

By Invitation: Asmar Diversity in Sports Medicine and Rehabilitation

## Persistent Lack of Female Orthopaedic Sports Medicine Fellows

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**Purpose:** To evaluate the gender composition of fellows, faculty, and leaders within orthopaedic sports medicine fellowship programs to provide a more complete description of gender diversity within this subspecialty. **Methods:** Official program websites of orthopaedic sports medicine fellowships listed on the Arthroscopy Association of North America fellowship directory were examined. Data collected for analysis included the gender of program directors, fellowship faculty, orthopaedic surgery department faculty, current sports medicine fellows, and fellows who graduated within the last 5 years. **Results:** Of the 132 orthopaedic sports medicine fellows in training in the United States in the 2021 to 2022 academic year, 113 (85.6%) were men and 19 (14.4%) were women ( $P < .001$ ). Within the past 5 years, 419 fellows were listed as completing a sports medicine fellowship, with 375 (89.5%) being men, and 44 (10.5%) being women ( $P < .001$ ). There was no significant difference in the gender composition of current fellows compared with the composition of fellows within the last 5 years ( $P = .74$ ). When we examined gender trends in sports medicine faculty, 639 (86.6%) were men and 99 (13.4%) were women ( $P < .001$ ). There were 14 women (14.4%) orthopaedic sports medicine faculty in leadership positions (i.e., program director or assistant program director) compared with 83 men in such positions (85.6%) ( $P < .001$ ). **Conclusions:** Orthopaedic sports medicine fellowships remain heavily male-dominated on all levels, including fellows, faculty, and leadership. There were no differences in the gender composition of current fellows when compared with those who graduated in the last 5 years, suggesting persistent gender disparity and the need for novel initiatives to enhance gender diversity in sports medicine. **Level of Evidence:** IV, descriptive study.

The percentage of women in medical school has risen from 46.9% to 50.5% between 2015 and 2019.<sup>1</sup> However, the field of orthopaedic surgery has

largely remained male-dominated. A 15-year report on the uneven distribution of women in orthopaedic surgery residency training programs in the United States showed that the mean percentage of female trainees from 2004 to 2009 was 11.6%, whereas from 2009 to 2014, the percentage increased to 13.6%, and from 2014 to 2019, there were no statistically significant improvements in increasing gender diversity in orthopaedic surgery residency training.<sup>2</sup>

In 2020, amongst the 7 surgical specialties (i.e., orthopaedic surgery, neurosurgery, ophthalmology, otolaryngology, plastic surgery, general surgery, and urology), orthopaedic surgery had the lowest representation of women residents, comprising only 16% of overall orthopaedic residents (700 of 4,342).<sup>3</sup> Comparatively, the percentage of women represented overall amongst the combined other 7 surgical specialties was 33% (6,879 of 20,788).<sup>3</sup> This suggests unique barriers to enhanced gender diversity are related to orthopaedics specifically, rather than environmental factors shared by all surgical fields, such as intense and challenging work hours.<sup>2,4-6</sup> Gender itself is a nonbinary identity that is subjective and self-ascribed,

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and therefore studying gender equity can be challenging.

Less research has focused on gender diversity within orthopaedic surgery fellowships when compared with residencies. The fellowships after orthopaedic surgery are adult reconstruction or arthroplasty, foot and ankle, hand and upper extremity, orthopaedic trauma, pediatric orthopaedics, oncology, spine, and sports medicine. Previous data from Kamalpathy et al.<sup>7</sup> show that among 87 active sports medicine fellowship programs, 98.9% (87) were led by male fellowship directors and 1 (1.1%) was led by a female fellowship director. However, there is lack of current data analyzing the gender composition of both faculty and fellows in sports medicine fellowships. As change can only occur if disparities are researched and acknowledged, knowing the current gender composition of fellows and faculty within sports medicine programs is important for gender equity efforts.

The purpose of this study was to evaluate the gender composition of fellows, faculty, and leaders within orthopaedic sports medicine fellowship programs to provide a more complete description of gender diversity within this subspecialty. We hypothesized that both the current and 5-year gender diversity of fellows within sports medicine orthopaedic fellowships would be heavily male skewed. We predicted that a male preponderance would also exist in faculty and leadership within sports medicine fellowship programs.

