









Under-representation of women is alive and well in sport and exercise medicine: what it looks like and what we can do about it

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INTRODUCTION

Despite constituting approximately 50% of the population, women specifically are under-represented in sport and exercise medicine (SEM) and they often experience a negative bias. Our authorship group has recognised this issue based on evidence from recent studies, personal experiences and the experiences of the wider SEM community. We understand that this is a complex issue. Through this editorial, we aim to briefly highlight the issue of insufficient representation of women in SEM, discuss some of the impacts of this inadequate inclusion and other negative aspects experienced and suggest steps that we can all take to address female under-representation to improve the field of SEM

FEMALE UNDER-REPRESENTATION IN SEM

Sex and gender bias in SEM settings are evident in multiple ways. Systematic reviews demonstrated that female athletes are under-represented in sports and exercise research.^{1,2} International Olympic Committee consensus statements identified the need for increased representation and inclusion of authors from different genders, ethnicities, skill sets and levels of experience.³ Female first and last authorship on scientific publications is less than 25%,^{4,5} they hold less than 25% of leadership roles in editorial boards in sports sciences, and they are also under-represented in leadership in primary care sport medicine.^{6,7} Women account for less than 20% of team doctors in both collegiate and professional sports, with the highest percentage

(31%) in the Women's National Basketball Association.⁸ At conferences, all-male conference panels and keynote speakers are still common.^{9,10}

HOW DOES IT AFFECT THE FIELD, AND WHAT OTHER ADVERSE CONSEQUENCES DO WOMEN IN SEM FACE?

Under-representation of female participants, clinicians and researchers in SEM can have detrimental effects for the field and women within it.

Knowledge gaps

Although female athletes constitute approximately 50% of the population, there are distinct knowledge gaps in areas such as sport performance, cardiovascular health, musculoskeletal health, postpartum physiology and lactation research.¹¹ It is crucial to foster diversity in both participant cohorts and research teams.¹² This includes designing experimental studies with female-specific physiological considerations and creating evidence-based exercise-related guidelines tailored for sportswomen.¹³ There is also a need for separate analyses to account for different causal mechanisms for injuries or health issues in men and women. Sex-specific exercise training recommendations can help improve adherence and physiological responses in clinical populations.¹⁴ However, women remain under-enrolled in both recreational and performance sports research, mirroring the under-representation of women across health and disease states.¹⁵



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Addressing this issue is vital to support performance and safe sport for women.

Workplace challenges

Harassment at the workplace can lead to unhealthy work environments, mental health challenges and poor job satisfaction for female practitioners.¹⁴ This may contribute to women leaving their positions early or seeking work in other areas. Moreover, the workload and work culture may differ for female and male clinicians and researchers. Higher suicide mortality rates are observed among female physicians compared with male

physicians.¹⁶ Work stressors have been identified as a risk factor for suicide among female physicians.¹⁷ Female sportmedicine physicians experience disrespect and have their judgement questioned more often than male sport medicine physicians. They have also reported experiencing sexual harassment.¹⁸

Reduced sports participation

Encouraging sports participation and actively striving to keep all children and adolescents, irrespective of their sex or gender, engaged in sports is crucial for promoting health throughout life.¹⁹ Sports dropout is a major

Table 1 Strategies and actions for promoting diversity and inclusivity in sport and exercise medicine and academia

Strategies	Actions
Build a culture of awareness, excellence and inclusivity	Embrace diverse views and diverse people, leading to better research and outcomes. Addressing gender bias through open discussions.
	Educate faculties on the impact of gender bias. ²³ Open and candid discussions about gender bias can help shift the focus to evaluating the quality of work conducted in science and medicine, rather than focusing on the practitioner's gender. This may create solutions to address bias rather than perpetuating it through silence.
	Improve gender representation and work–life balance in academia
	Ensure equal representation of male and female research participants. ²³
	Provide secure, long-term employment opportunities for early-career academics, and ensure that they have access to equal parental leave, support for dual-career relationships, part-time work options, and affordable, high-quality childcare. Additionally, consider organising family-friendly conferences that can accommodate attendees with caregiving responsibilities. ²⁴
Promote female inclusion in sports medicine	Diversify the applicant pool through initiatives such as training search committees. ²³
	Support and promote professional growth through mentoring, networking and development opportunities, particularly for women faculty. ²³
	Promote a healthy work–life balance by discouraging a culture of 24/7 work and encouraging employees to prioritise their well-being. ²⁴
	Foster a problem-solving environment in which colleagues can support each other and work as a team, increasing motivation, efficiency and health. ²⁴
	Provide diversity and inclusion training for athletes, coaches and other staff. ²⁵ Provide career coaching, mentorship and opportunities for growth as practitioners and in leadership positions.
Enhance female inclusion in research, publications, and conferences	Hold leaders accountable for driving business practices and clinics that improve diversity.
	Encourage diversity and inclusion in leadership positions within sports medicine organisations and address gender bias in hiring and promotion practices. ²⁵
	Implement intentional allyship strategies to address speaker gender inequity. ²⁵
Recognise the benefits of greater diversity	Conduct further research through an intersectional lens to examine factors leading to over-representation of white men in SEM. ²⁵
	Consider diversity at all stages of research and publication, including among author groups and peer reviewers. ²⁵
	Reflect on the reasons behind the gender disparity in acceptance rates of scientific work, and explore the possibility of implementing gender-blind review processes. ²⁴
Enhance the use of enabling technology	Ensure diversity at sport and exercise medicine conferences, increasing the representation of women and gender diverse people as speakers and attendees. ²⁶
	Acknowledge that greater diversity benefits both clinicians and patients, bringing different qualities, skills and experience to the table. ²⁵ Female providers are preferred by female athletes for sexual health problems and by both male and female athletes for psychosocial health issues. ²⁷ Female physicians have lower mortality rates for their patients. ²⁸
Distribute work equally	Promote the empowerment of women through information and communications technology. ²⁹
Implement anonymous reporting platforms and expert commentary to address bias in SEM settings	Ensure that work is distributed equally across genders. Do not overload women. ²⁴
	Initiatives like #SpeakUpOrtho provide a platform for anonymously sharing experiences of microaggressions, bullying, harassment, discrimination and retaliation. Expert commentary can help prevent the perpetuation of these behaviours. ³⁰
SEM, sport and exercise medicine.	

