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THE ROLE OF GENDER IN ORTHOPEDIC SURGERY: FACTORS INFLUENCING SUBSPECIALTY SELECTION AND MENTORSHIP GAPS

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Abstract
The study studied what affects orthopedic surgeons when they select their subspecialties and included examining perceived difficulty, life factors, teachers and gender. Those taking part gave their gender, age, years of experience and rated the choices influencing their field on Likert scales. Information from 150 people (91 women and 59 men) was looked at using descriptive statistics and two-tailed Student's t-tests (α=0.05). Outcomes showed that gender didn't influence differences in how mentorship, work-life balance, career progress, subspecialty settings, pay, family matters or scheduling influenced their decisions. Yet, women were more likely than men to be affected by views on bodily strength, how subspecialties look, being discriminated against and sharing the workplace with their gender. Approximately one quarter of female respondents said they were discouraged from choosing some subspecialties, compared to only 10% of male respondents ($p<0.05$) and frequent reasons given were adult reconstructive surgery and oncology. Women were more likely to use special strategies during surgery ($p<0.001$) and regularly experienced others thinking they could not do the task. For both genders, mentorship played the most significant part, but there are still many fewer female mentors. Even though it takes time to complete a training pathway, the latest statistics prove there are now more chances for female mentorship in the field. Although women do as well as men in their training and surgery outcomes, the idea of strength continues to limit their choice of subspecialty. Since there are more jobs for orthopedic surgeons now and not many women get involved, it is important to focus on helping female orthopedic surgeons. Women in orthopedic surgery can benefit more from inclusive programs and learning opportunities.

Key words: Gender Disparities, Orthopedic Subspecialty, Mentorship Gaps, Career Development

Introduction

Although more women are going into medical school and residency now, orthopedic surgery is one of the least feminine fields. Data collected now suggest that the vast majority of orthopedic surgeons are male, far fewer than are typically found in other areas of surgery. It is necessary to learn what is causing fewer women to work in orthopedics to fix this problem. Scientists have studied why orthopedics has mostly males working in it. Studies showed that being unfamiliar with orthopedics tended to make racial, gender and cultural minority students believe the field is less welcoming. But after spending time in orthopedics clinics, many minority students said they gained a better idea of

orthopedics accepting all patients. Survey results from more than six hundred medical students said that orthopedics is a tough, mostly men dominated specialty where doctors often work hard for long hours. The level of necessity for strength and the large number of men in the field were rated much more highly by female participants than by male participants. Orthopedics often seems to women like it calls for great physical stamina and lots of men in the field – yet men see it differently. Further research suggests that women are often put off from orthopedics because of worries about how their jobs fit with their personal and family lives, the physical work involved and lack of available mentors. Although numbers of female orthopedic surgeons and residents are increasing year by year, orthopedics is not as inclusive of women as many other surgical fields are. To show, there are more women living in these surgical subspecialties than there are in orthopedics. It looks like, with the present growth in the field, reaching gender equality in orthopedic surgery could take several hundred years. Even though people have worked on reducing gender bias in this field, progress is happening only slowly which means ongoing efforts and new interventions are required to fix the known issues.

There is an opportunity to change the culture of orthopedic surgery because more women are becoming trainees and specialists, but additional knowledge is needed to speed this process. There are also clear gaps when looking at orthopedic subspecialties. In comparison to adult spine and reconstructive procedures, women are more active in pediatric and hand orthopedic practice. Fellowship match outcomes suggest that spine surgery focuses less on women than does pediatrics and the field of foot and ankle. It has been found by looking at survey studies that the choice of subspecialty among female orthopedic surgeons is greatly influenced by how satisfied they are with their job and their intellectual challenges. It appears from other studies that women rate mentorship and intellectual stimulation as more important than men do.

These results give us an early idea of what causes residents to choose certain subspecialties, but this study looks deeper by asking about reasons for unequal participation of men and women in these specialties and by taking into account other factors such as lifestyle, how difficult subspecialties are and encouragement or lack thereof to pursue different specialties. We used this study to assess the role of different factors in choosing which subspecialty of orthopedics doctors enter, based on gender. It also looked at how someone's lifestyle, chances at mentorship and how strong they see themselves influence what subspecialty to enter. In this work, we focus on finding out what influences people to choose their orthopedic specialty and explore if beliefs about physical demands help explain the gender disparity seen in orthopedics.

