Journal of Cancer Education
https://doi.org/10.1007/s13187-025-02591-5

Gender Equity Education in Oncology: A Survey Study of Hematology-Oncology Fellowship Program Directors

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Accepted: 10 February 2025

Abstract

Female patients and physicians experience gender-based challenges in medicine. We aimed to evaluate the extent of training on gender disparities in patient care and equity among physicians by hematology-oncology (HO) programs, along with barriers to training implementation. We conducted an online survey of 171 HO fellowship program directors (PDs) registered in the Association of American Medical Colleges (AAMC) or participating in the Electronic Residency Application Service (ERAS). We asked about perceived importance of gender equity (GE), extent of GE training provided, and barriers to providing it. Responses were recorded using Likert scales, multiple choice, and open-ended responses. Data were analyzed using descriptive statistics. Fifty-six program directors completed the survey (32.7%). Most felt training in GE issues is "somewhat" to "very" important to patient care (69.6%) and the physician workforce (80.4%). However, most reported their programs do not provide training in GE regarding patient care (83.9%) or the physician workforce (78.6%), most commonly due to lack of resources. Most were interested in resources for patient (93.9%) and physician (88.6%) GE. Programs were open to sharing training materials for patient (44.4%) and physician (66.7%) GE. While most HO PDs feel that GE training is important for patient care and the physician workforce, most fellowships do not offer such training primarily due to lack of resources. Given the interest for more educational GE resources, there are opportunities to develop and share materials to enhance GE training for future HO physicians.

Keywords Gender equity · Diversity equality inclusion (DEI) · Medical education

Introduction

Understanding gender equity (GE) as it pertains to patient care as well as the healthcare workforce is essential to the education of future physicians to cultivate a more inclusive and equitable environment. Despite its significance, the landscape of GE education in hematology-oncology (HO) fellowship programs is not well-characterized. The purpose of this study was to examine the extent and manner in which current HO fellows are trained regarding GE as it relates to both patient care and the HO physician workforce. Furthermore, we aimed to identify barriers to providing such GE training and explore opportunities for educational initiatives that incorporate GE in HO fellowship training.

Gender-based differences in patient care in hematology and oncology can be partially attributed to a relative paucity of gender-specific research that reflects female physiology [1, 2]. This dearth contributes to a lack of awareness of gendered differences in disease patterns that can lead to worse outcomes in women. Guidelines of clinical practice are usually based on

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Published online: 18 February 2025

clinical trials conducted in primarily men and are limited in their ability to characterize gender-based differences in physiology or outcomes [1, 2]. This distinction may have serious consequences as pharmacokinetic differences between men and women may directly lead to over- or under-treatment of women with pharmaceutical interventions [3]. Underrepresentation of women is apparent in hematological and oncology clinical trials, and gender-based differences in outcomes are underreported despite efforts by the Food and Drug Administration (FDA) to report subgroup analyses by demographics [1]. There is also evidence that women are less likely to receive evidence-based medicine in a variety of medical contexts compared to men, which may be attributed to lack of awareness in disease presentation and clinical courses in female patients [2].

From the physician workforce perspective, GE issues include proper recognition of female physicians for their work and sociocultural factors that lead to the gender-based bias experienced by women in medicine [2, 4–7]. At this point in time, there are more women than men enrolled in medical school [1]; however, women make up less than 40% of hematologists and oncologists [2], and even fewer in leadership roles at the senior levels of academic medicine (including faculty, chair, and academic journal leadership positions) [2, 4–7]; one study found that only 21% of medical oncology chair positions are held by women [5]. Regarding oncology publications, less than one-third of first or senior authors are female scientists [8]. Furthermore, women in HO may face disparities while practicing medicine and while advancing their academic career. A disproportionate percentage of female oncologists experience gender-based harassment which persists even late into their career [9, 10]. Women in HO are less likely to receive recognitions and awards for their contributions to the field, and a wage gap for women continues to exist [4, 11]. These discrepancies have multifactorial roots which include implicit or overt bias, fewer mentorship opportunities, and workplace culture that may devalue or marginalize women [4, 12].

We conducted a survey-based study of HO program directors (PDs) with three overall objectives: (1) to assess the amount and type of training in gender-specific issues (gender differences in oncology patient care and GE in oncology physician workforce) currently offered by oncology fellowship training programs in the United States (US), (2) to determine what PDs believe to be barriers in providing training, and (3) to identify opportunities for development of GE curricula that can be offered to PDs for inclusion in their educational curriculum.

Methods

Survey Design

A cross-sectional survey was developed to assess the current educational landscape regarding GE in HO (gender differences in oncology patient care and gender equity in oncology physician workforce) currently offered by HO fellowship training programs in the US.

