

Scientific Article

Gender Differences in Work–Life Integration Among Medical Physicists



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Received February 18, 2021; revised April 12, 2021; accepted May 3, 2021

Abstract

Purpose: To generate an understanding of the primary concerns facing medical physicists regarding integration of a demanding technical career with their personal lives.

Methods and Materials: In 2019, we recruited 32 medical physics residents, faculty, and staff via emails to US medical physics residency program directors to participate in a 1-hour, semistructured interview that elicited their thoughts on several topics, including work–life integration. Standard techniques of qualitative thematic analysis were used to generate the research findings.

Results: Of the participants, 50% were women and 69% were non-Hispanic White individuals, with a mean (SD) age of 37.5 (7.4) years. They were evenly split between residents and faculty or staff. Participant responses centered around 5 primary themes: the gendered distribution of household responsibilities, the effect of career or work on home and family life, the effect of family on career or work, support and strategies for reconciling work–life conflicts, and the role of professional societies in addressing work–life integration. Participants expressed concern about the effect of heavy workloads on home life, with female respondents more likely to report carrying the majority of the household burden.

Conclusions: Medical physicists experience challenges in managing work–life conflict amid a diverse array of personal and professional responsibilities. Further investigations are needed to quantitatively assess the division of work and household labor by gender in medical physics, particularly after the outbreak of the COVID-19 pandemic, but this study's qualitative findings suggest that the profession should consider ways to address root causes of work–life conflict to promote the future success and well-being of all medical physicists, and perhaps women in particular.

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Sources of support: We gratefully acknowledge the Michigan Medicine Department of Radiation Oncology and the University of Michigan Center for Bioethics and Social Sciences in Medicine for support of this project.

Disclosures: Dr Moran reports grants from the National Institutes of Health, Blue Cross Blue Shield of Michigan, and Varian Medical Systems outside the submitted work. Dr Jagsi has stock options as compensation for her advisory board role in Equity Quotient; has received personal fees from Amgen and Vizient and grants from the National Institutes of Health, the Doris Duke Foundation, the Greenwall Foundation, the Susan G. Komen Foundation, and Blue Cross Blue Shield of Michigan for the

Michigan Radiation Oncology Quality Consortium unrelated to the current work; has a contract to conduct an investigator initiated study with Genentech; has served as an expert witness for Sherinian & Hasso and Dressman Benzinger LaVelle; and is an uncompensated founding member of TIME'S UP Healthcare and a member of the board of directors of American Society of Clinical Oncology. No other disclosures were reported.

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<https://doi.org/10.1016/j.adro.2021.100724>

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Introduction

Women are underrepresented in the field of medical physics. In 2019, they made up 23.3% of the membership of the American Association of Physicists in Medicine (AAPM) and 12% of medical physics clinical leadership roles in the US and had held only 1 of 42 council chair positions since 1970.¹ Studies in academic medicine more generally have suggested that gender differences in experiences with unconscious biases, gendered expectations of society, and willful harassment and discrimination exist and contribute to the continued underrepresentation of women. Worryingly, progress made toward gender equity in medicine has also faced considerable negative effects from the COVID-19 pandemic.²⁻⁴ The studies cited here have further suggested that work–life integration is a common concern,⁵ and gender differences in domestic responsibilities⁶ appear to be associated with gender differences in burnout among academic physicians.⁷ However, little is known about work–life integration experiences in the field of medical physics, how they might differ by gender, or how they may relate to well-being or success of those pursuing this important career path.