Methods

The study was designed to cover every practicing orthopedic surgeon living in the target area. Because there isn't an official system to survey licensed orthopedic surgeons, the survey was sent first to residency coordinators at all accredited orthopedic training programs, who then sent it to their current residents and employees by email. In addition, a message about the survey was sent to the association's email list for orthopedic surgeons. Those participating answered questions about their age, gender, experience, how various factors impacted their decision to enter the subspecialty, bias focused on physical strength and perceived difficulty of each area. Their data was organized by gender identity into male and female groups.

Since the number of non-binary respondents was too low for comparisons, one non-binary individual was included in all the analyses, but only the overall group, not those by gender. Since studies published before often relied on two genders, this analysis chose to classify people as male or female for the sake of comparisons. When questions had scaled answers, we used Student's t-tests compare male and female students with a 0.05 level of significance. For such binary question types, a chi-squared test was performed at the same α level.

Result

The survey responses revealed noticeable differences in race, training level, and subspecialty selection between female and male orthopedic surgeons. The majority of both women and men identified as White, non-Hispanic, accounting for 77% of women and 96% of men, with this difference being statistically significant ($p = 0.0002$). No male respondents identified as White, Hispanic, although this may be due to chance ($p = 0.06$). Smaller proportions of respondents identified as Indigenous/Native American, Black, Asian, or Other. Notably, 9% of women identified as Asian, while no male respondents did. Racial representation among other groups was similar across genders. Training levels were comparably distributed between women and men, with residents, fellows, and attending/staff surgeons represented across both groups (Table 2). A larger percentage of women were attendings or staff (69%) compared to men (61%), while a greater proportion of men were residents (34%) compared to women (24%). Fellowship representation was low and similar for both genders (7% women, 5% men). These differences in training levels were not statistically significant ($p = 0.2$). The average age of female respondents was 40 years (range 25–85), slightly younger than males at 43 years (range 26–89), with this age difference reaching statistical significance ($p = 0.04$). Subspecialty choices varied between genders (Table 3). Pediatrics was the most common choice among women (23%), followed by hand surgery (16%) and sports medicine (12%). Among men, sports medicine was most common (15%), followed by adult reconstructive surgery (12%) and hand surgery (12%). Men were more likely to specialize in spine surgery (9%) compared to women (2%). The proportion of undecided surgeons was similar between women (10%) and men (11%). Trauma was more frequently chosen by women (8%) than men (4%), whereas shoulder/elbow surgery was more common among men (5%) than women (2%). These patterns illustrate distinct gender-related trends in subspecialty preferences within orthopedic surgery.Overall, the findings underscore differences between female and male orthopedic surgeons in racial background, career stage, and subspecialty selection, highlighting the importance of considering gender factors in orthopedic education and training programs.

Table 1: Racial Demographics of Survey Respondents

Demographic	Women (n=77)	Men (n=23)	P value
White, non-Hispanic origin	59 (77%)	22 (96%)	0.0002
White, Hispanic origin	5 (6.5%)	0 (0%)	0.06
Indigenous	0 (0.5%)	0 (0%)	0.7
Black	3 (4%)	0 (0%)	0.3
Asian	7 (9%)	0 (0%)	0.02
Other	3 (3.5%)	1 (4.5%)	0.5

Table 2: Training Level Demographics of Survey Respondents

Demographic	Women (n=91)	Men (n=59)	P value
Training Level			0.2
Resident	22 (24%)	20 (34%)	
Fellow	6 (7%)	3 (5%)	
Attending/Staff	63 (69%)	36 (61%)	
Average age (range)	40 (25–85)	43 (26–89)	0.04

Table 3: Subspecialty Demographics of Survey Respondents

Subspecialty	Women (n=91)	Men (n=59)
Undecided	9 (10%)	6 (11%)
Foot/ankle	6 (7%)	4 (6%)
General	1 (1%)	2 (3%)
Hand	15 (16%)	7 (12%)
Adult reconstructive	7 (8%)	7 (12%)

Oncology	5 (6%)	4 (7%)
Pediatrics	21 (23%)	8 (14%)
Shoulder/elbow	2 (2%)	3 (5%)
Spine	2 (2%)	5 (9%)
Sports Medicine	11 (12%)	9 (15%)
Trauma	7 (8%)	2 (4%)
Other	3 (4%)	1 (2%)

