

Review

Social Media as a Tool to Advance Women in Cardiology: Paving the Way for Gender Equality and Diversity

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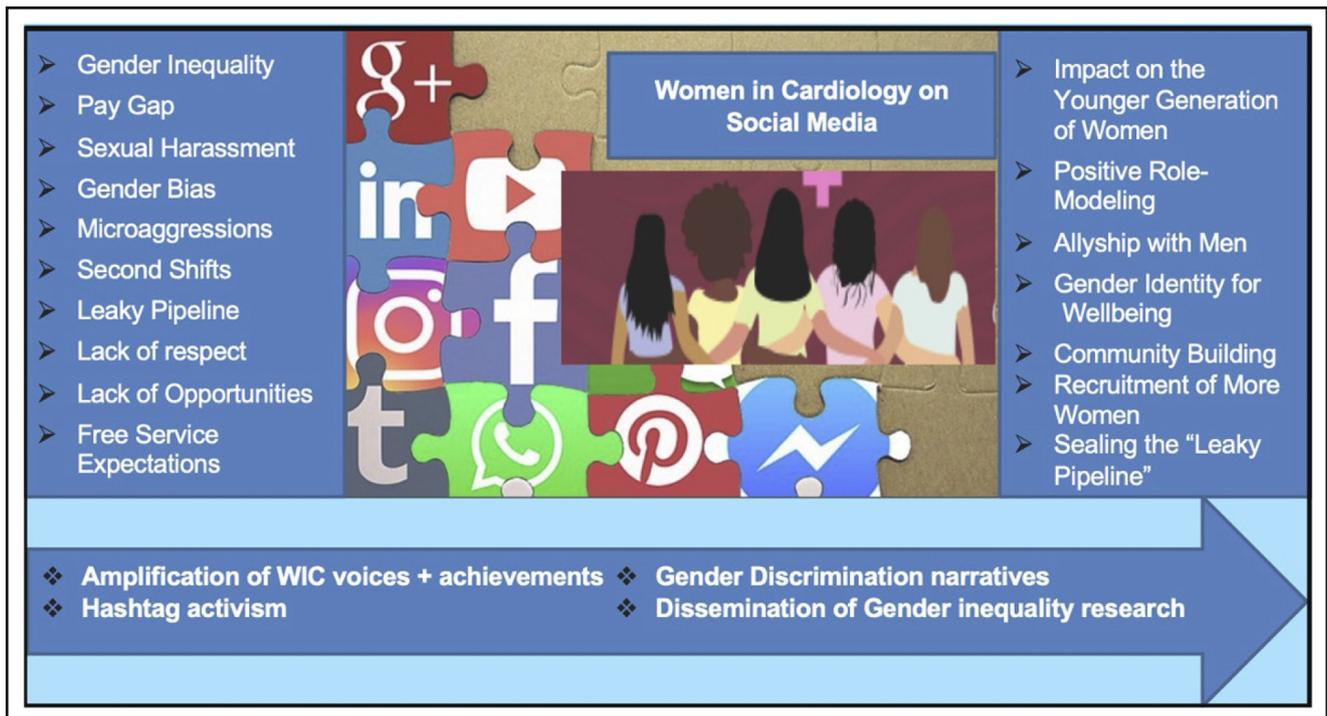
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ABSTRACT

Although the number of women in the field of medicine continues to rise, the discrimination against women and the gender inequity in both leadership roles and salary remains persistent. The gender divide is particularly prominent in male-dominated specialties, such as cardiology. Social media help foster global connections and disseminate information quickly and worldwide. The rise of social media has influenced how female physicians communicate and has shown its benefits particularly within the field of cardiology. Virtual platforms are important avenues where female physicians have united for greater representation of gender issues and advocacy efforts. Social media further amplify gender-equality activism by facilitating the conversations surrounding gender equity and proposing solutions to self-identified issues by the virtual community of female physicians and their allies. In this review, we discuss the role of social media as tools for advancing women in the field of cardiology and fostering gender equality and diversity.

