




# Health Disparity Curricula for Ophthalmology Residents: Current Landscape, Barriers, and Needs

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## Abstract

**Background** Social determinants of health play a critical role in visual health outcomes. Yet, there exists no structured curriculum for ophthalmology residents to identify and address health disparities relevant to eye care or no a standard assessment of health disparities education within ophthalmology residency programs. This study aims to characterize current health disparity curricula in ophthalmology residency programs in the United States, determine resident confidence in addressing health disparities in the clinical setting, and identify perceived barriers and needs of program directors (PDs) and residents in this area.

**Design** This was a cross-sectional survey study.

**Methods** A closed-ended questionnaire with comments was distributed to the Accreditation Council for Graduate Medical Education-accredited ophthalmology residency PDs and residents in April 2021 and May 2022. The questionnaire solicited characteristics of any existing health disparity curricula, PD and resident perceptions of these curricula, and residents' experience with and confidence in addressing health disparities in the delivery of patient care.

**Results** In total, 29 PDs and 96 residents responded. Sixty-six percent of PDs stated their program had a formal curriculum compared to fifty-three percent of residents. Forty-one percent of PDs and forty-one percent of residents stated their program places residents in underserved care settings for more than 50% of their training. Most residents (72%) were confident in recognizing health disparities. Sixty-six percent were confident in managing care in the face of disparities and fifty-nine percent felt they know how to utilize available resources. Residents were most concerned with the lack of access to resources to help patients. Forty-five percent of PDs felt the amount of time dedicated to health disparities education was adequate. Forty-nine percent of residents reported they felt the amount of training they received on health disparities to be

## Keywords

- ▶ Health disparities
- ▶ residency programs curriculum

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adequate. The top barrier to curriculum development identified by PDs was the availability of trained faculty to teach. Time in the curriculum was a major barrier identified by residents.

**Conclusions** Roughly half of ophthalmology residency programs who responded had a health disparity curriculum; however, both PDs and residents felt inadequate time is dedicated to such education. National guidance on structured health disparity curricula for ophthalmology residents may be warranted as a next step.

Social determinants of health play a critical role in visual health outcomes. Prior scholarly work in visual health equity has demonstrated that racial/ethnic minority groups have a higher risk of ocular diseases and blindness. Women are more likely to experience vision loss than men, and people with lower income and educational attainment have an increased risk of vision loss and blindness.<sup>1–8</sup> Most recently, health disparities as they relate to eyecare have been brought to the forefront and a call is being made to address the social determinants that can significantly impact the care our patients receive and to narrow the gap in visual health outcomes.<sup>9–11</sup>

Health disparities education targeting physicians, including trainees, is demonstrated to improve health outcomes and health disparities.<sup>12–20</sup> To our knowledge, this strategy has yet to be fully explored among ophthalmology trainees or customized to ophthalmology residency programs. Graduate medical education has struggled to provide structured health disparity curricula. In a 2017, Clinical Learning Environment (CLE) Review, the Accreditation Council for Graduate Medical Education (ACGME) noted that trainees frequently encounter health care disparities but lack formal training in addressing them.<sup>21</sup> A review of internal medicine residency programs revealed that despite CLE- and ACGME-required competencies for training in health disparities, few programs provided a structured curriculum, resulting in poor resident knowledge of health care disparities.<sup>22–24</sup>

In response to this critical gap in training, institutions began implementing and evaluating health disparity curricula for residents.<sup>25,26</sup> Major advances have been made recently to gather resources to help ophthalmology residents (and faculty) learn about health disparities, including a section on Social Determinants of Health in the 2022–2023 Basic Clinical and Science Course General Medicine Book and a Diversity, Equity, and Inclusion tool kit on the American Academy of Ophthalmology website.<sup>27,28</sup> However, to our knowledge, there is no formal needs assessment or standard guide to implementing such education into a curriculum. Furthermore, there is no standardized assessment of health disparities education or measurement of defined competencies for ophthalmology residents. The purpose of this study is to characterize current health disparity curricula in ophthalmology residency programs in the United States, to determine resident confidence in addressing health disparities in the clinical setting, and to identify perceived barriers and needs of program directors (PDs) and residents in this area.

## Methods

This was a cross-sectional, survey-based study of PDs and residents at ACGME-accredited ophthalmology residency programs across the United States. Approval from the University of California, San Francisco (UCSF) Institutional Review Board and Committee for Human Subjects Research was obtained. The study was conducted in accordance with the tenets of the Declaration of Helsinki. A closed-ended questionnaire (**Supplementary Material 1** [available in the online version]) with comments was created to identify the existence of health disparity curricula among ophthalmology residency programs, to assess resident and PD perceptions of such curricula and to assess resident confidence in identifying and addressing health disparities. The questionnaire was created through an iterative process with input from content experts.

