

Assessment of the Prevalence of Medical Student Mistreatment by Sex, Race/Ethnicity, and Sexual Orientation

Katherine A. Hill, BA, BS; Elizabeth A. Samuels, MD, MPH, MHS; Cary P. Gross, MD; Mayur M. Desai, PhD, MPH; Nicole Sitkin Zelin, MD; Darin Latimore, MD; Stephen J. Huot, MD, PhD; Laura D. Cramer, PhD, ScM; Ambrose H. Wong, MD, MEd; Down Boatright, MD, MBA, MHS

IMPORTANCE Previous studies have shown that medical student mistreatment is common. However, few data exist to date describing how the prevalence of medical student mistreatment varies by student sex, race/ethnicity, and sexual orientation.

OBJECTIVE To examine the association between mistreatment and medical student sex, race/ethnicity, and sexual orientation.

DESIGN, SETTING, AND PARTICIPANTS This cohort study analyzed data from the 2016 and 2017 Association of American Medical Colleges Graduation Questionnaire. The questionnaire annually surveys graduating students at all 140 accredited allopathic US medical schools. Participants were graduates from allopathic US medical schools in 2016 and 2017. Data were analyzed between April 1 and December 31, 2019.

MAIN OUTCOMES AND MEASURES Prevalence of self-reported medical student mistreatment by sex, race/ethnicity, and sexual orientation.

RESULTS A total of 27 504 unique student surveys were analyzed, representing 72.1% of graduating US medical students in 2016 and 2017. The sample included the following: 13 351 female respondents (48.5%), 16 521 white (60.1%), 5641 Asian (20.5%), 2433 underrepresented minority (URM) (8.8%), and 2376 multiracial respondents (8.6%); and 25 763 heterosexual (93.7%) and 1463 lesbian, gay, or bisexual (LGB) respondents (5.3%). At least 1 episode of mistreatment was reported by a greater proportion of female students compared with male students (40.9% vs 25.2%, $P < .001$); Asian, URM, and multiracial students compared with white students (31.9%, 38.0%, 32.9%, and 24.0%, respectively; $P < .001$); and LGB students compared with heterosexual students (43.5% vs 23.6%, $P < .001$). A higher percentage of female students compared with male students reported discrimination based on gender (28.2% vs 9.4%, $P < .001$); a greater proportion of Asian, URM, and multiracial students compared with white students reported discrimination based on race/ethnicity (15.7%, 23.3%, 11.8%, and 3.8%, respectively; $P < .001$), and LGB students reported a higher prevalence of discrimination based on sexual orientation than heterosexual students (23.1% vs 1.0%, $P < .001$). Moreover, higher proportions of female (17.8% vs 7.0%), URM, Asian, and multiracial (4.9% white, 10.7% Asian, 16.3% URM, and 11.3% multiracial), and LGB (16.4% vs 3.6%) students reported 2 or more types of mistreatment compared with their male, white, and heterosexual counterparts ($P < .001$).

CONCLUSIONS AND RELEVANCE Female, URM, Asian, multiracial, and LGB students seem to bear a disproportionate burden of the mistreatment reported in medical schools. It appears that addressing the disparate mistreatment reported will be an important step to promote diversity, equity, and inclusion in medical education.

JAMA Intern Med. 2020;180(5):653-665. doi:10.1001/jamainternmed.2020.0030
Published online February 24, 2020.

[← Editor's Note page 665](#)

[+ Supplemental content](#)

Author Affiliations: Author affiliations are listed at the end of this article.

Corresponding Author: Katherine A. Hill, BA, BS, 2022 MD Candidate, Yale School of Medicine, 333 Cedar St, Sterling Hall of Medicine, Room IE-61, New Haven, CT 06520 (katie.hill@yale.edu).

Medical student mistreatment remains a prevalent¹ and damaging² experience. Mistreatment encompasses a spectrum of abusive behaviors,³ including discrimination, assault, verbal abuse, and sexual harassment, and has been associated with burnout, depression, alcohol abuse, increased cynicism, and medical school attrition.³⁻⁵ These detrimental outcomes are especially concerning for women, racial/ethnic minorities, and sexual minorities. Physicians who are female, racial/ethnic minorities, and sexual minorities make important contributions to medical practice that improve health care access and quality,⁶⁻¹⁶ and mistreatment in these groups could have substantial consequences on physician workforce diversity.^{8,17-21}

Since 1991, the Association of American Medical Colleges (AAMC) has surveyed graduating medical students about mistreatment in its Graduation Questionnaire (GQ).²² Although the AAMC publishes GQ data yearly, these data have been presented only in aggregate, and little is known about how the prevalence of mistreatment varies by medical student demographic characteristics. It is possible that students with identities historically marginalized in medicine in terms of representation,^{17,23,24} compensation,²⁵⁻²⁷ career advancement,²⁸⁻⁴⁰ and exposure to discrimination^{8,18,20,21,41-47} (women, racial/ethnic minorities, and sexual minorities) experience a higher burden of mistreatment than other groups.

Although some prior studies^{48,49} have described mistreatment secondary to medical student sex, race/ethnicity, and sexual orientation, this work has tended to be limited by small sample size or low response rate or was conducted at only 1 or a few sites, limiting generalizability. To address this gap, we examined the prevalence and types of mistreatment reported by a large national cohort of medical students by student sex, race/ethnicity, and sexual orientation. Our study is unique in its large nationally representative sample, inclusion of a wide breadth of mistreatment types, and focus on the connection between membership in a marginalized group and the experience of mistreatment.

Methods

We conducted a retrospective cohort study of medical student responses to the AAMC-GQ. The AAMC-GQ is a survey that is administered annually to students graduating from all 140 accredited allopathic medical schools in the United States. The AAMC-GQ includes questions about student demographics, educational experience, finances, and career plans.^{1,22} Our study was deemed exempt from review by the Yale Institutional Review Board because the data were deidentified.

The AAMC-GQ contains items that assess negative behaviors by medical school faculty, nurses, residents and interns, additional institutional employees or staff, and other students. The questions address students' experience of general negative behaviors and 3 types of discrimination related to gender, race/ethnicity, and sexual orientation (eFigure in the Supplement).¹ These negative and discriminatory behaviors are seen as indicators of mistreatment and include experienc-

Key Points

Question Does the self-reported prevalence of medical student mistreatment vary based on student sex, race/ethnicity, and sexual orientation?

Findings In this cohort study of 27 504 graduating medical students, the following students reported a higher prevalence of mistreatment than male, white, and heterosexual students: female students; Asian, underrepresented minority, and multiracial students; and lesbian, gay, or bisexual students.

Meaning These findings suggest that there is a differential burden of mistreatment that must be addressed to improve the medical school learning environment.

ing public humiliation and being subjected to unwanted physical advances and bigoted remarks.²²

Measures and Descriptive Statistics

Data from student responses to the 2016 and 2017 AAMC-GQ were collected. Students from newer medical schools that did not participate in both the 2016 and 2017 AAMC-GQ were excluded from the data set provided to us by the AAMC. Descriptive statistics were computed for demographic variables, mistreatment type, and prevalence. For all descriptive statistics and analyses, respondents who did not answer all AAMC-GQ questions concerning general negative behaviors and discrimination were excluded.

The AAMC linked student AAMC-GQ responses to student self-reported sex and race/ethnicity via AAMC data applications and services. Students were excluded from descriptive statistics or analyses by race/ethnicity if the AAMC did not have data for their race/ethnicity or if race/ethnicity was reported only as "other." Student sexual orientation was identified by self-report on the AAMC-GQ. Students who did not report sexual orientation were excluded from descriptive statistics and analyses by sexual orientation. Although the AAMC-GQ includes questions about gender identity, these data were not made available to the study team secondary to the small number of students self-reporting as transgender and concerns for privacy.

Demographic variables included sex (male vs female), race/ethnicity (white vs Asian vs underrepresented minority [URM] vs multiracial), and sexual orientation (heterosexual vs lesbian, gay, or bisexual [LGB]). Students were classified as URM if their self-reported race/ethnicity was American Indian, Alaska native, black, African American, Hispanic, Latino, Spanish, Native Hawaiian, or Pacific Islander. Students who reported multiple races/ethnicities were classified as multiracial.

The AAMC-GQ response choices for all questions regarding negative behaviors and discrimination use a 4-point scale (never, once, occasionally, and frequently). Based on the frequency distribution of reported mistreatment, "occasionally" and "frequently" were combined to create a 3-point scale consisting of never, once, and more than once. By combining "once" and "more than once," we also created a dichotomous "ever/never" variable to describe if students reported ever having been mistreated.

Box. Association of American Medical Colleges Graduation Questionnaire General Negative Behaviors and Discrimination**During Medical School How Frequently Have You...****General Negative Behaviors**

- Been publicly humiliated?
- Been threatened with physical harm?
- Been physically harmed?
- Been subjected to unwanted sexual advances?
- Been asked to exchange sexual favors for grades or other rewards?