Figure 1: Survey Respondents: Racial Demographics, Distribution by Gender (n = 100 total respondents)

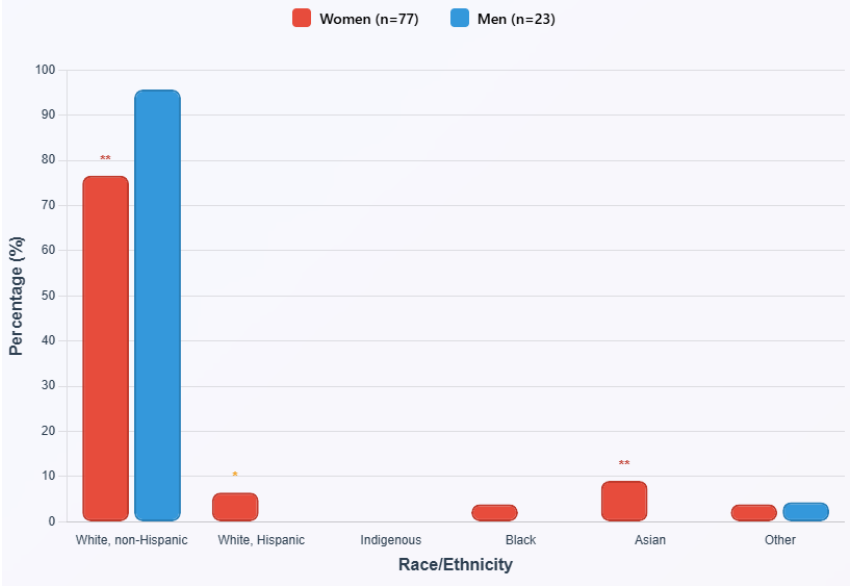


Figure 2: Training Level Demographics by Gender, Distribution and Age Comparison (n = 150 total respondents)

