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AOA Critical Issues in Education

Gender Representation in Major Orthopaedic Surgery Meetings

A Quantitative Analysis

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Background: Orthopaedic surgery suffers from gender disparity, and annual conferences are visible opportunities to quantify gender representation within a field. Therefore, the purpose of this manuscript was to investigate the prevalence of female speakers and moderators, and male-only panel sessions, at 10 major Orthopaedic Surgery meetings.

Methods: Conference programs and details of faculty moderating or presenting in 10 Orthopaedic Surgery annual meetings in 2021 were retrieved. Conferences were selected with the aim of size and diversity in subspecialty topics and included American Association of Hip and Knee Surgeons, American Association for Hand Surgery, American Academy of Orthopaedic Surgeons, American Orthopaedic Society for Sports Medicine, Canadian Orthopaedic Association (COA), European Federation of National Associations of Orthopaedics and Traumatology, North American Spine Society, Orthopaedic Research Society (ORS), Orthopaedic Trauma Association, and Pediatric Orthopaedic Society of North America (POSNA). Primary outcomes included percentage of female chairs and speakers and percentage of male-only panels, while secondary outcomes included number of publications, number of citations, and H-indexes of faculty. Further subgroup comparisons were performed between male-only panels and non–male-only panels and female members and male members.

Results: Of 207 included sessions, 121 (58.5%) were male-only panels and 150 (12.6%) of 1,188 faculty members were women. Conferences organized by the COA, ORS, and POSNA had higher percentages of female representation, while spine surgery and adult hip/knee reconstruction sessions had more than 70% male-only panels and fewer than 10% female members. There were no significant differences between male members and female members regarding years of practice; however, male members were more likely to hold the title of professor ($p < 0.001$). Male members and female members stratified by quartiles of publications, citations, and H-indexes, moderated or participated in similar numbers of sessions, indicating an absence of selection bias.

continued

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Conclusions: There is a high prevalence of male-only panels (58.5%) and an overall lack of female representation (12.6%) in 10 major Orthopaedic Surgery meetings. Male members and female members from these conferences were found to have similar qualifications academically. Specific strategies such as the elimination of male-only panels, selecting diverse conference organizers, and forming conference equity, diversity, and inclusion committees can help achieve cultural change.
Level of Evidence: Level V.

Introduction

Of all surgical subspecialties, orthopaedic surgery arguably suffers the most from gender disparity, with only 7.4% practicing orthopaedic surgeons in the United States being female in 2022[1]. This number is similar in Canada with the female surgeons comprising 13.6% of practicing orthopaedic surgeons in 2022[2]. In Europe, this statistic ranges from 4.8% to 16.8% in 2019[3]. The rate of increase in female residents in orthopaedic surgery is also much smaller than that of other surgical specialties[1]. For example, from 2012 to 2020, plastic surgery reported an increase in female residents by 12% compared with 3.3% for orthopaedics[1]. Several other male-dominated specialties are projected to reach equal gender representation by 2050; however, that benchmark is likely to be reached in 115 years for orthopaedic surgery[4].

A recent survey of female orthopaedic surgeons and trainees outlined 5 barriers that women face when entering the field, one of them being a lack of sufficient female mentorship[2]. Underrepresentation of female specialists in orthopaedics can cause a negative feedback loop, discouraging prospective female trainees from entering the field[5]. Annual meetings are visible markers of gender representation in a field, and invitations to speak at conferences demonstrate national and regional recognition, reasons that promotions and appointment committees can use to select individuals to become professors or chairs at academic institutions[6,7]. An increase in female staff in these institutions can help students develop female role models and decrease the "male culture" that exists in the field, another barrier that women face when entering orthopaedics[2].