Gender-Based Discrimination

- Been denied opportunities for training or other rewards based on gender?
- Been subjected to sexist remarks or names?
- Received lower evaluations or grades solely because of gender rather than performance?

Race/Ethnicity-Based Discrimination

- Been denied opportunities for training or other rewards based on race/ethnicity?
- Been subjected to racially/ethnically offensive remarks or names?
- Received lower evaluations or grades solely because of race/ethnicity rather than performance?

Sexual Orientation-Based Discrimination

- Been denied opportunities for training or other rewards based on sexual orientation?
- Been subjected to offensive remarks or names related to sexual orientation?
- Received lower evaluations or grades solely because of sexual orientation rather than performance?

Although the AAMC-GQ includes questions that examine a range of negative behaviors, the analysis is focused on the negative behaviors that we believed to be most detrimental to the student learning environment (Box). The prevalence and frequency of 8 types of mistreatment were assessed by student sex, race/ethnicity, and sexual orientation. These 8 types of mistreatment included 5 general negative behaviors and 3 types of discrimination associated with the specific student demographic category. For each student, we also evaluated the total number of the 8 types of mistreatment reported by student sex, race/ethnicity, and sexual orientation. Based on the frequency distribution of the number of self-reported mistreatment types, the following 4 categories were created: zero or no mistreatment, 1 type of mistreatment, 2 types of mistreatment, and 3 or more types of mistreatment.

Statistical Analysis

We used Pearson χ^2 test or Fisher exact test, as appropriate, to compare differences in the prevalence and frequency of self-reported medical student mistreatment and the total number of mistreatment types by student sex, race/ethnicity, and sexual orientation. We applied a Bonferroni correction to account for multiple comparisons (corrected $\alpha = 0.00250$). Because prior literature has suggested that much of the greater discrimination reported by URMs is directed at underrepresented women,⁵⁰ the interaction of URM status and sex on reports of any racial/ethnic discrimination were also tested using logis-

Table 1. Demographic Characteristics of the Study Cohort

Characteristic	No. (%) (N = 27 504)
Sex	
Male	14 153 (51.5)
Female	13 351 (48.5)
Race/ethnicity	
White	16 521 (60.1)
Asian	5641 (20.5)
URM	2433 (8.8)
Multiracial	2376 (8.6)
Other	268 (1.0)
Unknown	265 (1.0)
Sexual orientation	
Heterosexual	25 763 (93.7)
LGB	1463 (5.3)
Unknown	278 (1.0)
Age, y	
<24	89 (0.3)
24-26	11 348 (41.3)
27-29	11 312 (41.1)
30-32	3171 (11.5)
>32	1584 (5.8)

Abbreviations: LGB, lesbian, gay, or bisexual; URM, underrepresented minority.

tic regression. A 2-sided Wald test at $P = .05$ level of significance was used for logistic regression. For all other tests, $P = .003$ was used to indicate significance. Stata/SE, version 15.1 (StataCorp LP), was used to obtain predicted probabilities after logistic regression. All other analyses were performed using SPSS, version 26 (IBM).

Results

The initial study cohort included 30 651 respondents. Of these respondents, 3147 students (10.3%) were excluded because they did not respond to all mistreatment questions. Of those excluded for failing to answer mistreatment questions, 2517 (80.0%) did not answer any of the mistreatment questions. Among students who provided demographic information, non-respondents to the mistreatment questions were more likely than respondents to be male, Asian, URM, and multiracial. Therefore, our analysis included 27 504 unique student surveys, representing 72.1% of the 38 160 graduates from allopathic US medical schools in 2016 and 2017.

The final sample included the following: 13 351 female students (48.5%); 16 521 white students (60.1%), 5641 Asian students (20.5%), 2433 URM students (8.8%), and 2376 multiracial students (8.6%); and 1463 LGB students (5.3%). The demographic characteristics of the study cohort are summarized in Table 1.

Mistreatment Prevalence

Among respondents, 35.4% reported experiencing at least 1 type of mistreatment. The most commonly reported type of mistreatment was public humiliation (21.1%). Of all students,

18.5% reported experiencing discrimination secondary to gender, 8.8% secondary to race/ethnicity, and 2.3% secondary to sexual orientation. The eTable in the Supplement lists complete frequency data.

Mistreatment by Sex

Female students reported a higher prevalence of mistreatment than male students across several domains (Table 2). Overall, a larger proportion of female students compared with male students reported at least 1 episode of mistreatment (40.9% vs 25.2%, $P < .001$). Female students reported a higher prevalence of public humiliation (22.9% vs 19.5%, $P < .001$) and unwanted sexual advances (6.8% vs 1.3%, $P < .001$). Moreover, female students reported higher rates of gender-based discrimination than male students (28.2% vs 9.4%, $P < .001$), including being denied opportunities for training or rewards based on gender (6.7% vs 4.7%, $P < .001$), being subjected to sexist remarks or names (24.3% vs 3.4%, $P < .001$), and receiving lower evaluations or grades solely because of gender (6.8% vs 4.6%, $P < .001$). In addition, a higher percentage of female students compared with male students reported 2 or more types of mistreatment (17.8% vs 7.0%, $P < .001$).

Mistreatment by Race/Ethnicity

Compared with white students, Asian, URM, and multiracial students reported higher rates of mistreatment (24.0%, 31.9%, 38.0%, and 32.9%, respectively; $P < .001$) and discrimination based on race/ethnicity (3.8%, 15.7%, 23.3%, and 11.8%, respectively; $P < .001$) (Table 3). These reports of racial/ethnic discrimination included being denied opportunities for training or rewards based on race/ethnicity (1.5% [white students], 4.4% [Asian students], 7.3% [URM students], and 3.6% [multiracial students]; $P < .001$), being subjected to racially/ethnically offensive remarks or names (2.5%, 12.9%, 18.9%, and 9.6%, respectively; $P < .001$), and receiving lower evaluations or grades solely because of race/ethnicity (0.7%, 5.0%, 9.6%, and 3.4%, respectively; $P < .001$). Furthermore, Asian, URM, and multiracial students (4.9% white, 10.7% Asian, 16.3% URM, and 11.3% multiracial) reported a higher prevalence of experiencing 2 or more types of mistreatment compared with white students ($P < .001$). In addition, we found that the association of URM status with reports of racial/ethnic discrimination differed statistically significantly by sex ($P = .01$), with URM female students reporting the highest levels of racial/ethnic discrimination (26.5%) compared with URM male students (19.2%), non-URM women (7.8%) and non-URM men (6.8%).

Mistreatment by Sexual Orientation

For 3 of 5 general negative behaviors, LGB students reported a higher prevalence of mistreatment than heterosexual students (Table 4). Overall, 43.5% of LGB students reported an episode of mistreatment compared with 23.6% of heterosexual students ($P < .001$). A greater proportion of LGB students compared with heterosexual students said that they had been publicly humiliated (27.1% vs 20.7%, $P < .001$) and subjected to unwanted sexual advances (7.7% vs 3.7%, $P < .001$). In addition, LGB students reported higher rates of discrimination

based on sexual orientation than heterosexual students (23.1% vs 1.0%, $P < .001$), including being denied opportunities for training or rewards based on sexual orientation (3.2% vs 0.3%, $P < .001$), being subjected to offensive remarks or names related to sexual orientation (21.8% vs 0.8%, $P < .001$), and receiving lower evaluations or grades solely because of sexual orientation rather than performance (4.0% vs 0.3%, $P < .001$). Furthermore, 16.4% of LGB students reported 2 or more types of mistreatment compared with 3.6% of heterosexual students ($P < .001$).

Discussion

The major findings of our national study include not only a high prevalence of medical student mistreatment but also differences in the prevalence of mistreatment by student sex, race/ethnicity, and sexual orientation. Furthermore, results of the present study suggest an injurious interaction between URM status and sex, with URM female medical students reporting the highest prevalence of racial/ethnic discrimination. The differential treatment reported by medical students in this study suggests a noninclusive learning environment, which could have profound implications for the well-being and academic success of students. In fact, prior literature has shown an association between exposure to mistreatment and discrimination and student reports of decreased physical and mental health, worsening grades, and lower academic motivation and persistence.⁵¹⁻⁵⁹

Although the disproportionate burden of mistreatment reported by female, URM, multiracial, and LGB students is disquieting, these findings also demonstrate that several particularly harmful behaviors remain common in medical school. These reported behaviors include, but are not limited to, unwanted sexual advances (6.8% of female students and 7.7% of LGB students), lower evaluations secondary to bias and discrimination (6.8% of female students and 9.6% of URM students), and being subjected to sexist or bigoted comments (24.3% of female students, 18.9% of URM students, and 21.8% of LGB students). Moreover, 28.2% of female students, 23.3% of URM students, and 23.1% of LGB students reported an experience of discrimination.

