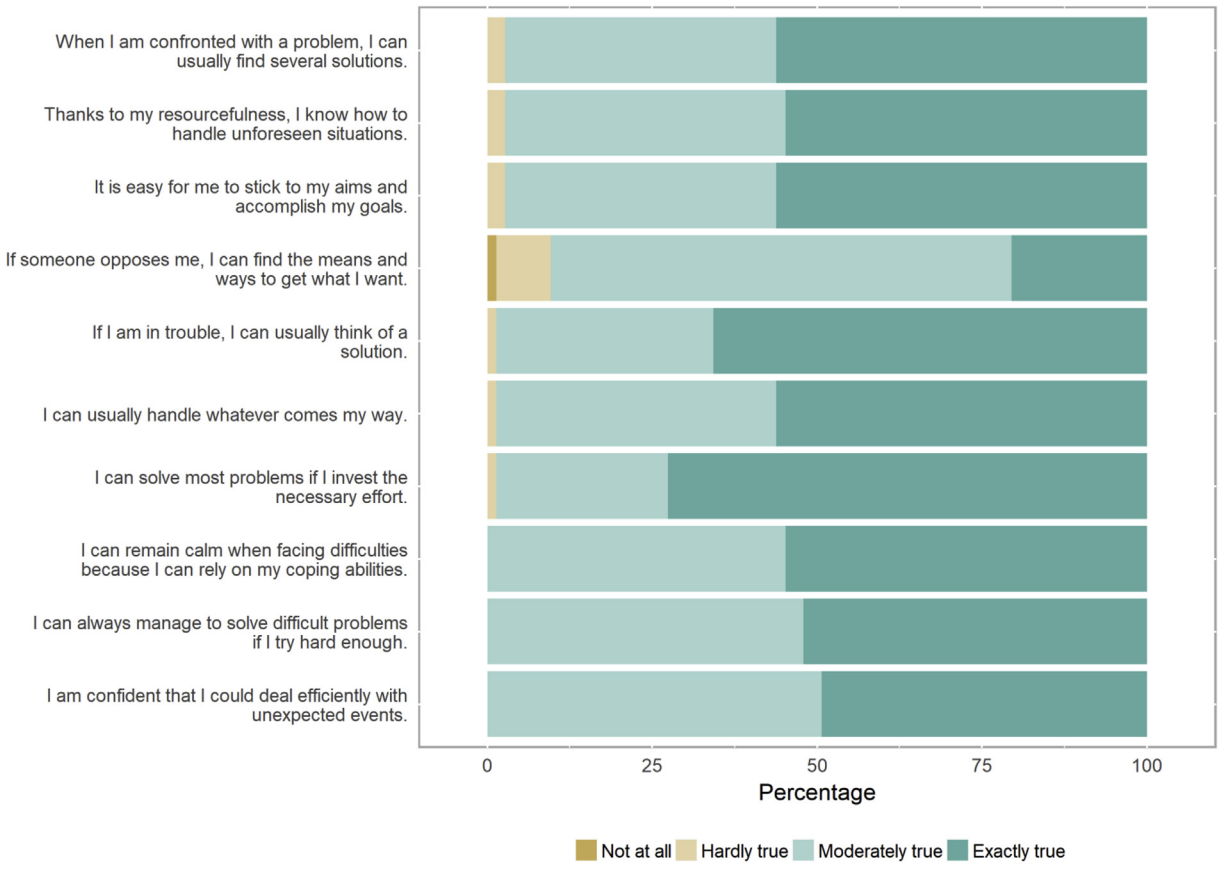

Fig. 1. Likert plot - general self efficacy scale results pre-intervention.

survey data. All 73 completed the Self Efficacy survey and 72 completed the Rosenberg survey. Of the 73 participants, the average age was 33.4 years (SD 7.1). All participants identified as female. When asked about ethnic/racial background, 66% identified as Caucasian or white, 23% Asian, 8% Hispanic, and 3% identified as two or more races. The majority, 49%, were married, 33% were single, and 14% were partnered. None of the participants were divorced. The number of children ranged from 0 to 5, with a median of 0 children (IQR 0–1). The most represented levels of training or academic rank were: attending 19%, and PGY 1 18%. Seventy-five percent of respondents were from Integrated or Combined programs, and 25% from Independent programs. Integrated residents match from medical school and graduate from plastic surgery residency after six years. Combined programs, which have been phased out, included three years of general surgery and three years of plastic surgery (also a match out of medical school). Independent residents complete a full surgical residency in general surgery or a surgical subspecialty prior to two to three years of plastic surgery training.

