Epistemic oppression of Black women in medical education publishing: A bibliometric study using intersectionality methodology

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Funding/Support: No specific funding was received for this work

Other disclosures: None reported

Ethical approval: Not applicable

Disclosures: None reported

Disclaimer: The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Uniformed Services University of the Health Sciences, the Department of Health and Human Services, the Department of Defense, or the U.S. Government.

Abstract

Introduction

Black women in academic medicine experience racial and gender discrimination with bias from colleagues, patients, and institutions, all while being tasked with improving a flawed system. Representation of Black women in medicine remains low, yet they bear the burden of fostering diversity and mentoring trainees, exacerbating their minority tax and emotional labor, and negatively impacting their career progression. This study seeks to examine how epistemic oppression—reduced access to knowledge consumption and creation—manifests for Black women in medical education publishing.

Methods

Adapting intersectionality methodology, we employed a bibliometric analysis of US-based journal articles published in 22 medical education journals between 2000 and 2020. Author race was determined using a probability-based algorithm incorporating US Census data, and author gender was ascribed based on Social Security Administration records. We conducted two negative binomial generalized linear models to estimate the average effect of epistemic oppression on Black women, from 2000-2020, by both first author publications and last author publications. Metadata for each article was retrieved from Web of Science and PubMed to include author names, country of institutional affiliation, and medical subject headings.

Results

The analytic sample consisted of 21,945 unique authors. Overall, Black authors average only 9.0% of the analytic sample, whereas white authors average 69.3% of the analytic sample. Taken together, the analysis reveals that white women and men dominate publications, with Black women (and other racially minoritized groups) publishing far fewer first and last authors papers. In addition, major Medical Subject Headings used by Black women authors reveal little overlap of eminent (highly ranked) topics within medical education.

Discussion

This research underscores the underrepresentation and epistemic oppression of Black women in medical education publishing, stemming from several forms of epistemic injustice. To address these challenges, we advocate for changes within the publishing ecosystem to address these disparities, as we believe that dismantling these oppressive structures is imperative for achieving equity and inclusivity in academic medicine. Additionally, we believe that qualitative research is needed to complement these quantitative findings and provide a more holistic perspective on Black women's experiences in the publishing process.

Introduction

To be a Black woman in academic medicine is to experience otherness, forever "drowning in the same system we are burdened to improve."[1(p1)] Black women in medicine face racial and gender discrimination of colleagues, patients, and the system, while asked to meet the same demands as their other academic colleagues. In medical education, Black women are called upon to mend this broken system, by recruiting and mentoring trainees of color and leading diversity efforts; and this minority tax burden,[1] in addition to requiring that Black women perpetually navigate the emotional labor to "anticipate and deflect harm" [2(p329)] is heavy as Black women comprise only 1.5% of medical school faculty.[3] Moreover, Black women's experiences of discrimination extend to academic publishing, a necessary and crucial component of career progression in academia. [4,5] Although we know about Black women's underrepresentation in medical schools and struggles with the publishing process, the *effects* of these challenges are not clear. The publishing record, as it currently stands, provides some information on author gender,[6,7] but it does not track race in a systematic way. Racism and sexism are usually studied as separate entities, rather than as a complex *intersection* "shaping structural, political, and representational aspects of violence against women of color."[8(p1244)] Here we seek to understand how intersectional oppressions function for Black women in medical education publishing.

While we have little data on underrepresentation in the medical education literature, we are starting to understand Black women's underrepresentation as faculty. Black women comprise just 28% of medical school assistant professors, 1.8% of associate, and a mere .76% of full professors.[3] A recent study of surgery faculty in the United States (US) found that only 123 were Black women and that just 0.34% of NIH grants awarded between 1998 and 2017 went to Black women.[9] Meanwhile, Black women are starting to share experiences of bias and discrimination

