



# Diversity and perception of equity and respect in the Society of Skeletal Radiology (SSR)

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## Abstract

**Purpose** To assess the perception of equity and respect in the workplace and within the SSR. We hypothesized that responses would differ by gender and minorities underrepresented in medicine (URiM) status.

**Methods** An electronic survey was sent to 1,531 SSR members between January 2020 and March 2020 to determine perception of equity and respect. Descriptive statistics were calculated, and analysis of differences in response by gender/minority status was performed using the Fisher's exact test. The study was exempt from IRB approval.

**Results** There were 176 responses (11.5%). Most respondents (61.9%) were between 30 and 50 years. Members identified as male (M) in 74.4%, as female (F) in 25.0%, and as "other" in 0.6%. URiM comprised 9.1% of members. Women worked more commonly in academia ( $p=0.005$ ), had the perception of unequal opportunities for leadership positions within the institution ( $p=0.006$ ), and emphasized the importance of having a mentor of the same gender ( $p=0.001$ ). URiM members were less likely to hold a leadership position ( $p=0.1$ , trend), had a perception of unequal opportunities for leadership positions within the institution ( $p=0.06$ , trend), and reported the importance of having a mentor of the same race ( $p=0.06$ , trend). There were no significant differences between gender or URiM status and perception of the SSR to provide an inclusive environment and leadership opportunities ( $p \geq 0.39$ ).

**Conclusion** While survey participation was limited and potentially biased, respondents perceived that women and minorities have fewer opportunities and are treated with lower regard in the workplace compared to male, non-minority colleagues.

**Keywords** Diversity and inclusion · Women in radiology · Workforce diversity · Equity · Society of Skeletal Radiology

## Introduction

A diverse biomedical workforce is essential for excellence in patient care and has been linked to better patient outcomes, access to and quality of care [1–3]. However, the physician workforce in radiology does not reflect the make-up of our

population. In the USA, radiologists are predominately male and white. Twenty-one percent of practicing radiologists are women, 1.7% of radiologists are Black, 3.7% Hispanic, and 13.2% Asian [4, 5]. Within musculoskeletal radiology in the USA, women represent 31% of radiologists, and there is a significant underrepresentation of women at higher academic ranks [6].

These disparities in the radiology workforce may be driven in part by how physicians perceive their work environment and professional relationships. A national survey of radiologists and radiation oncologists conducted by the American College of Radiology (ACR) has identified that women and minority faculty disproportionately experience unfair or disrespectful treatment in the workplace [7], but no such data exist for musculoskeletal radiology. The Society of Skeletal Radiology (SSR) is the oldest musculoskeletal society in the USA and focuses on issues of subspecialty recognition and representation, training, and research in musculoskeletal imaging and continuing education. Therefore,

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the purpose of our study was to assess the perception of equity and respect in the workplace and within the SSR. We hypothesized that responses would differ by gender and minority status.

## Materials and methods

An electronic survey was designed to determine perception of equity and respect in musculoskeletal radiology. The survey was intended to be anonymous and self-administered online and be sent by e-mail. No reminders were sent. Survey questions were adapted from the ACR survey [7] and reviewed by the president and senior leaders of the SSR prior to finalization. The survey included questions on demographics (age, gender, race, and ethnicity), practice setting (academic, private practice, hybrid practice, part time vs full time), and academic rank if applicable. Faculty underrepresented in medicine (URiM) was defined by the Association of American Medical Colleges (AAMC) (<https://www.aamc.org/initiatives/urm/>). We also asked about availability of mentors, opportunities for leadership and career advancement, compensation, and respectful treatment by patients and colleagues in the workplace and within the SSR. Participants were also asked to provide suggestions on what the SSR can do to support diversity (Supplementary Material).

The survey was e-mailed by the SSR management company to 1,531 members in January 2020 with a deadline for completion of March 2020. Of note, the survey was completed prior to the onset of the COVID-19 pandemic in the USA. Deidentified data were returned to the investigators for analysis.

## Data analysis

Statistical analyses were performed using JMP Statistical Discovery Software (Version 12, SAS Institute, Carey, NC). We used descriptive statistics per item and per group of interest. Analysis of differences in response by gender/minority status was performed using the Fisher's exact test. A  $p \leq 0.05$  was used to denote significance, and  $p \leq 0.1$  was used to denote a trend. The study was exempt from IRB approval.

## Results

From the 1,531 members the survey was sent to, there were 176 responses (11.5%). Most respondents (61.9%) were between 30 and 50 years. Members were identified as male in 74.4%, as female in 25.0%, and as "other" in 0.6%. This is similar to the composition of the SSR membership, which is 77% male and 23% female. Faculty underrepresented in

medicine (URiM) comprised 9.1% of members. Most members worked in an academic setting and were at the level of assistant professor, and most members worked full time (Table 1).