The inequitable environment described by our study builds on prior research examining both academic medicine and community practice settings. These prior studies have demonstrated differences by race/ethnicity and sex in receipt of academic awards,^{29,31,60} ratings on performance evaluations,^{28,61,62} rates of promotion,^{30,32} compensation,^{25-27,30} National Institutes of Health funding,^{35,37-39} and reports of discrimination.^{18,41-45,48} The findings of the present study add to prior literature^{48,49} on the topic by providing additional detail and nuance to the experience of mistreatment and discrimination encountered by a large national sample of medical students accounting for sex, race/ethnicity, and sexual orientation.

Some of the most commonly reported forms of mistreatment in this study were offensive remarks based on gender, race/ethnicity, and sexual orientation. Studies have shown that

Table 2. Percentage of Students Self-reporting Mistreatment by Sex

Variable	Male, % (n = 14 153)	Female, % (n = 13 351)	P Value ^a
General Mistreatment			
Publicly humiliated			
Never	80.5	77.1	
Once	11.1	14.2	<.001 ^b
More than once	8.4	8.7	
Ever	19.5	22.9	<.001 ^b
Threatened with physical harm			
Never	98.3	99.0	
Once	1.2	0.8	<.001 ^b
More than once	0.5	0.1	
Ever	1.7	1.0	<.001 ^b
Physically harmed			
Never	98.2	98.3	
Once	1.4	1.6	.002 ^b
More than once	0.4	0.2	
Ever	1.8	1.7	.62
Subjected to unwanted sexual advances			
Never	98.7	93.2	
Once	0.8	4.4	<.001 ^b
More than once	0.5	2.4	
Ever	1.3	6.8	<.001 ^b
Asked to exchange sexual favors for grades or other rewards			
Never	99.7	99.8	
Once	0.1	0.2	.002 ^b
More than once	0.2	0.1	
Ever	0.3	0.2	.48
Gender-Based Discrimination			
Denied opportunities for training or rewards based on gender			
Never	95.3	93.3	
Once	1.9	3.6	<.001 ^b
More than once	2.8	3.1	
Ever	4.7	6.7	<.001 ^b
Subjected to sexist remarks or names			
Never	96.6	75.7	
Once	1.6	11.9	<.001 ^b
More than once	1.8	12.5	
Ever	3.4	24.3	<.001 ^b
Received lower evaluations or grades solely because of gender rather than performance			
Never	95.4	93.2	
Once	3.1	4.5	<.001 ^b
More than once	1.6	2.3	
Ever	4.6	6.8	<.001 ^b
Ever experienced gender-based discrimination	9.4	28.2	<.001 ^b
No. of Mistreatment Types^c			
0	74.8	59.1	
1	18.3	23.1	
2	4.4	10.3	<.001 ^b
≥3	2.6	7.5	
Ever experienced any type of mistreatment	25.2	40.9	<.001 ^b

^a P value represents Pearson χ^2 test or Fisher exact test, as appropriate.

^b Statistically significant after Bonferroni correction (corrected $\alpha = .00256$).

^c Number of mistreatment types includes general negative behaviors and discrimination related to gender.

bigoted remarks can have negative consequences both on people targeted by the remarks⁶³⁻⁶⁶ and on bystanders,^{64,67-69}

including reports of depression, fear, anger, and lower self-esteem^{63-65,67} and lower job satisfaction, decreased pro-

Table 3. Percentage of Students Self-reporting Mistreatment by Race/Ethnicity

Variable	Students, % ^a				P Value ^b
	White (n = 16 521)	Asian (n = 5641)	URM (n = 2433)	Multiracial (n = 2376)	
General Mistreatment					
Publicly humiliated					
Never	80.4	77.6	75.4	75.9	
Once	11.6	13.7	14.5	14.3	<.001 ^c
More than once	8.0	8.8	10.1	9.8	
Ever	19.6	22.4	24.6	24.1	<.001 ^c
Threatened with physical harm					
Never	98.8	98.3	98.8	98.0	
Once	0.9	1.0	0.9	1.4	<.001 ^c
More than once	0.2	0.6	0.3	0.6	
Ever	1.2	1.7	1.2	2.0	.001 ^c
Physically harmed					
Never	98.5	98.0	97.5	97.5	
Once	1.3	1.4	2.2	2.1	<.001 ^c
More than once	0.2	0.6	0.3	0.5	
Ever	1.5	2.0	2.5	2.5	<.001 ^c
Subjected to unwanted sexual advances					
Never	96.0	96.8	96.5	94.2	
Once	2.6	2.0	2.1	3.5	<.001 ^c
More than once	1.4	1.2	1.4	2.3	
Ever	4.0	3.2	3.5	5.8	<.001 ^c
Asked to exchange sexual favors for grades or other rewards					
Never	99.8	99.6	99.8	99.8	
Once	0.1	0.2	0	0.1	.16
More than once	0.1	0.3	0.1	0.1	
Ever	0.2	0.4	0.2	0.2	.03
Race/Ethnicity-Based Discrimination					
Denied opportunities for training or rewards based on race/ethnicity					
Never	98.5	95.6	92.7	96.4	
Once	0.4	1.7	3.0	1.5	<.001 ^c
More than once	1.1	2.7	4.2	2.1	
Ever	1.5	4.4	7.3	3.6	<.001 ^c
Subjected to racially/ethnically offensive remarks or names					
Never	97.5	87.1	81.1	90.4	
Once	1.3	7.4	8.9	5.0	<.001 ^c
More than once	1.2	5.5	10.0	4.6	
Ever	2.5	12.9	18.9	9.6	<.001 ^c
Received lower evaluations or grades solely because of race/ethnicity rather than performance					
Never	99.3	95.0	90.4	96.6	
Once	0.5	2.6	4.1	1.7	<.001 ^c
More than once	0.3	2.3	5.5	1.7	
Ever	0.7	5.0	9.6	3.4	<.001 ^c
Ever experienced race/ethnicity-based discrimination	3.8	15.7	23.3	11.8	<.001 ^c

(continued)

Table 3. Percentage of Students Self-reporting Mistreatment by Race/Ethnicity (continued)

Variable	Students, % ^a				P Value ^b
	White (n = 16 521)	Asian (n = 5641)	URM (n = 2433)	Multiracial (n = 2376)	
No. of Mistreatment Types ^d					
0	76.0	68.1	62.0	67.1	
1	19.2	21.2	21.7	21.5	<.001 ^c
2	3.6	5.9	8.4	7.3	
≥3	1.3	4.8	7.9	4.0	
Ever experienced any type of mistreatment	24.0	31.9	38.0	32.9	<.001 ^c

Abbreviation: URM, underrepresented minority.

^a Percentages may not sum to 100% because students whose race/ethnicity was reported as "other" or "unknown" were excluded from the analysis.

^b P value represents Pearson χ^2 test or Fisher exact test, as appropriate.

^c Statistically significant after Bonferroni correction (corrected $\alpha = .00256$).

^d Number of mistreatment types includes general negative behaviors and discrimination related to race/ethnicity.

ductivity, and work-related depression.^{64,67-69} Bigoted remarks have the potential to harm organizational morale and compromise institutional diversity efforts.^{64,67-69}

Equally concerning, bigoted comments that may be pervasive in medical school can have pernicious consequences in the patient setting. Bigoted statements, especially when spoken by medical faculty and supervising residents, represent a form of negative role modeling, which has been shown to be associated with racial/ethnic and anti-LGB and transgender bias in medical students.⁷⁰⁻⁷⁷ This association is important because racial/ethnic minorities and sexual minorities experience substantial disparities in health and health care outcomes,⁷⁸⁻⁸² and physician bias has been identified as a key contributor to these disparities.^{82,83}

Another concerning negative experience reported by students was missed opportunities or lower grades because of discrimination. These experiences may have incremental consequences as trainees advance through their medical careers. Research has shown that small disadvantages can accumulate over time and prevent career advancement.^{84,85} This accumulation could partially explain findings that women and racial/ethnic minorities are less likely than their counterparts to be promoted and receive academic awards and honors.^{23,32-34,40,51-59,86-89}

In addition, a key finding from the present study is that higher proportions of female, Asian, URM, multiracial, and LGB students experienced 2 or more types of mistreatment during their medical school career compared with their male, white, and heterosexual counterparts. Although mistreatment was prevalent across all demographic groups, this result may demonstrate that students with marginalized identities are more likely to be subjected to a deleterious environment.

Implications

This study has implications for medical schools, leaders in academic medicine, national medical organizations, and medical school accrediting bodies. Medical student mistreatment has been well documented over the last 30 years,^{3-5,48,90-95} and its persistence remains a source of serious concern for students and educators. Despite efforts to curtail its occurrence,

mistreatment remains prevalent.⁹⁶ Given the differential burden of mistreatment reported by women, racial/ethnic minorities, and sexual minorities, future interventions to reduce medical student mistreatment would benefit by incorporating strategies to address bias and discrimination in medical education.