Representation of women in conferences of other surgical subspecialties has been analyzed; for example, in otolaryngology, only 24.0% of panels were male-only in 2018, showing a marked improvement from 2003 where 87.5% of panels were male-only[8]. In the field of urology, over a third of panels from 2019 to 2020 were composed entirely of men[9], while 53.8% of panels were male-only in neurosurgery from 2014 to 2018[10]. Despite orthopaedic surgery having a significant gender gap, annual meeting data have not been summarized for the field in the literature. These data include not only the amount of male-only panels but also the prevalence of female speakers and moderators. Moderator data are especially important because they organize sessions and typically select who the speakers are, and it is possible that there may be biased selection if most of the moderators are male[11]. Therefore, the purpose of this study was to investigate major Orthopaedic Surgery meetings hosted in 2021 to quantify the amount of female speakers and moderators and male-only panels. We hypothesize that there will be a high amount of male-only panels and a low percentage of female speakers and moderators.

Materials and Methods

Conference Selection

Orthopaedic conferences were selected with the aim for size and diversity in and subspecialty representation within North America and Europe. In total, 10 meetings were selected. These included virtual and in-person meetings in 2021 organized by the American Association of Hip and Knee Surgeons (AAHKS), American Association for Hand Surgery (AAHS), American Academy of Orthopaedic Surgeons (AAOS), American Orthopaedic Society for Sports Medicine (AOSSM), Canadian Orthopaedic Association (COA), European Federation of National Associations of Orthopaedics and Traumatology (EFORT), North American Spine Society (NASS), Orthopaedic Research Society (ORS), and Orthopaedic Trauma Association (OTA), and Pediatric Orthopaedic Society of North America (POSNA). Final selection of conferences was based on discussion with senior faculty among various subspecialties, and programs were reviewed to ensure relevance to orthopaedic surgery. Conferences associated with journals related to the subspecialty were selected with preference.

Data Extraction

Included sessions were panel, symposium, or moderated debate-style sessions. Included sessions are typically more formal, selected by conference organizers, and tend to be highly visible, well-attended events that have a strong presence within the conference proceedings. Among these sessions, data were collected on the chair/moderator and speakers. Collectively, all participants in the panel sessions are referred to in this article as "faculty." Abstract, poster, or individual paper presentations were excluded. All sessions were classified as either having female members or being all-male.

Study Outcomes

Proportions of sessions with no female chairs/moderators and/or speakers were calculated. Overall percentages of male vs. female faculty were calculated. These data were then stratified by subspecialty topic, position (chair vs. speaker), and conference/meeting. Data collected included the number of sessions within a meeting, chair/moderator and speaker details, and topic subspecialty.

Secondary outcomes investigated the presence of gender selection bias by comparing academic and research qualifications among faculty. Specific faculty-related information collected

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consisted of speaker sex, country of practice, subspecialty, academic position, years in practice, sum of times cited, and number of peer-reviewed publications. In addition, the H-index, a metric that uses the number of publications and times cited to estimate an individual's cumulative research productivity, was collected. These data were extracted using an internet search. Web of Science was used to identify H-indexes, number of citations, and number of publications. Based on these qualifications, male and female faculty were grouped into quartiles and the mean number of sessions per quartile was calculated.

Statistical Analysis

Independent sample *t* tests were performed for parametric continuous variables. The Mann-Whitney *U*-test or Kruskal-Wallis tests were performed for all nonparametric continuous variables. The χ^2 test was used to analyze categorical variables. Analysis of variance was used to determine whether there were significant differences in the percentages and number of sessions in subgroups (e.g., conferences, subspecialty, quartiles). If analysis of variance showed a significant difference, independent *t* tests were performed to determine any pairwise differences. All statistical analyses, including calculation of means and SDs, were conducted using SPSS version 28.0.0.0 (IBM), while a p-value of <0.05 was considered as statistically significant.

Results

Conference Demographics

A total of 207 eligible sessions from 10 conferences spanning from January 2021 to November 2021 were included. AAOS, AOSSM, NASS, ORS, and POSNA held meetings in person, while the AAHS, EFORT, COA, and ORS seminars were held virtually. AAHKS ran a hybrid virtual/in-person model.