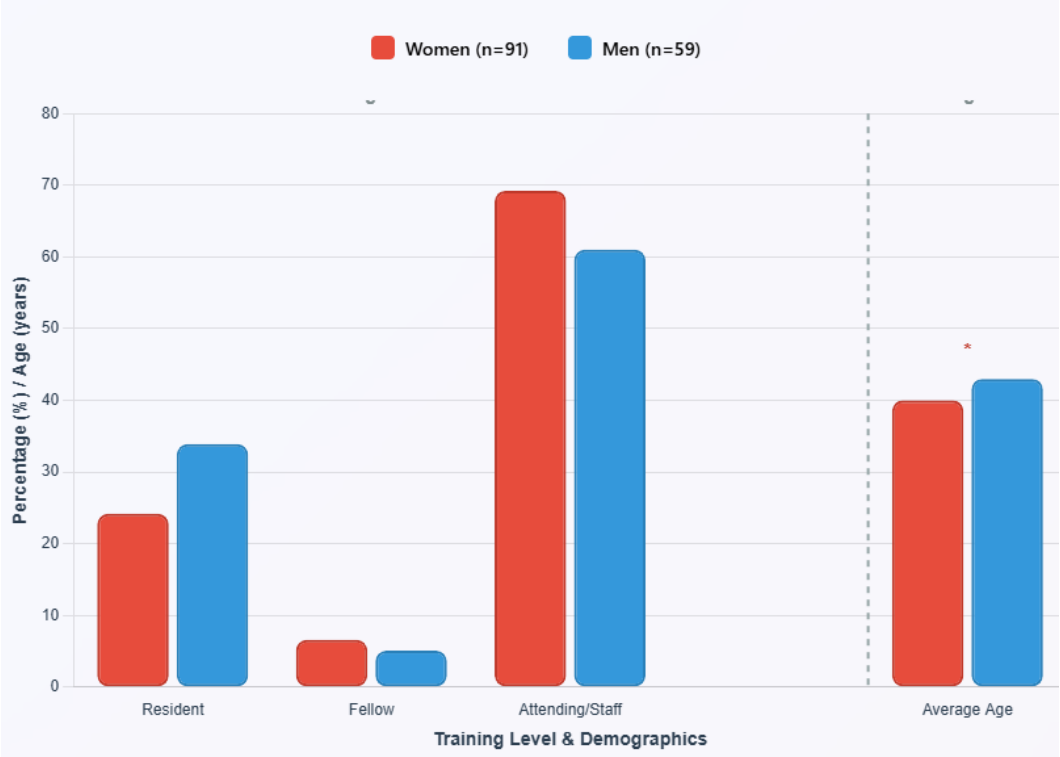
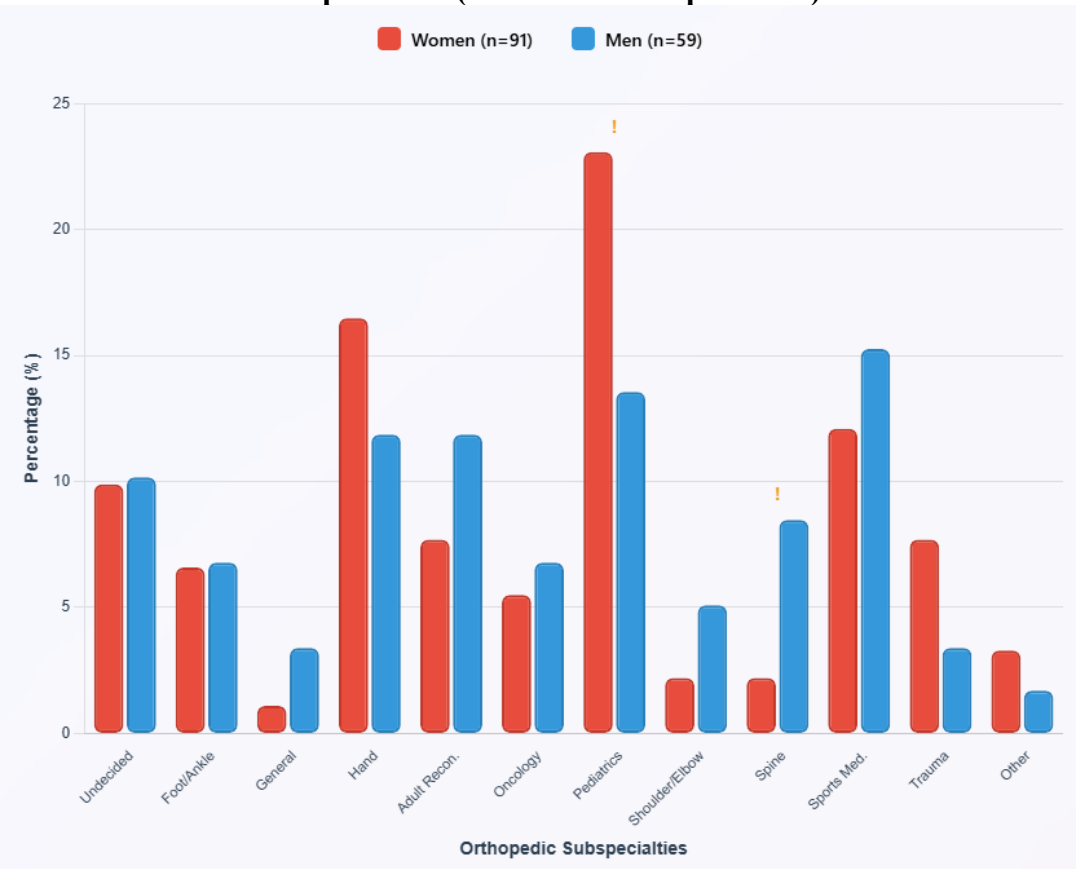


Figure 3: Subspecialty Demographics by Gender, Distribution across Orthopedic Subspecialties (n = 150 total respondents)