Most participants (74%) felt mentorship had helped them advance through their careers and increase their professional confidence. Approximately two thirds indicated that they had a current mentor (71%). Of those, 42% indicated that their mentors were female. Participants were split when asked, "When deciding on a residency or fellowship training program, or academic workplace, did gender and diversity of the attendings or residents in your program have an impact on your decision?", as 51% responded 'No', and 49% responded 'Yes' (Table 1).

Table 2
Summary of General Self Efficacy Scale questions.

Variable	Initial Data: N = 73
I can always manage to solve difficult problems if I try hard enough.	3.5 (0.5)
If someone opposes me, I can find the means and ways to get what I want.	3.1 (0.6)
It is easy for me to stick to my aims and accomplish my goals.	3.5 (0.6)
I am confident that I could deal efficiently with unexpected events.	3.5 (0.5)
Thanks to my resourcefulness, I know how to handle unforeseen situations.	3.5 (0.6)
I can solve most problems if I invest the necessary effort.	3.7 (0.5)
I can remain calm when facing difficulties because I can rely on my coping abilities.	3.5 (0.5)
When I am confronted with a problem, I can usually find several solutions.	3.5 (0.6)
If I am in trouble, I can usually think of a solution.	3.6 (0.5)
I can usually handle whatever comes my way.	3.5 (0.5)

All statistics reported are of the form "Mean (SD)". Individual item scores could range from 1 (Not at all) to 4 (Exactly true).