in academic medicine. Responding to the inequitable treatment leading to the tragic death of Dr. Susan Moore, a Black physician who died of COVID-19 in 2020, a group of Black biomedical scientists and clinicians talked about the painful and exhausting experience of "putting [their own] lives on the line to still die disproportionately."[10] Similarly, Balzora, a gastroenterologist in academic medicine, shared how she had "come to expect the suggestions of tokenism and otherness that affirm the racist and misogynistic beliefs of those who have encompassed my professional circles during my training and career."[1(p1)] She noted the pervasiveness of this "Intersectional discrimination" [1(p1)] and urged those in medical education to "protect Black women." [1(p1)] In another recent commentary, Bajaj, Tu, and Stanford explored what they call the "racialised sexism"[11(p1398)] Black women experience in academic medicine, having to "work twice as hard to get half as far" [11(p1398)] without any safety net. They characterize this as the "Goldilocks dilemma: [Black women] are either insufficient and unsuitable or boastful and overdone–never just right", [11(p1399)] and if they speak up they are "caricatured as just another angry Black woman and dismissed as being unreasonable and melodramatic." [11(p1399)]

In academic medicine, to be hired and to advance professionally (i.e., promotion from assistant to full professor) is contingent on a faculty member's ability to publish their research and to secure extramural funding,[12-14] which are intertwined. An analysis of promotion and tenure guidelines found that 95% of institutions with faculties of biomedical sciences included references to factors related to publications and grant funding.[14] Yet a growing body of literature in academic medicine suggests that Black women may have particularly difficult experiences with the publishing process. For instance, two recently published commentaries point to the vulnerability scholars of color may experience in the peer-review process: comments from reviewers may express bias when authors reveal their identity,[15] and this can lead Black women

authors to feel like their story is "not good enough."[4(p145)] Editorial leaders in medical education are starting to talk about and try to address the bias baked into the publishing process,[16,17] but we still know little about the actual representation of Black women in the medical education literature. We know a bit more about the overall state of Black women in science: a 2022 study of inequalities in scientific publishing in the *Proceedings of the National Academy of Sciences* found that Black and Latine authors were underrepresented overall and that Black, Latine, and white women were underrepresented in the fields of physics, mathematics, and engineering and were more overrepresented in lower-cited fields.[18] More specifically in the health field, researchers have examined the topics covered by Black authors finding that there is a concentration of articles focused on disparities, whereas white authors publish across all topics.[18] While not specific to race, we also know some about differences in the topics studied overall by women and men. Researchers have found that women tend to publish on topics that are people-related (e.g., articles focused on caring for others) and conducted using qualitative methods; whereas men tend to focus on topics related to things (e.g., power and control; politics; business).[19,20] Investigations of research topics addressed in publications have shown that there is variation in citation patterns and social media coverage (with some topics receiving more or less visibility than others), which has implications for researchers' career trajectories.[21,22]

We can better understand–and ultimately disrupt–the racist and sexist processes that combine to disadvantage Black women as they seek to publish their work through the lens of *intersectionality*: "the critical insight that race, class, gender, sexuality, ethnicity, nation, ability, and age operate not as unitary, mutually exclusive entities, but as reciprocally constructing phenomena that in turn shape complex social inequalities."[23(p2)] Kimberle Crenshaw coined the term 'intersectionality' in 1989 to explain how racism and sexism are not simply additive, but are

multiplicative, creating a unique character to the discrimination, bias, and oppression Black women experience.[24] This particularistic intersection of racism and sexism results in *epistemic oppression*: reduced access to the resources to consume and create knowledge due to group membership,[25,26] an issue that Wyatt and colleagues have raised for medical education.[27] In the present study, we aim to explore the hypothesis that editors, reviewers, publishers, colleagues, peers, and academic institutions in medical education epistemically oppress Black women through academic publishing.

