

# WOMEN IN ORTHOPEDICS AND THEIR FELLOWSHIP CHOICE: WHAT INFLUENCED THEIR SPECIALTY CHOICE?

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## ABSTRACT

**Background:** Female orthopedic surgeons have different life choices, experiences, and influences that may alter their decisions when choosing a fellowship. There is no data that describes why women choose their specialty and if it is related to their mentorship, athletic background, family, family planning, physical attributes needed, location, practice setting, or discrimination.

**After a five year orthopedic residency, what influences their specialty choice to work in a specific field?**

**Questions/purposes:** To understand why women in orthopedics chose a certain fellowship and if they are influenced by any specific factor.

**Methods:** A 28 question survey created through SurveyMonkey was emailed to all members of the Ruth Jackson Orthopedic Society (RJOS) in July 2019. After six weeks the survey was closed and data was analyzed through SurveyMonkey.

**Results:** 252 members of RJOS completed the 28 question survey. 94% of the women who responded did a fellowship after their orthopedic residency. 62% chose their fellowship specialty based on pure enjoyment. 79% were not influenced by a female role model, 92% were not influenced by a significant other, 85% were not influenced by wanting children or a family, and 96% were not influenced by being pregnant or planning on being pregnant. 64% were not influenced by physical attributes or perception of strength needed for the specialty.

**Conclusions:** 94% of the women who responded did a fellowship after their orthopedic residency and 62% chose their fellowship specialty based on pure enjoyment. It was not found that female mentorship, family, pregnancy, significant other, or

physical attributes contributed to their fellowship choice.

**Level of Evidence:** V

**Keywords:** orthopedics, women, fellowship, residency, ruth jackson orthopedic society, specialty

## INTRODUCTION

The majority of orthopedic residents pursue fellowship training.<sup>1</sup> The percentage of female residents has been consistent over the years at 14%.<sup>2</sup> Details regarding females in orthopedic fellowships are sparse. Cannada et al. found using the latest match data that the percentage of female applicants that matched were 8%-12% from 2010-2014. This was the most recent article to publish match data due to the difficulties of distinguishing genders on the SF match and ASES match applications. Both applications do not list gender, therefore first names and letters of recommendation were used. In their study, the women matched at a higher rate than men.<sup>3</sup>

Why women choose a certain fellowship specialty has not been reported. It is important to understand why women choose certain fellowships over others. It has been discussed women may not apply to orthopedic residencies due to work/life balance or physical strength perception.<sup>4</sup> How does this relate to women already in an orthopedic residency and now are deciding on a certain fellowship for a specialty they will focus on for another year?

Cannada et al. found pediatrics had the highest proportion of female applicants (25%) and spine had the lowest (3%). There is no study at this time that demonstrates the reasoning behind these statistics. A 28 question survey was sent to members of the Ruth Jackson Society (RJOS) to discover a better understanding as to why women choose a certain fellowship over another.

## METHODS

A 28 question survey was created through SurveyMonkey (Figure 1).

Questions included: Was there an influence from being in the military or a college athlete? Were they brought up in a family that consisted of a surgeon? Were there mentorships from a female role model along the way? Did their desire to have a family influence their choice of which fellowship they decided on? Did pregnancy

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1. What is your age?
  - a. 30-34
  - b. 35-39
  - c. 40-44
  - d. 45+
2. What is your ethnicity?
  - a. White or Caucasian
  - b. Black or African American
  - c. Hispanic or Latino
  - d. Asian or Asian American
  - e. American Indian or Alaska Native
  - f. Native Hawaiian or other Pacific Islander
  - g. Another race
3. What is your marital status?
  - a. Single (never married)
  - b. Married
  - c. Domestic partnership
  - d. Divorced
  - e. Widowed
4. Have you ever served in the military?
  - a. Yes
  - b. No
5. Were you a college athlete?
  - a. Yes
  - b. No
6. Do you have any family members that were surgeons?
  - a. Yes
  - b. No
7. How many publications do you have?
  - a. 0
  - b. 1-5
  - c. 5-10
  - d. 10+
8. Did you do a fellowship?
  - a. Yes
  - b. No
9. What fellowship did you go into?
 