Overall, the total percentage of panels that were all-male was 58.5% (n = 121, range by conference: 0.0%-75.0%). The mean number of chairs/moderators, speakers, and faculty for each meeting session were 1.44, 4.91, and 5.77, respectively (Table I). EFORT was the largest conference, organizing 38.65% of the included sessions, and 21.26% of the included studies centered on general orthopaedics, the most common subspecialty topic.

Male-Only Panels and Female Faculty by Conference

Of 1,188 faculty members in the included sessions, 150 (12.6%) were female. The mean percentage of female faculty across sessions at any conference was always <30%. Within the panels and symposia organized by NASS, 3.0% of chairs/moderators, 7.0% of speakers, and 7.0% of faculty were female, the lowest female representation of all included conferences. Gender representation was more balanced in the meetings organized by the AAHS (25.0% female chairs, 31.0% female speakers, 28.0% female faculty), POSNA (35.0%, 25.0%,

TABLE I Baseline Demographics

	Total Sessions (n = 207)		
		Mean Per Session, n (SD)	
Chairs		1.44 ± 0.60	
Speakers		4.91 ± 2.67	
Faculty		5.77 ± 2.62	
Organizing Society	Sessions, n (%)	Subspecialty	Sessions, n (%)
AAHKS	7 (3.38)	Adult reconstruction hip	27 (13.04)
AAHS	6 (2.90)	Adult reconstruction knee	14 (6.76)
AAOS	18 (8.70)	Foot and ankle	4 (1.93)
AOSSM	18 (8.70)	General orthopaedics	44 (21.26)
COA	20 (9.66)	Miscellaneous	33 (15.94)
EFORT	80 (38.65)	Musculoskeletal oncology	6 (2.90)
NASS	20 (9.66)	Pediatrics	13 (6.28)
ORS	5 (2.42)	Practice management/rehabilitation	9 (4.83)
OTA	25 (12.08)	Spine	21 (10.14)
POSNA	8 (3.86)	Sports medicine	10 (4.83)
		Trauma	7 (3.38)
		Upper extremity	18 (8.70)

AAHKS = American Association of Hip and Knee Surgeons, AAHS = American Association for Hand Surgery, AAOS = American Academy of Orthopaedic Surgeons, AOSSM = American Orthopaedic Society for Sports Medicine, COA = Canadian Orthopaedic Association, EFORT = European Federation of National Associations of Orthopaedic and Traumatology, NASS = National American Spine Society, ORS = Orthopaedic Research Society, OTA = Orthopaedic Trauma Association, and POSNA (Pediatric Orthopaedic Society of North America).

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TABLE II Percentage of Female Chairs/Moderators, Speakers, and Faculty at All Included Sessions and Percentage of Sessions Without Any Female Chair/Moderator, Speakers, or Faculty ("Male-Only Panels"), Stratified by Conference

	Chairs/Moderators		Speakers		All Faculty	
Conference	Female (Mean %, STD)	Sessions With No Female Members (%)	Female (Mean %, STD)	Sessions With No Female Members (%)	Female (Mean %, STD)	Male-Only Panels (%)
Total (207)	11.4 ± 26.5	88.8	11.6 ± 18.1	62.8	11.5 ± 17.2	58.5
AAHKS (7)	14.3 ± 37.8	85.7	18.6 ± 32.9	71.4	18.6 ± 32.9	71.4
AAHS (6)	25.0 ± 41.8	33.3	31.0 ± 10.1	50.0	28.0 ± 13.6	0.0
AAOS (18)	N/A	N/A	13.9 ± 15.4	38.9	13.9 ± 15.4	38.9
AOSSM (18)	6.0 ± 23.6	94.4	11.0 ± 24.8	72.2	10.0 ± 24.8	72.2
COA (20)	15.8 ± 24.5	57.9	20.5 ± 15.4	25.0	20.5 ± 15.4	25.0
EFORT (80)	11.0 ± 28.3	85	7.0 ± 14.1	76.3	7.3 ± 11.9	71.3
NASS (20)	13.0 ± 11.5	95.0	7.0 ± 17.3	80.0	7.0 ± 17.3	75.0
ORS (5)	30.0 ± 27.4	40.0	28.3 ± 24.0	20.0	28.6 ± 22.3	20.0
OTA (25)	4.0 ± 20.0	92.0	9.2 ± 17.0	72.0	7.5 ± 14.0	72.0
POSNA (8)	35.0 ± 22.6	25.0	25.0 ± 14.2	12.5	29.0 ± 8.7	0.0
ANOVA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

