



Systematic Review

Women in leadership in orthopaedic sports medicine societies throughout the world

Grace Tanguilig^a, Jade Meyers^a, Victoria K. Ierulli^a, Laurie Hiemstra^{b,c}, Mary K. Mulcahey^{d,*}^a Tulane University School of Medicine, New Orleans, LA, 70112, USA^b Banff Sport Medicine, Alberta, T1W 0L5, Canada^c University of Calgary, Calgary, Alberta, T2N 1N4, Canada^d Department of Orthopaedic Surgery & Rehabilitation, Loyola University Medical Center, 60153, USA

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ABSTRACT

Objectives: The proportion of women in orthopaedic surgery is low compared to other specialties, despite equal numbers of male and female students entering the medical profession. This gender disparity persists across various aspects of orthopaedic sports medicine, such as academic leadership, medical education, and on the sidelines. The purpose of this study was to conduct a comprehensive and updated global analysis of female representation in leadership positions within orthopaedic sports medicine and arthroscopy societies throughout the world.

Methods: Publicly available websites for orthopaedic sports medicine societies throughout the world were evaluated. For societies that met inclusion criteria, the following data were collected: types of leadership positions available and breakdown of male and female orthopaedic surgeons in those positions.

Results: There were a total of 55 societies analyzed from North America (5, 9.1%), South America (8, 14.5%), Europe (18, 32.7%), Asia (13, 23.6%), Africa (2, 3.6%), the Middle East (3, 5.5%) and Australia (3, 5.5%), as well as 3 international societies (5.5%). North America had the highest percentage of women in leadership positions with 19 of 97 positions (19.6%), followed by international societies with 11 of 92 (12.0%) positions filled by women. The Middle East and Australia had the fewest number of women, with all-male leadership. Globally, female orthopaedic surgeons served in 11 of 181 (6.1%) board of directors positions, 16 of 192 (8.3%) executive committees positions, 17 of 143 (11.9%) committee chair positions, 2 of 18 (11.1%) officer positions, 1 of 12 (8.3%) council positions, and 2 of 7 (28.6%) spokesperson positions.

Conclusion: While some countries have higher representation than others, the number of women in leadership positions in orthopaedic sports medicine societies throughout the world is significantly less than their male counterparts. While this is a preliminary analysis, future studies should aim to evaluate these trends over time. Providing equitable opportunities for women to rise into high-ranking positions in orthopaedic sports medicine may contribute to the interest of women and other minorities in the field of sports medicine and help improve diversity.

Level of Evidence: Level V.

What are the new findings?

- Female representation in orthopaedic surgery society leadership is disproportionate to male representation
- The proportion of women in leadership in orthopaedic sports medicine and arthroscopy societies varies across the world
- North America has the highest percentage of female representation, and the Middle East has the lowest

* Corresponding author. Department of Orthopedic Surgery & Rehabilitation, Loyola University Medical Center, 2160 S First Avenue, Maguire Building, Suite 1700, Maywood, IL, 60153, USA.

E-mail address: mary.mulcahey.md@gmail.com (M.K. Mulcahey).

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INTRODUCTION

There is a disparity in female representation in medicine. Despite women comprising 55.5% of medical school matriculants in the United States, and holding the majority proportion of practicing physicians in countries such as Latvia and Estonia [1,2], these numbers do not remain reflective of the proportion of women across all specialties. The Association of American Medical Colleges (AAMC) reports that in 2019, women represented 673 of 4214 (16.0%) orthopaedic surgery residents [3]. This disparity is further reflected by American Academy of Orthopaedic Surgeons (AAOS) membership in 2019 with 6.5% members identifying as female [4]. Similarly, academic orthopaedic surgery in Canada is male-dominated, with men holding 87% of leadership positions and female orthopaedic surgeons holding lower academic ranks [5]. The European Society of Sports Traumatology, Knee Surgery & Arthroscopy (ESSKA) is made up of only 6% female orthopaedic surgeons, and 8.5% of ESSKA section board members are women [6]. In South Africa, the trend continues with female orthopaedic surgeons representing 5% of the orthopaedic surgery workforce [7]. Although the percentage of female Australian medical students has increased by 40% since 1970, the proportion of female orthopaedic surgeons has only increased by 8% [8].