The full text of the survey is included as Supplementary Information (Online Resource 1). The survey included 17 questions with responses recorded using Likert scales, multiple choice, and open-ended responses. The survey included questions about PD demographics, fellowship program characteristics, the importance of gender-related issues as perceived by PDs, and the amount and type of training in gender-specific issues. If GE training was offered at the program, questions included whether they were willing to share resources with other programs. If GE training was not offered, the survey included open-ended questions about reasons for lack of current training and level of interest in obtaining resources for training fellows in the future.

Study Population and Survey Administration

All HO fellowship PDs of programs that were registered in the Association of American Medical Colleges (AAMC) or participating in the Electronic Residency Application Service (ERAS) 2023 application cycle were invited by e-mail to participate and complete the online study survey. PDs of programs that were not registered in AAMC or not participating in the ERAS application cycle at the time of the study were excluded. Survey participation was optional, and responses were anonymous. Potential participants received a weekly e-mail reminder, and survey responses were collected over a period of four weeks (January 31, 2023 to February 28, 2023) using a secure electron survey platform (REDCap).

Demmi Ethical Considerations

This study qualified for Institutional Review Board (IRB) exemption.

Clear coastal Data Analysis

Incomplete survey responses were excluded from data analysis. Data were summarized using descriptive statistics.

Results

Respondent Demographics and Program Characteristics

Out of 171 PDs invited, 56 completed the survey (response rate 32.7%). PD demographics and fellowship program characteristics are summarized in Table 1. About half of the respondents were female (53.6%, $n=30$), and a majority were 40–49 years

Table 1 Survey respondent characteristics

	N (%)
Sex	
Female	30 (53.6)
Male	25 (44.6)
Prefer not to answer	1 (1.8)
Age (years)	
35–39	4 (7.1)
40–49	34 (60.7)
50–59	11 (19.6)
60 +	7 (12.5)
Program location	
Northeast	22 (39.3)
Midwest	11 (19.6)
South	14 (25.0)
West	9 (16.1)
Fellows per year	
Less than 5	14 (25.0)
5–9	21 (37.5)
10–15	14 (25.0)
15 +	7 (12.5)
Percentage of female fellows	
Less than 25	3 (5.4)
25–49	21 (37.5)
50–74	29 (51.8)
75 +	3 (5.4)

Table 2 Responses regarding gender equity in patient care

	N (%)
Importance of patient gender equity	
Very unimportant	2 (3.6)
Somewhat unimportant	3 (5.4)
Neutral	12 (21.4)
Somewhat important	19 (33.9)
Very important	20 (35.7)
Patient gender equity training is provided	
Yes	9 (16.1)
No	47 (83.9)
Type of patient gender equity training provided	
Individual lecture	4 (36.4)
Discussion section	2 (18.2)
Other	5 (45.5)
Open to sharing resources for patient gender equity	
Yes	4 (44.4)
No	5 (55.6)
Reason for not providing patient gender equity training	
Lack of time	7 (14.9)
Lack of resources	27 (57.4)
Lack of interest	2 (4.3)
Perception that this education is not needed	4 (8.5)
Other	7 (14.9)
Would like patient gender equity resources	
Yes	44 (93.6)
No	3 (6.4)

old (60.7%, $n=34$). Twenty-nine PDs (51.8%) reported that their fellowship included 50–74% female fellows, and 21 (37.5%) respondents reported 25–49% female fellows. Most fellowship programs included in the study were located in the Northeast (39.3%, $n=22$) and South (25.0%, $n=14$).

Perception of GE Training in Patient Care and Physician Workforce

Most PDs reported that they believe that GE in patient care is "very important" (35.7%, $n=20$) or "somewhat important" (33.9%, $n=19$) (Table 2). Similarly, most respondents indicated that they feel physician GE is "very important" (50%, $n=28$) or "somewhat important" (30.4%, $n=17$) (Table 3). However, most programs do not offer GE training regarding patient care (83.9%, $n=47$) or regarding the physician workforce (78.6%, $n=44$).

Current Training Offered Related to GE in Patient Care and Physician Workforce

Of the PDs whose fellowship curriculum included GE training in patient care, most were in the form of individual lectures (36.4%, $n=4$) or discussion Sects. (18.2%, $n=2$). Programs that offered training about GE in the physician workforce were done mostly via discussion Sects. (27.3%, $n=3$) and individual lectures (27.3%, $n=3$). A theme that emerged from the open-ended responses was that GE issues in the physician workforce were addressed via participation in diversity, equity, and inclusion (DEI) groups at the institution and through national societies and networks (e.g., Women's Task Force Symposium, Heme Onc Women Physicians' Group, Blackwell Society, Women in Lymphoma). These DEI and GE-specific activities included workshops, lectures and seminars, meetings, and symposia (27.3%, $n=3$).