AAHKS = American Association of Hip and Knee Surgeons, AAHS = American Association for Hand Surgery, AAOS = American Academy of Orthopaedic Surgeons, ANOVA = analysis of variance, AOSSM = American Orthopaedic Society for Sports Medicine, COA = Canadian Orthopaedic Association, EFORT = European Federation of National Associations of Orthopaedic and Traumatology, NASS = National American Spine Society, ORS = Orthopaedic Research Society, OTA = Orthopaedic Trauma Association, and POSNA = Pediatric Orthopaedic Society of North America.

29.0%), and ORS (30.0%, 28.8%, 28.7%). POSNA and AAHS had the fewest male-only panels (0.0%) while NASS had the most (75.0%), followed by AOSSM (72.2%), OTA (72.0%), AAHKS (71.4%), and EFORT (71.3%) (Table II).

Analysis of variance revealed significant between-conference differences between the mean percentages of female chairs/moderators, speakers, and faculty and proportions of male-only panels by conference ($p < 0.001$). POSNA had statistically greater means for female faculty and non–male-only panels than most other conferences, while AOSSM and NASS had statistically greater proportions of male-only panels (Supplementary Digital Content—Appendix Tables A-C, http://links.lww.com/JBJSOA/A567).

Male Participants and Male-Only Panels by Subspecialty

Overall, the mean percentages of female participants stratified by subspecialty were all less than 25.0% (range: 4.7%-23.8%). Meeting sessions on practice management/rehabilitation (female chairs/moderators: 43.7%, female speakers: 27.3%, female faculty: 20.2%) and pediatrics (34.8%, 20.6%, 23.8%) demonstrated the highest percentages of female participants. Subspecialties of adult reconstruction hip (0.0%, 5.7%, 4.7%) and adult reconstruction knee (0.0%; 5.5%, 5.5%) had the lowest percentages of female participants. Adult hip and adult knee reconstruction had the highest proportion of male-only panels (81.5% and 78.6% for hip and knee, respectively). Trauma and pediatrics sessions consisted of the lowest proportion of male-only panels (28.6% and 23.1%, respectively) (Table III).

Analysis of variance displayed significant between-group differences between subspecialties in the mean percentage of female chairs/moderators ($p < 0.001$) and faculty ($p < 0.01$) and the percentage of sessions without any female chairs/moderators ($p < 0.001$) or speakers ($p < 0.001$). There were no statistically significant differences between the different subspecialties with regard to mean percentage of female speakers ($p = 0.09$). Adult hip and knee reconstruction had more male-only panels and male faculty, while pediatrics, musculoskeletal oncology, and practice management/rehabilitation sessions had a significant difference in non–male-only panels and female faculty (Supplementary Digital Content—Appendix Tables D-E, http://links.lww.com/JBJSOA/A567).

Comparison Between Male-Only Panel and Non–male-Only Panels

Of the 207 included sessions, 121 (58.5%) were classified as male-only panels, and 86 (41.5%) were non–male-only panel sessions (Table IV). The non–male-only panel sessions had a significantly higher mean number of female chairs/moderators ($p < 0.001$), speakers ($p < 0.001$), and faculty ($p < 0.001$).