Conceptual Framework

We structured our research around Haynes et al.'s features of Intersectionality Methodology (IM): (1) taking a critical framing to look explicitly at micro and macro *power relations*, (2) centering how *power* shapes the research process through *reflexivity* (particularly those on the team who are not Black women), (3) centering *Black women* through the statistical methods, and (4) "presenting Black women in the fullness of their humanity" in our results to illuminate openings for *institutional change*.[28]

Critical Framing: Black Feminist Thought

Alongside Crenshaw's work on intersectionality, we frame our research through Collins'[29] Black feminist thought. Through this lens, academic publishing is an institution supported by the structural, disciplinary, hegemonic, and interpersonal domains of power, but these domains are not only sites of oppression and domination, but of empowerment and resistance.[29] Moreover, the institution of academic publishing in medical education, like all spaces of power, is dynamic and responsive to our agency as humans.[29] We seek to find ways to support Black women authors within this institution.

Centering Power Through Reflexivity

Our positionality is critical to the methods we choose and the story we tell with our data. Four of us are established white researchers who have benefitted from the racist system, and one of us is a junior Black researcher. We are committed to disrupting "white methods": "practical tools used to manufacture empirical data and analysis to support the racial stratification in society".[30] As such, we do not see race as a *causal variable*; instead, the true causal factors around differential racial outcomes stem from racist practices and structures.[30] We situate our study within these racist practices, structures and ideologies that oppress and constrain Black women in medical education and seek to understand the effects of these on Black women's publishing records, central sources of advancement and prestige in academic medicine.

Centering Black Women Through Statistical Methods

To explore the epistemic oppression done to Black women by individuals in the publishing process in academic medicine, we conducted a bibliometric analysis of US-based journal article authors focused on their predicted gender and race. All data assembly, cleaning, and statistical modeling were performed using R version 4.2.1.

Methods

Data

This project is a sub-analysis of a larger project, conducted by members of this author team, that broadly investigated author characteristics on the global scale and that did not attempt to identify author race.[7] In the current study, we utilized a subset of the data specific to US-based authors. The original data set included journal articles on the Medical Education Journal List (MEJ-24), which has been described as a "seed set of journals" that represents the field of

medical education.[31] The MEJ-24 was derived using co-citation, which is an evidence-based approach for field delineation.[32-34]

For the original data set, on August 27, 2021 we used the database Web of Science (WoS) to retrieve metadata for articles published in 22 of these journals between 2000-2020 (as the *Journal of Graduate Medical Education* and the *Canadian Medical Education Journal* are not indexed in WoS). On the same day, we downloaded metadata for these journals using the Crossref REST API. For those journals in WoS, we also downloaded the citation data. Metadata included author first and last names, journal, publication year, title, abstract, and publication type. Citation data (i.e., the number of times an article had been cited) was downloaded for those 22 journals in WoS. For all journals we downloaded the associated Medical Subject Headings (MeSH), which we use as a proxy for article topic. From this data set we identified and extracted all authors that were located at institutions in the United States (US). We necessarily focused on US-based authors because our approach utilizes US Census data to provide the basis for making estimations on author race (which we use as a proxy for racism). Two separate algorithms were utilized to provide estimates on race and gender for the authors captured in these journals. In keeping with an IM approach, we interpret and present our data below examining the *intersection* of these algorithms.

Race Algorithm

We adapted a race algorithm originally developed by Kozlowski et al.,[18] which utilized family names (surnames) and given names, with data on frequency counts by the US Census Bureau (using 2010 Census data), to assign probabilities of race based upon these family and given names. The categories in this algorithm consist of collapsed categories of Asian, Black, Hispanic, white, and other (we would like to note that these racial category names are not

necessarily reflective of the lived identity of those to whom they refer, but we have decided to use the Census terms for ease of reference throughout). The 2010 Census work categorized race into the following groupings, and this study collapses some groupings to increase power for estimating effect sizes with the analytic sample. Of note, two racial categories were pooled ("Other") when performing summary statistics and statistical models due to low sample sizes with the analytic sample (Non-Hispanic American Indian and Alaska Native Alone and Non-Hispanic Two or More Races).