Although there remains much work to be done to identify evidence-based practices to reduce bias and discrimination, potential interventions include implicit bias⁹⁷⁻¹⁰⁰ and bystander intervention¹⁰¹⁻¹⁰³ training, better protections for individuals who have been subjected to and report instances of bias and discrimination,^{5,96,104-109} and greater transparency in policies for reporting and remediating instances of bias and discrimination.^{5,92,96,106-110} As concerns about medical student wellness grow, the unequal prevalence of mistreatment described herein is noteworthy. Because prior literature has demonstrated an association between mistreatment and depression,⁴ burnout,³ and a desire to leave medical school,⁵ the disproportionate burden of mistreatment reported by female, URM, multiracial, and LGB students could hinder efforts to recruit and retain individuals from diverse backgrounds.

Several medical schools have recently developed an institutional role for a chief wellness officer.¹¹¹ Although medical schools continue to develop strategies to improve student wellness, greater collaboration between an institution's chief diversity officer and chief wellness officer may be warranted. The chief diversity officer and chief wellness officer could work synergistically to develop novel interventions to address the association of mistreatment with the well-being of students from diverse backgrounds.

The reports of mistreatment and discrimination described in this study offer an opportunity for leaders in academic medicine and medical school governing bodies to reflect on the current climate of diversity, equity, and inclusion in medical education. Although recent data demonstrate that the diversity of medical school matriculants increased after the introduction in 2009 of the Liaison Committee on Medical Education diversity accreditation standards,¹¹² results from the present study indicate that much work remains to make medical school an inclusive and equitable

Table 4. Percentage of Students Self-reporting Mistreatment by Sexual Orientation

Variable	Heterosexual, % ^a (n = 25 763)	LGB, % ^a (n = 1463)	P Value ^b
General Mistreatment			
Publicly humiliated			
Never	79.3	72.9	
Once	12.4	14.4	<.001 ^c
More than once	8.2	12.6	
Ever	20.7	27.1	<.001 ^c
Threatened with physical harm			
Never	98.7	97.9	
Once	0.9	1.6	.02
More than once	0.3	0.5	
Ever	1.3	2.1	.005
Physically harmed			
Never	98.3	97.3	
Once	1.4	2.1	.005
More than once	0.3	0.6	
Ever	1.7	2.7	.003
Subjected to unwanted sexual advances			
Never	96.3	92.3	
Once	2.4	4.5	<.001 ^c
More than once	1.3	3.2	
Ever	3.7	7.7	<.001 ^c
Asked to exchange sexual favors for grades or other rewards			
Never	99.8	99.5	
Once	0.1	0.3	.07
More than once	0.1	0.2	
Ever	0.2	0.5	.09
Sexual Orientation-Based Discrimination			
Denied opportunities for training or rewards based on sexual orientation			
Never	99.7	96.8	
Once	0.1	1.2	<.001 ^c
More than once	0.2	2.0	
Ever	0.3	3.2	<.001 ^c
Subjected to offensive remarks or names related to sexual orientation			
Never	99.2	78.2	
Once	0.4	10.5	<.001 ^c
More than once	0.5	11.3	
Ever	0.8	21.8	<.001 ^c
Received lower evaluations or grades solely because of sexual orientation rather than performance			
Never	99.7	96.0	
Once	0.1	2.1	<.001 ^c
More than once	0.1	1.8	
Ever	0.3	4.0	<.001 ^c
Ever experienced sexual orientation-based discrimination	1.0	23.1	<.001 ^c
No. of Mistreatment Types^d			
0	76.4	56.5	
1	20.0	27.1	
2	2.8	11.4	<.001 ^c
≥3	0.8	5.0	
Ever experienced any type of mistreatment	23.6	43.5	<.001 ^c

Abbreviation: LGB, lesbian, gay, or bisexual.

^a Percentages may not sum to 100% because students who did not self-report their sexual orientation were excluded from the analysis.

^b P value represents Pearson χ^2 test or Fisher exact test, as appropriate.

^c Statistically significant after Bonferroni correction (corrected alpha = .00250).

^d Number of mistreatment types includes general negative behaviors and discrimination related to sexual orientation.

environment. Attention to a medical school's climate of equity and inclusion may represent an opportune focus for future medical school accreditation standards.

We believe our study findings also provide a basis for the AAMC, which has long advocated for diversity and inclusion,^{112,113} to reconsider how it reports student mistreatment. Although the AAMC releases GQ mistreatment data annually, these data are presented in aggregate.^{1,114} Given the disparate burden of mistreatment found in our study, a more granular breakdown of student mistreatment by sex, race/ethnicity, and sexual orientation may provide a more transparent reflection of the climate of diversity, equity, and inclusion present in medical education. Medical schools could use these data to more accurately monitor progress in reducing student mistreatment. In addition, these data could help identify and disseminate best practices among medical schools that have excelled in creating inclusive and equitable learning environments.

The results of the present study may also have implications for the Accreditation Council for Graduate Medical Education (ACGME), which released its first diversity accreditation standard in the 2019-2020 academic year.¹¹⁵ There are currently more than 124 000 resident physicians,¹¹⁶ and study findings have suggested that residents experience mistreatment and discrimination.^{21,43,45,48,117-120} As the ACGME establishes guidelines to assess adherence to its diversity accreditation standards, attention to how physician trainees from all backgrounds are treated during residency training will be critical. Because medical students and residents work in the same clinical environment, it may also be important to align questions on the AAMC-GQ and the ACGME wellness survey that trainees complete each year¹²¹ to better understand the similarities and differences in how mistreatment influences individuals at different levels of training.

In addition, the ACGME could consider adding questions to their annual program updates that ask participating residency programs how they monitor trainee mistreatment and what mechanisms are available to trainees who experience mistreatment to seek assistance. These narratives, in conjunction with mistreatment data, could possibly identify evidence-based practices to reduce trainee mistreatment in graduate medical education.

Future Directions

Findings from this study suggest that much work remains to address medical student mistreatment. To better tailor interventions to students' experiences of mistreatment, future studies should further explore the sources of mistreatment and how the mistreatment source affects student well-being. As medical schools strive to create more inclusive learning environments, investigation into the experience of mistreatment by

additional student demographic characteristics, such as age, religious beliefs, socioeconomic status, or disability, may be indicated. In addition, people do not experience aspects of their identities in isolation.^{50,122} Our analysis examining the interaction of URM status and sex suggests that a student's unique combination of multiple identities may contribute most substantially to mistreatment. Future studies should explore the effect of the intersectionality of student sex, race/ethnicity, and sexual orientation on the prevalence of mistreatment.

Limitations

This study has several limitations. Graduating medical students may be less likely to remember mistreatment occurring early in their medical school career.⁹⁶ Because of the association between mistreatment and burnout, it is possible that some students who experienced mistreatment left medical school before graduation or were overrepresented among the students who graduated during the study period but failed to complete the GQ. Consequently, this study may underreport medical student mistreatment.

In addition, male, Asian, URM, and multiracial students were overrepresented among nonrespondents to mistreatment questions, and it is possible that this study does not capture the full experience of mistreatment in these groups. Nevertheless, to our knowledge, this study represents the largest investigation of medical student mistreatment to date accounting for medical student sex, race/ethnicity, and sexual orientation. Another limitation of the study is that individuals from diverse backgrounds were combined to create the URM, multiracial, and LGB categories, which may obscure differences in the mistreatment experience of any single group.

All data on mistreatment were obtained by medical student self-report, and it is possible that students may classify their experiences differently than medical school faculty, staff, residents, or their peers. Nevertheless, prior literature has shown that medical students perceive mistreatment events in a similar manner to other members of the academic medicine community, including residents and attending physicians.¹²³

Conclusions

Our findings indicate that medical student mistreatment remains common. Women, racial/ethnic minorities, and sexual minorities appear to experience a disproportionate burden of the mistreatment reported in medical schools. This differential burden of mistreatment may have substantial implications for the medical school learning environment and the diversity of the physician workforce.

ARTICLE INFORMATION

Accepted for Publication: December 24, 2019.

Published Online: February 24, 2020.
doi:10.1001/jamainternmed.2020.0030

Author Affiliations: Yale School of Medicine, New Haven, Connecticut (Hill); Department of Emergency Medicine, Warren Alpert Medical School

of Brown University, Providence, Rhode Island (Samuels); Section of General Internal Medicine, Yale School of Medicine, New Haven, Connecticut (Gross, Latimore); National Clinician Scholars Program, Yale School of Medicine, New Haven, Connecticut (Gross, Cramer); Department of Chronic Disease Epidemiology, Yale School of Public Health, New Haven, Connecticut (Desai);

Department of Psychiatry and Behavioral Sciences, Stanford Medicine, Stanford, California (Sitkin Zelin); Section of Nephrology, Yale School of Medicine, New Haven, Connecticut (Huot); Department of Emergency Medicine, Yale School of Medicine, New Haven, Connecticut (Wong, Boatright).

Author Contributions: Ms Hill and Dr Boatright had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Hill, Samuels, Gross, Sitkin Zelin, Wong, Boatright.

Acquisition, analysis, or interpretation of data: Hill, Samuels, Desai, Sitkin Zelin, Latimore, Huot, Cramer, Wong, Boatright.