Barriers to GE Training and Interest in GE Educational Resources

The most common reasons reported for lack of GE training in patient care included lack of resources (57.4%, $n=27$), followed by lack of time (14.9%, $n=7$). Similarly, lack of GE training in the physician workforce was most attributed to lack of resources (42.9%, $n=24$) and lack of time (10.7%, $n=6$). A vast majority of PDs reported interest in acquiring educational resources for GE in patient care (93.6%, $n=44$) and in the physician workforce (88.6%, $n=39$).

Table 3 Responses regarding gender equity in the physician workforce

	N (%)
Importance of physician gender equity	
Very unimportant	1 (1.8)
Somewhat unimportant	3 (5.4)
Neutral	7 (12.5)
Somewhat important	17 (30.4)
Very important	28 (50.0)
Physician gender equity training is provided	
Yes	12 (21.4)
No	44 (78.6)
Type of physician gender equity training provided	
Individual lecture	3 (27.3)
Lecture series	2 (18.2)
Discussion section	3 (27.3)
Other	3 (27.3)
Open to sharing resources for physician gender equity	
Yes	8 (66.7)
No	4 (33.3)
Reason for not providing physician gender equity training	
Lack of time	6 (10.7)
Lack of resources	24 (42.9)
Lack of interest	4 (7.1)
Perception that this education is not needed	4 (7.1)
Other	7 (12.5)
Would like physician gender equity resources	
Yes	39 (88.6)
No	5 (11.4)

44.4% ($n=4$) of PDs whose programs currently offer GE training in patient care are willing to share their educational resources, while 66.7% ($n=8$) of PDs whose programs offer GE training in the physician workforce are open to sharing resources for training. In the open-ended responses, one participant highlighted that their training resources for workforce GE are a proprietary program which may not be shared externally.

Discussion

In this survey of HO PDs, there is a discrepancy between the idea that GE training is important and the actual implementation of formal GE training within HO fellowship programs. Most PDs stated that they believe that GE in both patient care and the physician workforce are important, but there is a paucity of GE training in current curricula for HO fellows.

Interestingly, the number one barrier to GE training reported by PDs is the lack of resources. While this lack of resources could take many different forms that may be institution-specific (such as insufficient funds or faculty time for development of training content), our results suggest that the sharing of existing resources is likely to be able to alleviate these barriers across the field. Considering most PDs of fellowship programs without GE training are interested in obtaining resources for fellow education, and PDs of other fellowship programs that do incorporate GE training are open to sharing resources, there is an opportunity to develop collaborations across programs and fill gaps in the curricula of fellowship programs.

To date, there is a dearth of comparable studies that specifically quantify the extent of and barriers to formal GE curricula during medical training as well as its perceived importance. A survey of 44 faculty representatives from 24 medical schools in different geographic regions in the US demonstrated that 40% of medical schools did not have any instated programs for "recruiting, promoting, and retaining" female faculty members, with most interviewees citing that GE concerns were not seen as priorities at their institution [13]. While their GE programs targeted childcare, funding incentives, and mentorship which can differ from the educational GE initiatives studied in our survey, both surveys examine measurable actions taken towards achieving GE and delve into the reasons behind the relative lack of these programs. Our study demonstrated that 83.9% of HO PDs reported that their fellowship programs did not include formal GE training, while the study by Carr et al. showed that only 40% of the medical schools included in the survey did not have programs specifically promoting female faculty members. These numbers suggest that 16.1% of HO fellowships included in our survey provided formal GE training, while 60% of medical schools included in the survey by Carr et al. had GE initiatives for female faculty. The higher percentage of GE programs instated in medical schools compared to that of HO fellowship programs in part may be explained by the fact that the study by Carr et al. included the existence of Women in Medicine chapters (which aim to address GE, recruitment, retention, and career advancement of female physicians) as a GE initiative, while our study specifically inquired about formal GE curricula for fellows, a more specific criterion. Interestingly, their study cites a main barrier to these programs as lack of perceived importance, while our study finds lack of resources as the major obstacle. Some respondents from the Carr et al. study stated they were not aware of issues in recruiting and retaining female faculty at their programs and that it is "not a problem." This discrepancy may be due to certain institutions having fewer GE issues, thus lessening the perceived need for GE initiatives. Other respondents in the Carr et al. study commented that GE at their institutions was an issue that was "glazed over" or simply not part of the mission of the medical school. In contrast, HO PDs may have more influence over the goals of their training programs and may also be more attuned

to Accreditation Council of Graduate Medical Education (ACGME) initiatives for DEI. These factors may lead HO PDs to be more likely to note an interest in GE compared to the respondents in the Carr et al. study who were not necessarily as deeply involved in building a medical curriculum. Shifts in awareness and priorities may also have occurred in the years elapsed between this 2016 study and the present study. In a cross-sectional survey of leaders in rheumatology, female rheumatologists placed higher importance on "gender-sensitive clinical practice, research, and training" than their male counterparts did [14].