a. Adult Reconstruction	f. Spine
b. Foot and Ankle	g. Sports
c. Hand	h. Trauma
d. Oncology	i. Shoulder and Elbow
e. Pediatrics	
10. Did you pursue a second fellowship?
  - a. Yes
  - b. No
11. What was your second fellowship?
  - a. Adult Reconstruction
  - b. Foot and Ankle
  - c. Hand
  - d. Oncology
  - e. Pediatrics
  - f. Spine
  - g. Sports
  - h. Trauma
  - i. Shoulder and Elbow
  - j. I did not do a second fellowship
12. Why did you pursue a fellowship?
  - a. Enjoy the subspecialty
  - b. Felt like you needed additional training in this field and did not receive adequate training in your residency
  - c. Desirable to do a fellowship for job market
  - d. It was suggested by others (fellow residents, mentor, program director, attending, etc)
  - e. Other \_\_\_\_\_
13. Were you influenced by a female role model when you made your fellowship choice?
  - a. Yes
  - b. No
14. Who was this female role model?
  - a. Program Director
  - b. Attending
  - c. Educator
  - d. Family Member
  - e. I did not have a female role model
  - f. Other \_\_\_\_\_
15. When did you decide on a fellowship choice?
  - a. Medical School
  - b. PGY 1/2
  - c. PGY 3/4
  - d. Other \_\_\_\_\_
16. Did a significant other/ partner influence your fellowship choice?
  - a. Yes
  - b. No
17. Did your desire to have children/ family influence your fellowship choice?
  - a. Yes
  - b. No
18. Did pregnancy (pregnant at time of fellowship/ or planning to be) influence your fellowship choice?
  - a. Yes
  - b. No
19. Did any of these physical aspects contribute to your fellowship choice?
  - a. Standing for majority of cases
  - b. Sitting for majority of cases
  - c. Case duration
  - d. Perception of strength needed
  - e. None of these contributed to my choice
  - f. Other \_\_\_\_\_
20. Did your desired practice setting (full time/part time) influence your fellowship choice?
  - a. Yes
  - b. No
21. Are you full time or part time?
  - a. Full time
  - b. Part Time
  - c. Other \_\_\_\_\_
22. What type of job did you go into?
  - a. Private practice
  - b. Hospital Employee
  - c. Hybrid
  - d. Academic
  - e. Other \_\_\_\_\_
23. Did geographic location influence your choice?
  - a. Yes
  - b. No
24. If location did influence your choice, why?
  - a. Close to family/friends
  - b. Familiar with location
  - c. Based choice off of climate
  - d. Other \_\_\_\_\_
25. Did you ever feel discriminated against (bullied harassed, sexually harassed) when pursuing/interviewing for fellowship?
  - a. Yes
  - b. No
26. If yes, what was the context?
  - a. Bullied
  - b. Harassed
  - c. Sexually Harassed
  - d. Other \_\_\_\_\_
27. Were you ever asked any negative questions during your fellowship interview process? Ex. Marital status, maternity leave, etc.
  - a. Yes
  - b. No
28. If yes, what was it pertaining towards
  - a. Significant other/partner
  - b. Marital status
  - c. Pregnancy plans
  - d. Maternity leave
  - e. Other \_\_\_\_\_

**Figure 1. Women in orthopedics survey.**

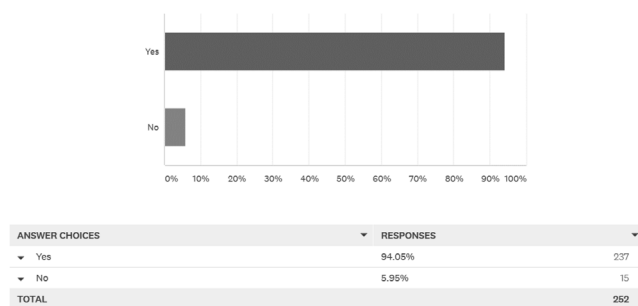


Figure 2. Did you do a fellowship?<sup>9</sup> Answered 252.

influence their choice, either at the time or in the future? Did they have a significant other that influenced their choice? Did physical aspect of a specialty influence their choice, for example standing for cases, sitting for cases, case duration, and perception of strength? Did lifestyle or desired practice setting influence their choice, for example full time, part time, private practice, hospital employed, academic. Did their location influence their choice, for example close to family/friends, familiarity, or climate. Or did the process of fellowship influence their choice? Were they ever discriminated against when pursuing a fellowship or interviewing for a fellowship, for example bullied, harassed, or sexually harassed.