Drafting of the manuscript: Hill, Boatright.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Hill, Desai, Cramer, Boatright.

Obtained funding: Hill, Latimore, Wong, Boatright.

Administrative, technical, or material support: Hill, Samuels, Sitkin Zelin, Huot, Boatright.

Supervision: Gross, Boatright.

Conflict of Interest Disclosures: Dr Samuels reported receiving grants from the Society of Academic Emergency Medicine (SAEM) Foundation/Academy for Diversity & Inclusion in Emergency Medicine (ADIEM) and from the Association of American Medical Colleges (AAMC) Northeast Group on Educational Affairs (NGEA). Dr Gross reported receiving grants from the National Comprehensive Cancer Network/Pfizer and from Johnson & Johnson and receiving support for travel to and speaking at a scientific conference from Flatiron Inc. Dr Wong reported receiving grants from the SAEM Foundation/ADIEM and from the National Institutes of Health (NIH) National Center for Advancing Translational Sciences (grant KL2TR001862). Dr Boatright reported receiving grants from the AAMC NEGA. No other disclosures were reported.

Funding/Support: This study was supported by the SAEM Foundation/ADIEM, the AAMC NEGA, and the NIH National Institute of Diabetes and Digestive and Kidney Diseases (award T35DK10468 [Ms Hill]).

Role of the Funder/Sponsor: The funding sources had no substantive involvement in any aspect of the study, including the design and conduct of the study; collection, management, analysis, and interpretation of the data; and preparation of the manuscript.

Disclaimer: The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Additional Contributions: Additional critical review of the manuscript was performed by David Matthew, PhD, and Marie Caulfield, PhD, at the AAMC, Washington, DC. They were not compensated for their contributions.

REFERENCES

- Association of American Medical Colleges. Medical School Graduation Questionnaire: 2018 All Schools Summary Report. <https://www.aamc.org/system/files/reports/1/2018gqallschoolssummaryreport.pdf>. Published July 2018. Accessed January 9, 2020.
- Mazer LM, Berekeyei Merrell S, Hasty BN, Stave C, Lau JN. Assessment of programs aimed to decrease or prevent mistreatment of medical trainees. *JAMA Netw Open*. 2018;1(3):e180870. doi:10.1001/jamanetworkopen.2018.0870
- Cook AF, Arora VM, Rasinski KA, Curlin FA, Yoon JD. The prevalence of medical student mistreatment and its association with burnout.

Acad Med. 2014;89(5):749-754. doi:10.1097/ACM.000000000000204

- Richman JA, Flaherty JA, Rospenda KM, Christensen ML. Mental health consequences and correlates of reported medical student abuse. *JAMA*. 1992;267(5):692-694. doi:10.1001/jama.1992.03480050096032
- Sheehan KH, Sheehan DV, White K, Leibowitz A, Baldwin DC Jr. A pilot study of medical student "abuse": student perceptions of mistreatment and misconduct in medical school. *JAMA*. 1990;263(4):533-537. doi:10.1001/jama.1990.03440040072031
- Thurmond VB, Kirch DG. Impact of minority physicians on health care. *South Med J*. 1998;91(11):1009-1013. doi:10.1097/00007611-199811000-00003
- Greenwood BN, Carnahan S, Huang L. Patient-physician gender concordance and increased mortality among female heart attack patients. *Proc Natl Acad Sci U S A*. 2018;115(34):8569-8574. doi:10.1073/pnas.1800097115
- Sánchez NF, Rankin S, Callahan E, et al. LGBT trainee and health professional perspectives on academic careers: facilitators and challenges. *LGBT Health*. 2015;2(4):346-356. doi:10.1089/lgbt.2015.0024
- Sitkin NA, Pachankis JE. Specialty choice among sexual and gender minorities in medicine: the role of specialty prestige, perceived inclusion, and medical school climate. *LGBT Health*. 2016;3(6):451-460. doi:10.1089/lgbt.2016.0058
- Tsugawa Y, Jena AB, Figueroa JF, Orav EJ, Blumenthal DM, Jha AK. Comparison of hospital mortality and readmission rates for Medicare patients treated by male vs female physicians. *JAMA Intern Med*. 2017;177(2):206-213. doi:10.1001/jamainternmed.2016.7875
- Cohen JJ. The consequences of premature abandonment of affirmative action in medical school admissions. *JAMA*. 2003;289(9):1143-1149. doi:10.1001/jama.289.9.1143
- Roter DL, Hall JA, Aoki Y. Physician gender effects in medical communication: a meta-analytic review. *JAMA*. 2002;288(6):756-764. doi:10.1001/jama.288.6.756
- Marrast LM, Zallman L, Woolhandler S, Bor DH, McCormick D. Minority physicians' role in the care of underserved patients: diversifying the physician workforce may be key in addressing health disparities. *JAMA Intern Med*. 2014;174(2):289-291. doi:10.1001/jamainternmed.2013.12756
- Cooper LA, Roter DL, Johnson RL, Ford DE, Steinwachs DM, Powe NR. Patient-centered communication, ratings of care, and concordance of patient and physician race. *Ann Intern Med*. 2003;139(11):907-915. doi:10.7326/0003-4819-139-11-200312020-00009
- Wallis CJ, Ravi B, Coburn N, Nam RK, Detsky AS, Satkunavim R. Comparison of postoperative outcomes among patients treated by male and female surgeons: a population based matched cohort study. *BMJ*. 2017;359:j4366. doi:10.1136/bmj.j4366
- Saha S, Guiton G, Wimmers PF, Wilkerson L. Student body racial and ethnic composition and diversity-related outcomes in US medical schools. *JAMA*. 2008;300(10):1135-1145. doi:10.1001/jama.300.10.1135
- Deville C, Hwang WT, Burgos R, Chapman CH, Both S, Thomas CR Jr. Diversity in graduate medical education in the United States by race, ethnicity, and sex, 2012 [published correction appears in

JAMA Intern Med. 2015;175(10):1729]. *JAMA Intern Med*. 2015;175(10):1706-1708. doi:10.1001/jamainternmed.2015.4324

- Nunez-Smith M, Pilgrim N, Wynia M, et al. Health care workplace discrimination and physician turnover. *J Natl Med Assoc*. 2009;101(12):1274-1282. doi:10.1016/S0027-9684(15)31139-1
- Adesoye T, Mangurian C, Choo EK, Girgis C, Sabry-Elnaggar H, Linos E; Physician Moms Group Study Group. Perceived discrimination experienced by physician mothers and desired workplace changes: a cross-sectional survey. *JAMA Intern Med*. 2017;177(7):1033-1036. doi:10.1001/jamainternmed.2017.1394
- Eliason MJ, Dibble SL, Robertson PA. Lesbian, gay, bisexual, and transgender (LGBT) physicians' experiences in the workplace. *J Homosex*. 2011;58(10):1355-1371. doi:10.1080/00918369.2011.614902
- Lee KP, Kelz RR, Dubé B, Morris JB. Attitude and perceptions of the other underrepresented minority in surgery. *J Surg Educ*. 2014;71(6):e47-e52. doi:10.1016/j.jsurg.2014.05.008
- Mavis B. Measuring mistreatment: honing questions about abuse on the Association of American Medical Colleges Graduation Questionnaire. *Virtual Mentor*. 2014;16(3):196-199. doi:10.1001/virtualmentor.2014.16.03.stas1-1403
- Wehner MR, Nead KT, Linos K, Linos E. Plenty of moustaches but not enough women: cross sectional study of medical leaders. *BMJ*. 2015;351:h6311. doi:10.1136/bmj.h6311
- Association of American Medical Colleges. Diversity in the physician workforce: facts & figures 2014. <https://www.aamcdiversityfactsandfigures.org/>. Accessed January 9, 2020.
- Weeks WB, Wallace AE. The influence of physician race and gender on obstetrician-gynecologists' annual incomes. *Obstet Gynecol*. 2006;108(3, pt 1):603-611. doi:10.1097/01.AOG.0000231720.64403.6f
- Jena AB, Olenki AR, Blumenthal DM. Sex differences in physician salary in US public medical schools. *JAMA Intern Med*. 2016;176(9):1294-1304. doi:10.1001/jamainternmed.2016.3284
- Jagsi R, Griffith KA, Stewart A, Sambuco D, DeCastro R, Ubel PA. Gender differences in the salaries of physician researchers. *JAMA*. 2012;307(22):2410-2417. doi:10.1001/jama.2012.6183
- Ross DA, Boatright D, Nunez-Smith M, Jordan A, Chekroud A, Moore EZ. Differences in words used to describe racial and gender groups in Medical Student Performance Evaluations. *PLoS One*. 2017;12(8):e0181659. doi:10.1371/journal.pone.0181659
- Boatright D, Ross D, O'Connor P, Moore E, Nunez-Smith M. Racial disparities in medical student membership in the Alpha Omega Alpha honor society. *JAMA Intern Med*. 2017;177(5):659-665. doi:10.1001/jamainternmed.2016.9623
- Butkus R, Serchen J, Moyer DV, Bornstein SS, Hingle ST; Health and Public Policy Committee of the American College of Physicians. Achieving gender equity in physician compensation and career advancement: a position paper of the American College of Physicians. *Ann Intern Med*. 2018;168(10):721-723. doi:10.7326/M17-3438
- King JT Jr, Angoff NR, Forrest JN Jr, Justice AC. Gender disparities in medical student research awards: a 13-year study from the Yale School of Medicine. *Acad Med*. 2018;93(6):911-919. doi:10.1097/ACM.0000000000002052

