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Mitigating delayed academic promotion of female radiologists due to the COVID pandemic

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ABSTRACT

Achieving promotion in rank is considered an important measure of career success for academic radiologists. Multiple studies have shown prevailing gender inequities disadvantaging women in medicine. The recent global pandemic due to COVID-19 has affected all parts of society but has disproportionately impacted women and may delay academic promotion of female academic radiologists. We reviewed the evidence regarding the potential career impact of the COVID-19 pandemic on female radiologists. The pandemic has disproportionately increased women's domestic and childcare responsibilities and decreased female researchers' productivity which may delay academic promotion. Strategies to address the problem of delayed promotion of female radiologists include raising awareness, mentorship and sponsorship, operational flexibility, and support with domestic and childcare responsibilities.

1. Introduction

For academic radiologists, achieving promotion in rank is considered a reflection of one's career development and success.^{1,2} The road to promotion typically involves comprehensive reviews by an institutional academic promotion and tenure committee.³ The committee reviews not only the candidate's contribution to the academic medical center but also the candidate's entire body of work in the field of medicine. To achieve promotion in rank, the candidate must undergo frequent detailed evaluations and meet specific benchmarks. Each promotion in rank may confer rewards for the candidate in the form of increases in prestige, job security, and salary increase.^{2,4}

Multiple studies have shown prevailing gender inequities disadvantaging women in medicine.⁵ Not only are women underrepresented in academia,⁶ but the proportion of female full professors remained unchanged from 1980 to 1995 and only nominally increased between 1995 and 2015.⁵ A study published in 2020 demonstrated that women represented only 22% of full professors and 18% of department chairs in academic medicine.⁷ Within radiology, almost 30% of radiologists are women,⁸ but only 17% of radiology department chairs are women.⁹ The proportion of female radiologists decreases with each increase in academic rank.¹⁰ In recent years, the number of women entering medicine has gradually increased.⁵ However, while other

specialties have demonstrated increased female representation, this has not been the case for radiology.^{11,12}

The tripartite mission of academic medical centers encompasses clinical care, education, and research.¹³ Many academic medical centers have promotion and tenure committees in place to evaluate candidates and provide recommendations regarding advancement.¹⁴ Academic medical centers often expect faculty members to undertake clinical and/or basic science research alongside other scholarly activities.^{15,16} And while there is variability from institution to institution,^{1,17} research productivity is a key component scrutinized by promotion and tenure committees during review of academic radiologists' applications for academic promotion.^{3,15,16}

The COVID-19 pandemic has affected all parts of society, but the pandemic's operational challenges^{18,19} have disproportionately impacted the research productivity of female academic radiologists,^{20–23} which may delay their academic promotions. The purpose of this article is to review the evidence regarding the career impact of the COVID-19 pandemic on female radiologists and to describe strategies to mitigate unintentional delayed and/or decreased promotion of female academic radiologists as a result of the pandemic.

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2. Disproportionate impact of the COVID-19 pandemic on women

The COVID-19 pandemic may hinder female academic radiologists' chances for promotion because the pandemic has disproportionately increased women's domestic and childcare responsibilities and decreased female researchers' productivity.

2.1. Impact of the pandemic on women's domestic and childcare responsibilities and work-life balance

Studies have long established that women assume a disproportionate share of domestic and childcare responsibilities. A 2014 study examined gender differences in time spent on childcare and domestic tasks by married or partnered physician recipients of National Institutes of Health (NIH) K08 and K23 career development awards who had at least one child. These awards are highly selective grants awarded to early-career physicians to support career development. The results showed that the female physicians performed 8.5 more hours per week of household responsibilities than the male physicians did.⁴ It has been postulated that women may choose medical specialties with less demanding hours to better balance work with family and childcare duties.²⁴ Similarly, early-career young female physicians may choose part-time positions to accommodate family and childrearing responsibilities.²⁴ Some female radiologists may have the opportunity (or one could even say privilege) to outsource household demands by hiring additional domestic and/or childcare help in order to forge ahead with their careers, but not all will.

The sudden onset of the COVID-19 pandemic and the subsequent stay-at-home orders resulted in a further strain to female physicians related to childcare. When COVID-19 caused the shutdown of schools and limits on daycare hours,^{25,26} female physicians were often the ones left to seek out last-minute alternative childcare.⁷ Finding reliable childcare is challenging enough during non-pandemic times; it was made further challenging by the pandemic. Healthcare workers have reported that limited access to reliable childcare has been a stressor during the pandemic.²⁷ Safe and dependable childcare is an essential need for radiologists during the pandemic. An April 2020 study by Joshi et al of staff members, faculty members, and trainees at a large radiology institution demonstrated that 23% of respondents reported minor childcare gaps and 53% reported major childcare gaps during the early days of the pandemic.²⁸ Interestingly, 100% of the trainees with children reported experiencing major or minor childcare gaps, which may be attributed to the younger age of trainees and their children compared to established radiologists and their children.²⁸ A survey by Andrew et al of families in the United Kingdom in 2020 during the pandemic demonstrated that mothers were spending 2.3 h more per week on childcare than fathers spent and that mothers were 47% more likely than fathers to have lost or left paid work.²⁹ Even in households where the father had lost his job while the mother was still working, women still had as many childcare and household responsibilities as men did.²⁶ Other domestic responsibilities, like meal preparation, also became a challenge because of the pandemic as grocery stores were open with only limited hours and supply and closures of nonessential businesses reduced options to get take-out food from restaurants.³⁰