The questionnaire was distributed in April 2021 and again in May 2022 to ACGME-accredited ophthalmology residency PDs using a list of PDs available in the Fellowship and Residency Electronic Interactive Database (FREIDA) hosted by the Association of American Medical Colleges.<sup>29</sup> Targeted emails were sent to 125 individual PDs whose email addresses were on the FREIDA database, known to the authors, or available on program websites. The PDs were asked to share the questionnaire with their residents. Responses were collected from May to June 2021, and then, reopened for additional responses from May to June 2022. All data were captured, anonymized, and stored within Qualtrics. Participants who completed all elements of the study received a \$5 electronic coffee gift card.

Summaries of PD and resident responses were reported as counts (with percentage) or means (with standard deviations, SDs) as appropriate. The Mann–Whitney U test was used to estimate the mean difference between groups. R (R Core Team 2022)<sup>30</sup> was used for data management and statistical analysis. Statistical significance was set at  $p < 0.05$ .

## Results

Completed questionnaires were received from 29 out of 125 PDs (response rate of 23.2%) and 96 residents. PDs who responded had been at their respective institutions ranging from 1 to 21 years, with a mean of 5.8 years. Of the residents who provided their current training level, 12% indicated PGY-1/internship year, 24% PGY-2, 32% PGY-3, and 28% PGY-4. PD and resident demographics (gender identity, race/ethnicity, and geographic

**Table 1** Survey participant demographics

	Program directors ( <i>n</i> = 29)	Residents ( <i>n</i> = 96)
Gender Identity, <i>n</i> (%):		
Male	13 (45)	50 (52)
Female	15 (52)	42 (44)
Nonbinary	0	1 (1)
Please list if not specified	0	0
Prefer not to answer	1 (3)	3 (3)
Race/Ethnicity/Ancestry, <i>n</i> (%):		
African American/Black	2 (7)	3 (3)
American Indian or Alaskan Native	0	0
Asian	12 (41)	37 (39)
Hispanic/Spanish/LatinX	1 (3)	6 (6)
Middle Eastern and/or North African	1 (3)	9 (9)
Native Hawaiian or other Pacific Islander	0	0
White/Caucasian	13 (45)	42 (44)
Multiple races	1 (3)	3 (3)
Other	1 (3)	1 (1)
Prefer not to answer	2 (7)	5 (5)
Geographical region, <i>n</i> (%):		
West:		
(AZ, CA, CO, HI, ID, NV, NM, OR, UT, WA)	7 (24)	23 (24)
South:		
(AL, AR, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV)	12 (41)	26 (27)
Northeast:		
(CT, MA, NH, NJ, NY, PA, RI, VT)	2 (7)	23 (24)
Midwest:		
(IL, IN, IA, KS, MI, MN, MO, NE, OH, WI)	8 (28)	24 (25)

location) are described in ►Table 1. Regarding resident responses to race/ethnicity, answers were matched to the National Institutes of Health's definition of underrepresented in medicine (URM).<sup>31</sup> Eight residents (8.3% of overall residents) self-identified in URM racial or ethnic groups.

### Program Director Responses

Among PDs, nine (31%) stated that their residents spent 0 to 25% of their time in an underserved setting, eight (28%) 25 to 50% their time, 6 (21%) 50 to 75% their time, and 6 (21%) 75 to 100% their time. Overall, 41% (12/29) of PDs stated their residents spend more than 50% of their time in underserved settings including those that are rural or part of a county health system. ►Table 2 shows PD estimates of patients cared for by residents that are uninsured, experience homelessness, or have limited English language proficiency.

Most PDs (*n* = 21, 72%) reported they never received formal training in health care disparities either during or after their own residency training. Sixty-six percent of PDs (*n* = 19) stated their current program for residents had a formal health disparity curriculum. "Formal" was defined as

having scheduled lectures, required reading or multimedia assignments, journal clubs, the inclusion of health-equity cases at grand rounds or morbidity and mortality conferences, small group activities, and/or required workshops. Of the ten PDs who did not have a formal curriculum, five said they wanted to and/or were planning to implement one. When asked if they felt the amount of time dedicated to health care disparities education in their current program was adequate, 45% (*n* = 13) of PDs somewhat or strongly agreed on a 5-point Likert scale. When responses were further analyzed among those with and without a formal curriculum, 53% of PDs with a formal curriculum (10/19) somewhat or strongly agreed compared to 30% of PDs without a formal curriculum (3/10; *p* = 0.046). Among PDs with a curriculum, the total number of hours allotted for formal curricula ranged from 1 to 20 hours, with a median of 4 hours per year (mean = 6 hours per year, SD of 5; data are right-skewed, so the median is more accurate).