More than half of members (56.3%) had leadership positions, most common at the level of division chief. Members were encouraged to apply for leadership positions within and outside their institution. Most members agreed that opportunities for leadership and career advancement were similar for female, male, and transgender radiologists in their department or practice (Table 2).

More than one-third of members had a mentor, about one-third was neutral, and one-third did not. Most members did not feel that it was important to have a mentor of the same gender or race. Most members (69.3%) felt that the compensation was fair in their institution. Most members ( $\geq 82.4\%$ ) felt that they are treated with respect

**Table 1** Demographics of survey respondents ( $n = 176$ )

| Variable   | <i>N</i> | %    |
|--|----------|------|
| <b>Age</b>   |          |      |
| 30–40 years  | 60       | 34.1 |
| 40–50 years  | 49       | 27.8 |
| 50–60 years  | 47       | 26.7 |
| 60–70 years  | 16       | 9.1  |
| > 70 years   | 3        | 1.7  |
| No answer  | 1        | 0.6  |
| <b>Sex</b>   |          |      |
| Male   | 131      | 74.4 |
| Female   | 44       | 25.0 |
| Other  | 1        | 0.6  |
| <b>Race/ethnicity</b>  |          |      |
| White  | 126      | 71.6 |
| Asian or Asian American  | 29       | 16.4 |
| Black or African American                                      | 7        | 4.0  |
| Latino or Hispanic   | 7        | 4.0  |
| American Indian or Alaska Native                               | 0        | 0    |
| Native Hawaiian or Pacific Islander                            | 0        | 0    |
| Persian/Middle Eastern   | 3        | 1.7  |
| More than one race   | 2        | 1.1  |
| No answer  | 2        | 1.1  |
| <b>Specialty</b>   |          |      |
| Academic radiology   | 101      | 57.4 |
| Private practice   | 62       | 35.2 |
| Hybrid   | 10       | 5.7  |
| Other  | 3        | 1.7  |
| <b>Academic rank if academic/hybrid (<math>n = 111</math>)</b> |          |      |
| Fellow   | 6        | 5.4  |
| Instructor   | 0        | 0    |
| Assistant professor  | 50       | 45.1 |
| Associate professor  | 27       | 24.3 |
| Professor  | 28       | 25.2 |
| <b>Full time vs part time work</b>                             |          |      |
| Full time  | 157      | 89.2 |
| Part time  | 18       | 10.2 |
| No answer  | 1        | 0.6  |

**Table 2** Responses to questions about leadership ( $n=176$ )

| Question   | <i>N</i> | %    |
|--|----------|------|
| Do you hold a leadership position?   |          |      |
| Yes  | 99       | 56.3 |
| No   | 73       | 41.5 |
| No answer  | 4        | 2.2  |
| Leadership position ( $n=99$ )   |          |      |
| Fellowship director/assistant director   | 17       | 17.2 |
| Program/committee director   | 15       | 15.2 |
| Division chief   | 31       | 31.3 |
| President/chair/vice chair   | 26       | 26.2 |
| Other  | 10       | 10.1 |
| I am encouraged to apply for leadership positions at the local level   |          |      |
| Agree  | 76       | 43.2 |
| Neutral  | 56       | 19.9 |
| Disagree   | 35       | 36.9 |
| No answer  | 9        |      |
| I am encouraged to apply for leadership positions at the national level  |          |      |
| Agree  | 50       | 28.4 |
| Neutral  | 72       | 40.9 |
| Disagree   | 46       | 26.1 |
| No answer  | 8        | 4.5  |
| Opportunities for leadership and career advancement are similar for female, transgender, and male radiologists in my department or practice                            |          |      |
| Agree  | 105      | 59.7 |
| Neutral  | 46       | 26.1 |
| Disagree   | 19       | 10.8 |
| No answer  | 6        | 3.4  |
| Opportunities for leadership and career advancement are similar for faculty underrepresented in medicine (URiM) and non-URiM radiologists in my department or practice |          |      |
| Agree  | 88       | 50.0 |
| Neutral  | 61       | 34.7 |
| Disagree   | 18       | 10.2 |
| No answer  | 9        | 5.1  |

by their colleagues and staff and patients. Most members (68.2%) felt that the SSR provides an inclusive environment and that the SSR promoted women and minority members for leadership roles (56.2%) (Table 3).