Understanding the challenges faced by medical physicists is essential given the substantial levels of burnout among this population. In a recent study of medical physicists, 33% of respondents reported experiencing burnout,⁸ which is similar to the 42% burnout rate among oncology physicians.⁹ Mazur et al found that medical physicists reported quantitatively high workloads and mental demand levels in comparison with other radiation oncology professionals.¹⁰ Medical physicists also express an uncertainty in how or even if to seek out and receive wellness-related support.⁸ Left unaddressed, burnout in this group of health care professionals may lead to similar consequences as for physicians, including a potential effect on the quality of patient care.^{9,11,12}

Little published information exists to inform interventions to reduce burnout for physicists or whether existing interventions translated from other areas of health care may be successful. We sought to understand the concerns facing medical physicists as they attempt to integrate a demanding medical and technical career with their personal lives, including whether gender differences exist in how medical physicists experience and attempt to address these concerns. We explored this subject using qualitative methods, conducting semistructured interviews with practicing medical physicists across the US. The current study represents, to our knowledge, the first formal qualitative investigation of the work–life integration experiences, concerns, and challenges in a cohort of medical

physicists. To enable a robust interpretation of the results, we interpreted our findings in the context of the much larger body of work that already exists for the physician workforce.

Methods and Materials

This study was reviewed and approved by the University of Michigan institutional review board. This study is reported in accordance with Proposed Criteria for Systematic Evaluation of Qualitative Oncology Research by Hannum et al.¹³

Sample and data collection

Participants in this study were recruited via emails to medical physics residency program directors using publicly available contact information from the Commission on Accreditation of Medical Physics Education Programs (CAMPEP) website (www.campep.org). Therapeutic radiation oncology and diagnostic imaging programs were both included. Exclusion criteria were international programs, non–hospital-affiliated programs, and the host institution, leaving 96 eligible programs, all of which were contacted. We requested that the program director forward the study recruitment letter to medical physics faculty, staff, and residents at their own institution. We defined *faculty* as participants with an academic appointment (eg, assistant professor) and *staff* as participants without such an appointment; all participants had roles that were primarily clinical.

All potential participants were prescreened for institutional affiliation, job rank, gender, and other basic demographic information. Participants were deemed eligible if they were either a practicing medical physicist (staff or faculty) or currently enrolled in a medical physics residency program. Forty-one medical physicists responded to the study invitation and completed the prescreening questionnaire. Of these, we interviewed an initial cohort of 32 participants, evenly distributed across gender and between residents and faculty or staff, with no more than 2 participants from any single program. Of the 9 individuals who were screened but not interviewed, 5 were not interviewed owing to the per-program cap and 3 owing to the gender or job rank cap, and 1 (who had heard about the study via word-of-mouth) was not from a CAMPEP-accredited institution. The study team determined that thematic saturation was reached via the initial 32 interviews, and therefore, no additional participants were interviewed. Descriptive statistics were used to summarize the participant characteristics (see [Table 1](#)).

Table 1 Participant characteristics (N = 32)

	Total participants, No. (% or SD)	Women, No. (% or SD)	Men, No. (% or SD)
Gender			
Women	16 (50)	-	-
Men	16 (50)		
Age, mean (SD), y	37.5 (7.4)	35.9 (6.9)	39.1 (7.7)
Years in practice (SD)	7.5 (6.6)	8.0 (5.5)	7.0 (7.7)
Race/ethnicity (select all that apply)			
African American or Black	2 (6.3)	1 (6.3)	1 (6.3)
American Indian or Alaska Native	2 (6.3)	1 (6.3)	1 (6.3)
Asian American or Asian	5 (15.6)	2 (12.5)	3 (18.8)
Hispanic or Latino	3 (9.4)	1 (6.3)	2 (12.5)
Middle Eastern	2 (6.3)	1 (6.3)	1 (6.3)
Multiracial	4 (12.5)	3 (18.8)	1 (6.3)
Pacific Islander	0 (0)	0 (0)	0 (0)
White or Caucasian	22 (68.8)	11 (68.8)	11 (68.8)
Other	1 (3.1)	0 (0)	1 (6.3)
Job rank			
Faculty	12 (37.5)	6 (37.5)	6 (37.5)
Resident	16 (50.0)	8 (50)	8 (50)
Staff	4 (12.5)	2 (12.5)	2 (12.5)
US region of current institution			
Midwest	11 (34.4)	6 (37.5)	5 (31.3)
Northeast	5 (15.6)	3 (18.8)	2 (12.5)
South	5 (15.6)	2 (12.5)	3 (18.8)
West	11 (34.4)	5 (31.3)	6 (37.5)
Degree			
PhD	29 (90.6)	15 (93.8)	14 (87.5)
MS	3 (9.4)	1 (6.3)	2 (12.5)
Relationship status			
Married or living with a partner	23 (71.9)	9 (56.3)	14 (87.5)
Children			
Yes	20 (62.5)	9 (56.3)	11 (68.8)

Abbreviation: SD = standard deviation.