Of the 19 PDs who had a formal curriculum, 95% (*n* = 18) stated that the curriculum was required for residents. Seventy-four percent (*n* = 14) of those PDs described the quality

**Table 2** Program director and resident estimates of exposure to patients that are uninsured, experience homelessness, or have limited English language proficiency

PDs: approximately what percentage of the patients your residents care for are:	n = count (percentage of respondents)				
	0–25%	25–50%	50–75%	75–100%	Not answered
Uninsured	14 (48)	10 (34)	1 (3)	2 (7)	2 (7)
Experiencing houselessness	21 (80)	1 (3)	–	–	7 (24)
Limited in English proficiency	18 (62)	6 (21)	4 (14)	1 (3)	–
Residents: approximately what percentage of the patients you care for are:	0–25%	25–50%	50–75%	75–100%	Not answered
Uninsured	39 (41)	29 (30)	14 (15)	2 (2)	12 (13)
Experiencing houselessness	58 (60)	19 (20)	4 (4)	0	15 (16)
Limited in English proficiency	33 (34)	33 (34)	20 (21)	7 (7)	3 (3)

of health disparities education as good, very good, or excellent on a 5-point Likert scale ranging from poor to excellent. About half ( $n = 9, 47\%$ ) of the formal curricula did not employ evaluation and assessment. For those that did have evaluation and assessment ( $n = 10, 53\%$ ), 80% ( $n = 8$ ) solicited learner evaluations of curricular content, 40% ( $n = 4$ ) assessed learner attitudes and comfort levels, and only 1 (10%) assessed clinical patient outcomes. Of health disparity curricular topics, PDs reported “effects of systemic racism,” “inadequate medical insurance,” and “gender disparities” as the most covered topics. “Housing insecurity,” “poor health literacy,” “unemployment,” and “disparities due to religious beliefs” were least covered (►Fig. 1). Per PDs, the most common modalities for delivering health disparity curricula were scheduled lectures and small group discussion sessions. Panels, role-playing, and case-based activities were less often used (►Fig. 2).

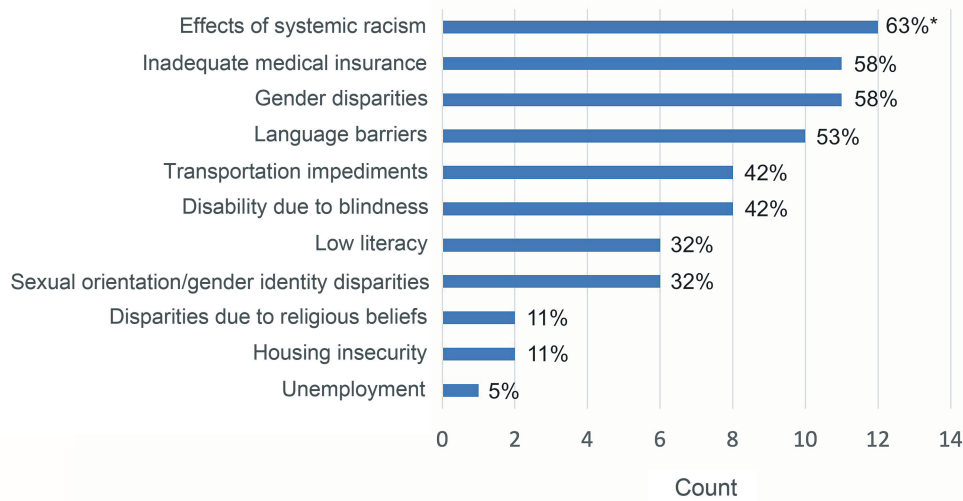
►Table 3 reports PD and resident perceived barriers to the development of a health disparity curriculum. “Trained faculty to teach” was the most cited barrier by PDs who had a formal

curriculum followed by “interest from learners/faculty”. Among PDs lacking a formal curriculum, “trained faculty to teach” was also the most cited perceived barrier.