Table 1. Crosswalk of Racial Categories

US Census Bureau Racial Categories	This Study
Non-Hispanic Black or African American Alone	Black
Non-Hispanic White Alone	White
Hispanic or Latino Origin	Hispanic
Non-Hispanic Asian and Native Hawaiian and Other Pacific Islander Alone	Asian
Non-Hispanic American Indian and Alaska Native Alone	Other
Non-Hispanic Two or More Races	Other

A key element of this algorithm is the distinction for how race is attributed to each author. As opposed to utilizing a race assignment to the most prominent racial group, each author was given an associated probability to each race classification (i.e., the sum of all race categories, by author, sums to 100%). Previous research has shown[18] that if race is assigned based upon the most prominent racial group (or an overall attribution), Black authors are often underestimated and white authors are overestimated in the results. The intent behind using this algorithm with assigned probabilities across all racial categories was to examine intersectionality

at the aggregate level, not at the individual author level. In cases where data were missing, if the Census data did not capture the family and given name, mean imputation was used for the author's racial probability based upon the distribution for the entire analytic sample.

Gender Algorithm

While gender is neither fixed nor binary, it is a powerful social construct, so we use the categories "women" and "men" in this analysis to explore sexism. To classify authors by gender, given name data covering years 1880-2021 from the Social Security Administration (SSA)[35] were used to assign gender categories to authors based upon the frequency of the name from birth records. These data capture the top 1,000 names for each year, and each name is associated with a specific gender (women or men). Unlike the racial attribution methodology, here, authors were classified as women or men according to which name in the SSA data has the greatest frequency attributed to the specific gender.

Statistical Analysis

Two negative binomial generalized linear models were used to estimate the average effect of epistemic oppression on Black women, from 2000-2020, by both first author publications and last author publications. For both negative binomial models, the outcome variable was the sum of manuscripts published by each race and gender category by publication year. Indicator variables were then constructed for time and to identify Black authors and women authors.

MeSH Term Analysis

To evaluate the topics that first authors wrote about, major MeSH terms were incorporated into the analysis by pairing the MeSH terms with the first author publications. Percentile rankings for each racial category and associated feminization were calculated using

the joint probability for race and the proportion of women authors for individual terms, respectively.

Results

The analytic sample consisted of 21,945 unique authors. Of these authors, 43% (n = 9,553) were represented as first authors and 37% (n = 8,280) as last authors. Of the 9,553 first authors, 5.6% (n = 541) had missing race values imputed. For the last authors, 6.6% (n = 550) had missing race values that were imputed. Just under five percent (n = 1,090) of authors could not be assigned a specific gender as their given name was unavailable for reference with the SSA data.

The first step towards our IM analysis was examining the descriptives for race and gender separately. This approach, presented in Table 2, displays summary statistics from papers published between 2000 and 2020 by racial and gender categories. Black individuals make up only 9% of the sample and women represent 49.9% (excluding non-attributable sources).

Table 2. Summary Statistics on Unique Authors (n = 21,945)

