



Gender Disparities in Journal Citations—Another Metric of Inequity in Academia

Helen R. Burstin, MD, MPH; Vineet M. Arora, MD, MAPP

While women are increasingly represented in the medical profession, they continue to face significant barriers to advancement in academic medicine. Research consistently demonstrates disparities for women in academic promotion, journal authorship, research funding, leadership roles, and compensation. A recent article¹ demonstrated that the gap for women to advance to associate professor, full professor, or department chair has not narrowed over time and has likely worsened during the pandemic.

Elsewhere in *JAMA Network Open*, Chatterjee and Werner² describe a novel metric of gender inequity that may offer another reason for the lagging advancement of women in academic medicine—a disparity in citations of women's research in high-impact journals. The timely and important article demonstrates two important findings: women are less likely to be published in high-impact journals, and they are less likely to have their research cited by others. The combination of men primary and senior authors was most frequently cited, while women primary and senior authors were less likely to be cited. While others have previously noted disparities in publication in high-impact journals,³ this article goes further by demonstrating that even after achieving the goal of publication in a high-impact journal, women's research is less likely to be cited and amplified. The authors note that research citations are often used in promotion and academic advancement as a proxy for scholarly impact.

Although women researchers increasingly publish in prestigious journals, advancement can be limited without recognition by peers for the quality of their scholarship. As noted by the authors, this critical recognition is limited if women are not invited to share their research with academic colleagues or recognized for their scholarship in the press and social media. Zhu and colleagues⁴ previously found that women in academic medicine were less likely to be amplified on Twitter. A recent article found that compared with male physicians, female physicians were less likely to report professional benefits from social media engagement on Twitter, such as opportunities for invited talks or research collaborations.⁵ Given that Twitter is an increasingly important platform to promote research, women's research and women's voices need greater amplification.

Greater recognition of the challenges and root causes of these disparities in academic advancement for women may provide actionable opportunities to support advancement for women. In an article in the *Harvard Business Review*, Mangurian and colleagues⁶ describe the barriers to women's advancement, including biased assumptions about women's desire to advance, especially for women physicians with children, and challenges in identifying mentors and sponsors. Potential solutions include bias training for academic departments, formal mentoring programs, and the use of metrics and feedback for academic sponsors. Women in academic medicine need male colleagues to serve as allies and sponsors by promoting women's research, opening doors for leadership opportunities, and helping shatter glass ceilings that limit women's academic advancement. The combination of institutional bias and racism on top of gender inequities leads to even greater disparities for women from minority racial and ethnic groups. Focused efforts are needed to address the additional barriers faced by women physicians from groups traditionally underrepresented in medicine.

Chatterjee and Warner note the need for "a level playing field that equally values and promotes their successes."² However, given entrenched structural barriers to academic advancement for women, multiple proactive strategies need to be deployed across entities to move the needle on women's advancement, including academic institutions, journals, and specialty societies. Academic

+ Related article

Author affiliations and article information are listed at the end of this article.

Open Access. This is an open access article distributed under the terms of the CC-BY License.

health centers should provide support for women who carry greater workloads at work and home. Equal access to public relations and media training should be provided to actively promote research by women. Specialty societies should ensure equal opportunities to leadership positions, presentations at regional and national meetings, and targeted promotion on social media platforms. Journals should be held accountable for equitable promotion of research by women and those underrepresented in medicine, including greater gender and racial balance for high-profile invited commentaries, for which editors have more freedom in author selection.

Although completed before the pandemic, the urgency of this work is even greater given the how the pandemic has disproportionately affected the productivity of women faculty. In a recent article, Malisch and colleagues argued that "academia needs new solutions to ensure gender equity."⁷ They suggested that academic institutions move beyond "biased gender-neutral reactions" and provide focused support for women researchers. Academic health systems should closely track the impact of the pandemic on women faculty, including women from groups traditionally underrepresented in medicine, and develop plans that address this impact on women's research and academic advancement to ensure gender equity is not set back a generation. Academic institutions should also support women's extra burdens by providing childcare and consideration of their career disruption during promotion due to the pandemic.

To drive academic advancement for women in medicine, an armamentarium of metrics and data are needed to shine a light on issues that drive persistent disparities. When an array of actionable metrics and transparent data for journal publications, journal citations, promotion, and compensation are available, comprehensive strategies can be developed to hold those responsible for women's advancement accountable for their success. Achieving equity in academic medicine for women and those underrepresented in medicine is not just important, it is critically necessary to achieve excellence in medicine.

ARTICLE INFORMATION

Published: July 2, 2021. doi:[10.1001/jamanetworkopen.2021.14787](https://doi.org/10.1001/jamanetworkopen.2021.14787)

Open Access: This is an open access article distributed under the terms of the [CC-BY License](https://creativecommons.org/licenses/by/4.0/). © 2021 Burstin HR et al. *JAMA Network Open*.

Corresponding Author: Helen R. Burstin, MD, MPH, Council of Medical Specialty Societies, 20 F St NW, Washington, DC, 20001 (hburstin@cmss.org).

Author Affiliations: Council of Medical Specialty Societies, Washington, DC (Burstin); Department of Medicine, Pritzker School of Medicine, University of Chicago, Chicago, Illinois (Arora).

Conflict of Interest Disclosures: None reported.

REFERENCES

1. Richter KP, Clark L, Wick JA, et al. Women physicians and promotion in academic medicine. *N Engl J Med*. 2020; 383(22):2148-2157. doi:[10.1056/NEJMsa1916935](https://doi.org/10.1056/NEJMsa1916935)
2. Chatterjee P, Werner RM. Gender disparities in citations in high-impact journal articles. *JAMA Netw Open*. 2021; 4(7):e2114509. doi:[10.1001/jamanetworkopen.2021.14509](https://doi.org/10.1001/jamanetworkopen.2021.14509)
3. Silver JK, Poorman JA, Reilly JM, Spector ND, Goldstein R, Zafonte RD. Assessment of women physicians among authors of perspective-type articles published in high-impact pediatric journals. *JAMA Netw Open*. 2018;1(3): e180802. doi:[10.1001/jamanetworkopen.2018.0802](https://doi.org/10.1001/jamanetworkopen.2018.0802)
4. Zhu JM, Pelullo AP, Hassan S, Siderowf L, Merchant RM, Werner RM. Gender differences in Twitter use and influence among health policy and health services researchers. *JAMA Intern Med*. 2019;179(12):1726-1729. doi:[10.1001/jamainternmed.2019.4027](https://doi.org/10.1001/jamainternmed.2019.4027)
5. Waitowich NC, Arora VM, Pendergrast T, Gottlieb M, Trueger NS, Jain S. Gender differences in physician use of social media for professional advancement. *JAMA Netw Open*. 2021;4(5):e219834. doi:[10.1001/jamanetworkopen.2021.9834](https://doi.org/10.1001/jamanetworkopen.2021.9834)

6. Mangurian C, Linos E, Urmimala S, Rodriguez C, Jagsi R. What's holding women in medicine back from leadership. *Harvard Business Review*. June 19, 2018. Accessed March 14, 2021. https://hbr.org/2018/06/whats-holding-women-in-medicine-back-from-leadership?utm_source=twitter&utm_medium=social&utm_campaign=hbr
7. Malisch JL, Harris BN, Sherrer SM, et al. Opinion: in the wake of COVID-19, academia needs new solutions to ensure gender equity. *Proc Natl Acad Sci U S A*. 2020;117(27):15378-15381. doi:10.1073/pnas.2010636117