Female academic radiologists offered the opportunity to work from home may be confronted with additional obstacles to work-life balance. Securing physical space for a home office may be a challenge if children are also at home attending virtual school or partners/spouses are working from home. Furthermore, working from home may not be an efficient or productive environment for female researchers who face inevitable interruptions³¹ from children or spouse or domestic duties, such as squeezing in an extra load of laundry between responding to email requests.³² The above-referenced United Kingdom survey by Andrew et al also demonstrated that women were more likely than men to be interrupted during the workday, with 47% of women's work hours

but 30% of men's work hours split between paid work and house/childcare duties.²⁹ A 2020 study by Collins et al on dual-earning heterosexual couples with young children demonstrated that mothers decreased their work hours by 2 h per week when both members of the couple were working from home during the pandemic while hours remain unchanged for fathers.³⁰

When domestic duties and childcare cannot be outsourced to people outside the family, often it is women who have had to decrease to part-time status or even resign from their positions in order to address family needs.^{29,31} As many female physicians may be working from home, this difference in gender roles on the home front is important to acknowledge.

2.2. Impact of the pandemic on women's research productivity

We were interested in analyzing the impact of the COVID-19 pandemic on academic promotion of female radiologists, which is based on clinical, educational, and research output. However, on review of the literature, we found no current data on the clinical or educational output of male versus female radiologists during the pandemic. We therefore focused on research output, as evidence regarding research output was available.

Prior to the COVID-19 pandemic, various studies had demonstrated that women were underrepresented in medical research.^{20,33,34} During the pandemic, preliminary data are demonstrating a significant decrease in research by women.^{20,21} To compare the effects of the pandemic on men and women researchers, Andersen et al examined the gender distribution of first-author papers about COVID-19 published in scientific journals.²⁰ They demonstrated not only that there were fewer female than male first authors but also that there were 19% fewer female first authors of papers about COVID-19 than of papers published in the same journals in 2019.²⁰ Various journal editors in different fields have also reported a decrease in submissions from female authors.²² This author gender-gap trend is also evident in preprint databases such as bioRxiv ([biorxiv.org](https://www.biorxiv.org)), which is an online archive and distribution service for preprints in the life sciences.²³

The pandemic may also impact female researchers' funding from the NIH. The average female first-time principal investigator receives approximately \$40,000 less from the NIH than the average male first-time principal investigator.⁷ Female radiologists are also less likely to receive NIH funding than male radiologists.³⁵ Similar to how manuscript submissions from female researchers have drastically decreased during the pandemic, NIH grant submissions are expected to decrease as completing a grant application is both time-consuming and arduous.⁷ Future research is needed to determine the long-term impact of the pandemic on grant funding for and research by women in academia.

Decreased research productivity by female researchers during the pandemic also may have other significant consequences, such as decreased opportunities for women to obtain important speaking engagements or leadership positions.³⁶ Before the pandemic, numerous studies demonstrated that women were less likely than their male counterparts to have opportunities for leadership positions and significant research projects resulting in publications, grants, and/or awards.^{35,37,38} The cancelation of multiple local, regional, national, and international in-person conferences or transition of such conferences to online virtual meetings has presented new challenges to female physicians. A recent survey by Catalyst, a global nonprofit group promoting workplace inclusion of women, reported that approximately 45% of female leaders find speaking up in virtual meetings difficult and that approximate 20% of female respondents felt talked over.^{39,40} Furthermore, online meetings have reduced networking opportunities, most of which historically happened organically and informally during live conferences in hotel hallways in between conference presentations. Virtual meetings are not conducive to this type of informal networking and potential mentorship.⁷

2.3. Summary and call for future research

There is lack of literature specific to the impact of the pandemic on female radiologists, although data is emerging. As mentioned above, we focused on research output because we found no published data on the impact of the pandemic on clinical or educational output of radiologists by gender. We hope to see future publications by other authors who are interested in these other areas that are important for academic promotion. And while not all the evidence presented here is specific to radiology, it does demonstrate a gender bias in society and among working professionals. We strongly believe that the COVID-19 pandemic will have an indelible impact on female radiologists, and we look forward to future studies on the downstream effects of COVID-19 on female radiologists.

3. Strategies to mitigate delayed promotion of female academic radiologists

There is no easy panacea to this complex issue of delayed promotion of female academic radiologists, but here we present some strategies that academic radiology departments and institutions may consider: raising awareness, mentorship and sponsorship, operational flexibility, and domestic support.