Comparison Between Male and Female Faculty

Of 1,188 included faculty, 1,038 (87.3%) were male and 150 (12.6%) were female. There was no significant difference in the mean years of practice between male and female faculty. There were significant differences between male and female faculty based on the location of practice ($p < 0.001$), specialty area ($p < 0.001$), and academic rank (43.2% of male vs. 16.0% of female faculty held the title of professor, $p < 0.001$) (Supplementary Table 1, http://links.lww.com/JBJSOA/A567). The number of male and female faculty per specialty or career of practice

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TABLE III Percentage of Female Chairs/Moderators, Speakers, and Faculty at All Included Sessions and Percentage of Sessions Without Any Female Chair/Moderator, Speakers, or Faculty ("Male-Only Panels"), Stratified By Subspecialty

	Chairs/Moderators		Speakers		All Faculty	
Subspecialty	Female (Mean %, STD)	Sessions With No Female Members (%)	Female (Mean %, STD)	Sessions with no Female Members (%)	Female (Mean %, STD)	Male-Only Panels (%)
Total (207)	11.0± 26.5	79.8	12.0 ±19.0	61.6	11.5 ± 17.2	58.5
Adult Reconstruction Hip (27)	0.0 ± 0.0	100.0	5.7±10.7	95.7	4.7 ± 8.5	81.5
Adult Reconstruction Knee (14)	0.0± 0.0	90.9	5.5 ± 10.9	78.6	5.5 ± 10.9	78.6
Foot and Ankle (4)	12.5 ± 25.0	75.0	12.5± 25.0	75.0	12.5 ± 25.0	75.0
General (44)	11.1 ± 26.6	77.5	11.3 ± 17.9	63.6	11.7 ± 18.5	59.1
Miscellaneous (33)	11.1 ± 25.2	78.8	15.8 ± 24.4	56.3	14.7 ± 21.	48.5
Musculoskeletal oncology (6)	30.0 ± 44.7	60.0	17.4± 22.3	50.0	19.7 ± 16.8	33.3
Pediatrics (13)	34.8 ± 32.0	36.4	20.6± 16.3	30.8	23.8 ± 15.6	23.1
Practice Management/ Rehab (10)	44.7 ± 49.6	50.0	27.3± 31.9	40.0	20.2 ± 21.3	40.0
Trauma (7)	0.0 ± 0.0	66.7	15.7± 16.6	28.6	17.4 ± 14.1	28.6
Spine (21)	2.5 ± 11.2	95	7.5± 17.9	81	6.8 ± 17.2	76.2
Sports (10)	0.0 ± 0.0	100	8.1± 11.1	60	7.1 ± 9.6	60.0
Upper Extremity (18)	16.7 ± 34.3	76.5	10.5 ± 15.2	66.7	11.6 ± 13.5	55.6
ANOVA	<0.001	<0.001	0.09	<0.001	0.003	<0.001

ANOVA = analysis of variance.

stratified by conference is depicted in Supplementary Table 2, http://links.lww.com/JBJSOA/A567. The number of male and female faculty per location stratified by conference is depicted in Supplementary Table 3, http://links.lww.com/JBJSOA/A567.

Number of Sessions Stratified by Quartile of Publications, Citations, and H-Index

Faculty were stratified into quartiles based on their mean H-index, number of sums of times cited, and number of publications (measures of research output and academic success). The mean number of sessions per faculty member was 1.29. Comparisons between men and women in each quartile showed that faculty in each quartile participated in statistically similar numbers of mean sessions (Supplementary Table 4, http://links.lww.com/JBJSOA/A567).

Discussion

The most important finding from this study is that there is an overwhelming proportion of male-only panels (58.5%) in these 10 Orthopaedic meetings. The proportion of overall female representation in the panels was 12.6%. POSNA and AAHS contained the fewest male-only panels with NASS having the most. In addition, subspecialties of adult reconstruction hip and knee had the highest proportion of male-only panels, while trauma and pediatrics contained the least. The men and women who were invited to be faculty members on the panels had similar qualifications, regarding their number of publications, citations, and H-index. There was a difference found, however, in the rank of the speakers in that men were more likely to hold the title of professor, while women were more likely to be assistant professor, despite similar years in practice and research qualifications.