In the past decade, there has been a steady rise in the percentage of women in the field of medicine. According to Association of American Medical Colleges (AAMC) data, the percentage of self-identified women in medical school was 53.6% in 2020, up from 46.9% in 2015, tipping the scale in favor of female predominance in medical education programs.¹ Despite this increase, a significant number of women in the medical field still face sex- and gender-based harassment (sex is a biological construct that defines an individual as being a man or a woman according to anatomy, physiology, and genetics; gender is a psychosocial construct and has a wider scope incorporating the effects of social norms and expectations, roles, behaviours, expressions, and identities of women, girls, men, boys, and gender-diverse people in each society²), microaggressions, and workplace inequality,³ suggesting that the rapid rise in matriculation has not translated into the culture change required to improve retention of women in the field of medicine. The National Academies of Sciences, Engineering, and Medicine reported widespread gender-based inequality in classrooms, laboratories, academic medical centers, field sites, observatories, and conferences.⁴ Women face discrimination and are met with social and institutional barriers that can negatively impact their work and mental health, ultimately resulting in skilled, educated, professional women leaving science careers.⁵ Among the fields most affected, medicine ranked at the top in terms of sexual harassment and discrimination.⁶ In a recent investigation of the components and impact of a hostile work environment among cardiologists, it was determined that 56% experienced discrimination, 43% experienced emotional harassment, and 12% experienced sexual harassment. These events negatively impacted patient care and interaction with colleagues.⁶ In this report, the “high-risk sexual harassment workplaces” within the STEM fields (science, technology, engineering, math, and medicine), such as cardiology, were found to be directly

RÉSUMÉ

Bien que le nombre de femmes dans le domaine de la médecine continue d'augmenter, la discrimination à l'égard des femmes et l'inégalité entre les sexes, tant au niveau des rôles de direction que des salaires, persistent. L'écart entre les sexes est particulièrement marqué dans les spécialités à prédominance masculine, comme la cardiologie. Les médias sociaux contribuent à favoriser les liens à l'échelle mondiale et permettent de diffuser des renseignements rapidement dans le monde entier. L'essor des médias sociaux a influencé la manière dont les femmes médecins communiquent, et ces médias ont démontré des bienfaits, notamment dans le domaine de la cardiologie. Les plateformes virtuelles sont des moyens importants utilisés par les femmes médecins pour s'unir afin de mieux mettre de l'avant les questions de genre et d'améliorer les efforts de sensibilisation. Les médias sociaux amplifient encore davantage le militantisme en faveur de l'égalité des sexes en facilitant les conversations autour de l'égalité des sexes et en proposant des solutions aux problèmes ciblés par la communauté virtuelle des femmes médecins et de leurs alliés. Dans cet examen, nous discutons du rôle des médias sociaux à titre d'outils permettant de faire progresser les femmes dans le domaine de la cardiologie et de favoriser l'égalité des sexes et la diversité.

correlated to “male domination and organizational tolerance,” in comparison to gender-balanced workgroups. This perhaps suggests that the medical field, and some specialties more than others, perpetuates an environment that in totality is damaging to women's careers.⁴

The percentage of women in some medical specialties, such as cardiology and orthopedic surgery, is low compared to that of their male counterparts. Although women comprise > 50% of medical school trainees, there is a notable decline in women in cardiovascular medicine as they progress beyond medical school, with only 43% of internal medicine residents, 25.2% of cardiovascular disease fellows, and 13% of interventional cardiology fellows in 2019 being women.⁷ From 2019-2020, the Accreditation Council for Graduate Medical Education (ACGME) reported that general cardiology fellowship training was ranked as being one of the worst in terms of underrepresentation of women among medical subspecialties.⁸ Similarly, there are fewer women cardiologists, as they comprise 15% of active physicians within cardiovascular disease, and 8% within interventional cardiology.⁷ Of 3810 cardiologists with faculty appointments, only 630 were noted to be women in 2014.⁹ Women are also underrepresented in various leadership roles. Between 1998 and 2018, there were no female editors-in-chief for US general cardiology journals, and only 1 for general European cardiology journals.¹⁰ Although there has been an increase in women serving on the editorial boards for *Circulation*, *Journal of the American College of Cardiology*, and *American Journal of Cardiology* taken together, the overall level of representation remains low, with only 2 editors-in-chief being women in over 20 years, with 2 more women recently named as such for 2019, and a coauthor (E.D.M.) of this piece becoming editor-in-chief in 2021 at the *American Journal of Preventive Cardiology*.¹⁰ Lack of female representation in leadership positions within cardiology also creates a dearth of female mentors