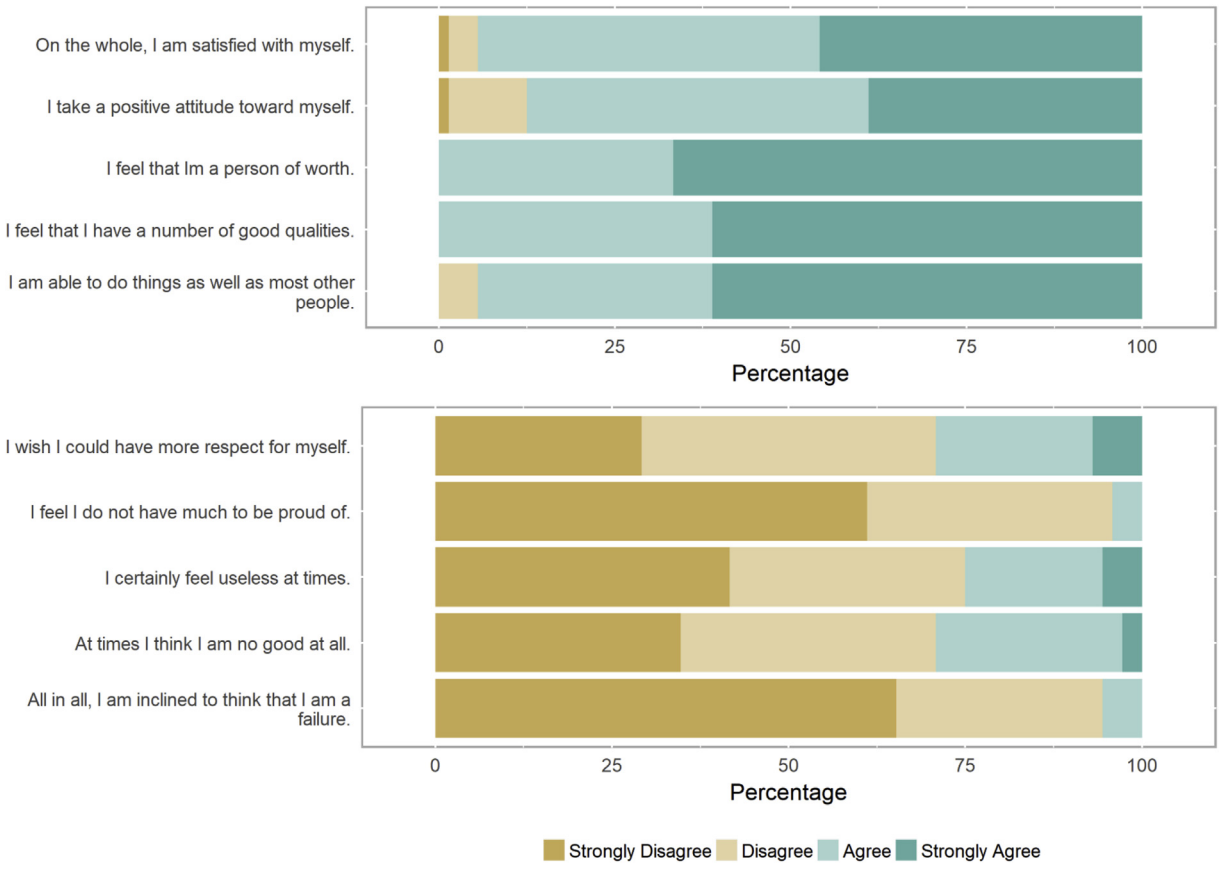

Fig. 2. Likert plot - general rosenberg self esteem scale results pre-intervention.

Survey results

The General Self Efficacy Scale Results are shown in Fig. 1. A total of 73 participants completed the survey, and most participants selected Moderately True or Exactly True when asked the self-efficacy questions, where 'Exactly True' indicates a positive response with higher self-efficacy. Table 2 summarizes the initial mean score per question. There was a low outlier mean in response to the statement "If someone opposed me, I can find the means and ways to get what I want." The highest scoring mean response was in answer to the statement, "I can solve most problems if I invest the necessary effort."

The General Rosenberg Self Esteem Scale Results are shown in Fig. 2. A total of 72 participants completed this scale. The preponderance of participants selected Agree or Strongly Agree when asked the self-esteem questions, where 'Strongly Agree' indicates a positive response correlating with higher self-esteem. Responses to the negatively worded questions were more diverse and there was more than one participant who responded that she agreed or strongly agreed with the statements "I wish I could have more respect for myself," "I certainly feel useless at times," or "At times I think I am no good at all." Table 3 summarizes the initial mean score per question for the 72 participants. Of the positively worded items, the lowest mean score was in response to the statement "I take a positive attitude toward myself." The highest mean score was in answer to the statement, "I feel that I'm a person of worth." Of the negatively worded items, most respondents disagreed or strongly disagreed with the statements., "I feel I do not have much to be proud of," and "All in all, I am inclined to think that I am a failure."

Table 3
Summary of General Rosenberg Scale questions.

Variable	Initial Data: N = 72
On the whole, I am satisfied with myself.	3.4 (0.6)
[a]At times I think I am no good at all.	2 (0.9)
I feel that I have a number of good qualities.	3.6 (0.5)
I am able to do things as well as most other people.	3.6 (0.6)
[a]I feel I do not have much to be proud of.	1.4 (0.6)
[a]I certainly feel useless at times.	1.9 (0.9)
I feel that I'm a person of worth.	3.7 (0.5)
[a]I wish I could have more respect for myself.	2.1 (0.9)
[a]All in all, I am inclined to think that I am a failure.	1.4 (0.6)
I take a positive attitude toward myself.	3.2 (0.7)

All statistics reported are of the form "Mean (SD)".
[a] Item is reverse direction (lower scores indicate greater self-esteem).

Linear regression was performed for the Self-Efficacy total score and for the Rosenberg total score to analyze which demographic variables correlated with higher or lower scores (Tables 4 and 5). Scores ranged from 10 to 40 for each survey, and the points listed below are the average difference between two compared groups. For the Self-Efficacy survey, univariable analysis demonstrates that compared to scores of those who have no children, those who have one or more children have higher scores on average (2.14 points, 95% CI: 0.31, 3.97; $p = 0.025$). Attendings and PGY 4–7 residents have overall higher scores compared to PGY 1–3 residents (2.82 points, 95% CI: 0.58, 5.05; $p = 0.016$ and 2.09 points, 95% CI: 0.16, 4.01; $p = 0.037$, respectively). The participants who answered "yes" to the question, "When deciding on a residency or fellowship training program, or academic workplace, did gender and diversity of the attendings or residents in your program have an impact on

Table 4
Linear regression of self efficacy total score.