Recruitment began in February 2019, and telephone interviews were conducted between February 2019 and May 2019. All participants consented verbally to being interviewed. Confidentiality was protected by having a study team member who was not a medical physicist (K.A.R.) facilitate all recruiting efforts and conduct interviews. The identities and home institutions of study participants were blinded to the remainder of the study team.

Interviews

The semistructured interview guide was adapted from a prior qualitative investigation involving academic physicians.^{5,14-17} The guide was revised with input from an interdisciplinary working group of clinicians and researchers with content area and qualitative research methods expertise and was designed such that the study results could be used to inform a quantitative instrument for follow-up investigations. The final interview guide

contained open-ended questions related to 3 primary topics: work–life integration, mentorship, and discrimination. Work–life integration topics composed approximately one-third of the interview time and are the focus of the current report. The remaining elements of the interviews will be addressed in another publication.

Each participant was interviewed for approximately 1 hour and was provided a \$100 honorarium. Transcriptions of the interviews were redacted by the interviewer where necessary to protect confidentiality.

Data analysis

Interviews of the 32-person cohort were completed before data analysis. The qualitative coding scheme was developed using inductive thematic analysis for interpretive description.¹⁸⁻²¹ All team members participating in coding were trained in qualitative data analysis techniques. To construct the initial coding scheme, study team

members (K.C.P. and K.A.R.) read through all of the redacted transcripts and noted concepts, codes, and potential themes that emerged from the data. Three study team members (K.C.P., K.A.R., and S.S.) who were trained in qualitative data analysis techniques then coded a subset of 6 transcripts. The coding scheme was revised based on initial findings and was used to code all 32 transcripts. All transcripts were coded and reviewed by 2 or more of the noted study team members, with differences in coding resolved by consensus. Transcripts were analyzed in MAXQDA (VERBI Software, 2017), a qualitative data analysis software program that assists with searching text, coding thematic domains, and organizing data. To help address potential bias in the analysis, the transcript coders included both men and women, and 2 were not medical physicists. Additionally, after coding and subsequent analysis, results were then reviewed and revised by a larger group of 6 medical physicists and 4 radiation oncologists to confirm consensus on the themes. The study team determined that thematic saturation was reached via the initial 32 interviews, and therefore, no additional participants were recruited.

Results

Participant characteristics

Of the 32 participants, 16 (50%) were women, 22 (69%) were non-Hispanic White individuals, and the mean (SD) age was 37.5 (7.4) years. Seventy-two percent of participants were married or living with a partner, and 63% had children. More detailed participant characteristics are shown in [Table 1](#).

Qualitative data analysis

The results were separated into 5 primary themes: the gendered distribution of household responsibilities, the effect of career or work on home and family life, the affect of family on career or work, support and strategies for reconciling work–life conflicts, and the role of professional societies in addressing work–life integration. We provide exemplar quotes related to each theme in [Table 2](#) (additional quotes can be found in [Table E1](#)).

Theme 1: Gendered distribution of household responsibilities

Among the respondents, male and female medical physicists both reported that women carried the majority of the physical and mental workload²² at home. None of the male respondents in this study reported carrying the majority of the household or childcare responsibility. Male respondents were also more likely to report having

partners who work primarily inside the home, which facilitated the described role divisions. These differences in household responsibilities and having a spouse who can take on these household responsibilities was a critical component of managing work–life balance as reported by the respondents.

Theme 2: Effect of career or work on home and family life

In the study sample, medical physicists expressed concern about the effect of their heavy workload on their personal and family life (or potential family life). Participants reported spending time working at home during off hours, which disrupted the household dynamic and their ability to switch between roles. Female respondents in the cohort more often described concerns about work–life integration, given the gendered division of domestic responsibilities as described in theme 1.