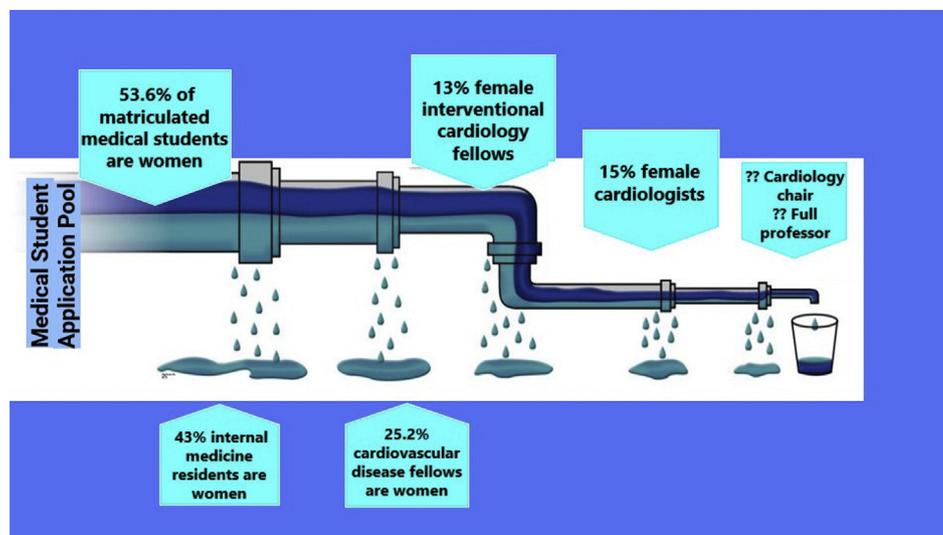


Figure 1. “The Leaky Pipeline”^{1,4,6,7}: the diagram outlines the gradual decline in the number of women—from the majority in medical school to a minority within cardiology subspecialties, and with only a small proportion in academic leadership positions. WIC, women in cardiology.

for trainees, a significant power differential, and translates into fewer opportunities for women to be heard and make an impact. This effect is known as the “leaky pipeline,” as women do not follow the hierarchical path or “pipeline” of moving consistently toward senior positions⁵ (Fig. 1). In addition to the leadership disparities, women continue to be paid less than their male colleagues, despite spending more time with their patients. Although the degree of wage discrepancy varies among subspecialties, significant sex differences in salary have been demonstrated within the majority of subspecialties, and this difference persists even after statistical adjustments for age, experience, specialty, faculty rank, and measures of research productivity and clinical revenue.¹¹ The gap is particularly prominent in cardiology, a field in which, over a 35-year career, a woman cardiologist in the US is estimated to earn \$2.5 million less than a male cardiologist.¹² Notably, a 2016 study reported that among all other subspecialties, after adjusting for years of experience and hours worked, cardiology ranked top among fields with the largest absolute sex-based differences in physician salary. The astounding point to be taken from these studies remains the fact that for equal work, there is a significant lack of equal pay, despite adjusting for all other potential external variables, such as age, academic degree, specialty, and number of sessions per week or day.¹¹

Gender-based disparities in professional lives are compounded by those in personal lives, an effect termed “the second shift” by sociologist Arlie Hochschild. Women in cardiology (WIC) more often face the challenges of disparities in not only their professional life, but also their personal life, particularly in relation to household duties such as cleaning, caring for children, and cooking.^{13,14} This imbalance creates a further disadvantage for women who not only are trying to excel professionally, but also feel the additional pressure of taking care of domestic duties at home.¹⁵ Physician mothers in both procedural and nonprocedural specialties reported having primary responsibility for most domestic tasks in a survey of 1712 attending physician mothers.¹⁶ This study also

found that increased responsibility at home was associated with career dissatisfaction or a desire to change careers.^{13,14,17}