Studies have shown that female representation in leadership roles at orthopaedic surgery academic meetings has been proportional to the representation of women in the specialty. Potter et al. found that 44 of 653 (6.7%) moderators and course instructors at the American Orthopaedic Society for Sports Medicine (AOSSM) annual meetings from 2015 to 2019 were women, which correlated with the 6.6% representation of female orthopaedic sports medicine surgeons reported by the AAMC in 2017 [9]. In Canada, Hiemstra et al. found that at the 2018 Canadian Orthopaedic Association (COA) annual meeting, 25% of attendees were women and 22% of podium appearances were by women [10]. Additionally, the percentage of active female surgeons within the COA correlated with the percentage of female orthopaedic surgeons in Canada (11.6% and 11.2%) [10]. Tougas et al. found that there was a statistically significant increase in the proportion of women presenting at the annual meetings of national orthopaedic surgery subspecialties from 2008 to 2017 ($p < 0.0001$), and women were proportionally more often authors presenting abstracts ($p < 0.0001$) than men [11]. However, men were more often faculty/instructors and moderators/chairs than women. At the British Orthopaedic Association annual conference from 2014 to 2018, less than 5% of lectures were presented by female orthopaedic surgeons, compared to women comprising 7% of practicing orthopaedic surgeons [12].

This trend of low female representation continues further into leaders in medical education. Kamalpathy et al. surveyed 87 orthopaedic sports medicine fellowship programs in the United States and found that only one (1.1%) fellowship director was female [13]. A similar study analyzing orthopaedic sports medicine division chiefs in the United States, found that of 100 programs, only 4 (4%) had a female division chief [14].

Women also constitute the minority when caring for athletes. O'Reilly et al. found prevalent gender disparities across team physicians in professional and collegiate athletics [15]. Women represented 112 of 879 (12.7%) team physicians and 30 of 443 (6.8%) orthopaedic surgeons ($P < 0.0001$). Additionally, male team physicians were more likely to be orthopaedic surgeons (53.9%; 413/767) than female physicians (26.8%; 30/112) [15]. Similarly, Hinkle et al. evaluated the distribution of men and women among team physicians for the National Basketball Association (NBA) and Women's National Basketball Association (WNBA) [16]. Over the last 10 years, 3 of 125 (2.4%) NBA physicians were female, and 8 of 28 (28.6%) physicians for the WNBA were female. These data highlight the widespread gender disparity across all aspects of orthopaedic sports medicine.

The purpose of this study was to conduct a comprehensive and updated global analysis of female representation in leadership positions within orthopaedic sports medicine and arthroscopy societies throughout the world.

METHODS

Publicly accessible websites for orthopaedic sports medicine societies throughout the world were evaluated for information regarding current leadership positions and the breakdown of male/female surgeons serving in those roles. Data collection was performed in August of 2023 using Google Chrome. International societies were identified through the website for the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS), on their list of International Societies and Presidents [17]. Additionally, the names of eight societies were provided by members of the group Women in Orthopaedics Worldwide (WOW). The search was then divided by continent to find national organizations. Search terms included the country of interest and “arthroscopic,” “sports medicine,” and “society.”

Societies lacking publicly available leadership information were excluded, as were non-surgical sports medicine societies. Societies with gender-specification for membership, such as The Forum, were excluded, and only societies of open access to all genders were included.

The leaders of the societies were categorized as Board of Directors, Executive Committee, Committee Chairs, Council Member, Officers, and Spokespersons. The names of orthopaedic surgeons that were gender-neutral or otherwise unclear to the authors were researched for clarification. This was done via a Google search of their name and examining photos and biographies. Since not all societies specifically stated gender identification, we categorized surgeons based on their photo or typical usage of their name. Society websites in languages other than English were translated using Google Translate and excluded if sufficient translation was not possible. The proportion of male and female orthopaedic surgeons in each leadership role was calculated as percentages.

RESULTS

Data were collected from the websites of 55 orthopaedic sports medicine societies, representing six continents. Of the 55 societies, 5 were in North America (9.1%), 8 in South America (14.5%), 18 in Europe (32.7%), 13 in Asia (23.6%), 2 in Africa (3.6%), 3 in the Middle East (5.5%), 3 in Australia (5.5%), and 3 societies were international (5.5%) Table 1 lists the orthopaedic sports medicine societies throughout the world that met inclusion criteria.