The percentage of female participants in the 10 included meetings is in line with the percentage of practicing orthopaedic surgeons in North America and Europe; however, the subspecialties of adult reconstruction hip and knee and spine seem to have the worst gender representation. This is consistent with the literature outlining that female authorship in the field of arthroplasty is lagging behind other subspecialties in orthopaedics[12]. The AAHKS recently published a study that found that from 2012 to 2019, there was no change in the proportion of speakers at the conference despite female membership doubling in amount[13]. In addition, only women make up 3% of spine fellows compared with 25% for pediatrics in the United States, highlighting how sex varies significantly between subspecialties of orthopaedics. A lack of leadership roles held by women in societies such as NASS and AAHKS contribute to stagnancy in the progress of representation in the subspecialties of spine and arthroplasty[14].

Two organizations serve as positive case studies for removing male-only panels and increasing the representation at annual meetings. In 2019, the COA released a

TABLE IV Characteristics of Male-Only Panel vs. Non–Male-Only Panel Sessions*

	Total	Male-Only Panel Sessions	Non–male-Only panel sessions	p
Mean no. of chairs/moderators	1.44 ± 0.60	1.30 ± 0.55	1.65 ± 0.61	<0.001
Mean no. of speakers	4.91 ± 2.67	4.26 ± 1.80	5.84 ± 3.35	<0.001
Mean no. of faculty	5.77 ± 2.62	5.11 ± 1.89	6.71 ± 3.17	<0.001
Conference (%)				
AAHKS	3.4	71.4	28.6	<0.001
AAHS	2.9	0.0	100.0	
AAOS	8.7	38.9	61.1	
AOSSM	8.7	72.2	27.8	
COA	9.7	25.0	75.0	
EFORT	38.7	71.3	28.8	
NASS	9.7	75.0	25.0	
OTA	12.1	72.0	28.0	
ORS	2.4	20.0	80.0	
POSNA	3.9	0.0	100.0	
Subspecialty (%)				
Adult reconstruction hip	13.0	81.5	18.5	<0.001
Adult reconstruction knee	6.8	78.6	21.4	
Foot and ankle	1.9	75.0	25.0	
General	21.3	59.1	40.9	
Miscellaneous	15.9	48.5	51.5	
Musculoskeletal oncology	2.9	33.3	66.7	
Pediatrics	6.3	23.1	76.9	
Practice management/rehabilitation	4.8	40.0	60.0	
Spine	10.1	76.2	23.8	
Sports medicine	4.8	60.0	40.0	
Trauma	3.4	28.6	71.4	
Upper extremity	8.7	55.6	44.4	

*Stratified into subgroups by conference and subspecialty. AAHKS = American Association of Hip and Knee Surgeons, AAHS = American Association for Hand Surgery, AAOS = American Academy of Orthopaedic Surgeons, AOSSM = American Orthopaedic Society for Sports Medicine, COA = Canadian Orthopaedic Association, EFORT = European Federation of National Associations of Orthopaedic and Traumatology, NASS = National American Spine Society, ORS = Orthopaedic Research Society, OTA = Orthopaedic Trauma Association, and POSNA = Pediatric Orthopaedic Society of North America.

comprehensive action plan to eliminate gender-based inequalities existing in orthopaedics. Its stated goals include the promotion of a gender-diverse leadership that is engaged and diversity-aware, the elimination of all-male panels, and implementation of minimum quotas of female speakers and faculty[15]. Minimum quotas for diversity representation are seen in other major industries, such as the Rooney Rule in the National Football League, Title IX mandates in National Collegiate Athletic Association sports, and similar rules in corporate industry[16,17]. One must be careful to select competent women, avoiding the "token minority" phenomenon.