3.1. Raising awareness

The radiology community has a duty to raise awareness of potential delayed and/or decreased academic promotion of women because of the COVID-19 pandemic. The pandemic has suddenly amplified the issues of gender inequality on a global scale. Attention has previously been drawn to the unbalanced representation of women in academia⁴¹ and their disproportionate domestic burden.^{1,16,17} Now, it is important to recognize the unprecedented challenges faced by female junior faculty during this pandemic. Medical societies and professional organizations are in a position to publish white papers and elevate support for inclusion of women.⁴¹ It is vital to continually examine gender inequity, scrutinize inconsistencies, modify policies as indicated, and share publicly with the global community the short-term and long-term effects of gender inequality.⁴² Future long-term research in this domain is specifically encouraged.

3.2. Mentorship and sponsorship

Important aspects of career development include networking, mentorship/sponsorship, and leadership development, especially for female academic physicians.⁴³ Unfortunately, female physician networks are limited compared to male physician networks.^{43,44} This challenge is compounded during the COVID-19 pandemic by the cancellation of in-person conferences and leadership development courses, which are ideal grounds for networking and growth opportunities. Ensuring gender equity through conscious senior faculty sponsorship is encouraged.⁷ Mentorship and sponsorship programs should continue to be highlighted.^{45,46} Mentorship by a successful female leader is critical for promotion in the field of radiology.^{10,47,48} Institutions should also consider prioritizing continued funding for institutional programs that support female physician leadership and career development, despite COVID-19-related financial setbacks.⁴³

3.3. Operational flexibility

Flexibility is vital during this unprecedented time when both operational and personal needs are rapidly changing and adjusting. Operational flexibility, including permitting remote reading (temporarily, and in particular when childcare issues arise), work sharing, and schedule adjustments, can help radiologists work successfully within the challenging environment of the pandemic.^{41,49} It is essential for radiology

groups and institutions to support female physicians, especially physician mothers, for them to achieve professional and departmental success.²¹

Some institutions, including Stanford University,⁵⁰ Cornell,⁵¹ and the University of Washington,⁵² are offering tenure-clock extensions due to the pandemic in which additional time (such as a year) is given to faculty members, and not just those on a tenure track, to complete their mandatory promotion or advancement. Tenure clock extension is traditionally given to individuals taking personal leave for purposes not related to improving one's scholarly efforts, such as maternity leave. It is paramount to normalize tenure clock extensions due to the pandemic and promote a culture of acceptance of these extensions and to possibly consider automatically granting a pandemic-related tenure clock extension to all.⁴³

3.4. Childcare and domestic support

Academic medical centers might consider providing childcare through on-site facilities; inviting medical students and residents, who have been sidelined from clinical care due to social distancing requirements, to provide childcare; or partnering with local childcare facilities/providers to provide childcare for radiologist's children.⁴³ In a pre-pandemic study by Piltch-Loeb et al⁴¹ on identifying barriers to the success of female radiology researchers, respondents stated that they had networks in place to secure childcare. However, given the abrupt start of the pandemic and the infectious nature of COVID-19, disruption in childcare resulted in a significant strain for many healthcare professionals. The effects of the COVID-19 pandemic have been especially difficult for female academic physicians, in particular mothers, and the long-term professional fall-out is yet to be determined.²¹ Beyond providing childcare, institutions may even consider offering their physicians' children access to educational options similar to [FirstAidTutoring.com](https://www.FirstAidTutoring.com), organized by high school and college students of healthcare workers to provide online tutoring sessions for other children of healthcare workers struggling with online virtual school. Additionally, to alleviate the burden of domestic chores, institutions may also consider collaborations with local stores, groceries, restaurants, delivery services, and housecleaning services.⁴³ For example, Memorial Hermann Health System in Houston, Texas, supplied their cafeteria (which was closed to the public and limited to employees) with household basics such as flour, sugar, etc. This allowed essential workers to purchase household essentials which were in limited supply at public grocery stores at the time.

4. Conclusion

The COVID-19 pandemic has heightened existing gender equity issues in society in general and in academic medicine in particular. However, society is changing, and gender roles are more fluid than ever before. As society and more physicians acknowledge the disproportionate burden of household work and childcare borne by women and are willing to work towards a more balanced distribution of these domestic responsibilities, deserved promotions may be more equitably attainable for female academic radiologists. Ultimately, the COVID-19 pandemic is an unprecedented event that calls for flexibility and empathy on the part of institutional leaders and promotion committees and understanding of the unexpected challenges that female academic physicians may encounter.

CRediT authorship contribution statement

Substantially contributed to the conception or design of the work, the writing and/or revision of the manuscript, approved the final version of the manuscript, be accountable for the manuscript's contents.

Declaration of competing interest

None relevant to the article. The authors declare that they had full access to all of the data in this study and the author(s) take(s) complete responsibility for the integrity of the data and the accuracy of the data analysis.

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