Discussion

No matter if they are men or women, respondents said the most important factors in picking their subspecialty were how well-known the specialty was, the possibility of mentoring, a good balance between work and life and career growth. However, women were much more likely than men to mention perceived physical requirements, the feel of the subspecialty, gender discrimination and having companions with the same gender as important factors when making their subspecialty choice. The results agree with previous work that found similar factors limited to orthopedic subspecialty choices. A desire by some female patients to see a female doctor motivates more women to enter orthopedic surgery. Previous studies have found that a majority of patients say they have no preference about their doctor's gender, but those who do tend to prefer a female doctor. During common or private medical visits, diversity among orthopedic experts plays a big role in helping patients trust and enjoy better results. All of this shows that gender matters in choosing surgery subspecialties and that more efforts are needed to reduce connected bias. Women were more likely than men to be urged by others to specialize in hand and pediatric surgery. A similar trend was found among women, who were more discouraged by adult reconstruction and oncology. They may represent uneven access to mentors or different kinds of bias found in them, whether positive or negative. All orthopedic surgeons seem to find mentorship a key factor in selecting their subspecialty. Unfortunately, at present, there are fewer orthopedic mentors who are women than men in the specialty. Since training takes around nine years from start to finish, much of the feedback used today was established years before. The number of female orthopedic surgeons and women appointed to leadership is growing despitet BC. New information collected by orthopedic programs shows that more women are being appointed to assistant program director and program director posts. If these numbers keep rising, it will benefit women who want to become leaders and start closing the mentorship divide in orthopedics. Increasing the number of female mentors is likely one of the best ways to reduce gender differences in orthopedic subspecialties. This hypothesis is

supported by evidence that shows that places that employ more female orthopedic surgeons usually recruit more women in their trainee programs. We already know from research that women in medical school believe perceptions about physical strength matter in their decision to do orthopedics, but it was unknown if such ideas impact female surgeons' decision on their specific specialty. It was clear from the study that women are more likely than men to base their subspecialty choices on how much physical effort the job may require. Both men and women said they used adaptive techniques in the operating room, however, women were more likely to be questioned by healthcare workers about their abilities. Even though male surgeons typically outperform females in overall hand grip force and females have better hand precision, these descriptors have not been linked to variations in surgical results. EqulKnúk, no gender differences were found in assessments of orthopedic residents' performance. It is interesting to note that, according to studies not closely connected to orthopedics, some female doctors accomplish better outcomes after elective procedures than do their male colleagues. More study is needed to learn how colleagues and staff's assumptions about a person's strength affect their views on the subspecialty chosen. Orthopedic surgery continues to employ fairly few women, in spite of the increasing use of orthopedic services. There is a limited number of orthopedic surgeons in several areas and as life expectancy goes up, demand for them will probably grow. Bringing more women into surgery is important for solving shortages in the field and for helping patients receive better treatment. To get highly qualified individuals interested in orthopedic surgery, we have to find and overcome anything that might turn capable people away. It is clear from this study that female surgeons choose their career paths largely influenced by mentors and find the particular requirements of different surgeries to matter a lot. A higher number of women starting to lead in this field gives people the opportunity to help modernize the specialty. Increasing access to mentorship opportunities for women can prompt them to start practicing in areas lacking female experts and thereby help gender equality in the field.

Conclusion

Researchers find that orthopedic surgeons' selection of subspecialty is affected by several aspects and there are noticeable differences between men and women. Both men and women in the study said factors like exposure to a particular subspecialty, support, a good balance between life and work and possible career progress helped them choose their field. In contrast, women ranked perceived challenges in the specialty, the character of the subspecialty, gender bias and gender matching among their colleagues as more important factors when picking their subspecialty. Such findings agree with previous studies and add more evidence that career paths in orthopedic surgery depend on gender. Mentorship was very important in deciding a subspecialty for all surgeons, but finding female mentors is still a difficulty. Because orthopedic surgeons must train for a long period, the current mentorship patterns mostly come from efforts put in place years ago. Increasingly, women hold leadership roles in orthopedics, mainly at the beginning of their careers, suggesting many talented women will become leaders in time. Having more women as mentors may be the best step to even out the gender gap and increase diversity in orthopedic subspecialties. Many women surgeons say their decisions about specialty areas are influenced by their body strength more than male surgeons. Despite using a lot of adaptive methods and seeing no gaps in results or performance by gender while in training, people still make assumptions about women's physical skills in surgery. This points to the importance of additional study of how bias regarding disabilities affects work life and efforts by organizations to accept and challenge ideas about physical differences. Because orthopedic surgery is in greater demand every day, it is worrying that women are still underrepresented. Increasing the number of male and female workers is necessary both to solve staffing problems and to benefit patients by promoting diversity. Growing the number of mentors, attempting to address bias and offering female physicians assistance in fields often dominated by men are all necessary for making faster progress in gender equity. A more diverse, equitable and efficient orthopedic workforce will be possible through educational programs, good examples set by senior surgeons and supportive cultural practices that help female orthopedic surgeons.

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