Across the 55 societies, female orthopaedic surgeons served in 11 of 181 (6.1%) Board of Directors positions, 16 of 192 (8.3%) Executive Committee positions, 17 of 143 (11.9%) Committee Chair positions, 2 of 18 (11.1%) Officer positions, 1 of 12 (8.3%) Council positions, and 2 of 7 (28.6%) Spokesperson positions (Fig. 1). Council and Office members were listed in 6 of the 55 societies (10.9%) and consisted of the society's head governing members such as president, vice president, secretary, and treasurer. Two of the 55 societies (3.6%) listed Spokespersons as part of the Board of Directors' leadership. North America had the highest percentage of women in leadership positions with 19 of 97 positions (19.6%), followed by international societies with 11 of 92 positions filled by women (12.0%). The Middle East and Australia had the fewest number of women, with all male leadership.

We were able to collect information regarding total number of women members in a few of the societies. For ISAKOS, 212 of 3385 (6.3%) members are women. For AANA, 89 active members and 287 across all member categories identified as female. In AOSSM there are 324 active/candidate female members, and nearly 50 female members in the other membership categories.

Table 1
Orthopaedic sports medicine societies throughout the world.

South America	Asia	Europe	North America
<ul style="list-style-type: none"> • Argentine Arthroscopy Association • Argentinian Association of Sports Traumatology • Arthroscopy Chapter of Sociedad Peruana de Ortopedia y Traumatología • Brazilian Society of Arthroscopy and Sports Traumatology • Colombian Society of Arthroscopy and Sports Traumatology • Latin American Society of Arthroscopy, Knee and Sports • Panamanian Arthroscopy Association 	<ul style="list-style-type: none"> • Arthroplasty Society in Asia • Asia Pacific Arthroplasty Society • Asia Pacific Orthopaedic Association (Sports Section) • Asia–Pacific Knee, Arthroscopy and Sports Medicine Society • Indian Arthroscopy Society • Japanese Orthopaedic Society of Knee, Arthroscopy and Sports Medicine • Japanese Orthopaedic Society for Sports Medicine • Korean Knee Society • Korean Orthopaedic Society for Sports Medicine • Malaysian Arthroscopy Society • New Zealand Orthopaedic Association • Philippine Orthopaedic Society for Sports Medicine • Taiwan Arthroscopy and Knee Society 	<ul style="list-style-type: none"> • British Orthopaedic Sports Trauma and Arthroscopy Association • Czech Society for Sports Traumatology and Arthroscopy • Danish Society for Arthroscopic Surgery and Sports traumatology • Dutch Arthroscopy Society • Estonian Arthroscopy and Sports Trauma Society • European Federation of Sports Medicine Associations • European Society of Sports Traumatology, Knee Surgery and Arthroscopy • French Society of Arthroscopy • German-Austrian-Swiss Society for Orthopaedic and Traumatologic Sports Medicine • Hellenic Arthroscopy Association • The Hip Preservation Society • Hungarian Arthroscopy Association • Italian Society of Knee Surgery, Arthroscopy, Sport, Cartilage and Orthopaedic Technologies • Polish Sport Traumatology Society • Portuguese Arthroscopy and Sports Trauma Society • Society for Arthroscopy and Joint Surgery • Spanish Arthroscopy Association • Turkish Society of Sports Traumatology, Arthroscopy and Knee Surgery 	<ul style="list-style-type: none"> • American Orthopaedic Society for Sports Medicine • Arthroscopy Association of Canada • Arthroscopy Association of North America • Mexican Association of Joint Reconstructive Surgery and Arthroscopic Surgery • Sociedad Mexicana de Cirujanos de Hombro y Codo
Middle East	Africa	Australia	International
<ul style="list-style-type: none"> • Iranian Society of Knee Surgery, Arthroscopy, and Sports Traumatology • Israeli Society of Knee Surgery and Arthroscopy • Israeli Society of Sports Medicine 	<ul style="list-style-type: none"> • East African Arthroscopy Association • South African Society for Hip Arthroscopy 	<ul style="list-style-type: none"> • Australian Knee Society • Australian Orthopaedic Association • Shoulder and Elbow Society of Australia 	<ul style="list-style-type: none"> • International Society of Arthroscopy, Knee Surgery, and Orthopaedic Sports Medicine • International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty • Magellan Orthopaedic Society

DISCUSSION

There is a large difference in the number of women compared to men in leadership positions in orthopaedic sports medicine and arthroscopy societies throughout the world. Women comprised only 6.1% of members on the Board of Directors (BOD), as compared to 28.6% of Spokesperson. However, these data are difficult to interpret for a few reasons. First, this reflects a single year of data without further information on the percentage of women members or average ages of the leadership. Second, if spokespersons are potentially considered a lower rank than the Board of Directors, the high percentage of women in this role could be encouraging, as they may rise to higher positions in the years to come. The highest percentages of women in leadership overall were seen in North American and international societies, and the lowest were seen in the Middle East and Australia. This study demonstrates the wide disparity across the 55 societies included in this study, as 34 societies completely lacked female leadership. While we were able to provide information about overall female membership percentage for a few societies, it would be extremely helpful if more societies provided a way to share or publicly access this information.