32. Nunez-Smith M, Ciarleglio MM, Sandoval-Schaefer T, et al. Institutional variation in the promotion of racial/ethnic minority faculty at US medical schools. *Am J Public Health*. 2012;102(5):852-858. doi:10.2105/AJPH.2011.300552
33. Jagi R, Tarbell NJ, Henault LE, Chang Y, Hylek EM. The representation of women on the editorial boards of major medical journals: a 35-year perspective. *Arch Intern Med*. 2008;168(5):544-548. doi:10.1001/archinte.168.5.544
34. Jena AB, Khullar D, Ho O, Olenksi AR, Blumenthal DM. Sex differences in academic rank in US medical schools in 2014. *JAMA*. 2015;314(11):1149-1158. doi:10.1001/jama.2015.10680
35. Ginther DK, Haak LL, Schaffer WT, Kington R. Are race, ethnicity, and medical school affiliation associated with NIH R01 Type 1 award probability for physician investigators? *Acad Med*. 2012;87(11):1516-1524. doi:10.1097/ACM.0b013e31826d726b
36. Ginther DK, Basner J, Jensen U, Schnell J, Kington R, Schaffer WT. Publications as predictors of racial and ethnic differences in NIH research awards. *PLoS One*. 2018;13(11):e0205929. doi:10.1371/journal.pone.0205929
37. Ginther DK, Schaffer WT, Schnell J, et al. Race, ethnicity, and NIH research awards. *Science*. 2011;333(6045):1015-1019. doi:10.1126/science.1196783
38. Eloy JA, Swider PF, Kovalevich O, Baredes S, Kalyoussef E, Chandrasekhar SS. Gender differences in successful NIH grant funding in otolaryngology. *Otolaryngol Head Neck Surg*. 2013;149(1):77-83. doi:10.1177/0194599813486083
39. Oliveira DFM, Ma Y, Woodruff TK, Uzzi B. Comparison of National Institutes of Health grant amounts to first-time male and female principal investigators. *JAMA*. 2019;321(9):898-900. doi:10.1001/jama.2018.21944
40. Carr PL, Raj A, Kaplan SE, Terrin N, Breeze JL, Freund KM. Gender differences in academic medicine: retention, rank, and leadership comparisons from the National Faculty Survey. *Acad Med*. 2018;93(11):1694-1699. doi:10.1097/ACM.0000000000002146
41. Bright CM, Duefield CA, Stone VE. Perceived barriers and biases in the medical education experience by gender and race. *J Natl Med Assoc*. 1998;90(11):681-688.
42. Nunez-Smith M, Pilgrim N, Wynia M, et al. Race/ethnicity and workplace discrimination: results of a national survey of physicians. *J Gen Intern Med*. 2009;24(11):1198-1204. doi:10.1007/s11606-009-1103-9
43. Fitzgerald CA, Smith RN, Luo-Owen X, et al. Screening for harassment, abuse, and discrimination among surgery residents: an EAST Multicenter Trial. *Am Surg*. 2019;85(5):456-461.
44. Pololi LH, Evans AT, Gibbs BK, Krupat E, Brennan RT, Civian JT. The experience of minority faculty who are underrepresented in medicine, at 26 representative U.S. medical schools. *Acad Med*. 2013;88(9):1308-1314. doi:10.1097/ACM.0b013e31829eef
45. Bruce AN, Battista A, Plankey MW, Johnson LB, Marshall MB. Perceptions of gender-based discrimination during surgical training and practice. *Med Educ Online*. 2015;20:25923. doi:10.3402/meo.v20.25923
46. Przedworski JM, Dovidio JF, Hardeman RR, et al. A comparison of the mental health and well-being of sexual minority and heterosexual first-year medical students: a report from the Medical Student CHANGE Study. *Acad Med*. 2015;90(5):652-659. doi:10.1097/ACM.0000000000000658
47. Nama N, MacPherson P, Sampson M, McMillan HJ. Medical students' perception of lesbian, gay, bisexual, and transgender (LGBT) discrimination in their learning environment and their self-reported comfort level for caring for LGBT patients: a survey study. *Med Educ Online*. 2017;22(1):1368850. doi:10.1080/10872981.2017.1368850
48. Fnais N, Soobiah C, Chen MH, et al. Harassment and discrimination in medical training: a systematic review and meta-analysis. *Acad Med*. 2014;89(5):817-827. doi:10.1097/ACM.000000000000200
49. Brogan DJ, Frank E, Elon L, Sivanesan SP, O'Hanlan KA. Harassment of lesbians as medical students and physicians. *JAMA*. 1999;282(13):1290-1292, 1292. doi:10.1001/jama.282.13.1290-JMS1006-5-1
50. Schulman KA, Berlin JA, Harless W, et al. The effect of race and sex on physicians' recommendations for cardiac catheterization. *N Engl J Med*. 1999;340(8):618-626. doi:10.1056/NEJM199902253400806
51. Alfaro EC, Umaña-Taylor AJ, Gonzales-Backen MA, Bámaca MY, Zeiders KH. Latino adolescents' academic success: the role of discrimination, academic motivation, and gender. *J Adolesc*. 2009;32(4):941-962. doi:10.1016/j.adolescence.2008.08.007
52. Neblett EW, Philip CL, Cogburn CD, Sellers RM. African American adolescents' discrimination experiences and academic achievement: racial socialization as a cultural compensatory and protective factor. *J Black Psychol*. 2006;32(2):199-218. doi:10.1177/0095798406287072
53. Eccles JS, Wong CA, Peck SC. Ethnicity as a social context for the development of African-American adolescents. *J Sch Psychol*. 2006;44(5):407-426. doi:10.1016/j.jsp.2006.04.001
54. Stone S, Han M. Perceived school environments, perceived discrimination, and school performance among children of Mexican immigrants. *Child Youth Serv Rev*. 2005;27(1):51-66. doi:10.1016/j.childyouth.2004.08.011
55. Clark R, Adams JH. Moderating effects of perceived racism on John Henryism and blood pressure reactivity in black female college students. *Ann Behav Med*. 2004;28(2):126-131. doi:10.1207/s15324796abm2802_8
56. Goosby BJ, Malone S, Richardson EA, Cheadle JE, Williams DT. Perceived discrimination and markers of cardiovascular risk among low-income African American youth. *Am J Hum Biol*. 2015;27(4):546-552. doi:10.1002/ajhb.22683
57. Williams DR, Mohammed SA. Discrimination and racial disparities in health: evidence and needed research. *J Behav Med*. 2009;32(1):20-47. doi:10.1007/s10865-008-9185-0
58. Jamieson JP, Koslov K, Nock MK, Mendes WB. Experiencing discrimination increases risk taking. *Psychol Sci*. 2013;24(2):131-139. doi:10.1177/0956797612448194
59. Pascoe EA, Smart Richman L. Perceived discrimination and health: a meta-analytic review. *Psychol Bull*. 2009;135(4):531-554. doi:10.1037/a0016059
60. Silver JK, Slocum CS, Bank AM, et al. Where are the women? the underrepresentation of women physicians among recognition award recipients from medical specialty societies. *PM R*. 2017;9(8):804-815. doi:10.1016/j.pmrj.2017.06.001
61. Klein R, Julian KA, Snyder ED, et al; From the Gender Equity in Medicine (GEM) Workgroup. Gender bias in resident assessment in graduate medical education: review of the literature. *J Gen Intern Med*. 2019;34(5):712-719. doi:10.1007/s11606-019-04884-0
62. Dayal A, O'Connor DM, Qadri U, Arora VM. Comparison of male vs female resident milestone evaluations by faculty during emergency medicine residency training [published correction appears in *JAMA Intern Med*. 2017;177(5):747]. *JAMA Intern Med*. 2017;177(5):651-657. doi:10.1001/jamainternmed.2016.9616
63. Swim JK, Hyers LL, Cohen LL, Fitzgerald DC, Bylsma WH. African American college students' experiences with everyday racism: characteristics of and responses to these incidents. *J Black Psychol*. 2003;29(1):38-67. doi:10.1177/0095798402239228
64. Swim JK, Hyers LL, Cohen LL, Ferguson MJ. Everyday sexism: evidence for its incidence, nature, and psychological impact from three daily diary studies. *J Soc Issues*. 2001;57(1):31-53. doi:10.1111/0022-4537.00200
65. D'Augelli AR. Lesbian and gay male undergraduates' experiences of harassment and fear on campus. In: *Life-Span Development: A Diversity Reader*. Dubuque, IA: Kendall/Hunt Publishing Co; 1993:199-208.
66. Garnets L, Herek GM, Levy B. Violence and victimization of lesbians and gay men: mental health consequences. In: *Psychological Perspectives on Lesbian and Gay Male Experience*. New York, NY: Columbia University Press; 1993:579-597.
67. Dickter CL. Confronting hate: heterosexuals' responses to anti-gay comments. *J Homosex*. 2012;59(8):1113-1130. doi:10.1080/00918369.2012.712817
68. Chrobot-Mason D, Riggins BR, Linnehan F. Second hand smoke: ambient racial harassment at work. *J Manag Psychol*. 2013;28(5):470-491. doi:10.1108/JMP-02-2012-0064
69. Low KSD, Radhakrishnan P, Schneider KT, Rounds J. The experiences of bystanders of workplace ethnic harassment. *J Appl Soc Psychol*. 2007;37(10):2261-2297. doi:10.1111/j.1559-1816.2007.00258.x
70. Wittlin NM, Dovidio JF, Burke SE, et al. Contact and role modeling predict bias against lesbian and gay individuals among early-career physicians: a longitudinal study. *Soc Sci Med*. 2019;238:112422. doi:10.1016/j.socscimed.2019.112422
71. Benbassat J. Role modeling in medical education: the importance of a reflective imitation. *Acad Med*. 2014;89(4):550-554. doi:10.1097/ACM.000000000000189
72. Blanchard FA, Crandall CS, Brigham JC, Vaughn LA. Condemning and condoning racism: a social context approach to interracial settings. *J Appl Psychol*. 1994;79(6):993-997. doi:10.1037/0021-9010.79.6.993
73. Goodman JA, Schell J, Alexander MG, Eidelman S. The impact of a derogatory remark on prejudice toward a gay male leader. *J Appl Soc Psychol*. 2008;38(2):542-555. doi:10.1111/j.1559-1816.2008.00316.x
74. Maudsley RF. Role models and the learning environment: essential elements in effective medical education. *Acad Med*. 2001;76(5):432-434. doi:10.1097/00001888-200105000-00011
75. Weiss HM. Subordinate imitation of supervisor behavior: the role of modeling in organizational socialization. *Organ Behav Hum Perform*. 1977;19(1):89-105. doi:10.1016/0030-5073(77)90056-3