## Methods

This is a descriptive study examining the gender composition of fellows, faculty, and leadership within sports medicine fellowships. The 97 orthopaedic sports medicine fellowships in the United States listed on the Arthroscopy Association of North America (AANA) fellowship directory were analyzed. Programs were limited to orthopaedic-based sports medicine fellowships. Therefore, primary care sports medicine fellowships were excluded from this analysis. All fellowship programs were accredited by the Accreditation Council for Graduate Medical Education except for Yale School of Medicine Division of Sports Medicine and John A. Feagin Jr. Sports Medicine Fellowship. The geographic location and private versus academic structure of programs was noted.

Data were collected in February of 2022 from the official program website, as listed in the AANA fellowship directory. Data gathered included program-specific information such as gender of the program director, fellowship faculty, orthopaedic surgery department faculty, current fellows, and fellows within the last 5 years. Gender was determined using methods demonstrated by the previous research of Okike et al.<sup>8</sup> and Grandizio et al.,<sup>9</sup> with gender being categorized on the basis of name and/or photograph attached. If a

person's gender could not be determined by this method, then they were excluded from analysis. Two fellows were excluded from analysis due to this reason. The number of women in leadership positions (i.e., program director or assistant program director) within the sports medicine fellowship was collected from the official program website, as well as the presence or absence of a women's sports medicine program.

Descriptive statistics of demographic trends in program directors, faculty, fellows, and geographic region, and presence of a women's sports medicine program were analyzed. Continuous variables were assessed via mean and standard deviation, whereas categorical variables such as differences between numbers of men versus women fellows or faculty were assessed via chi square analysis. A significant *P* value was assigned as *P* < .05.

## Results

### Program Characteristics

Ninety-seven orthopaedic sports medicine fellowship programs were listed on the AANA directory and included in this study. Programs displayed considerable geographic diversity, with 23 programs in the Northeast (23.7%), 24 in the Midwest (24.7%), 26 in the South (26.8%), and 24 in the West (24.7%). Of these programs, 59 were academic (60.8%), 32 were private (33%), 1 was military-based (1%), and 5 were other/unspecified (5.2%). A women's sports medicine program was available at 15 institutions (15.5%), whereas 77 (79.4%) did not have this, and 5 (5.2%) were unspecified (Table 1).

**Table 1.** Characteristics of Analyzed Sports Medicine Fellowship Programs

Program Characteristics	Number of Programs, n	% of Programs
Geographic region*		
Northeast	23	23.7%
Midwest	24	24.7%
South	26	26.8%
West	24	24.7%
Practice setting		
Academic	59	60.8%
Private	32	33%
Military	1	1%
Unspecified	5	5.2%
Women's sport's medicine program		
Present	15	15.5%
Absent	77	79.4%
Unspecified	5	5.2%

\*Geographic regions were defined as such: Northeast (ME, NH, VT, MA, RI, CT, NY, NJ, and PA), Midwest (IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, and WI), South (AL, AR, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV), and West (AK, AZ, CA, CO, HI, ID, NV, NM, MN, OR, UT, WA, WY).

**Table 2.** Gender Composition of Sports Medicine Fellowship Program Fellows, Alumni, and Faculty

	Average No. of Men	Average No. of Women	P Value	Mean Difference (95% Confidence Interval)
Current fellows	2.30	0.30	<.001	2.00 (1.57-2.43)
Annual fellows past 5 years	2.11	0.27	<.001	1.84 (1.34-2.34)
Sports medicine faculty	7.52	1.16	<.001	6.35 (5.20-7.51)
Nationwide general orthopaedic faculty	38.72	6.35	<.001	32.37 (25.01- 39.73)

What Is the Current Gender Diversity of Fellows Within Sports Medicine Orthopaedic Fellowships and How Does This Compare With the Gender Diversity Within the Last Five Years?