Similarly, POSNA formed a Justice, Equity, Diversity, and Inclusion Committee in 2021, whose goals include making recommendations for the annual meeting to ensure inclusive panels, course faculty, and content[18]. Organizing committees with greater gender balance are less prone to implicit biases that prevent women from being selected and accepted as leaders. POSNA notably had the lowest proportion of male-only panels and was one of only 2 conferences to not have any male-only panel sessions. This finding is supported by the knowledge that from 2010 to 2019, pediatric orthopaedics consistently had the highest proportion of female orthopaedic surgeons in the United States[19]. This finding also shows that societies such as NASS and AAHKS can follow the footsteps of POSNA to reduce the proportion of male-only panels at their meetings, as a first step to change within the respective subspecialties of spine and arthroplasty.

Various actions can be taken to improve male-only panels in the setting of Orthopaedic meetings. Increasing the pool of speakers and organizers at a symposium may increase the likelihood of women being included in both categories[20,21]. Notably, this study showed that non–male-only panel sessions

had a greater number of female chairs/moderators. It is also possible that improving the amount of female moderators can help increase the amount of female speakers[5]. Our findings show that there is a similar level of academic qualifications held by both male and female chairs/moderators and speakers, indicating an absence of selection bias. However, we were unable to find criterion on selection; therefore, implicit selection bias cannot be ruled out. Leading individuals and organizations in the field of orthopaedics should strive to improve public awareness of imbalanced gender representation; some hashtags that have circulated on social media to discuss these issues include #ILookLikeASurgeon, #NoManels, and #SpeakUpOrtho[18]. Conference organizers should be considerate to pregnant and breastfeeding attendees, providing facilities such as easily accessible lactation rooms[22].

It is evident that female representation in the field of orthopaedics is lacking and that there needs to be systemic change. Issues such as workplace harassment, unequal standards between men and women, as well as constrained communications are all common experiences by female residents and faculty[2]. The International Orthopaedic Diversity Alliance (IODA) based out of Europe provides a number of suggestions to improve the experience of women in Orthopaedic Surgery, challenges laid out in a recent review article[3,22]. This article highlights the efforts of Sweden having 231 female orthopaedic surgeons, comprising 16.8% of practicing orthopaedists in the country in 2019[22]. Sweden had the second highest percentage of female orthopaedic surgeons in the world in this cross-sectional analysis, with Canada being ranked as fourth[22]. These countries can be looked to as inspirations for increasing diversity worldwide.

The Perry Initiative is a program by female orthopaedic surgeons who provide career exploration for women interested in the field at the high school and college level[23,24]. Avenues such as the Perry Initiative can help combat the inaccurate stereotype of orthopaedic surgery being for "jocks," a common notion perpetuated through jokes and medical satire[14]. Currently, female surgeons represent 34% of faculty in plastic surgery, compared with 17% of practicing surgeons in the United States, showing an improvement in gender diversity within the younger generation[25]. The Perry Initiative can potentially do the same for orthopaedic surgery in years to come.

There are a few limitations associated with this study. First, the low percentage of female faculty increases the likelihood of a Type II error when investigating faculty selection bias. Subgroup analyses for female faculty organized by conference and subspecialty should be interpreted with caution because of this hindrance. Conferences were overwhelmingly held in Europe and North America; however, analyses of gender diversity by the IODA suggest that similar or even worse findings are likely to be observed worldwide. Finally, we were unable to find any criteria for selecting faculty, nor the individuals responsible for these decisions, precluding any definitive conclusion on the absence of selection bias. Presidents of all included conferences during this time frame were male as per conference websites and suggests this to be a place of potential change for organizations.

Conclusion

There is a high prevalence of all-male panel sessions (58.5%) and an overall lack of female representation (12.6%) in 10 major Orthopaedic Surgery meetings. Unequal gender diversity in orthopaedics can perpetuate discriminatory environments and limit the academic advancement of women. Specific strategies such as the elimination of male-only panels, selecting diverse conference organizers, and forming conference equity, diversity, and inclusivity committees can help achieve the benchmark of 30% of female faculty needed for cultural change.

Appendix

eA Supporting material provided by the authors is posted with the online version of this article as a data supplement at jbjs.org (http://links.lww.com/JBJSOA/A567). This content was not copyedited or verified by JBJS. ■

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