76. Phelan SM, Burke SE, Hardeman RR, et al. Medical school factors associated with changes in implicit and explicit bias against gay and lesbian people among 3492 graduating medical students. *J Gen Intern Med*. 2017;32(11):1193-1201. doi:10.1007/s11606-017-4127-6
77. van Ryn M, Hardeman R, Phelan SM, et al. Medical school experiences associated with change in implicit racial bias among 3547 students: a Medical Student CHANGES Study report. *J Gen Intern Med*. 2015;30(12):1748-1756. doi:10.1007/s11606-015-3447-7
78. Cochran SD, Björkenstam C, Mays VM. Sexual orientation and all-cause mortality among US adults aged 18 to 59 years, 2001-2011. *Am J Public Health*. 2016;106(5):918-920. doi:10.2105/AJPH.2016.303052
79. Blosnich JR, Hanmer J, Yu L, Matthews DD, Kavalieratos D. Health care use, health behaviors, and medical conditions among individuals in same-sex and opposite-sex partnerships: a cross-sectional observational analysis of the Medical Expenditures Panel Survey (MEPS), 2003-2011. *Med Care*. 2016;54(6):547-554. doi:10.1097/MLR.0000000000000529
80. Bränström R, Hatzenbuehler ML, Pachankis JE. Sexual orientation disparities in physical health: age and gender effects in a population-based study. *Soc Psychiatry Psychiatr Epidemiol*. 2016;51(2):289-301. doi:10.1007/s00127-015-1116-0
81. Frost DM, Lehavot K, Meyer IH. Minority stress and physical health among sexual minority individuals. *J Behav Med*. 2015;38(1):1-8. doi:10.1007/s10865-013-9523-8
82. Institute of Medicine. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care; 2003.
83. Institute of Medicine. *The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding*. Washington, DC: National Academies Press; 2011.
84. Martell RF, Lane DM, Emrich C. Male-female differences: a computer simulation. *Am Psychol*. 1996;51(2):157-158. doi:10.1037/0003-066X.51.2.157
85. Teherani A, Hauer KE, Fernandez A, King TE Jr, Lucey C. How small differences in assessed clinical performance amplify to large differences in grades and awards: a cascade with serious consequences for students underrepresented in medicine. *Acad Med*. 2018;93(9):1286-1292. doi:10.1097/ACM.0000000000002323
86. Tesch BJ, Wood HM, Helwig AL, Nattinger AB. Promotion of women physicians in academic medicine: glass ceiling or sticky floor? *JAMA*. 1995; 273(13):1022-1025. doi:10.1001/jama.1995.03520370064038
87. Boiko JR, Anderson AJM, Gordon RA. Representation of women among academic grand rounds speakers. *JAMA Intern Med*. 2017;177(5): 722-724. doi:10.1001/jamainternmed.2016.9646
88. Silver JK, Ghalib R, Poorman JA, et al. Analysis of gender equity in leadership of physician-focused medical specialty societies, 2008-2017. *JAMA Intern Med*. 2019;179(3):433-435. doi:10.1001/jamainternmed.2018.5303
89. Levy DJ, Heissel JA, Richeson JA, Adam EK. Psychological and biological responses to race-based social stress as pathways to disparities in educational outcomes. *Am Psychol*. 2016;71(6): 455-473. doi:10.1037/a0040322
90. Frank E, Carrera JS, Stratton T, Bickel J, Nora LM. Experiences of belittlement and harassment and their correlates among medical students in the United States: longitudinal survey. *BMJ*. 2006;333 (7570):682. doi:10.1136/bmj.38924.722037.7C
91. Barrett J, Scott KM. "Constantly ignored and told to disappear": a review of the literature on "teaching by humiliation" in medicine. *Focus Health Prof Ed*. 2015;16(4):3-14.
92. Baldwin DC Jr, Daugherty SR, Eckenfels EJ. Student perceptions of mistreatment and harassment during medical school: a survey of ten United States schools. *West J Med*. 1991;155(2): 140-145.
93. Richardson DA, Becker M, Frank RR, Sokol RJ. Assessing medical students' perceptions of mistreatment in their second and third years. *Acad Med*. 1997;72(8):728-730. doi:10.1097/00001888-199708000-00022
94. Schuchert MK. The relationship between verbal abuse of medical students and their confidence in their clinical abilities. *Acad Med*. 1998;73(8):907-909. doi:10.1097/00001888-199808000-00018
95. Scott KM, Caldwell PHY, Barnes EH, Barrett J. "Teaching by humiliation" and mistreatment of medical students in clinical rotations: a pilot study. *Med J Aust*. 2015;203(4):1-6. doi:10.5694/mja15.00189
96. Fried JM, Vermillion M, Parker NH, Uijtdehaage S. Eradicating medical student mistreatment: a longitudinal study of one institution's efforts. *Acad Med*. 2012;87(9):1191-1198. doi:10.1097/ACM.0b013e3182625408
97. Capers Q IV, Clinchot D, McDougle L, Greenwald AG. Implicit racial bias in medical school admissions. *Acad Med*. 2017;92(3):365-369. doi:10.1097/ACM.0000000000001388
98. Jackson SM, Hillard AL, Schneider TR. Using implicit bias training to improve attitudes toward women in STEM. *Soc Psychol Educ*. 2014;17(3):419-438. doi:10.1007/s11218-014-9259-5
99. Devine PG, Forscher PS, Austin AJ, Cox WT. Long-term reduction in implicit race bias: a prejudice habit-breaking intervention. *J Exp Soc Psychol*. 2012;48(6):1267-1278. doi:10.1016/j.jesp.2012.06.003
100. Dasgupta N, Rivera LM. When social context matters: the influence of long-term contact and short-term exposure to admired outgroup members on implicit attitudes and behavioral intentions. *Soc Cogn*. 2008;26(1):112-123. doi:10.1521/soco.2008.26.1.112
101. Katz J, Moore J. Bystander education training for campus sexual assault prevention: an initial meta-analysis. *Violence Vict*. 2013;28(6):1054-1067. doi:10.1891/0886-6708.vv-d-12-00113
102. Coker AL, Bush HM, Fisher BS, et al. Multi-college bystander intervention evaluation for violence prevention. *Am J Prev Med*. 2016;50(3): 295-302. doi:10.1016/j.amepre.2015.08.034
103. Nelson JK, Dunn KM, Paradies Y. Bystander anti-racism: a review of the literature. *Anal Soc Issues Public Policy*. 2011;11(1):263-284. doi:10.1111/j.1530-2415.2011.01274.x
104. Best CL, Smith DW, Raymond JR Sr, Greenberg RS, Crouch RK. Preventing and responding to complaints of sexual harassment in an academic health center: a 10-year review from the Medical University of South Carolina. *Acad Med*. 2010;85(4):721-727. doi:10.1097/ACM.0b013e3181d27fd0
105. Dzau VJ, Johnson PA. Ending sexual harassment in academic medicine. *N Engl J Med*. 2018;1591;379(17):1589-1591. doi:10.1056/NEJMp1809846
106. Fried JM, Uijtdehaage S. An abuse-free medical school environment: an ethical imperative. *Virtual Mentor*. 2014;16(3):187-191. doi:10.1001/virtualmentor.2014.16.03.medu3-1403
107. Robinson GE, Stewart DE. A curriculum on physician-patient sexual misconduct and teacher-learner mistreatment, part 1: content. *CMAJ*. 1996;154(5):643-649.
108. Komaromy M, Bindman AB, Haber RJ, Sande MA. Sexual harassment in medical training. *N Engl J Med*. 1993;328(5):322-326. doi:10.1056/NEJM199302043280507
109. Gordon GH, Labby D, Levinson W. Sex and the teacher-learner relationship in medicine. *J Gen Intern Med*. 1992;7(4):443-448. doi:10.1007/BF02599165
110. Acosta D, Karp DR. Restorative justice as the Rx for mistreatment in academic medicine: applications to consider for learners, faculty, and staff. *Acad Med*. 2018;93(3):354-356. doi:10.1097/ACM.0000000000002037
111. Shanafelt T, Trockel M, Ripp J, Murphy ML, Sandborg C, Bohman B. Building a program on well-being: key design considerations to meet the unique needs of each organization. *Acad Med*. 2019;94(2):156-161. doi:10.1097/ACM.0000000000002415
112. Boatright DH, Samuels EA, Cramer L, et al. Association between the Liaison Committee on Medical Education's diversity standards and changes in percentage of medical student sex, race, and ethnicity. *JAMA*. 2018;320(21):2267-2269. doi:10.1001/jama.2018.13705
113. Mansh M, White W, Gee-Tong L, et al. Sexual and gender minority identity disclosure during undergraduate medical education: "in the closet" in medical school. *MEDSCAPE 2/18/2015. Mo Med*. 2015;112(4):266.
114. Accreditation Council for Graduate Medical Education. Medical School Graduation Questionnaire (GQ) FAQ. <https://www.aamc.org/data-reports/students-residents/medical-school-graduation-questionnaire-gq-faq>. Accessed January 13, 2020.
115. Accreditation Council for Graduate Medical Education. Common Program Requirements. <https://www.acgme.org/What-We-Do/Accreditation/Common-Program-Requirements>. Accessed January 13, 2020.
116. Brotherton SE, Etzel SI. Graduate medical education, 2016-2017. *JAMA*. 2017;318(23):2368-2387. doi:10.1001/jama.2017.16203
117. vanIneveld CH, Cook DJ, Kane SL, King D; The Internal Medicine Program Directors of Canada. Discrimination and abuse in internal medicine residency. *J Gen Intern Med*. 1996;11(7):401-405. doi:10.1007/BF02600186
118. Osseo-Asare A, Balasuriya L, Huot SJ, et al. Minority resident physicians' views on the role of race/ethnicity in their training experiences in the workplace. *JAMA Netw Open*. 2018;1(5):e182723. doi:10.1001/jamanetworkopen.2018.2723
119. Ayyala MS, Rios R, Wright SM. Perceived bullying among internal medicine residents. *JAMA*. 2019;322(6):576-578. doi:10.1001/jama.2019.8616