Theme 3: Effect of family on career or work

Participants reported that the interplay between childcare needs and long or nonstandard working hours affects the career advancement of medical physicists with children. As 1 respondent pointed out,

... childcare is a huge issue in the United States, and the fact that we don't work 8 to 5 in medical physics and to square that with the childcare offerings that is mostly aimed at 8 to 5 is very difficult. And that hits people, both men and women, early on in their medical physics [career] when they're in their late twenties/early thirties, when it's really crucial to make career progress. (Female faculty member)

Participants also expressed concern about the effect of having a family on career advancement or putting in the necessary work hours to move up in the field of medical physics. One critical aspect of academic careers for medical physicists is carrying out and disseminating research. Lack of dedicated time for research makes it difficult for medical physicists with children to pursue research, which affects their academic productivity and advancement. However, the breadth and depth of female respondents' concerns about the effect of home and family on their careers were markedly different from those of male respondents.

Concerns about work–life balance affected women's expectations and experiences related to the type of career they felt they could have. For example, female respondents expressed concerns about the effect of motherhood on pursuing an academic career or academic leadership positions. Some women respondents with children struggled to find the time and flexibility to pursue learning and professional development opportunities. Women respondents also perceived that gender differences in childcare responsibilities had a negative effect on

Table 2 Exemplar quotes for the 5 major themes

Themes	Exemplar quotes
Theme 1: Gendered distribution of household responsibilities	<p>...managing the playdates, managing the school stuff. You know, all that kind of household management stuff is solely my job. So the housework stuff is either outsourced or, I guess, reasonably split, and then the household management is completely me. (Female faculty member)</p> <p>I mostly take care of lots of the kids’ training or soccer games or like take them to places, things like that, entertainment or education at home. My wife takes care of all the other things. (Male resident)</p> <p>...one thing that has made that much more manageable is the fact that my spouse stays home. (Male faculty member)</p>
Theme 2: Effect of career or work on home and family	<p>Also, when meetings are scheduled, typically research meetings, faculty meetings, and all these things get scheduled before or after the clinical day, which means before 8:00 AM or after 5:00 PM, and that is extremely hard when you have family. (Female faculty member)</p> <p>So like how am I supposed to do clinical and do research if I’m still going to take care of a family? Also the outside interests, my own interests. So, I think it just limits how much time I have, you know, to parent. (Male faculty member)</p> <p>I think that my hours at work are crazy, and it makes it very, very difficult to kind of prioritize anything like outside of that. [...] I’m not able to go home as often as I’d like to. I think if I did have a family to take care of or go home to, it would be very challenging because the majority of my time is spent at work or working. (Female resident)</p> <p>...it is difficult to switch gears and turn off and take off my medical physics hat and put on my dad and husband hat. It’s not that I’m necessarily on-call all the time or the clinic won’t go on without me, but there is that sense of responsibility to 2 different masters. (Male faculty member)</p>
Theme 3: Effect of family on career or work	<p>After having a child, I don’t want to stay at work so late that I miss her bedtime. I don’t want to come to work so early that I don’t get to see her when she wakes up. [...] I think I would have a higher probability of being successful in achieving promotion if I could work more hours, but I don’t wish to work more hours because I wish to see my family. (Male faculty member)</p> <p>Maybe I’m not the most productive publisher in my clinic but, you know, I definitely wouldn’t miss my kids’ childhood just to publish an extra paper. (Male faculty member)</p> <p>I definitely was concerned about pursuing an academic career. In fact, I didn’t think it was going to be possible with kids [...] You know, when they’re under 2 and you’re nursing them, it’s pretty much you’re doing all the work. (Female faculty member)</p> <p>I guess the career goals within the medical physics path are either research or administrative directorships, right? So you... see other people do it, and then it’s like, my competitive side steps in and is like, Oh, I could do it. And then I’ve done a lot of soul searching, what’s important, because work–life balance is really important to me, and family is really important to me. (Female staff member)</p> <p>It definitely slowed down my academic progress [...] I mean I eventually got to tenure and stuff, but it was over a long time span because of having a young family, which I didn’t see my male colleagues with young families have to do at all. (Female faculty member)</p> <p>It’s more for females than for males, especially when you have smaller kids and the care. You know, as I said, the medical physicist field, heavy male-oriented field. So sometimes to keep up, I feel like, I do not spend a lot of early morning hours or late hours because I’m a mom, but I know my colleagues who are all males have no issues. ... (Female resident)</p>
Theme 4: Support and strategies for reconciling work-life conflicts	<p>I’m in a job [...] which allows me the flexibility to hire somebody to do things like prune the bushes, scrub the floors, clean the toilets. ... all those things that take lots and lots and lots of time. (Female faculty member)</p> <p>So we have a nanny during the day. Other than that, we, as far as mornings before the nanny comes, I would say, you know, we kind of split that up based on whatever is happening in the morning typically. (Male resident)</p> <p>So there actually may be a night where I would just say, “You know, I really can’t stay late tonight. Who can do it for me?” And [my colleagues] know that I’ll pay them back when they need it, you know? (Female faculty member)</p> <p>Occasionally our hours as medical physicists can be kind of late. So that would be one</p>