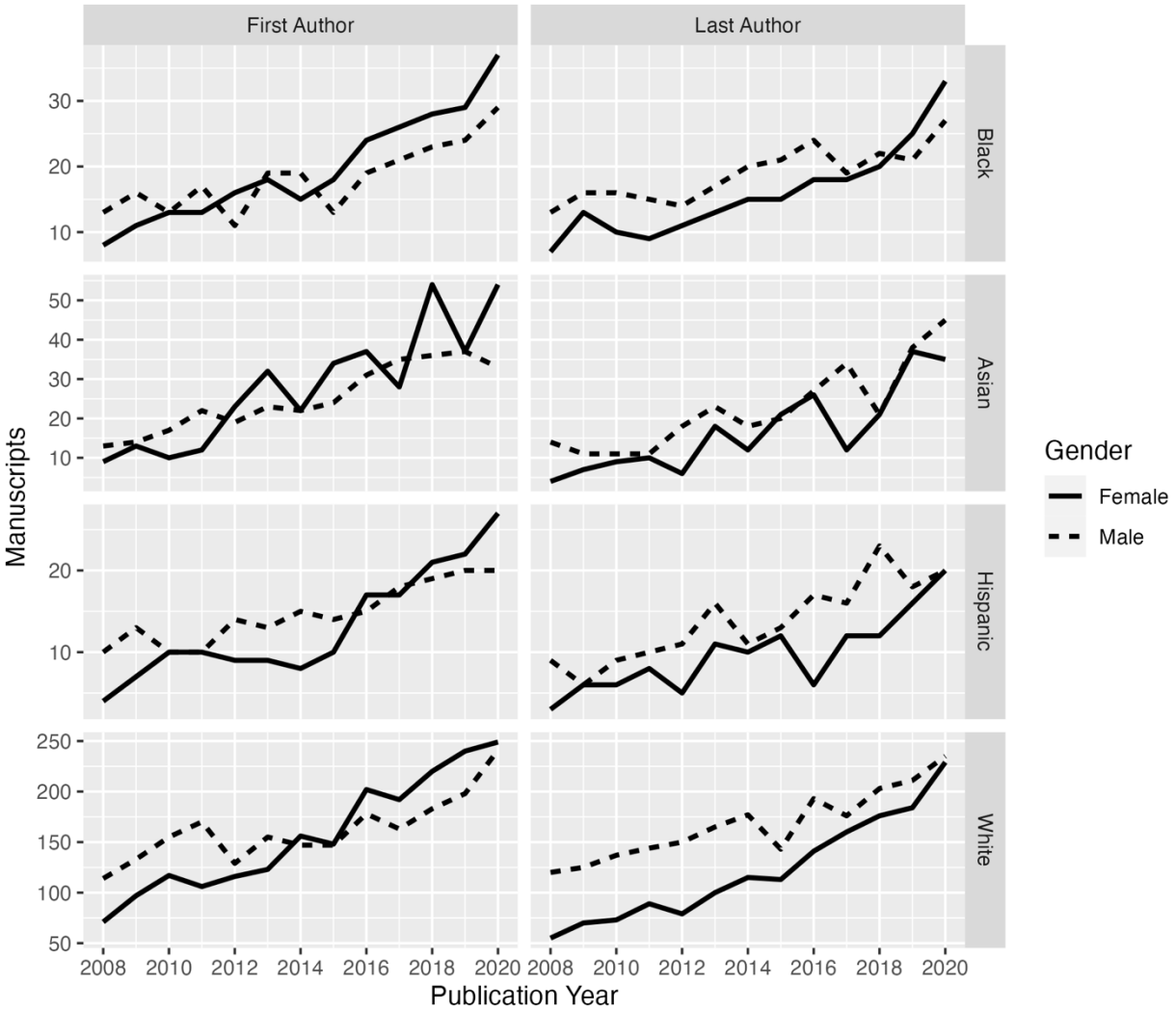
Category	**Statistic**
Race Black, Mean (SD)	0.090 (0.126)
Race Asian, Mean (SD)	0.132 (0.276)
Race Hispanic, Mean (SD)	0.061 (0.156)
Race Other, Mean (SD)	0.024 (0.021)
Race: White, Mean (SD)	0.693 (0.299)
Gender: Women , % (n)*	44.9% (9,372)

*Gender could not be assigned to 1,090 authors, so

the total sample for this category is 20,855.

To explore the epistemic oppression of Black women through an intersectional lens, Figure 2 presents the extrapolated manuscript counts by author type. Of note, the y-axis has a “floating” (not fixed) scale, which could mislead the reader into thinking that the magnitude of publications across races are similar. It is not: white women and men have far more publications than others, followed by Asian, Black, and then Hispanic women and men. However, we used this floating scale to highlight the trends for Black women compared to other racially minoritized authors and to avoid “drowning out” by white authors. As Figure 2 shows, Black women (and other racially minoritized groups) have far fewer first and last authorship publications than white women and men. Unfortunately, this is unsurprising, given that white authors largely dominate the field of Medical Education (and considering the journals included in the MEJ-24). Looking within races, regarding first authorship, Black women have had higher counts than Black men since 2015. Similarly, Hispanic and Asian women first authors have larger counts than men of their race. Regarding last authorship, Black women moved ahead of Black men in 2018 and Hispanic, Asian, and white women last authors remain behind men of their race.