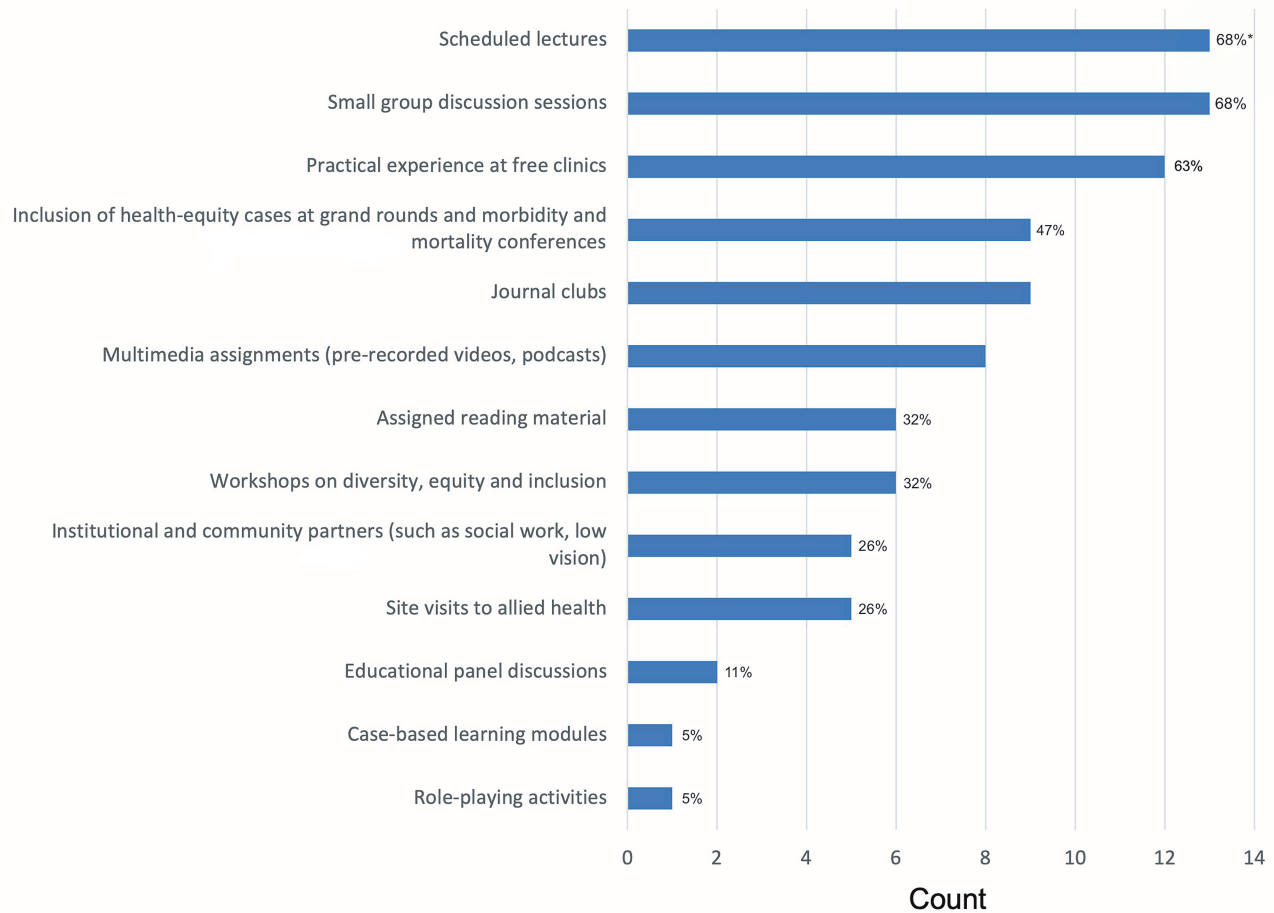
**Resident Responses**

Forty-one percent (39/96) of residents reported spending over 50% of their training in underserved settings. Time spent in underserved settings by residents broken down by region is noted in ►Table 4. Sixty-seven percent ( $n = 16$ ) of residents in the Midwest indicated that more than 50% of their time was spent in an underserved setting (county or rural hospital setting), higher than 43% of residents in the Northeast, 31% of residents located in the South, and 22% of residents located in the West. Resident perceptions of percentages of patients cared for who are uninsured, experiencing houselessness, or with limited English proficiency are described in ►Table 2.

Forty-nine percent of residents ( $n = 47/96$ ) strongly or somewhat agreed the amount of training they received on health disparities to be adequate. Seventy-two percent ( $n = 69/96$ ) of residents were at least somewhat confident



**Fig. 1** Curricular topics in formal curricula as stated by program directors (PDs). \*Percent of respondents = count/total respondents of 19.