A persistent theory for women not entering the field of orthopaedic surgery is a paucity of female role models. Since every surgeon plays some leadership role in their career, whether through teaching, specialty societies, academic meetings, medical education, or caring for athletes, women in these roles have the opportunity to inspire the members, medical students, residents, junior faculty, and athletes.

There are very few women serving in leadership roles in the field of medicine as a whole. Jagsi et al. evaluated the gender of members and leaders of 30 major medical specialty societies in the United States from 2000 to 2015 [18]. The highest percentage of women serving as president or chair reached 37.5% (The Endocrine Society and the American Psychiatric Association), and the American Academy of Orthopaedic Surgeons (AAOS) was among five societies reporting zero women in the highest-ranking position.

Data from the Accreditation Council for Graduate Medical Education (ACGME) orthopaedic academic residency programs website in July 2020 found that 4 of 153 (3%) department chairs, 5 of 161 (8%) vice chairs, 18 of 161 (11%) program directors, 20 of 75 (27%) assistant program directors, and 45 of 514 (9%) division chiefs were women [19]. Similarly, Saxena et al. found that although the percentage of women members in an orthopaedic specialty society correlated with the percentage of women on its board of directors, both percentages remained

the minority when compared to men [20]. A cross-sectional study of cardiology fellowship programs in 2018 found that there was an increase in female program directors from 1992 to 2017, but no significant difference in the number of women at the level of division chief [21]. The authors also noted a lack of proportional increases in higher positions of leadership, suggesting a lack of upward mobility for women after reaching a certain level. These results are similar compared to those found in our study - the range of female ACGME leadership was from 3 to 27%, while our international study ranged from 6.1 to 28.6%. In both studies, there was a lower percentage of women in higher ranking positions such as division chief for their study and president for ours. Also, women did not exceed 12% of leadership positions, except in the category that is considered lower in hierarchy which was spokesperson for our study and assistant professor for theirs. This further emphasizes the question of why women in orthopaedic sports medicine are not represented in leadership as well as their male counterparts.

According to Ahmed et al., “We cannot develop as a profession unless women are completely included, not just in numbers, but also in respect and authority. Factors affecting the uptake of females include unconscious bias, inflexible training, and lack of female role models.” [12] A study regarding the gender disparity in global health leadership collected data from women in New York, Haiti, Tanzania, and India, and found that the top gender-based challenge in the workplace was work-life balance [22]. The different cultural expectations of women could be contributing to the leadership disparity, as women may be expected to take care of the home more in some regions than others. There could also be reasons women may even avoid leadership positions, such as past discriminatory experiences, harassment, or lack of time due to family or personal commitments. However, the leadership may vary by specialty, as women held the slight majority in dermatology society leadership in South American, Central America, and Africa in a study published in 2021, although women were less likely to be in first-in-command positions [23].

The wide disparity across societies found in this study could be representative of the number of female orthopaedic surgeons in some of the societies, or lack of opportunities for women to train in different areas of the world. It is up to both women and men to support and implement change. Investing in programs that address unconscious biases in medical school, assistance such as family planning classes, surveying residents regarding areas for improvement, or building residency programs that support women are all realms for future attention. This could improve visibility of women in the field, and potentially increase mentorship of women in orthopaedic societies around the world. One example of this