Overall, there is growing interest in gender-specific training in HO fellowship programs. A recent survey of adult HO PDs showed that routine cancer care does not include formal counseling on sexual and reproductive health due to limited clinician training on this topic [14], which would be important for holistic patient care. Despite the sparse amount of literature focused on our specific research question, a large body of literature exists that describes the need for GE training across many medical specialties [15–20].

There are many strengths to our study including being one of the first to investigate the landscape of GE education in HO fellowship training. Our survey garnered a sufficient response rate, reflecting attitudes across the four geographic regions of AAMC and PDs of all genders, therefore making this data relatively generalizable across HO fellowship programs nationwide. In prior studies in HO, including large national workforce studies, response rates often range in the 20–30% range. For example, a large national survey of burnout in the US oncology community had a response rate of 22.6% [21], and a study of physicians and advanced practice providers (APPs) in hematology had response rates of 18.7% and 23.1% for physicians and APPs, respectively [22]. Therefore, we consider a response rate of 32.7% to be adequate compared to other work in the HO field. Given the growing interest in the field of GE in medicine, we hope that our study will encourage exploration of the topic in other medical specialties as well as non-academic training programs. Furthermore, we collected PD perspectives on a variety of areas related to GE, reflecting not only the current status of GE training in HO fellowship but also demonstrating opportunities for future curriculum development and training.

One limitation of this study is the possibility of response bias inherent to cross-sectional surveys. Voluntary participants in surveys may feel more strongly about the topic, generating results that are different from the average sentiment in the population. In addition, social desirability bias could motivate responses to favor GE; to limit the effect of this bias, responses were anonymous, and survey questions were written to be as neutral as possible. Although the study was fully optional and anonymous, the effect of response bias, especially with increasingly prevalent movements to improve DEI, are difficult to ascertain. Lack of resources and time are barriers prevalent in all areas of education including GE that may prevent development in DEI and non-DEI related curricula. While we acknowledge that making change is multifactorial and will require more than providing resources, we believe that this is an attainable step in working towards GE. These solutions may not solve the issue of "lack of time" in the program; however, making free resources like online webinars that can be distributed to fellows to listen to on their own time may help mitigate scheduling conflicts for synchronous in-person activities. It may also afford time for PDs who are interested in adding GE components into their curricula as they would not have to create modules from square one.

Sharing these GE educational resources has great potential to reduce gender differences in patient care and outcomes as well as gender-based discrepancies in physician experiences. Researchers have examined the efficacy of a 20-min teaching module given to radiation oncology faculty aimed at elucidating implicit gender biases, showing that participants had a positive effect on implicit bias about women and leadership [23]. Another study looked at the effect of a 2.5-h workshop for implicit bias awareness, motivation to reduce gender biases, and GE action. Immediately after the intervention and 3 months after, researchers showed that participants exhibited behavioral change and were more likely to engage in GE-promoting behaviors [24]. The study also demonstrated that when at least 25% of the department faculty participated in the intervention, there was a significant increase in behavioral change, which reflects results of other studies on the impact of critical mass on organizational changes. Considering the outcome of this study may further support the importance of formal GE training in order to reach enough participants for significant cultural change within institutions. These educational interventions suggest that GE training may be a great tool in enabling change in gender biases in both the short and long term.

This study's results suggest that there is a clear interest in GE training, but most programs may not have educational resources that can readily be used. Now that a "lack of resources" has been identified as a major barrier, a further study may be done to tailor what resources may be created to help address this need, including how much time may be allotted to training and how resources will be distributed. To address the other barrier of "lack of time," specific resources for fellowship PDs to share with trainees may be created in an online or webinar format so that there is flexibility to review these materials in an in-person discussion or individually on the trainees' own time. A follow-up study may be conducted to evaluate trainee and PD satisfaction with training as well as to assess longer-term effects of the GE training. Another next step may be to expand this study by performing qualitative interviews with PDs, both those

whose fellowship programs offer GE training and those who do not. PDs of programs that offer GE training could be asked to discuss specific aspects of their training curricula to see what might be modified and expanded to offer to other programs. PDs of programs that do not offer GE training could be asked what types of resources they might find most helpful as well as asked to discuss more specifically the challenges of offering GE training.

In the evolving field of healthcare, understanding and integrating principles of GE is crucial for both patient care and workforce development. While most recognize the value of GE training, the majority of HO PDs note that their fellowships do not offer official training due to a lack of educational resources. We hope that the results of the present study will be leveraged to prompt collaboration and foster connections for facilitating sharing of existing GE resources and educational materials, with the goal of bridging resource gaps that currently exist in GE training for HO physicians and trainees.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s13187-025-02591-5.

Declarations

Competing Interests The authors declare no competing interests.

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