**Fig. 2** Program directors' reported modalities and education strategies for formal curricula implementation. \*Percent of respondents = count/total respondents of 19.

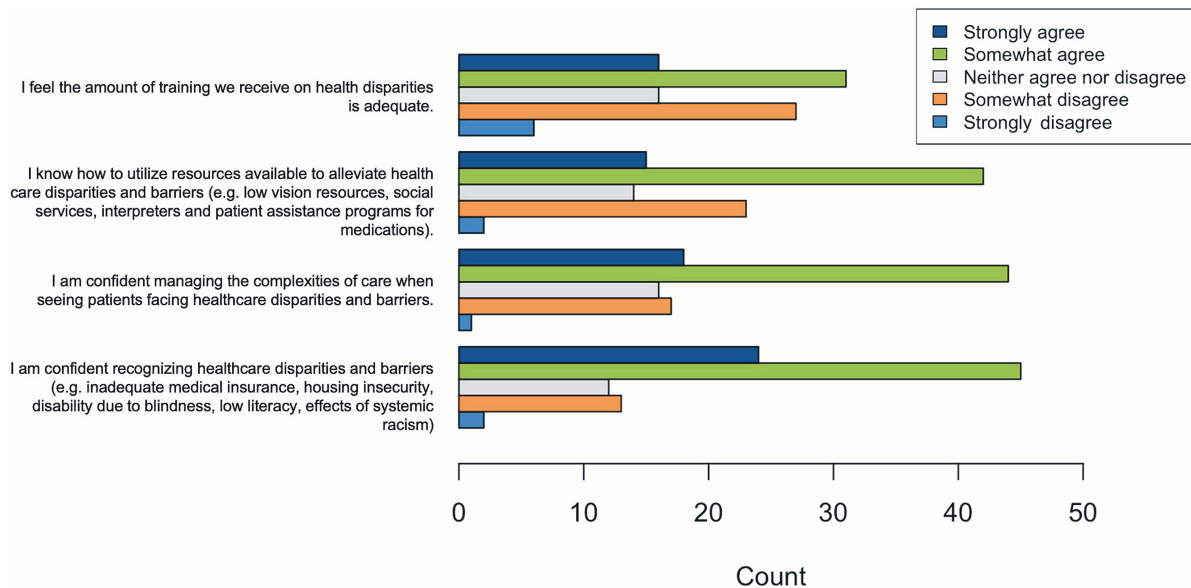
**Table 3** Program director and resident perceived barriers to the development of a health disparity curriculum

		Perceived barriers to health disparity curriculum development n = count (percentage of respondents)				
Presence of formal curriculum		Trained faculty to teach	Time in curriculum	Interest from learners/faculty	Institutional/Department financial support	Other
Present	PDs (19 respondents)	16 (84)	7 (37)	8 (42)	6 (3)	1 ("run by Graduate Medical Education")
Absent	Residents (45 respondents)	33 (73)	40 (89)	20 (44)	18 (40)	–
	PDs (10 respondents)	9 (90)	4 (40)	5 (50)	4 (40)	–

Abbreviation: PD, program directors.

**Table 4** Resident time spent in underserved setting divided by US region

		Approximately how much time during residency training do you spend in an underserved setting (e.g. county or rural hospital setting)? n = count (percentage of respondents)				
Region	Total residents	0–25%	25–50%	50–75%	75–100%	I don't know
Midwest	24	3 (13)	3 (13)	6 (25)	10 (42)	2 (8)
Northeast	23	6 (26)	3 (13)	7 (30)	3 (13)	4 (17)
South	26	10 (38)	7 (27)	6 (23)	2 (8)	1 (4)
West	23	11 (48)	5 (22)	3 (13)	2 (9)	2 (9)