Figure 2. Extrapolated Manuscripts by Author Type, Gender, and Race



Note: The y-axes in the faceted plots have free-floating scales.

The negative binomial generalized linear model in Table 3, however, shows that the difference between Black women and men is not statistically significant in either the first or last author model. When looking at Black women and men together, however, there is a significant and large difference: the average incident rate ratio (IRR) among first and last Black authors, as compared to non-Black authors, is 66% lower and 64% lower, respectively. In other words, the average rate across time at which Black women and men authors publish compared to white

authors is decreased by approximately 65%. Similarly, when considering all women as last authors, the difference falls just short of statistical significance (p-value = 0.07). In both models, the function of time was statistically significant, indicating that the average rate of published manuscripts increases over time.

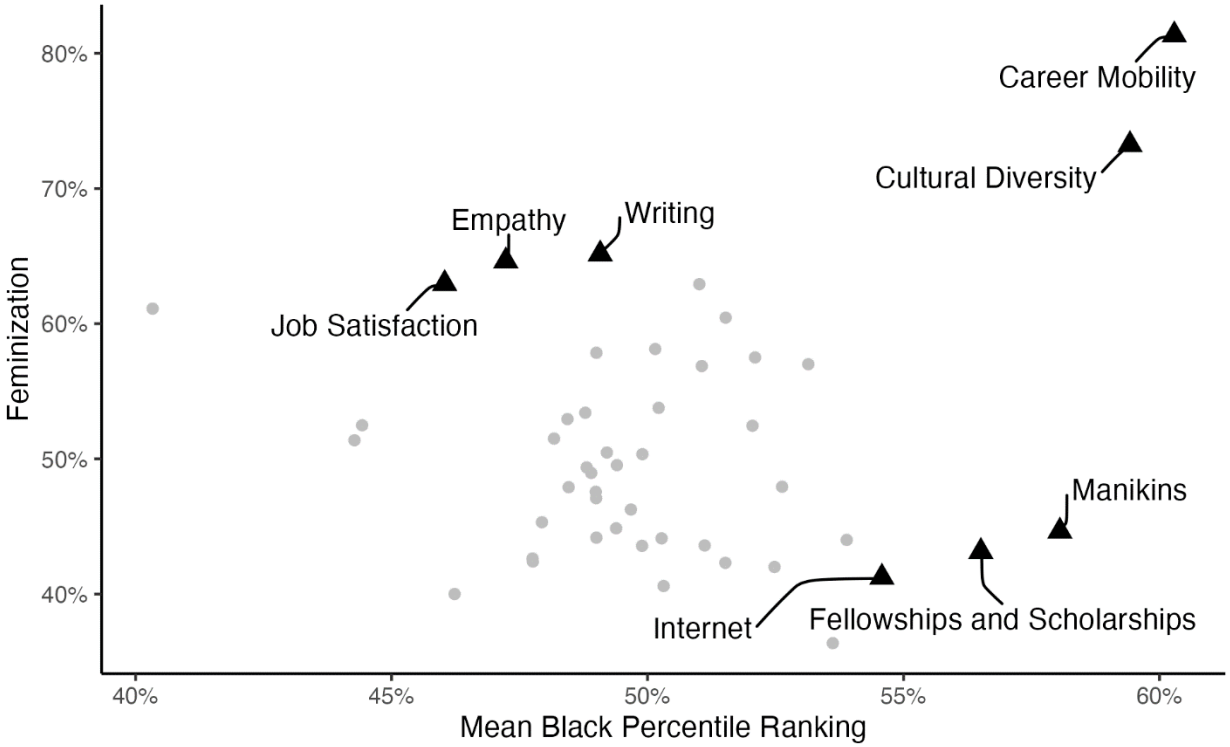
Table 3. Negative Binomial Author Models Results

	First Author Model			Last Author Model		
Coefficient	**IRR**	**SE**	**z Value**	**IRR**	**SE**	**z Value**
(Intercept)	29.90 ***	0.22	14.80	28.30 ***	0.23	14.2
Black X Woman	1.11	0.47	0.21	1.16	0.48	0.30
Black	0.34 **	0.33	-0.31	0.36 **	0.34	-2.93
Woman	0.92	0.20	-0.37	0.68	0.21	-1.76
Time	1.08 **	0.02	3.08	1.09 **	0.02	3.27