Variable	Level	Univariable Estimate (95% CI)	p-value	Multivariable Estimate (95% CI)	p-value
Age		0.06 (−0.06, 0.18)	0.33	−0.15 (−0.43, 0.14)	0.31
Ethnic/Racial Background	Caucasian/White	- Reference -		- Reference -	
	Hispanic	−1.50 (−4.62, 1.62)	0.35	−0.46 (−3.96, 3.04)	0.80
	Asian	−0.22 (−2.25, 1.82)	0.84	−0.39 (−3.12, 2.34)	0.78
	Two or More Races	−0.33 (−5.54, 4.87)	0.90	−1.11 (−6.82, 4.60)	0.70
Relationship status	Single	- Reference -		- Reference -	
	Partnered	0.50 (−2.20, 3.20)	0.72	1.67 (−1.54, 4.87)	0.31
	Married	0.97 (−0.91, 2.86)	0.32	0.09 (−2.45, 2.63)	0.95
	Other	2.50 (−1.88, 6.88)	0.27	2.86 (−3.24, 8.97)	0.36
Number of children	No Children	- Reference -		- Reference -	
	1+ Children	2.14 (0.31, 3.97)	0.025	2.38 (−0.12, 4.89)	0.068
	Unknown	1.73 (−0.71, 4.17)	0.17	2.63 (−0.78, 6.04)	0.14
Current academic rank/PGY level	PGY 1-3	- Reference -		- Reference -	
	PGY 4-7	2.09 (0.16, 4.01)	0.037	2.02 (−1.08, 5.12)	0.21
	PGY 8+/Fellow	1.32 (−1.58, 4.21)	0.38	1.22 (−4.04, 6.48)	0.65
	Attending	2.82 (0.58, 5.05)	0.016	3.66 (−1.61, 8.94)	0.18
Type of plastic surgery training	Independent	- Reference -		- Reference -	
	Integrated/Combined	−0.07 (−2.01, 1.86)	0.94	0.27 (−2.55, 3.10)	0.85
Region	Northeast	- Reference -		- Reference -	
	Midwest	−0.14 (−2.51, 2.23)	0.91	0.47 (−2.36, 3.30)	0.75
	South	0.68 (−1.63, 2.99)	0.57	0.48 (−2.22, 3.19)	0.73
	West	−0.67 (−3.67, 2.34)	0.67	−0.67 (−3.95, 2.61)	0.69
Mentor Gender	No Mentor	- Reference -		- Reference -	
	Female Mentor	1.94 (−0.21, 4.09)	0.081	2.34 (−1.53, 6.22)	0.24
	Male Mentor	0.57 (−1.43, 2.57)	0.58	0.42 (−2.86, 3.71)	0.80
Has mentorship helped you advance through your career, and increased professional confidence?	No	- Reference -		- Reference -	
	Yes	0.92 (−0.98, 2.81)	0.35	0.11 (−3.31, 3.54)	0.95
When deciding on a residency or fellowship training program, or academic workplace, did gender and diversity of the attendings or residents in your program have an impact on your decision?	No	- Reference -		- Reference -	
	Yes	−1.83 (−3.45, −0.21)	0.030	−0.95 (−3.75, 1.85)	0.51

Table 5
Linear regression of initial rosenberg total score.

Variable	Level	Univariable Estimate (95% CI)	p-value	Multivariable Estimate (95% CI)	p-value
Age		0.24 (0.07, 0.41)	0.007	0.27 (−0.10, 0.63)	0.16
Ethnic/Racial Background	Caucasian/White	- Reference -		- Reference -	
	Hispanic	−4.73 (−9.18, −0.28)	0.041	−2.71 (−7.22, 1.80)	0.24
	Asian	0.58 (−2.33, 3.48)	0.70	−0.06 (−3.60, 3.48)	0.97
	Two or More Races	2.61 (−4.81, 10.02)	0.49	−0.32 (−7.65, 7.02)	0.93
Relationship status	Single	- Reference -		- Reference -	
	Partnered	−0.19 (−4.26, 3.87)	0.93	1.61 (−2.64, 5.87)	0.46
	Married	0.14 (−2.60, 2.88)	0.92	−1.70 (−4.96, 1.56)	0.31
	Other	5.92 (−0.46, 12.29)	0.073	0.12 (−7.73, 7.97)	0.98
Number of children	No Children	- Reference -		- Reference -	
	1+ Children	3.70 (1.02, 6.37)	0.008	3.95 (0.72, 7.17)	0.020
	Unknown	1.65 (−1.91, 5.21)	0.37	2.52 (−1.85, 6.90)	0.26
Current academic rank/PGY level	PGY 1-3	- Reference -		- Reference -	
	PGY 4-7	2.24 (−0.56, 5.03)	0.12	−1.18 (−5.17, 2.81)	0.56
	PGY 8+/Fellow	0.82 (−3.38, 5.02)	0.70	−3.87 (−10.63, 2.89)	0.27
	Attending	5.25 (2.00, 8.50)	0.002	−1.64 (−8.41, 5.13)	0.64
Type of plastic surgery training	Independent	- Reference -		- Reference -	
	Integrated/Combined	−0.97 (−3.73, 1.79)	0.49	−0.15 (−3.79, 3.48)	0.94
Region	Northeast	- Reference -		- Reference -	
	Midwest	−2.09 (−5.59, 1.40)	0.24	−2.12 (−5.75, 1.51)	0.26
	South	−1.71 (−5.08, 1.66)	0.32	−2.87 (−6.36, 0.63)	0.11
	West	−2.63 (−7.02, 1.75)	0.24	−3.10 (−7.31, 1.12)	0.16
Mentor Gender	No Mentor	- Reference -		- Reference -	
	Female Mentor	1.76 (−1.47, 5.00)	0.29	5.63 (0.63, 10.63)	0.032
	Male Mentor	0.12 (−2.86, 3.11)	0.94	1.52 (−2.70, 5.73)	0.48
Has mentorship helped you advance through your career, and increased professional confidence?	No	- Reference -		- Reference -	
	Yes	0.39 (−2.42, 3.20)	0.79	−0.53 (−4.93, 3.88)	0.82
When deciding on a residency or fellowship training program, or academic workplace, did gender and diversity of the attendings or residents in your program have an impact on your decision?	No	- Reference -		- Reference -	
	Yes	−3.66 (−5.99, −1.33)	0.003	−2.54 (−6.14, 1.06)	0.17