The gender composition of sports medicine fellows for the 2021–2022 academic year was 113 men (85.6%) and 19 women (14.4%) ( $P < .001$ ), as shown in Table 1. When we analyzed orthopaedic sports medicine fellows within the past 5 years, overall, there were 375 men (89.5%) and 44 women (10.5%) ( $P < .001$ ). Therefore, 75 male fellows and 8 female fellows were trained on average per year within the last 5 years. There was no difference in the gender composition of the current years' fellows compared to the composition of fellows within the last 5 years ( $P = .74$ ).

What Is the Current Gender Diversity of Faculty and Leadership Within Sports Medicine Fellowship Programs?

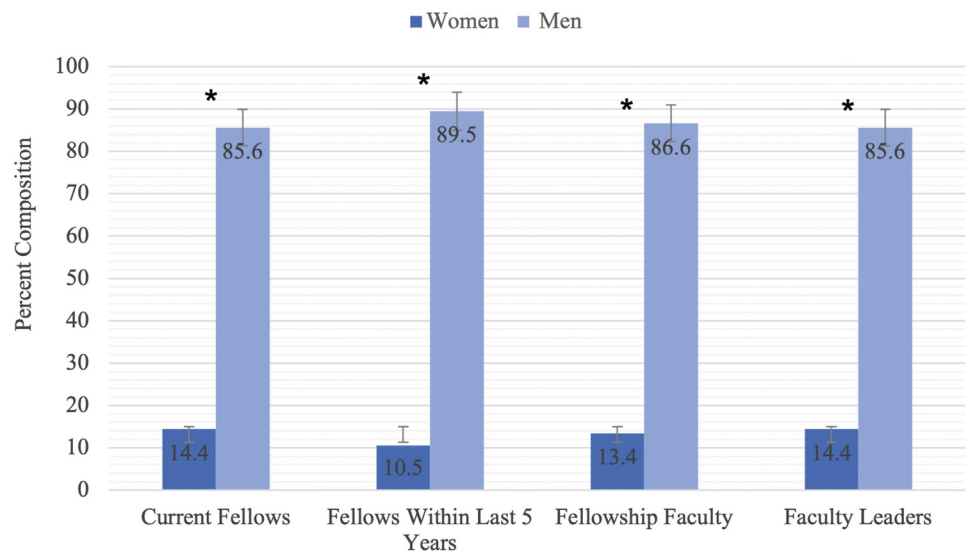
There were 3,214 (86%) male faculty members in general orthopaedic surgery departments across all institutions analyzed and 521 female faculty members (14%) ( $P < .001$ ). When analyzing sports medicine fellowship faculty specifically, there were 639 men (86.6%) and 99 women (13.4%) ( $P < .001$ ). Table 2 shows the gender composition of sports medicine faculty in 2021–2022. There were 14 total women

(14.4%) orthopaedic sports medicine faculty in leadership positions (i.e., assistant program director or program director) compared with 83 men (85.6%) ( $P < .001$ ). These differences are further demonstrated in Figure 1.

## Discussion

This study reveals an overall lack of gender diversity in orthopaedic sports medicine fellowship programs and faculty which ultimately affirmed our hypothesis. The under-representation of women in sports medicine is evident by the low percentages of current and past women fellows. Women accounted for 10.5% of all fellows (44 of 419) within the last 5 years and 14.4% of fellows in the 2021-2022 academic year. A recent study by Klyce et al.<sup>10</sup> demonstrated similar numbers of women sports medicine physicians, with women comprising 12% of sports medicine faculty in 2015-2017. Although the comparison of gender diversity within the last 5 years to the 2021-2022 academic year was not significantly different, our study demonstrated a 3.9% increase in women sports medicine fellows during this period (10.5%-14.4%), suggesting gender diversity may slowly be trending in a more balanced direction.

**Fig 1.** Gender distribution of fellows, faculty, and leaders in orthopaedic sports medicine fellowship programs. Shown is the percentage of men (light blue) and women (dark blue) fellows and faculty in sports medicine fellowship programs that were examined. The asterisk indicates significance ( $P < .05$ ).