concern among specifically female adolescents. Role models may play a role in ameliorating this.^{20 21}

ADDRESSING FEMALE UNDER-REPRESENTATION

At peak sport medicine bodies, academic researchers and training institutions, there are a number of ways we can address female under-representation and its consequences. In [table 1](#), we describe the following strategies: (a) build a culture of awareness, excellence and inclusivity, (b) promote female inclusion in sport medicine, (c) enhance female inclusion in research, publications and conferences, (d) recognise the benefits of greater diversity, (e) enhance the use of enabling technology, (f) distribute work equally, (g) implement anonymous reporting platforms and expert commentary to address bias in SEM settings. By incorporating these strategies, we can work towards creating a more diverse and inclusive environment in the field of sport medicine that benefits everyone involved.

Portugal is an example of a country that has achieved parity between men and women in research, with women representing 50% of published researchers.²² Women are highly represented among first authors, indicating greater equality and representation for early-career researchers. Unlike other comparable nations, women researchers in Portugal are likely to continue publishing over time and remain engaged in research.

It is important that we acknowledge the under-representation and work to break the cycle of gender bias through role models. The lack of female role models in SEM can perpetuate the cycle of gender bias. Breaking this cycle is essential to ensure that future generations do not perceive gender bias as normal and continue to pass it down to new practitioners joining the field. In the future, gender equity should be normal.

CONCLUSION

Like many disciplines, there is an evident under-representation of women and potential negative bias in SEM, research and occupations at all levels. There are great benefits to achieving gender equity in SEM. We believe that we can ensure that the brightest minds from all backgrounds can contribute to the advancement of science and enhance not only the sports medicine community but also society at large by acknowledging and addressing this under-representation.

RECOMMENDED RESOURCES

- ▶ Follow the hashtag #WomenInSTEM
- ▶ See BJSM blog August 2022 <https://blogs.bmj.com/bjsem/2022/08/22/gender-bias-in-sports-medicine/>

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Sports medicine must up its game to break cycle of gender bias, urge doctors

Dearth of women in all roles hindering advancement of specialty and 'normalising' inequity

Sports and exercise medicine must up its game to break the cycle of gender bias in the specialty, urge an international group of doctors in an editorial in the open access journal ***BMJ Open Sport & Exercise Medicine***.

The dearth of women in all roles—from participants through to clinicians and researchers—is hindering the progress and scientific advancement of the specialty and helping to 'normalise' gender inequity for future generations, say the authors from across the Americas, Africa, Australasia, and Europe.

They cite a slew of evidence spelling out the lack of gender parity in the specialty.

Women make up less than 25% of senior authors on scientific research and leadership roles on editorial boards in sports sciences. And they account for less than 20% of team doctors in both collegiate and professional sports, the authors point out.

All-male conference panels and keynote speakers in sports and exercise medicine are still common, while female sports medicine doctors experience disrespect and sexual harassment, have their judgment questioned more often than their male counterparts, and have higher rates of death by suicide, they add.

There continue to be major knowledge gaps in key research areas, such as women's sport performance, their cardiovascular and musculoskeletal health, and the impact of the reproductive cycle.

In a bid to address the gender imbalance in sports and exercise medicine practice and research, the authors recommend a series of strategies and actions for professional bodies and academic institutions in the specialty.

These include:

- Building a culture of awareness, excellence, and inclusivity through education, training, and open discussion; family friendly policies; mentoring and professional development opportunities
- Promoting female inclusion in sport medicine, by, among other things, holding leaders to account for driving business practices and clinics that improve diversity, including in hiring and promotion practices
- Bolstering women's inclusion and participation in research, publications, and conferences, by considering diversity at all stages of research and publication, including among peer reviewers; and by increasing the representation of women and gender diverse people as speakers and attendees
- Recognising that greater diversity benefits both clinicians and patients, by bringing different qualities, skills, and experience to the table
- Boosting the use of enabling technology to empower women

- Distributing work equally
- Implementing anonymous reporting platforms for microaggressions, bullying, harassment, discrimination and retaliation, and providing expert commentary to prevent perpetuation of these behaviours

“It is important that we acknowledge the underrepresentation, and work to break the cycle of gender bias through role models. The lack of female role models in sports and exercise medicine can perpetuate the cycle of gender bias,” write the authors.

“Breaking this cycle is essential to ensure that future generations do not perceive gender bias as normal and continue to pass it down to new practitioners joining the field.”

In so doing, “We believe that we can ensure that the brightest minds from all backgrounds can contribute to the advancement of science and enhance not only the sports medicine community but also society at large,” they conclude.