The survey was emailed to RJOS members in July 2019. Members of RJOS were given the opportunity to complete the survey up to 6 weeks. The data was then collected through SurveyMonkey analysis.

### RESULTS

The survey was completed by 252 members of RJOS between July-September 2019. Of the 252 responses, 94% did a fellowship and 19% of those individuals did a second fellowship (Figure 2).

For the demographics, 20% were between 30-34 years old, 31% 35-39 years old, 15% 40-44 years old, and 34% were 45+. 84% of the respondents were Caucasian, 7% Asian or Asian American, 4% Hispanic/Latino, 2% African American, and 3% chose “another race”.

70% of the respondents were married, 17% single (never married), 8% divorced, 4% in a domestic partnership, and 1% widowed. 7% of the women served in the military at some point in time.

88% of the respondents are working full time. 22% are working private practice, 16% are hospital employed and 42% are in an academic practice.

Overall 62% chose their fellowship based on their enjoyment of the sub specialty, with 67% of the women making their decision as a PGY 3/4 during residency. 17% felt it was desirable for the job market and 12% felt they needed additional training in their chosen fellowship. The most popular choice of fellowship was hand 23% and

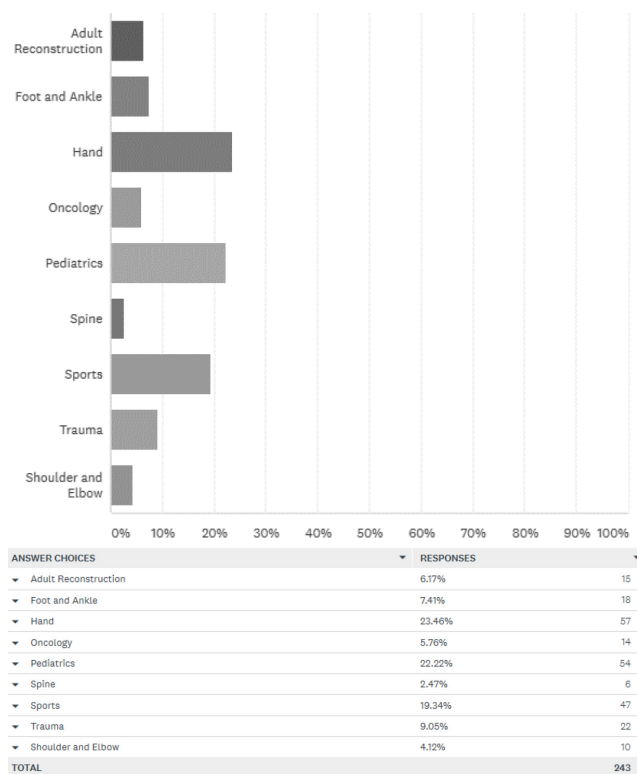


Figure 3. What fellowship did you go into?<sup>9</sup> Answered: 243.

pediatrics 22%, and the least was spine 2% (Figure 3).

The 19% of females that chose to do a second fellowship completed a shoulder and elbow (40%) or oncology (36%) fellowship initially. 20% of the shoulder and elbow trained completed a second fellowship in hand and 15% of those completing an oncology fellowship did a second fellowship in adult reconstruction or pediatrics.

Only 21% were influenced by a female role model, 15% of which were a female attending. Therefore 79% were not influenced by a female role model at any stage during their training. When making their fellowship choice, 92% were not influenced by a significant other, 85% were not influenced by wanting children or a family, and 96% were not influenced by being pregnant or planning on being pregnant.

Overall 81% were not influenced by their desired practice setting or type. 67% were not influenced by geographic location.

We asked if physical attributes of the specialty contributed to their choice. Overall 2% chose standing for the majority of the case, 9% chose sitting, 16% chose case duration, and 9% chose perception of strength, 64% selected “other” in which the comments the majority of women wrote “no”. Of women who did hand fellowships 29% answered sitting for the majority of the case and 12% perception of strength.

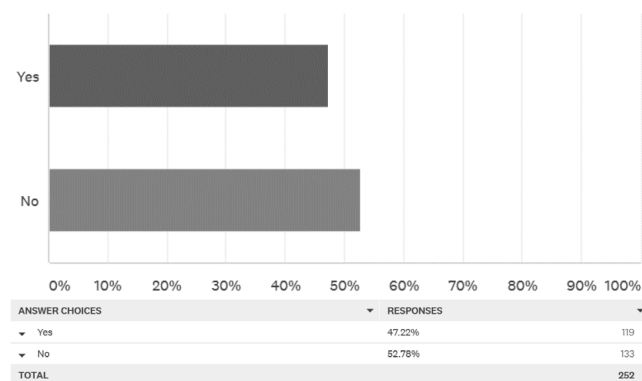


Figure 4. Were you a college athlete?<sup>9</sup> Answered: 252.