Gender inequalities in specialties within the field of medicine are extensive.^{15,18} There is growing evidence that these issues and the inequality described above create a complex interplay of institutional and societal biases against women physicians.¹⁷ Recently, various solutions have been proposed to overcome these biases. In this review, we discuss how social media may serve as tools for advancing WIC and foster gender equality and diversity.

The Rise of Social Media and Hashtag Activism

The use of social media in the field of academic medicine has increased over the past few years,¹⁹ with the creation of online communities of physicians in the field of medicine and its specialties. The rise of social media has influenced how female physicians communicate.²⁰ Virtual platforms are important avenues where female physicians have united to create greater female representation in regard to gender issues and advocacy efforts. An important example of these efforts is the hashtag activism used to bridge the gap in gender issues (Fig. 2). Initially started by the non-medical community, social media hashtags such as #metoo, which trended in 85 countries,²¹ allowed for the amplification of women’s voices, owing to the hashtags’ global accessibility and ease of use. Women in the field of medicine (WIM) participated, using the hashtag #metoomedicine. Within cardiology, the hashtags #WIC, #ACCWIC (American College of Cardiology Women in Cardiology), and #AHAWIC (American Heart Association Women in Cardiology) have been used to collectively represent the voices of WIC. The use of “hashtag activism” has allowed WIC to connect through a common experience, but more importantly, to share that experience on a public platform through Twitter, elevating their voice and creating allies in the process. This social media activism has been used to promote a culture shift within the field of cardiology, creating a more inclusive, respectful work environment.²²



Figure 2. The phrases of “hashtag activism”¹⁹⁻²¹: a representation of the frequently used hashtags within the women in cardiology (WIC) network. ACCWIC, American College of Cardiology Women in Cardiology; AHAWIC, American Heart Association Women in Cardiology; SCAIWIN, Society for Cardiovascular Angiography and Interventions Women in Innovations.

Social media provide a unique means of fostering collaboration, networking, mentorship, and dissemination of research, which may help to both increase representation and close the gender gap within the field.^{19,23} It has been shown that platforms such as Twitter greatly extend the reach of tweets and journal articles related to issues of gender equity and increase the impact of publications and the number of paper downloads.^{23,24} Thus, social media serve to further amplify gender-equality activism by facilitating the conversations surrounding gender equity and proposing solutions to self-identified issues by the virtual community of female physicians and their allies.¹⁹

As the presence of WIC on social media increases, along with the use of hashtags, it is imperative to understand how these increases are impacting discussions. Recent analysis of hashtags, such as #WIC and #WomeninMedicine, has shown an upward trend in usage in the cardiology Twitter

community.²⁴ Analysis of 6 key hashtag phrases identified showed that, over a period of 3 years (2016-2019), there was a 706% increase in tweets and retweets of tagged posts, a 207% increase in impressions, and a 440% global increase in Twitter users sending tweets within the “Women in Cardiology Twitter Network.”²² The momentous increase in tweet shares and global impressions signifies the power of hashtags to reach a target audience. The nature of what is shared on the virtual platform has also shifted over the years, with WIC speaking about the real-life stories of gender discrimination such as the pay gap in comparison to what their male colleagues in cardiology earn, lack of respect by patients, staff, and colleagues, skepticism from patients about their qualifications simply because they are women, being recognized as a “girl” and not as a doctor, lack of consideration and/or accommodation during and after pregnancies, and other issues (Fig. 3).²⁴ By using gender-activist hashtags in combination with specialty-focused hashtags, WIC can put their experiences of gender inequity and sexual harassment front-and-center on the pages of their cardiology peers who need to confront, evaluate, and adjust their behaviour and hopefully impact the culture they are a part of at their institution. An analysis of various women-centric hashtags, such as #WIC, revealed that community-building was the focus of most posts by social media users using the hashtag.²² In the percentage of both original tweets and “amplified” tweets (via re-tweets), professional development and mentorship were key content focuses of WIC and those within the cardiology network.²² Social media have therefore increased the visibility of WIC achievements and increased awareness of gender discrimination within the workplace, and generated solidarity.²²