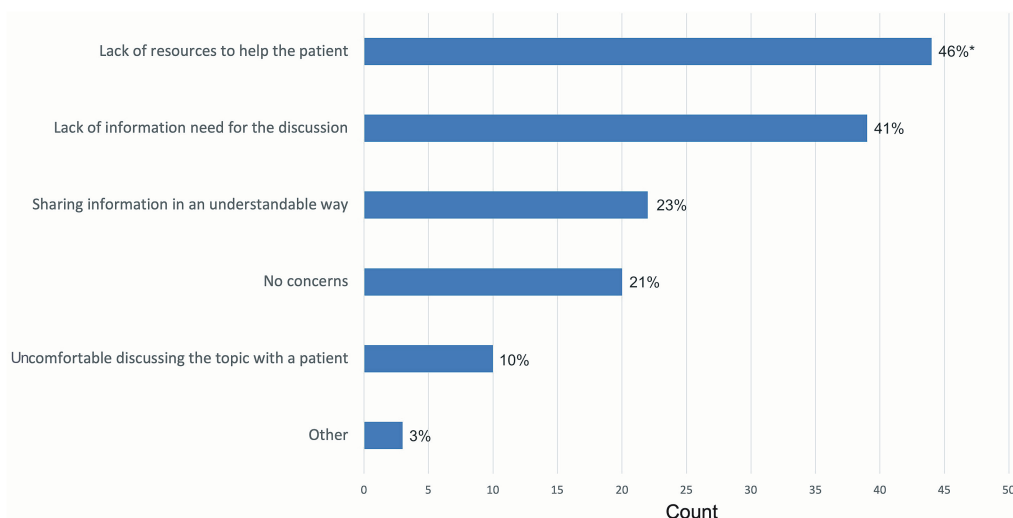
**Fig. 3** Resident ranking of confidence approaching health care disparities during training.

recognizing health disparities and barriers. Sixty-six percent ( $n = 62/96$ ) were at least somewhat confident managing complexities of care in the face of health disparities and 59% ( $n = 57/81$ ) felt they knew how to utilize available resources (► **Fig. 3**). The difference in the percentage of residents who felt confident recognizing health disparities versus knowing how to utilize available resources was statistically significant ( $p = 0.03$ ).

Residents who reported spending 50% or more of their time in an underserved setting were more confident in managing the complexities of care in the face of health disparities than residents who spent less time in underserved settings ( $p = 0.006$ ). These residents were also more likely than residents who spent less time in underserved settings to feel that the amount of health disparities training received was adequate ( $p = 0.04$ ).

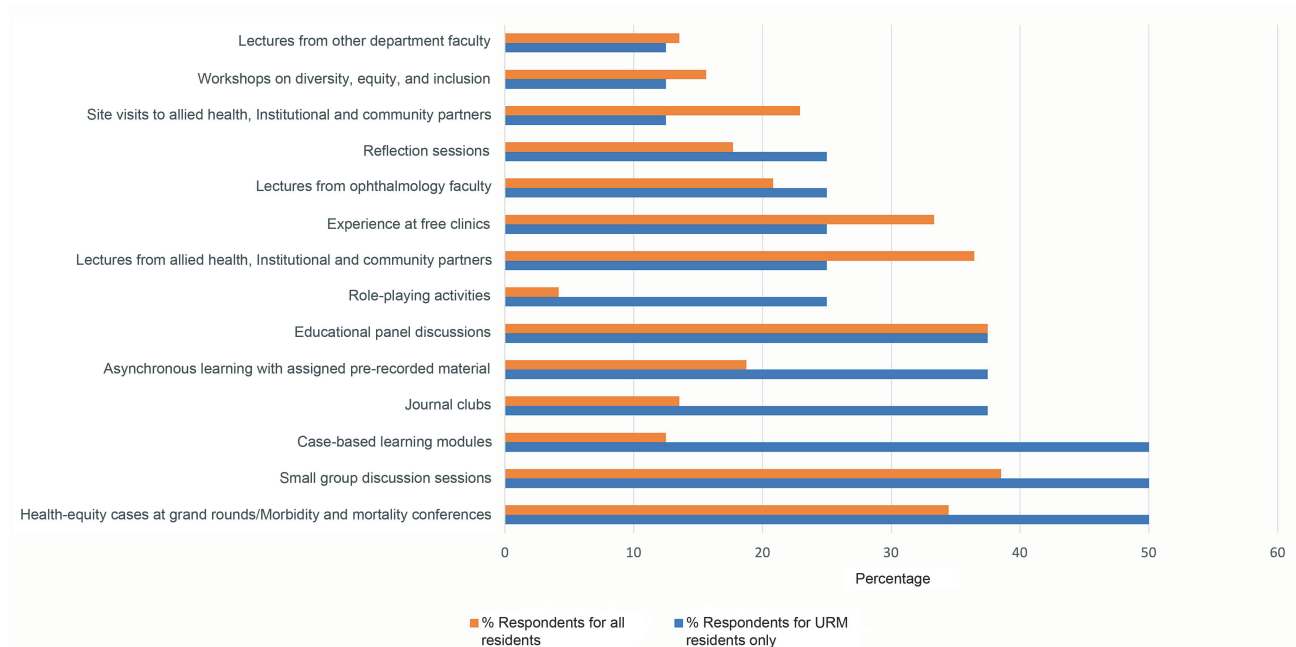
When asked what concerns they had about discussing health care disparities with patients, the most reported concerns were the lack of access to resources to help patients and lack of information to lead challenging discussions (► **Fig. 4**). Free response comments from residents included two concerning time restraints (“I do not think the current structure of outpatient appointments will allow for such discussions without being at the expense of expected volume residents are supposed to take on” and “I don’t feel there is enough time”) and “language barrier.”