Table 6
Comparison of self efficacy scores.

	This Study	Previous Study	Difference (95% CI)	p-value
Mean	35.15	28.79	6.37 (5.45, 7.28)	<0.001
SD	3.62	5.08	–	–
n	73	773	–	–

your decision?" compared to those who answered "no," had overall lower self-efficacy scores (−1.83 points, 95% CI: 3.45, −0.21; $p = 0.030$). Multivariable analysis did not demonstrate any statistically significant differences amongst demographic variables.

For the Rosenberg survey total score, univariable analysis demonstrated that with an increase in age, there is a mean increase in Rosenberg total score (0.24 points per year of age, 95% CI: 0.07, 0.41; $p = 0.007$). Similar to the self-efficacy study, women with children had overall higher scores compared to those without children (3.70 points, 95% CI: 1.02, 6.37; $p = 0.008$). Attendings have higher scores, on average, (5.25 points, 95% CI: 2.00, 8.50; $p = 0.002$) compared to PGY 1–3 residents. Compared to scores of those who are Caucasian/White participants of Hispanic ethnicity have overall lower scores (−4.73 points, 95% CI: 9.18, −0.28; $p = 0.041$). Once again, the participants who had considered gender and diversity at their programs had lower scores on average (−3.66 points, 95% CI: 5.99, −1.33; $p = 0.003$). Two variables were statistically significant in the multivariable analysis: number of children (3.95 points, 95% CI: 0.72, 7.17; $p = 0.020$) and having female mentors (5.63 points, 95% CI: 0.63, 10.63; $p = 0.032$), both of which were protective factors, associated with higher scores.

In addition to analyzing Self-Efficacy results within our cohort, we also compared our population to a control population of 773 US women that are not in plastic surgery. We found that the mean Self-Efficacy survey score among plastic surgeons was significantly higher than the general public (6.37 points, 95% CI: 5.45, 7.28; $p < 0.001$).[27] (Table 6).

Discussion

A growing body of literature has shown that on average, women display less confidence than men.[11,18,19] It has also been shown that confidence matters just as much, if not more than competence, in professional and leadership roles.[17] Even though women are now earning more undergraduate and medical degrees than men,[1] men get promoted faster, are paid more, and hold more leadership positions.[34] Women are also less likely to ask for promotions, which certainly may be a function of confidence.[29] In a study at The University of California, Berkley, people who were more confident, even if they were less competent, were more likely to rise to positions of social leadership.[31] This may be related to gendered socialization in that many of the behaviors that convey confidence are traditionally masculine including sitting tall, speaking loudly and projecting one's voice, and even avoiding self-disclaimers.[18,19,39] And while to our knowledge this has not been discussed extensively in the surgical education literature, there are several studies in the overlapping resuscitation literature that find "authoritative styles" and traditional masculine traits to be associated with stronger leadership.[40]