47% were a college athlete (Figure 4). Of the college athletes, 96% did a fellowship and 25% did a sports fellowship. 16% had a family member that was a surgeon (Figure 5). Of the women who had a family member that was a surgeon, 61% were college athletes, 100% did a fellowship with 20% completing a hand fellowship.

Overall, 39% of the respondents had 10+ publications at the time they answered the survey, with 86% of those being women who did an oncology fellowship.

During the fellowship process or interviewing, 18% felt discriminated (bullied, harassed, or sexually harassed). Of the 18%, 83% were women pursuing spine fellowships and stated 50% of their discrimination was from harassment. 39% overall had negative questions asked (marital status or maternity leave) during the interview process, again 83% were women pursuing a spine fellowship, with 33% of the questions asking about a significant other or marital status, 17% asking about pregnancy.

## DISCUSSION

Why women choose a certain fellowship has not been reported previously. The influences throughout the life of a female orthopedic surgeon differs from the male with the choices they have to make with work/life balance, pregnancy, and family. This has been a hypothesis why women do not apply to orthopedic residencies to begin with.<sup>4</sup> However, our results found these life choices of family, pregnancy, and significant other did not influence their choice of their fellowship specialty. This could be due to the fact a fellowship involves only one year of training.

With 47% of the women being college athletes, it is apparent this is an influence on choosing orthopedics and demonstrates a relationship with a fellowship choice. With 25% of those who responded “yes” to a college athlete did a sports fellowship.

Mentorship from a female was listed as not influential in choosing a fellowship by 79%. It has been widely

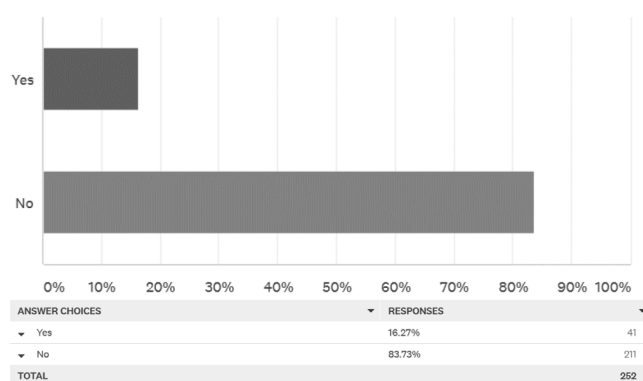


Figure 5. Do you have any family members that were surgeons?<sup>9</sup> Answered: 252.

reported having a female role model is important in choosing a career in orthopedics.<sup>1,5,7,8</sup> Many programs are developed to encourage exposure to females as role models for a career in orthopedics.<sup>7,8</sup> Yet for fellowship choice, the respondents indicated having a female mentor was not a significant influence in their decision.

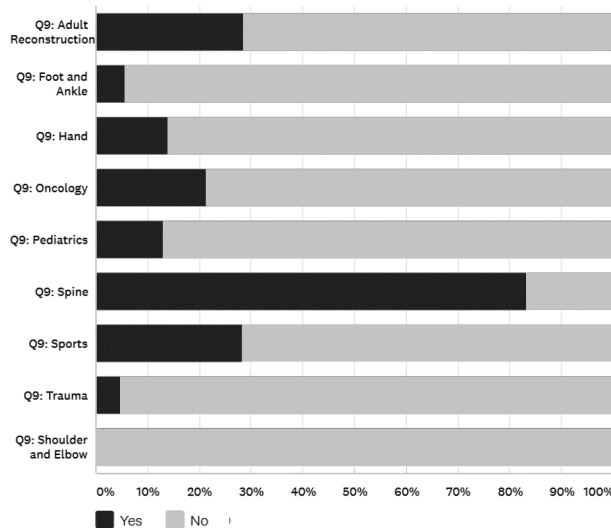
It was interesting to see 16% of these women had a family member that was a surgeon. It was not asked what gender the family member was or what specialty they were in, but 100% of these women that had a family member that was a surgeon did a fellowship.