120. Hu YY, Ellis RJ, Hewitt DB, et al. Discrimination, abuse, harassment, and burnout in surgical residency training. *N Engl J Med*. 2019;381(18):1741-1752. doi:10.1056/NEJMsa1903759

121. Accreditation Council for Graduate Medical Education. ACGME resident/fellow survey content areas. https://www.acgme.org/Portals/0/ResidentSurvey_ContentAreas.pdf. Published November 2019. Accessed January 13, 2020.

122. National Public Radio; Robert Wood Johnson Foundation; Harvard T.H. Chan School of Public Health. Discrimination in America: experiences and views of LGBTQ Americans. <https://www.npr.org/documents/2017/nov/npr-discrimination-lgbtq-final.pdf>. Published November 2017. Accessed January 9, 2020.

123. Ogden PE, Wu EH, Elnicki MD, et al. Do attending physicians, nurses, residents, and

medical students agree on what constitutes medical student abuse? *Acad Med*. 2005;80(10)(suppl):S80-S83. doi:10.1097/00001888-200510001-00022

Editor's Note

PHYSICIAN WORK ENVIRONMENT AND WELL-BEING

Addressing Mistreatment in Medical Education

Anjali B. Thakkar, MD, MBA; Colette Dejong, MD, MS; Mitchell H. Katz, MD

In this issue of *JAMA Internal Medicine*, Hill et al¹ report rates of medical student mistreatment obtained from the 2016 and 2017 Association of American Medical Colleges Graduate Questionnaire. More than one-third of medical students reported experiencing at least 1 episode of mistreatment by



Related article [page 653](#)

faculty, peers, or clinical staff.

Female trainees reported a higher prevalence of mistreatment, public humiliation, unwanted sexual advances, and gender-based discrimination than male students. Students from underrepresented minorities reported a higher prevalence of mistreatment and discrimination based on race/ethnicity than white students. Sexual orientation minorities reported higher prevalence of mistreatment and were more likely than heterosexual students to report having been publicly humiliated, subjected to unwanted physical advances, and discriminated against based on sexual orientation.

The findings by Hill et al¹ are a harsh reminder of the need to improve the current learning climate in medical education. The stakes are high: mistreatment contributes to high rates of depression and suicidality among medical students² and has long-term consequences on career choices and career satisfaction.³ Ultimately, mistreatment perpetuates inequity and lack of diversity in medicine by discouraging certain groups.

So where can we go from here? Both individual and institutional responses are needed. Attending physicians and residents should understand the lasting and inequitable consequences associated with mistreatment for learners and should assume the role of first responder when microaggressions or

offensive statements occur. Supervisors should beware of mistaking students' responses to mistreatment, such as silence or preoccupation, as disinterest or lack of knowledge.⁴ Educators need to be able to give useful and constructive feedback to students who are underrepresented in medicine, while being mindful of avoiding implicit bias.

At the institutional level, systems for confidential reporting are essential. Several medical schools are also investing in faculty training programs to prepare educators to identify and respond to race/ethnicity and sex-related microaggressions. Numerous medical schools are piloting bystander intervention and implicit bias training programs to address bias in clerkships.⁵ Several have moved to a pass-fail grading system for clerkship students, which may reduce vulnerabilities for implicit bias and reduce the risk of grading consequences when students come forward about inappropriate treatment.⁴ Systems to reduce burnout among attending physicians and residents, such as work-hour restrictions and team caps, may also increase time for reflection and thereby expand emotional bandwidth and reduce vulnerability for thoughtless actions. We need to continuously evaluate and learn from the successes and failures of these programs.

Although the culture of diversity and inclusion in medicine has progressed by leaps and bounds over the past few decades, there remain large gaps and challenges for true inclusiveness that goes beyond numbers. We should aspire to a higher standard, where all educators are trusted by students to take the lead in naming and responding to instances of mistreatment in clinical settings. It is our patients who will benefit most from a thriving and diverse physician workforce.

Author Affiliations: Department of Medicine, University of California, San Francisco (Thakkar, Dejong); NYC Health + Hospitals, New York, New York (Katz); Deputy Editor, *JAMA Internal Medicine* (Katz).

Corresponding Author: Mitchell H. Katz, MD, NYC Health + Hospitals, 125 Worth St, Room 514, New York, NY 10013 (mitchell.katz@nychhc.org).

Published Online: February 24, 2020.
doi:10.1001/jamainternmed.2020.0004

Conflict of Interest Disclosures: None reported.

- Hill KA, Samuels EA, Gross CP, et al. Assessment of the prevalence of medical student mistreatment by sex, race/ethnicity, and sexual orientation [published online February 24, 2020]. *JAMA Intern Med*. doi:10.1001/jamainternmed.2020.0030
- Richman JA, Flaherty JA, Rospenda KM, Christensen ML. Mental health consequences and correlates of reported medical student abuse. *JAMA*. 1992;267(5):692-694. doi:10.1001/jama.1992.03480050096032
- Cook AF, Arora VM, Rasinski KA, Curlin FA, Yoon JD. The prevalence of medical student

mistreatment and its association with burnout. *Acad Med*. 2014;89(5):749-754. doi:10.1097/ACM.000000000000204

4. Lucey CR, Navarro R, King TEJ Jr. Lessons from an educational never event. *JAMA Intern Med*. 2017;177(10):1415-1416. doi:10.1001/jamainternmed.2017.3055

5. Sherman MD, Ricco J, Nelson SC, Nezhad SJ, Prasad S. Implicit bias training in a residency program: aiming for enduring effects. *Fam Med*. 2019;51(8):677-681. doi:10.22454/FamMed.2019.947255