In our study, female trainee and attending plastic surgery participants had exceptionally high scores at baseline. For example, compared to General Self Efficacy scale studies of women from 14 countries/cultures around the world, our confidence related mean score of 35.2 in all female plastic surgeons was much higher than the range of mean scores of 20.17–33.04 in all women.[41] A study on physicians in China suggests that this may be protective for surgeons, in that occupational stress declined significantly with an increase in General Self Efficacy scores.[42]

In order to survive in the "shark tank" of surgical training, women must be tough. Compared to peers, women may feel they struggle, but this is a subjective measure. They seem to be inherently more critical of their skills at work.[15] Objective measures of confidence may not reveal this discrepancy, because as compared to age matched peers, they must have relatively high confidence to survive medical school and surgical training. We also know that higher scores help in one's ability to avoid negative health behaviors such as smoking or poor diet.[43] From these numbers we can infer that women in plastic surgery are well-equipped to cope with the stressful, time-consuming, and fatiguing nature of a plastic surgery residency.

Baumeister et al. showed that higher self-esteem may have greater persistence in the face of failure, better coping strategies, and higher levels of happiness.[44] In nursing, those with higher self-esteem have been shown to have lower levels of psychological distress, better coping skills, lower emotional exhaustion, and better job satisfaction.[45]

Several factors seem to be protective amongst female plastic surgeons and were associated with higher scores on at least one of the surveys: older age, having children, having a mentor, being an attending or senior resident, and being white as compared to underrepresented minorities. Age and seniority give hope to young surgeons that with passing time, confidence will increase. This finding of increased confidence in older women has been validated in large studies in business as well. A study published in the Harvard Business Review, for example, found that women start out less confident, but show steady increases from their mid-20's until their mid-60's.[46] There seems to be overlap between factors that contribute to both burnout & confidence. For example, having children is protective against burnout,[47] and in our study, is linked to increased confidence scores. Conversely, junior status is associated with increased burnout,[47] and also seems to be associated with lower confidence. Mentorship is promoted as a way to decrease burnout and combat some of the leadership obstacles faced by women plastic surgeons.[4,8,23,47,48] Our participants recognized this, as 74% felt mentorship "helped them advance through their career, and increased professional confidence."

Limitations

Our study does have several limitations, most notably that this is a cross sectional cohort study and lacks a direct control or comparison group. We did not survey an age and training level matched cohort of men, so while the existing literature suggests that male plastic surgeons would have higher survey scores, we do not demonstrate that in this study.[11,13] Given that participation in the survey was voluntary, it is also likely that there is a degree of selection bias among participants. Further, the decision to forward our invitation email to program trainees and female faculty was left up to the program coordinator or director, so select programs lacked any participation. Finally, we found that minority groups were more likely to score lower on the confidence scales, but given low participation from minority groups, we were underpowered to draw meaningful contributions based on race/ethnicity. In the statistical analysis, age showed a strong relationship to number of children and PGY level, thus the effect of each individual variable was difficult to isolate. Future investigations should include matched male respondents, make efforts to recruit underrepresented minorities, and systematic enrollment of all eligible participants.

Conclusion

Awareness around issues of gender parity has been increasing rapidly, particularly in business, where it has been found that diverse teams actually perform better.[49] Academic medicine, however, continues to suffer from the "leaky pipeline" in which few women are represented in senior leadership positions. A recent series of articles in Plastic and Reconstructive Surgery, the Journal of the American Society of Plastic surgeons, addressed issues that women in plastic surgery face, including but not limited to: negotiation, overcoming obstacles to leadership, pregnancy and parenting, gender bias, sexual discrimination, financial planning and retirement and work-life balance.[4,7–9,30,50] Despite growing numbers, women have made little progress towards parity in plastic surgery. They may also be faced with obstacles that disproportionately affect women, including lack of confidence. In a surgical field, where surgeons are, "sometimes wrong, but never in doubt," perceived or real lack of confidence can have detrimental effects on one's performance and career advancement. Not only are women less likely to apply to leadership positions and to publish successfully, they are also less likely to complete surgical residency, and to become board certified.[4,8,10,51] We found that female Plastic Surgeons have much higher confidence than the general population of women and identified several factors that were associated with higher self-esteem. Future investigations should compare confidence in women and men to yield additional insights into the etiology of confidence, any existing confidence gap and its role in the underrepresentation of women, in an effort to support gender parity in academic plastic surgery.

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