When data were analyzed by gender, more women worked in academia (65.1% of women vs 55.7% of men,  $p=0.005$ ), had the perception of unequal opportunities for leadership positions within the institution (36.7% of women vs 8.5% of men,  $p=0.006$ ), and emphasized the importance of having a mentor of the same gender (30.0% of women vs 5.5% of men,  $p=0.001$ ). There was a trend of women being more likely to work part time (18.2% of women vs 7.7% of men,  $p=0.08$ ) and less likely to be treated with respect by their colleagues (92.5% of women vs 98.3% of men,  $p=0.1$ ).

When data were analyzed by minority status, URiM members were less likely to hold a leadership position (37.5% of URiM vs 59.4% of non-URiM,  $p=0.1$ , trend), had a perception of unequal opportunities for leadership positions for URiM faculty within the institution (40.0% of URiM vs 14.6% of non-URiM,  $p=0.06$ ), and had the

importance of having a mentor of the same race (18.2% of URiM vs 2.6% of non-URiM,  $p=0.06$ , trend).

There were no significant differences between gender or URiM status and the remaining questions. Specifically, there were no differences between gender or URiM status and the perception of the SSR to provide an inclusive environment ( $p\geq 0.39$ ) and leadership opportunities ( $p=1.0$ ).

The 10 most common suggestions on how the SSR could support diversity are summarized in Table 4. Survey respondents suggested to create opportunities for women and URiM for leadership positions, pipeline development with outreach to medical students and residents, and creation of mentoring opportunities, and to foster an inclusive environment.

## Discussion

Participants of a survey from the SSR were predominately male and White. In addition, women and members underrepresented in medicine (URiM) perceived that they had fewer

**Table 3** Responses to questions about mentorship, equity, and respect in the workplace and the SSR ( $n = 176$ )

| Question   | <i>N</i> | %    |
|--|----------|------|
| I have a mentor who supports my career development                   |          |      |
| Agree  | 63       | 35.8 |
| Neutral  | 46       | 26.1 |
| Disagree   | 59       | 33.5 |
| No answer  | 8        | 4.5  |
| Having a mentor that is the same gender is important to me           |          |      |
| Agree  | 14       | 8.0  |
| Neutral  | 46       | 26.1 |
| Disagree   | 108      | 61.4 |
| No answer  | 8        | 4.5  |
| Having a mentor that is the same race is important to me             |          |      |
| Agree  | 5        | 2.8  |
| Neutral  | 42       | 23.9 |
| Disagree   | 121      | 68.8 |
| No answer  | 8        | 4.5  |
| The compensation at my institution is fair amongst radiologists      |          |      |
| Agree  | 122      | 69.3 |
| Neutral  | 31       | 17.6 |
| Disagree   | 14       | 8.0  |
| No answer  | 9        | 5.1  |
| I am treated with respect by my colleagues and staff                 |          |      |
| Agree  | 152      | 86.4 |
| Neutral  | 12       | 6.8  |
| Disagree   | 5        | 2.8  |
| No answer  | 7        | 4.0  |
| I am treated with respect by patients                                |          |      |
| Agree  | 145      | 82.4 |
| Neutral  | 20       | 11.4 |
| Disagree   | 2        | 1.1  |
| No answer  | 9        | 5.1  |
| The SSR provides an inclusive environment for women and URiM members |          |      |
| Agree  | 120      | 68.2 |
| Neutral  | 48       | 27.3 |
| Disagree   | 2        | 1.1  |
| No answer  | 6        | 3.4  |
| The SSR promotes women and URiM members for leadership roles         |          |      |
| Agree  | 99       | 56.2 |
| Neutral  | 67       | 38.1 |
| Disagree   | 1        | 0.6  |
| No answer  | 9        | 5.1  |

**Table 4** Comments from survey respondents on what the Society of Skeletal Radiology (SSR) could do to support diversity

| Suggestions   |
|---|
| Create opportunities for women and URiM for leadership positions and networking       |
| Create opportunity for mentoring of women and URiM in the SSR                         |
| Reach out to medical students/residents to join the SSR/pursue MSK radiology          |
| Actively recruit women and URiM to join the SSR                                       |
| Encourage women and URiM to apply for leadership positions in the SSR                 |
| Promote diversity in SSR committees   |
| Openly advertise leadership positions within the SSR                                  |
| Continued dialogue and awareness of diversity within the SSR and within MSK radiology |
| Focus on diversity of thought and opinion   |
| Foster inclusive environment  |
| <i>URiM</i> underrepresented in medicine  |
| <i>MSK</i> musculoskeletal radiology  |

leadership opportunities and reported the importance for mentorship of the same sex and race for women and URiM members. Women also felt to be treated with lower regard in the workplace compared to male colleagues. Of note, most members felt that the SSR provides an inclusive environment and that the SSR promoted woman and minority members for leadership roles.