Approximately half of the residents (53%,  $n = 51$ ) stated their program had a formal health disparity curriculum. Most residents with a formal curriculum ( $n = 51$ ) evaluated it favorably; 86% ( $n = 44$ ) rated their curriculum as good, very good, or excellent (on a 5-point Likert scale). For residents who did not have a formal curriculum, most ( $n = 30/45$ , 67%)



**Fig. 4** Resident concerns when addressing healthcare disparities with patients. \*Percent of respondents = count/total respondents of 96.





**Fig. 5** Resident perceptions of effective tools for a health disparity curriculum, total and URM only.

believed that such a curriculum should be a part of their residency training program. Perceived barriers to curriculum development are noted in **Table 3**. The top perceived barrier among residents without a formal curriculum was “time in the curriculum” (89%,  $n = 40$ ), which was significantly higher than reported by PDs ( $p = 0.001$ ). “Trained faculty to teach” was the second most commonly identified barrier (73%,  $n = 33$ ).

Residents identified “small group discussion sessions” ( $n = 41/96$ , 43% of respondents), “health-equity cases at grand rounds and morbidity and mortality conferences” ( $n = 37$ , 39%), “lectures from allied health institutional and community partners” ( $n = 37$ , 39%), and “experience at free clinics” ( $n = 34$ , 35%), as the most effective tools for a health disparity curriculum (**Fig. 5**). URM students noted “small group discussion sessions,” “case-based learning modules,” and “health-equity cases at grand rounds/morbidity and mortality conferences” as their preferred tools for learning ( $n = 4/8$ , 50% for all). “Site visits to allied health institutional and community partners,” “workshops on diversity, equity, and inclusion,” and “lectures from other department faculty” all ranked among the least useful tool/curriculum element for all residents ( $n = 1/8$  [12.5%] for all).

## Discussion

There is increasing development of health equity and disparity curricula in medical schools.<sup>32</sup> While this should inevitably facilitate the exploration of these topics for ophthalmology residents, resident-specific curricula are still necessary to further a nuanced understanding appropriate for the level of the subspecialty.

Recognition of the importance of health disparity curricula among trainees and PDs would be a strong impetus for more ophthalmology health disparity curricula across the United States. Most ophthalmology PDs who responded to the survey

have or plan to implement a required health disparity curriculum for their residents. Among residents who did not have a formal curriculum, most believed that such training should be included in their residency program. While the majority of PD respondents indicated their commitment to developing such programs, the low response rate to our survey calls into question whether, as a whole, ophthalmology PD’s view this as a national priority. Yet, requirements set forth by the ACGME<sup>21</sup> effectively necessitate a nationwide effort to create health disparities curricula to ensure physicians attain competency in caring for diverse populations.

The format in which the health disparity curricula were most often delivered was scheduled lectures and small group discussions. However, residents preferred small group sessions, health-equity cases during grand rounds, and lectures from allied health professionals and institutional/community partners. This suggests that residents prefer interactive and clinically relevant modes of instruction. Focusing the curriculum on cases and community involvement may increase the level of satisfaction among residents. When assessing the needs of URM residents, health-equity cases during grand rounds, small group discussions, and case-based learning were similarly preferred tools. Previous undergraduate educational research has shown both URM and non-URM students benefit from group learning and peer workshops as they provide a social context encouraging cooperation, but URM students may show a larger improvement in objective assessment.<sup>33,34</sup> All residents, including URM residents, ranked lectures and workshops on diversity, equity, and inclusion as least helpful while PDs indicated that workshops on diversity, equity, and inclusion were used in 32% of the curriculums. Further research into understanding the role of workshops on diversity, equity, and inclusion in the context of health disparity curricula is needed.