When comparing gender diversity amongst all orthopaedic subspecialty fellowships, sports medicine is neither the least nor most diverse subspecialty. Klyce et al.<sup>10</sup> found that women comprised 32% of pediatric orthopaedic surgeons, followed by hand surgeons (20% women), and sports surgeons (12% women). In this study, orthopaedic faculty with sports fellowships had greater gender diversity (12% women) than spine (5%) and adult reconstruction (3%) fellowship trained physicians, suggesting sports medicine is middle of the road for diversity compared to the other orthopaedic subspecialties.<sup>11</sup> The low gender diversity seen in these subspecialties is likely related to the persistent gender disparity in orthopaedic surgery residency programs, as residents comprise the pool of fellowship applicants. Only 15.4% of orthopaedic surgery residents were women in 2018-2019; therefore, enhancing fellowship gender diversity largely depends on recruiting more women within such residency programs.<sup>11</sup>

Our study also found a lack of gender diversity among sports medicine fellowship faculty. Only 14.4% of orthopaedic sports medicine faculty members were women, with this gender disparity persisting into leadership positions as well. Grandizio et al.<sup>9</sup> evaluated the gender diversity of leaders within orthopaedic fellowship programs. The authors found that only 3% of sports medicine fellowship program directors were women, thus supporting our finding of a lack of gender diversity in faculty leadership. Our study demonstrated a greater percentage (14.4%) of women sports medicine fellowship leaders. However, this number is likely higher due to including assistant program director in our consideration of leadership, which was not considered in the work by Grandizio et al.<sup>9</sup> In contrast to sports medicine, orthopaedic oncology was the fellowship with the greatest percentage of female faculty leadership (27%), followed by hand surgery (13%). However, programs with a female fellowship director did not have a greater percentage of female fellows compared with programs with a male program director (26% vs 25%).<sup>10</sup> It is unclear whether greater female faculty presence leads to the recruitment of more female fellows.

### Possible Solutions

It is important to increase the representation of women in orthopaedic sports medicine to improve the doctor–patient relationship, promote cultural competency, and maximize patient satisfaction. Studies show that patients prefer treatment by physicians of the same gender, and in orthopaedics, women undergo greater rates of orthopaedic surgical interventions than men.<sup>12,13</sup> Therefore, efforts should be made to make sports medicine more representative of the communities that they serve.

In a survey distributed to members of the Ruth Jackson Orthopaedic Society, the most common reasons cited for a woman's lack of interest in orthopaedic surgery were perceived lack of work/life balance, perception that too much physical strength is required, and lack of strong mentorship.<sup>6,7</sup> However, outreach efforts and clinical experiences to discredit stereotypes that may discourage women from considering orthopaedics, as well as enhancing women's sense of "belonging" in the field, may have contributed to the upward trend in the percentage of female orthopaedic surgery residents and the number of residency programs with greater than 20% female residents.<sup>14,15</sup>

Belk et al.<sup>16</sup> described several strategies for increasing representation of women and minorities. These strategies consist of intentional recruitment of women and minorities by individuals responsible for position appointment, mentoring programs, and considering term limits to reduce the time frame an individual is allowed to serve as a fellowship director.<sup>17</sup> Our study demonstrates the increased need for innovative strategies in recruiting not only women fellows, but women faculty and leaders within sports medicine. We show that although positive trends exist, there have not been significant changes in gender diversity over the past 5 years, indicating that the rate of change, if any, for increasing gender diversity in orthopaedic sports medicine training is slow.

### Limitations

Our study has several limitations. First, we used publicly available data from orthopaedic sports medicine fellowship websites. Although most programs had current listings of their program faculty, and fellows, some data were not available or could be outdated. Since 2 fellows were excluded from analysis due to unknown gender, and many programs did not publish certain data pertaining to its demographics (gender make-up, race, etc.), our demographic data are not an exact representation of all the orthopaedic sports medicine fellowship programs in the country. For the purposes of this research, gender determinations were made based on the provided gender demographics by each program and limited to the gender binary and thus are subject to error or misclassification. We acknowledge that gender is nonbinary and determined by only one's own self rather than from an outsider's classification. Therefore, we did not capture the full spectrum of representation.

### Conclusions

Orthopaedic sports medicine fellowships remain heavily male-dominated on all levels, including fellows, faculty, and leadership. There were no differences in the gender composition of current fellows when compared with those who graduated in the last 5 years, suggesting persistent gender disparity and the need for

novel initiatives to enhance gender diversity in sports medicine.

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