*** = p-value < 0.001; *** = p-value < 0.01; * = p-value < 0.05. IRR = incident rate ratio; SE = standard error.

Figure 3 presents the major MeSH terms for first author manuscripts, organized by feminization and percentile Black ranking. Each point represents a major MeSH term present in the manuscripts—the triangle points with text labels represent the top 10% of MeSH terms as represented by feminization or Black percentile ranking. Career mobility, cultural diversity, and cooperative behavior are common major MeSH terms for first authors with greater than 60% feminization and exceeding the 50th percentile ranking in Black authors. Comparing these top MeSH terms to the overall top MeSH terms of all authors (Table 4), it is evident there is little overlap of the topics.

Figure 3. Major Medical Subject Heading (MeSH) Terms by Feminization and Mean Black Percentile Ranking



Note: Due to the multitude of Major MeSH terms for the first author manuscripts in the analytic sample, a minimum threshold of 50 was utilized for major MeSH terms to help distinguish visual patterns.

Table 4. Top 10 Ranking of Overall Medical Subject Heading (MeSH) Terms in Analytic Sample

Major MeSH Term	n	Proportion of Total MeSH Terms
Education, Medical	1,800	0.105
Clinical Competence	896	0.052
Curriculum	657	0.038
Students, Medical	632	0.036
Faculty, Medical	335	0.01
Learning	312	0.01
Attitude of Health Personnel	273	0.01

Schools, Medical	227	0.01
Career Choice	217	0.01
Physician-Patient Relations	217	0.01

Note: Proportion values will not sum to 1 due to rounding.

Discussion

Our critical research using Haynes' IM examined epistemic oppression of Black women by exploring trends in demographics of authorship within medical education and topic selection. To begin, white women and men eclipse all authors of color in publications, inclusive of Black women. (Note: while this is equally concerning for other intersectional identities (e.g., Hispanic women, Black men), we maintain our focus here on Black women.) This reflects the larger trends in representation of Black women in academic medicine,[3] despite calls for diversification of the workforce in medical education.[36,37] Nonetheless, the dearth of Black women's voices in publishing *specifically* is a form of epistemic oppression, denying them equal access to the resources to create knowledge. Dotson, building on Fricker, offers three types of epistemic injustice leading to oppression, each of which is at play here, and each of which those of us in any leadership position in medical education publishing must claim at least partial responsibility for (LM, AA, and AK are all on journal editorial boards).[38] First, we commit *testimonial* injustice, deflating individual Black women's capacity as knowers, either through rejection of publication or creating the situation where Black women do not feel they can even submit for publication.[38] Second, we commit *hermeneutical* injustice, unknowingly limiting access to the epistemic resources (concepts, terms, stories) that would allow Black women to more fully participate in the field by not publishing them.[38] Third, *if* we continue on our present path without actively addressing this epistemic oppression, we commit *contributory* injustice, *willfully*

marginalizing Black women as knowers by not taking action.[38] Thus, following Haynes' focus on institutional change, we commit to partnering with Black women to eliminate epistemic oppression against Black women within our own editorial work through actions such as tracking Black women's publication trends, actively soliciting manuscripts from Black women authors, or intentionally amplifying and sponsoring Black women in our field publish. We call for others to do the same.