WIC Networks on Social Media

In conjunction with Twitter, which promotes social movements through the grouping of topics by use of “hashtags,”^{25,26} other platforms, such as Facebook, have become

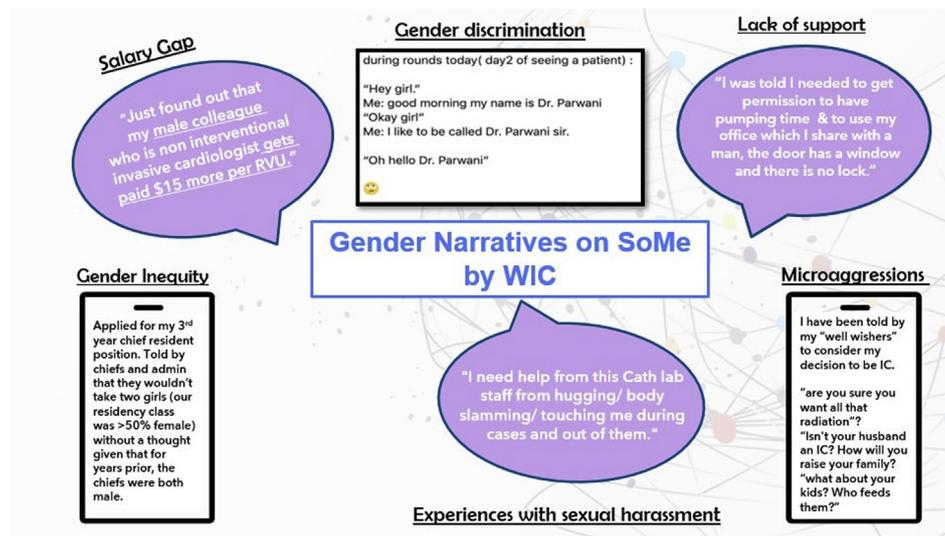


Figure 3. Visual representation of gender narratives on social media by women in cardiology.^{26,38,39} SoMe, social media; WIC, women in cardiology.

home to growing communities in which WIC can communicate and support one another. Notably, Facebook's WIC group has become a hub for women to communicate freely in an open forum outside the workplace and to connect with WIC beyond their immediate workplace.²⁷ The private Facebook group has allowed WIC to have candid discussions and exchange shared experiences without the fear of judgment from male or unfriendly onlookers. In this closed group, WIC can further seek support regarding the difficulties they face, such as managing the "second shift" or navigating workplace discrimination.^{27,28}

Emerging social media platforms such as Clubhouse²⁹ further expand the connections women make to one another and broaden the reach of gender-equality activism, becoming popular among healthcare professionals and being used as an educational tool. Any user on the platform can form a "club," which is generally focused on a more specific topic to appeal to those who are interested. For example, the WIM and WIC clubs have gained over 1000 and 440 members, respectively, in the past 3 months, facilitating conversations such as "sexism in healthcare," "the leaky pipeline for women in medicine," and other topics surrounding the disparities that women in healthcare face and how to combat them.¹⁹ These community spaces foster a sense of solidarity among female health professionals with similar experiences of gender bias and allow for open and extemporaneous communication regarding positive strides that have been made; having the ability to speak up and share experiences and particularly to have men in the audience listen to the conversation unfiltered and participate, may help stimulate further change in the misogynistic culture that has persisted in medicine and cardiology.⁵