(continued on next page)

Table 2 (Continued)

Themes	Exemplar quotes
Theme 5: Role of medical physics professional societies in addressing work–life integration	<p>concern, whether you would be stuck in the clinic if you have to get home and pick up children or something like that, but at least in all of the clinics I've worked in, it's always been a very open and accommodating environment to where if somebody needs to take the day off because their kid is sick or they need to leave early today because they have to pick up their child from daycare or something like that, I've never seen it be an issue. (Male resident)</p>
	<p>Thankfully for us, we have so many physicists and residents that there's always someone available to help out. At smaller clinics though, that probably won't be the case. . . (Female resident)</p>
	<p>The managers are working really long hours, like 12-hour days, and it's unclear why they have to do that. But that's what they're doing. It's very hard for all the other people to just leave. [. . .] Like if I stay late to do a QA one night and I go downstairs, it's like almost every single physicist is there. It's not everyone's QA night. Not everyone has something to work on. So I think some of it is like modeling good behavior. (Female faculty member)</p>
	<p>It'd be nice to see more possibilities for flexible working arrangements as far as, you know, more opportunities to have 4-day work weeks or things like that, flexible work-from-home time. Just as a profession, it'd be nice to have more space for that. I think the grand majority of us in this profession are working full-time definitely and beyond full time. It'd just be nice to find some more flexible solutions. (Female staff member)</p>
	<p>In fact, I usually have to hire a babysitter to work weekends, which always kills me that to work more time, I have to pay. I'm salaried and so I don't get paid more to work the weekend, but it costs me more to work the weekend. (Female faculty member)</p>
	<p>. . .they have onsite daycare for parents who have kids but want to attend the meeting. They now have this at our annual meeting. They started that last year, and this is like important for my wife and I because we're both medical physicists, we're both trying to attend the meeting. . . (Male faculty member)</p>
	<p>So perhaps the professional societies could offer courses or classes or events where different departments could come together and share experiences about how they manage it or things that they're trying or even have someone professional come in and help brainstorm strategies for how it would work in our field. (Female resident)</p>
	<p>So a lot of times that, you know, in meetings or something, they have these sort of like Women in Physics or Women in Whatever events. I find them not to be very helpful. I always go to them very optimistic [. . .] but they're not very representative of what the typical woman in the field is like. So it would be nice if there was better representation of sort of your average physicist, not like the super, super successful sort of crazy genius physicist who, you know, was granted tenure at 25 or whatever, you know? I think it would also be helpful to have more than just women at the event. Like they're geared toward women, but it would be nice if you had sort of these women sharing their stories to a male audience as well. (Female resident)</p>
	<p>I guess maybe look at some studies and see what productivity is. If you have a physicist who is working 80 hours a week versus one who's working 60 hours a week, at some point you're going to start seeing a drop in quality of workmanship. It might be worth it from a patient care perspective, for example, to have someone who is not tired all the time doing cancer treatment plans or checking cancer treatment plans. So I think it's definitely something that should be looked at. (Male resident)</p>
	<p>I mean I think the problem is like they don't have any authority over employers or things like that. Like at their annual meeting, they have all kinds of different programs. So it would be easy for them to have seminars or lectures or help in group sessions on obtaining a work–life balance, telling people, you know, these are things you can do, but then the problem is when they get home, are those things, are they actually things they can do in their institution or are they powerless in that? (Male faculty member)</p>

women's career advancement and women's ability to "keep up" in the field of medical physics.