The participation of women and individuals URiM in the biomedical workforce is critical to our nation's health, and diversity of this workforce has been identified as a strategy to reduce health disparities [4, 8]. Gender and ethnic diversity among physicians and scientists have been linked to improved access and quality of care for women and minorities [9, 10]. Physicians and scientists from URiM backgrounds are more likely to conduct research in URiM populations and may also be able to gain the trust of minority groups and engage them in research studies [11, 12]. Furthermore, women and URiM faculty serve as important role models and mentors to prospective minority trainees. Therefore, it is crucial that the demographics of the biomedical workforce is more reflective of the nation's population. There is a known gender disparity in radiology with less than 25% women [4, 5]. Our results confirm similar gender composition within musculoskeletal radiology, with 25% of SSR survey respondents being women. This is similar to a study by Qamar et al. [6] surveying 274 musculoskeletal radiologists in North America and Canada that showed 30% women [6]. URiM faculty as defined by the AAMC comprised only 9.1% of respondents, which is slightly higher than reported URiM faculty in radiology (5.8%) [4]. Between 1997 and 2017, the proportion of URiM medical student in the USA dropped from 15% to 13% [13]. A retrospective study examining over 180,000 resident physicians of the 20 largest resident specialties in the USA from 2007 to 2018 showed that radiology was the only specialty that had a statistically significant increase in the proportion of Black trainees. However, it would take radiology 77 years to reach levels of Black representation which would be comparable to that of the US population [14]. In a survey from the ACR which included radiologists and radiation oncologists, 9.5% of respondents were URiM. The study oversampled women to have representation; therefore, our study cannot be compared with regard to gender [7].

Survey respondents suggested to increase the pipeline and reaching out to women and URiM trainees to pursue musculoskeletal radiology and to join the SSR. While women comprise 48.3% and URiM 15.3% of medical school graduates, only 27.8% and 8.3% of radiology residents are women and URiM, respectively [4]. A survey of medical students to determine gender differences in choosing a medical specialty revealed that female medical student valued gender diversity within the specialty and exposure to third-year clerkships when choosing a future

specialty [15]. Therefore, efforts should be made to expose medical students early in their training and within their third-year clerkship to radiology and possibly musculoskeletal radiology. It will be important to involve women in the radiology teaching.

Most members in the SSR worked in an academic setting, and there was a higher likelihood for women to work in academia. More than half of members had leadership positions, most common at the level of division chief. Members were encouraged to apply for leadership positions within and outside of their institution. While most members agreed that opportunities for leadership and career advancement were similar for female, male, and transgender and URiM radiologists in their department or practice, women and URiM faculty felt that there were fewer leadership opportunities for women and URiM faculty. Survey respondents suggested that the SSR should openly advertise leadership positions within the SSR and encourage women and URiM members to apply for those positions. A survey of 11,781 anesthesiologists on the perception of gender equity and leadership opportunities showed that women were disadvantaged in obtaining leadership positions and were more likely to be mistreated in the workplace [16].

More than one-third of respondents had a mentor and about one-third did not. Women and URiM faculty reported the importance for mentorship of the same sex and race, respectively. Suggestions from the survey respondents were to create opportunities within the SSR to mentor women and URiM members. Targeted mentoring in radiology has been shown to improve career advancement of URiM faculty [17], and a departmental "women in radiology" group accelerated career development, increased networking and research involvement, and improved camaraderie among its members [18].

Most members felt that they are treated with respect by their colleagues, staff, and patients; however, there was a trend of women feeling to be treated with lower respect by their colleagues. There was no difference in perceptions of URiM radiologists to be treated with lower respect by colleagues or patients; however, our analyses were limited by the small number of URiM respondents. A systematic review of women in radiology has shown that between 40 and 47% of women radiologists face discrimination and sexual harassment [19]. The role of the SSR is to foster an inclusive and welcoming environment and to continue to raise awareness of diversity within the SSR and within musculoskeletal radiology.

Main limitations of our study include the low response rate of 11.5% which was potentially biased towards people with an interest in this topic, and the low number of URiM faculty which limited detailed analyses. In addition, the perception of respondents towards gender bias in leadership may be skewed as over 50% held leadership positions.

In conclusion, women and URiM are underrepresented in the SSR. Respondents of our survey perceived that women and minorities have fewer opportunities and are treated with lower regard in the workplace. Given the need for developing the pipeline and importance of mentorship of the same sex and race for women and URiM members, the SSR might create programs to reach out to medical students and residents and to provide mentorship to women and URiM members to improve workforce diversity.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s00256-021-03901-w>.

## Declarations

**Ethics approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed consent** The study was exempt from IRB approval.

**Conflict of interest** The authors declare no competing interests.

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