The Impact of Gendered Conversations on Social Media

It is well documented that social media greatly influences perceptions of self-worth and self-concept of the members of younger generations, who consume social media constantly throughout their days.²⁹ Moreover, social media are particularly influential for young women, impacting their preferences, social behaviours, and even academic interests as early as elementary school.³⁰ Representation of genders in media not only influences not only gender roles on a societal scale but also how women perceive themselves. This process becomes a cycle in which girls do not see themselves represented in medical fields, and therefore self-select out of these professions by tailoring—either consciously or subconsciously—their expressed interests to match those in fields that are traditionally female-dominated.³¹ The solution to this vicious cycle is to promote and publicize WIM and WIC. Social media, such as television and film, influence cultural norms by modeling gender-appropriate behavior.³⁰ Social media's ease of accessibility and rapid turnover time, including its accessibility to the broader public outside of medicine, makes it a remarkable conduit of social influence.²⁹ In 2018, 93.5% of medical students reported using some form of social media, including Facebook, Twitter, and LinkedIn.³² These numbers continue to rise as novel social media platforms develop and social media use becomes more pervasive, particularly with the shift to online classes and work-from-home that has occurred during the coronavirus disease 2019 (COVID-19) pandemic.³³ The use of

electronic media for work in the form of telemedicine in 2020 was paralleled by an increase in use of social media for personal engagement as well, thereby amplifying the presence of both aspiring physicians and current physicians on social media platforms.³³ This increased presence on social media provides an opportunity to further spotlight WIC and amplify their presence. As WIC, as well as women from other subspecialties of medicine, continue to grow their public presence on social media, young women who frequently use social media sites such as Twitter, Facebook, Instagram, and now Clubhouse, will hear the amplification of voices and perhaps will visualize themselves represented in medicine in the future. This growth will help minimize self-selection of women out of male-dominated subspecialties such as cardiology; hopefully, through representation and positive role modeling, this growth will help eliminate the underrepresentation of WIC.

Although these social media platforms provide the ability for women to talk freely about their experiences and bring light to the issues they face, they also encourage being allies with men, with the use of hashtags such as #HeforShe, which allows male colleagues to be part of the movement to change the misogynistic culture. With the emergence of social media platforms such as Clubhouse, men can express their support in real time, actively participate in conversations, and listen to the problems women in medicine face professionally and personally. Hashtag activism has also allowed for identification and public criticism of all-male panels (also known as a "manel") in conferences and meetings.³⁴ The importance of having gender diversity at medical conferences has been continuously highlighted on social media, with a slow increase in women in key speaking roles, but much work remains to be done.³⁵ With social media, medical professionals can help garner a community that helps bring light to issues such as these and ensure gender diversity in all facets of medicine.³⁶

Online tweeting about sexism has also been shown to promote the well-being of the activists via promotion of positive properties of gender identity.³⁷ While sharing their stories on social media, women take pride in identifying themselves as women while interacting with other women and thriving in that environment, one in which women can be heard and share their experiences and not feel alone.³⁸ Indeed, documenting the pervasiveness of these negative experiences is the first step in effecting change.

Conclusion

For a long time, WIC issues have been in the blind spot of the cardiovascular community. Social media is that high-quality mirror that makes the #WIC blind spot visible. The power of social media to influence societal norms and cultural beliefs, and to eliminate rigid gender roles, is immense; this fact, coupled with the ever-changing nature of social media and its ability to leverage current social change trends, presents an opportunity for culture change for WIC. By using social media to highlight their presence and amplify their voices, WIC perhaps will be able to shift the social perceptions of cardiology as a male-dominated space to one where women can coexist and even thrive. This process will help recruit more women into the field of cardiology, create allies in men, promote changes to the

gender-biased culture in the workplace, and hopefully seal the leaky pipeline (Central Illustration).

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Dr Parwani serves as a Guest Editor to *Journal of the American College of Cardiology (JACC): Case Reports*. Dr Choi serves as Social Media Editor for *JACC: Cardiovascular Imaging*. Dr Grapsa serves as an Editor-in-Chief for *JACC: Case Reports*. Dr Michos serves as co-Editor-in-Chief for the *American Journal of Preventive Cardiology*. All the other authors have no conflicts of interest to disclose.

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