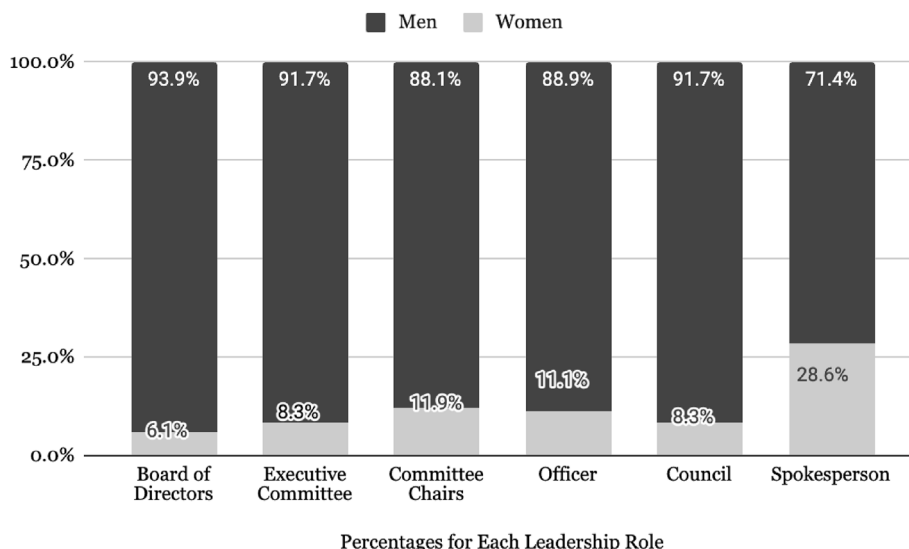


Fig. 1. Percentages of male and female orthopaedic sports medicine surgeons in leadership roles.

movement in action is the American Academy of Orthopaedic Surgeons (AAOS), who has a specific goal to foster the recruitment of underrepresented minorities and women into the field. The Gender Diversity and Inclusion Task Force was also established via ISAKOS that includes female members from around the world to increase female representation and leadership in the field of orthopaedics. In 2018, the European Society for Sports Traumatology, Knee Surgery and Arthroscopy (ESSKA) proposed an initiative now known as Women in ESSKA. While other societies have implemented similar proposals, future studies should investigate how these intentional actions are now influencing the number of women in leadership positions. Additionally, as these initiatives are implemented and the number of women in the field increases, it may take many years for this progress to be reflected in society leadership, since these appointments typically arise after years of participation in a society.

There are several limitations to this study. First, we were unable to access data regarding the total number of female members in each of the societies, which would be important to accurately compare representation in leadership across societies. Second, there were inconsistencies in the number and type of leadership roles listed for each society online. For example, not every society specifically identified a Board of Directors or Executive Committee, and some reported leadership roles such as Council or specific committee chairs. Some society websites were only accessible to members of that society; thus, no data could be obtained. Additionally, there were several websites where the language could not be translated. There was also difficulty verifying the gender of some members due to lack of publication and accessibility. When evaluating society websites, some members listed did not have any information about their specific occupation or role. Additionally, the information presented in this article reflects one point in time, rather than historical perspectives of progress over time. Given the time it takes to rise to society leadership positions, the current leadership likely reflects surgeons who trained at least 15–20 years ago. This delay in rise to leadership could misrepresent the current reality, so we acknowledge that this is a preliminary study, and future studies should aim to evaluate trends in leadership over time. However, to our knowledge, this is the first study to report female representation in leadership positions in sports medicine and arthroscopy societies on a global scale.

CONCLUSION

While some countries have higher representation than others, the number of women in leadership positions in orthopaedic sports medicine societies throughout the world is significantly less than their male counterparts. While this is a preliminary analysis, future studies should aim to evaluate these trends over time. Providing equitable opportunities for women to rise into high-ranking positions in orthopaedic sports medicine may contribute to the interest of women and other minorities in the field of sports medicine and help improve diversity.

Declaration of competing interest

The authors declare the following financial interests/personal relationships that may be considered as potential competing interests: Mary Mulcahey, MD reports a relationship with Arthrex Inc that includes: consulting or advisory. Mary Mulcahey, MD reports a relationship with American Academy of Orthopaedic Surgeons that includes: board membership. Mary Mulcahey, MD reports a relationship with American Orthopaedic Association that includes: board membership. Mary Mulcahey, MD reports a relationship with American Orthopaedic Society for Sports Medicine that includes: board membership. Mary Mulcahey, MD reports a relationship with Arthroscopy Association of North America that includes: board membership. Mary Mulcahey, MD reports a relationship with The Association of Bone and Joint Surgeons that includes: board membership. Mary Mulcahey, MD reports a relationship with

International Society of Arthroscopy Knee Surgery and Orthopaedic Sports Medicine that includes: board membership. Mary Mulcahey, MD reports a relationship with Ruth Jackson Orthopaedic Society that includes: board membership. American Journal of Sports Medicine Electronic Media: Editorial or governing board - M.M Journal of Bone and Joint Surgery – American: Editorial or governing board - M.M. Ortho Info: Editorial or governing board – M.M.

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