The most covered health disparity curricular topics included the effects of systemic racism, inadequate medical

insurance, and gender disparities. Further research should be conducted to understand optimal topic selection, perhaps specific to the geographic location and social milieu of the program. Overall, differences in the implementation of health disparity curricula are representative of the general heterogeneity of the curricula, similar to that of other medical specialties.<sup>32,35</sup> This heterogeneity may support a need for official guidance on creation of a health disparity curriculum with core competencies that can then be customized to each program.

In this study, only half of the residents felt they had sufficient training to provide effective care for patients facing disparities, despite having high overall confidence in recognizing the disparities. Residents also reported significantly lower confidence accessing and utilizing resources to help underserved patients in comparison to identifying the disparities patients faced. These findings align with the ACGME's finding that residents lack formal training for addressing health disparities in settings where health disparities exist. These findings also suggest that health disparity curricula must include practical toolkits and resources to assist patients. This can help to improve disparities competencies in clinical practice.<sup>36</sup>

Residents who spent more than half their time in underserved settings reported higher confidence managing patients facing health disparities and were more likely to feel their health disparities training was adequate. As this is a self-report, it is unclear if these residents are truly more equipped, or this confidence level is reflective of increased exposure equating to increased confidence. Prior studies have shown that care of at-risk populations does not necessarily translate into relevant knowledge among residents,<sup>37</sup> which suggests formal training (and not simply clinical exposure) is required.

In terms of barriers to the implementation of health disparity curricula, residents and PDs without formal curricula reported "time in the curriculum" as the top perceived barrier. PDs with formal curricula reported "trained faculty to teach" as the top encountered barrier.

This difference in opinion suggests that curricular time may be limited but can be overcome and then having trained faculty becomes the limiting factor. Integrating new content into already protected didactic time and existing lectures may overcome the barrier of limited curricular time and also avoid resident overload.<sup>38</sup> Most PDs had received little to no training on health disparities during or after their own residency training. Other studies suggest this finding is not limited to ophthalmology, resulting in a small pool of appropriately trained faculty.<sup>39</sup> Moreover, faculty of minoritized identities disproportionately work on diversity and inclusion efforts.<sup>40</sup> Perpetuating the "minority tax" must be considered when recruiting faculty to lead health disparities efforts.<sup>41</sup> The existence of guidelines and/or a templated structured curriculum may enhance faculty recruitment and participation. Having a framework by which to build off of may prove attractive to faculty who would otherwise be interested but are daunted by the initial task of deconstructing a topic as complex as health disparities and equity.

The curriculum can also be used to augment training for existing faculty in diversity, equity, and inclusion. Additionally, including DEI and health disparities considerations in faculty recruitment may encourage faculty to expand their knowledge and training in these arenas to improve their academic resumes. Finally, intentional training of current residents in health equity and disparities will likely add to the ranks of faculty who are competent and interested in teaching this topic in the future.

About half of the formal curricula did not employ evaluation and assessment. For those that did, most relied on learner evaluations, and only one program assessed clinical patient outcomes. Other studies have demonstrated health disparities curricula in residency programs generally focus on educational outcomes for the resident as opposed to how additional training may improve outcomes for patients.<sup>24</sup> Incorporating patient needs (including community needs assessments and priorities of existing community organizations) has been suggested as a technique to increase resident awareness of patients' health literacy and health concerns.<sup>42</sup> Additionally, if health disparities curricula can promote empathy, the curriculum may then in part help improve patient health outcomes and satisfaction.<sup>43</sup> However, whether or not health disparities curricula promote empathy has yet to be studied.

This study has several limitations, namely the small sample size, low response rate, and use of a nonvalidated questionnaire. PDs distributed the questionnaire to their residents; thus, the resident response rate is unknown. There was a higher representation of PDs from the West and South regions of the United States which may limit the external validity of this study. PDs with formal health disparities curricula may have been more likely to participate in the survey, resulting in an ascertainment bias and an overestimation of the percentage of residency programs with health disparity curricula. Additionally, given that program quality was dependent on self-rating of one's own training program, we are unable to draw conclusions on the quality of current health disparity curricula.

## Conclusion

This study demonstrates a lack of structured health disparities curricula in ophthalmology residency programs. Roughly half of the programs represented in the survey have a health disparity curriculum; however, both PDs and residents feel an inadequate time is dedicated to such education. A top resident concern is the lack of access to resources, and there is decreased resident confidence in knowing how to utilize available resources. National guidance on curricular development and implementation may be warranted, along with an additional need for toolkits and easily accessible resources on a local and national level.

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**Conflict of Interest**

None declared.

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