Furthermore, this study found that none of the top 10 topics common to women Black authors (as based on MeSH) appeared within the top 10 overall ranking of topics in medical education. In fact, the two topics Black women authors most addressed were career mobility, defined as "the upward or downward mobility in an occupation or the change from one occupation to another"[39] and cultural diversity. Cultural diversity is often described as the "coexistence of numerous distinct ethnic, racial, religious, or cultural groups within one social unit, organization, or population" and is notably a parent term for diversity, equity, inclusion.[40] The focus on these topics raises questions regarding epistemic oppression through perceived or intentional gendered/racialized topic expectations, resulting in an additional minority tax levied upon Black women authors as Superwomen. Is there an expectation that Black women write about race in service to the broader medical education community, similar to how they are disproportionately tasked with serving on diversity related initiatives, even if it is at their own expense? Could this perceived expectation result in an additional barrier to publication in the form of stereotype vulnerability threat, where Black women authors feel at risk of confirming to a negative stereotype about the group they identify with? Researchers' topic selection behaviors are influenced by multiple factors which often intersect, including gender, race, research interests and background, and funding opportunities.[22] However, research topic selection comes at a

cost.[18] For example, an analysis of NIH funding applications found that the research topics proposed by Black scientists (e.g., health disparities, patient-focused interventions) were less likely to be funded.[41] Similarly, researchers have found that topics covered by Black women authors garnered fewer citations compared to other groups.[18] These findings have critical implications for a researcher's career success and trajectory. Not only does this also suggest epistemic oppression to this population, but also serves as a limitation to the growth of this field without the full and unfettered participation and epistemic agency of Black women.

This study also is, to our knowledge, the first to bring Haynes et al.'s IM to medical education. Building on Wyatt, Johnson and Zaidi,[27] we seek to support other scholars in the application of intersectionality so that the research itself does not commit epistemic oppression. This was particularly difficult when drawing our data from institutions linked with domination and oppression like academic publishers and the U.S. Census Bureau. A true Black feminist epistemology would use a dialogic approach to explore the lived experiences of Black women within an ethic of care and personal accountability.[29] IM's four strategies, however, guided us in centralizing Black women, using a critical lens, bringing out our own and the field's whiteness, and keeping in mind the wholeness and complexity of Black women.[28] While not truly honoring "the social experience of individual identity as dynamically produced from mutually constitutive elements,"[42(p218)] we were able to frame the data critically, using it to expose oppression and argue for structural change.

Limitations

This study must be considered in light of its limitations. First, our methodology essentialized and simplified the constructs of gender and race, meaning we were not able to fully embrace an intersectional Black feminist epistemology. Racial and gender identification can be

manifold and dynamic (e.g., two or more races; nonbinary or shifting gender identity); applying an aggregate-level algorithm to both family names can result in misattribution of specific racial categories. However, we felt it was important to tell this story, so for feasibility we simplified racial categories and also attributed gender (binary) based upon historical data. Second, race and gender characterizations were collected for only researchers identifying as based at US institutions, posing interpretation issues for global authors in the sample. Additionally, some authors at US institutions may not have been originally born in the US; this does not impact our Census data findings, but does impact SSA data, which resulting in more than 1,000 missing name values. We encourage future researchers to explore alternate methods and sources. Third, we relied on metadata supplied by journals featured in the MEJ-24.[31] The MEJ-24 was created as a starting point for describing the field of medical education, however, it does not include articles from journals that may be about medical education, but that are published in those journals not specific to medical education (e.g., clinical journals). Moreover, we were reliant on what data publishers—largely *not* Black women—chose to collect and how they collected it.

Conclusion

The inclusion of the voices of Black women and other minoritized groups in medical education publishing is vital to advance equity and address oppression—epistemic and otherwise—in medical education.[43] This study suggests that the lack of diversity we see in the broader field of medical education[3] holds in publishing as well. As we work towards increasing the number of Black women in medical education, it is vital to fully understand the barriers to entry and promotion—authorship, the "coin of the realm" in academia[44] is a central piece of this puzzle. In order to do this, Black women must be given full epistemic agency to share their authentic voices and knowledge using their schemata without being asked to be Superwomen. Quantitative intersectional analyses like this one can help us to understand the scope of the oppression. Yet we must also draw Black women—those who are already authors and who desire to be authors—into dialogue through qualitative intersectional research. How do Black women experience authorship in medical education and how can we ensure that they do not feel, as Johnson did when she went through the publishing process, that "'*you* are not enough,' 'your *story* is not enough,' 'your *voice* is not enough.'"?[45]

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