Theme 4: Support and strategies for reconciling work–life conflicts

Study participants provided several examples of ways in which they manage work–life conflicts, including both individual strategies and structural supports (institutional, departmental, and colleague-based). Outsourcing domestic tasks was cited as 1 solution to making up for long hours spent at work. However, this is a luxury to which not all medical physicists may have access. Additionally, support from partners (theme 1) was often cited as a crucial aspect of being able to successfully navigate work–life conflicts (especially for male medical physicists in the interview cohort).

The support of colleagues was also an important aspect in managing the integration of work and home responsibilities. Medical physicists noted that working with their colleagues allowed them to gain the flexibility they needed to manage their work–life integration with children. However, not all physicists have access to this type of support in their clinics. Better management by leadership of work–life expectations, as well as flexible working hours, were mentioned as potential structural solutions to managing work–life conflict among medical physicists.

More so than the men in the study cohort, women discussed tradeoffs in reducing their availability at home so they could attend to work needs and vice versa. They also discussed additional personal and financial costs to managing work–life balance with children. For example, 1 female faculty member arranged to live close to work, incurring private-school expenses, to better balance work and children.

Theme 5: Role of medical physics professional societies in addressing work–life integration

Several respondents expressed appreciation that the AAPM offered childcare at its annual meeting. However, respondents also reported that they would like to see professional societies offer more courses or sessions related to work–life balance. Regarding professional offerings geared toward supporting women in the field, it was noted that strategies used by medical physicists at different stages in their careers (or with markedly different career paths) may not resonate with all physicists and that the AAPM should strive to include medical physicists from all demographic backgrounds in these gatherings.

Respondents reported that they would also appreciate professional societies' supporting research and offering guidelines related to safe and reasonable work-hour recommendations. However, respondents acknowledged barriers to the ability of professional societies to make positive changes in work–life integration, and many

participants were unsure whether this was within the purview of professional societies (eg, the AAPM).

Discussion

In this study, which was, to our knowledge, the first formal qualitative study of medical physicists' work–life integration, several key insights emerged. Male and female medical physicists both reported struggling to reconcile work–life conflicts. Some of the specific conflicts that were discussed by study participants included inflexible or nonstandard working hours, an inflexible work location or presentee-ism, reduced work productivity owing to care of children or dependents or other domestic responsibilities, reduced work productivity owing to the participant's choice to prioritize family, pressure to or desire to prioritize work over home life, and difficulty in switching between roles. Gender-based expectations and divisions of labor were perceived to influence these concerns for the study participants. In the study cohort, female medical physicists were more likely to report concerns related to household burdens and responsibilities and their effect on career choices and advancement. These results parallel those observed in numerous previous studies of physicians and other medical professionals, particularly with regard to the gendered division of domestic labor and the challenges of integrating highly demanding careers involving both clinical care and research.^{23–26} One potential cause of this gender-based difference could be that men are more likely than women to have partners who stay at home,^{6,27,28} which was true for this study cohort but has not yet been investigated for the field of medical physics in general. We also recognize that life and career stages are important factors. A medical physicist with children at home (or other caregiving responsibilities) is likely to face more challenges with work–life balance than a physicist without these responsibilities, regardless of gender. This was highlighted in our results within theme 3 as well as within theme 5, where participants noted that strategies to improve work–life balance depend on career stage.

Some strategies for reconciling work–life concerns that have already been promoted in other areas of medicine, such as flexible working hours and locations, improved parental leave, onsite childcare options, outsourcing of household-related work, and reexamining the distribution of domestic responsibilities, may translate to the field of medical physics.²⁹ However, field-specific insights also emerged, and a particularly key observation was that promotion of work–life integration in medical physics needs to come from within the profession itself. Solutions that have been successful for physicians, such as increasing focus on patient care³⁰ or taking an

employment sabbatical³¹ to focus on family, may not translate well into the medical physics arena.