Our survey also brings light to the negative aspect of the fellowship application process for women. 18% felt they were being discriminated against and 39% were asked negative questions related to marital status, pregnancy, or maternity leave. The most common negative questions a study done by Bohl from 1971-2015 were associated with pregnancy (29.7%), raising children (37.9%), and marital status (32.4%) during residency.

Overall, 61.7% of participants were asked an inappropriate question during an interview and only 1.4% were reported the incident to authorities. In a study by Mulchaey, 59.5% reported they experienced bias from co-residents about women having children during residency and 49.5% reported bias from their attendings.

We did not ask if these negative questions/discriminations altered or changed their fellowship choice specialty. With the majority of these women who felt discriminated against or were asked negative questions, they were women who did a spine fellowship (Figure 6). With 2% of women in spine fellowships further research needs to be pursued if this is a causal relationship as to why more women do not pursue spine.

With 94% of these women doing a fellowship and 62% selecting their choice base on pure enjoyment of the subspecialty this may correlate with the findings from Kavolus that intellectual stimulation was one of the major reasons behind selecting a fellowship.



	YES	NO	TOTAL
Q9: Adult Reconstruction	28.57% 4	71.43% 10	5.83% 14
Q9: Foot and Ankle	5.56% 1	94.44% 17	7.50% 18
Q9: Hand	14.04% 8	85.96% 49	23.75% 57
Q9: Oncology	21.43% 3	78.57% 11	5.83% 14
Q9: Pediatrics	12.96% 7	87.04% 47	22.50% 54
Q9: Spine	83.33% 5	16.67% 1	2.50% 6
Q9: Sports	28.26% 13	71.74% 33	19.17% 46
Q9: Trauma	4.76% 1	95.24% 20	8.75% 21
Q9: Shoulder and Elbow	0.00% 0	100.00% 10	4.17% 10
Total Respondents	42	198	240

Figure 6. Did you ever feel discriminated against (bullied, harassed, sexually harassed) when pursuing/interviewing for fellowship?<sup>9</sup>

**Limitations**

Our survey did not break up the responders by age/date they went through their fellowships, therefore fellowship choice could have been altered by when they were pursuing their fellowship. We also only sent the survey to women in RJOS and had 253 responses.

Therefore, this may not include all of the female members of RJOS or represent the entirety of all female orthopedic surgeons.

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**REFERENCES**

1. **Mead M, Atkinson T, Srivastava A, Walter N.** The Return on Investment of Orthopaedic Fellowship Training: A Ten- year Update. *J Am Acad Orthop Surg.* 2019 Oct 29.
2. **Van Heest AE, Fishman F, Agel J.** A 5-Year Update on the Uneven Distribution in Orthopedic Surgery Residency Training Programs in the United States. *J Bone Joint Surg Am.* 2016 Aug 3;98(15):e64

3. **Cannada, Lisa K.** “Women in Orthopaedic Fellowships: What Is Their Match Rate, and What Specialties Do They Choose?” *Clin Orthop Relat Res.* 2016 474,9: 1957-61.
4. **Rohde R, Wolf JM, Adams JE.** Where are the Women in Orthopedic Surgery? *Clin Orthop Relat Res.* 2016 474:1950-1956
5. **Kavolus J, Matson A, Byrd W, Brigman B.** Factors Influencing Orthopedic Surgery Residents’ Choice of Subspecialty Fellowship. *Orthopedics.* 2017;40(5):e820- e824
6. **Bohl DD, Iantorno SE, Kogan M.** Innapropriate Questions Asked of Female Orthopedic Surgery Applicants From 1971 to 2015: A Cross-sectional Study. *J Am Acad Orthop Surg.* 2019 Jul 15;27(14):519-526.
7. **Pellegrini VD Jr.** Mentoring during residency education: a unique challenge for the surgeon? *Clin Orthop Relat Res.* 2006;449:143-148
8. **Lattanza LL, Meszaros-Dearolf L, O’Connor MI, Ladd A, Bucha A, Trauth-Nare A, Buckley JM.** The Perry Initiative’s Medical Student Outreach Program Recruits Women Into Orthopaedic Residency. *Clin Orthop Relat Res.* 2016 Sep;474(9):1962-6.
9. SurveyMonkey Inc. San Mateo, California, USA www.surveymonkey.com