According to the 2018 Professional Survey by the AAPM, 49% of physicists employed in a medical school or university hospital setting work at least 50 hours per week, with 20% working more than 55 hours.³² The responses elicited in the current study illuminate that much of this work happens outside of the treatment day and therefore after typical daytime working hours and on weekends or holidays. The added complexity of balancing childcare with these unusual work hours was noted by male and female medical physicists alike, as was the concern that family responsibilities may delay or derail career advancement. Gender differences in household responsibilities compound this issue, suggesting that field-wide, inclusive conversations must consider this problem in the context of a gendered society where stereotypes exist that influence and constrain options for behavior. Women and men alike must recognize the damage of these social constructs and seek to change their responses to them. Although this study was conducted before the outbreak of the COVID-19 pandemic, there is considerable evidence that these issues have only become more acute, more visible, and more relevant in the current environment, with past progress in advancing gender equity in medicine negatively affected in multiple domains.²⁻⁴

Responses of the study participants were mixed regarding the role of professional societies in addressing work–life integration topics. Many participants cited the new childcare offering at the annual AAPM meeting as a positive step in helping more physicists have the opportunity to attend this meeting. Continued presentations and discussions at society meetings, especially those tailored specifically to medical physicists at different career levels and in different work environments, would be valued, as would further recommendations for safe and reasonable work hours. However, other participants expressed skepticism about the role of the AAPM in these areas. Some believed that initiatives developed by the AAPM would have a limited effect on departments that they do not directly control, whereas others believed that it was out of the scope of the professional society altogether. Professional societies also face the added challenge of ensuring that members are aware of the resources that they are providing. However, the strategic plans of both the AAPM and the American Society for Radiation Oncology indicate that professional societies have a strong incentive to acknowledge and address the issues of burnout, societal inequity, and gender discrimination in the field of medical physics, particularly given the direct links to loss of intellectual capital and quality of care. Where professional societies have limitations in addressing institution-specific

policies, institutions must step in to take responsibility in working directly with employees to enact change for the benefit of both parties.³³

We acknowledge several limitations of the current study. We classified gender as binary and static and did not directly investigate the experiences of same-sex couples, individuals with a nonbinary gender identity, or gender-fluid individuals. Additionally, gender is far from the only social category that affects work–life integration within the field of medical physics, and we expect there to be aspects of intersectionality³⁴ with important associated effects that this study was not designed or powered to explore. We also only included institutions that employ medical physics residents, which may bias the results toward academic institutions, even though all participants had roles that were primarily clinical. Other biases may also be present: We did not have control over which individuals the initially contacted residency director invited for participation, and those who chose to participate in the study may have been medical physicists with strong existing opinions about the subject matter. Owing to the limited cohort size that could be accommodated in this study, we analyzed collective responses from groups with potentially different work–life integration contexts (residents vs staff vs faculty). A larger, quantitative survey study is needed to test the generalizability of these findings across the broader field. Although these interviews were confidential and conducted by a study team member who was not a medical physicist, participants may not have felt comfortable speaking freely regarding sensitive topics, which may lead to differences in the results of this study compared with an anonymous, quantitative survey. However, given the use of rigorous techniques of qualitative research, including purposeful sampling to obtain a diverse array of perspectives, robust thematic analysis of rich verbatim narratives by multiple coders bringing different points of view, and continuing interviews until the attainment of thematic saturation,¹⁸⁻²¹ the current study offers valuable insights into an issue that has implications for wellness in medical physics, the success of colleagues, the safety of patients, and the future success of the field.

Conclusions

To optimize the pursuit of clinical care, promote scholarly discovery, and support the health and well-being of the members of the field, the profession of medical physics should consider the evidence collected in this study to encourage the development and implementation of creative strategies to ease the work–life integration challenges described by men and women alike, and by women in particular.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.adro.2021.100724.

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