Critical Reflection to Investigate Medical Student Attitudes Toward Skin Tone in Their Preclinical Years

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ABSTRACT

Introduction: Implicit racial bias, defined as unreasoned judgement based solely on an individual's skin color, is a persistent barrier to quality medical care for people of color in the United States. Early, learner-centered intervention is crucial to establish cultural competence within health professional training programs.

Methods: Over 3 academic years, preclinical, second-year medical students were asked to submit an anonymous critical reflection regarding skin tone in medicine (n=794). Critical reflection is an instructional approach that encourages students to investigate their own thoughts and actions. Course credit was given based on the honor system. Reflection submission content and student feedback were analyzed quantitatively and qualitatively using constructivist thematic analysis.

Results: Most students completed the assignment (93.0%) and reported feeling comfortable expressing themselves honestly in the anonymous format (84.6%). Students' comfort level with honesty declined if they would have had to identify themselves (50.8%). Student comments indicated relief to have a place to process experiences and emphasized the importance of anonymity for value of this assignment. Thematic analysis identified 2 themes and 13 subthemes among student submissions. Submissions varied in format and typically contained multiple codes (4.08 ± 1.77 subthemes), indicating that students participated meaningfully in the assignment.

Conclusions: Although some educators may hesitate to address these topics, students at our institution appreciated having a space to process their thoughts. This assignment structure is an effective way for educators to address a difficult, sensitive, and important topic in a meaningful way with students.

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INTRODUCTION

Racism and implicit bias remain barriers to equitable care for people of color in the United States.[1] However, addressing bias during training is an internal process requiring significant learner buy-in.[2] Educators often struggle to understand how learners feel about emotionally intense issues like racism, making it difficult to design curricula that adequately supports student growth. In this study, we describe a critical reflection paradigm to explore learner attitudes toward health care discrepancies based on skin color.

In 2021, the American Medical Association defined racism as a public health threat.[1] Race-based inequities are so intertwined with social determinants of health that they must be addressed through comprehensive governmental and social policy reform, but the medical care and educational systems must play a central role, in part by addressing gaps such as the current impact of skin color on medical decision-making.[3,4]

Despite the acceptance that race is a social construct rather than a biological category,[1,5-8] it remains common to discuss race as a purely biological characteristic in preclinical science curriculum.[5,9] While genetic differences may relate to disease risk or treatment efficacy, describing race as an essential consideration for epidemiology and diagnosis without presenting relevant social context can perpetuate bias in future physicians.[9-11] Furthermore, clinician use of skin tone as a proxy for race often leads to inaccurate assumptions.[9]

Comparatively, bias exists when assumptions – even unconscious ones – are likely to have negative impacts for a marginalized group.[12] Multiple studies have shown implicit bias in health care workers,[12,13] some having found that increased bias was correlated with poorer quality of care.[12]

With this in mind, it is important for physicians-in-training to recognize personal behaviors and how those behaviors may affect others.[14,15] Critical reflection is a useful tool to develop this understanding, which requires thought about the influence of external factors, how actions may be viewed from multiple perspectives, setting goals for the future, and exploring benefits of change.[2,10] Critical reflection assignments can benefit growth of the learner directly, while analysis of these reflections by educators can provide awareness of where students are struggling and what they need to progress further.[16] Unfortunately, structured reflection assignments often inadvertently encourage students to describe what the teacher wants to hear, rather than process their own thoughts.[17] Especially for sensitive topics, students must be provided with a safe space in which to explore their perspectives and behaviors, even when those perspectives are controversial or uncomfortable.

Students grapple with difficult topics throughout training and must have a way to thoroughly question and process their thoughts safely and effectively. Critical reflection can be used as a tool to stimulate this process, but students cannot be disincentivized from being vulnerable and honest. The purpose of this study was to explore the use of a critical reflection initiative designed to maximize learner value and explore current learner attitudes toward relevance of skin color on patient care.

METHODS

Setting

The Medical College of Wisconsin (MCW) is a private medical school in the midwestern United States. All second-year learners enroll in the Musculoskeletal Skin Unit, which teaches dermatologic and musculoskeletal content. The retrospective study described here was conducted using data collected from an assignment within this course. Informed consent for this study was waived by the Medical College of Wisconsin Institutional Review Board, PRO00041742.

Critical Reflection Initiative

As part of the week of required curriculum introducing dermatology, second-year students in academic years 2020-2021 (n = 252), 2021-2022 (n = 272), and 2022-2023 (n = 270) were asked to consider how dermatological disease may present differently depending on skin pigmentation. At the end of this week, students were required to submit a critical reflection responding to the prompt "How is skin tone relevant to the care you provide as a future physician?"

Students were provided with resources regarding critical reflection via their learning management system, Brightspace (D2L, Kitchener, Canada), including a matrixed feedback tool demonstrating different critical reflection components and levels of reflection.

To maximize comfort expressing feelings honestly, students submitted their reflections anonymously through the online survey platform, Qualtrics (Provo, Utah). Students then submitted a blank document to the learning management system to confirm their reflection was complete and receive credit for completion. To encourage thoughtfulness and creativity, the reflection format was left open, allowing learners to submit reflections using the medium of their choice. Reflection submissions were read by several staff and faculty (authors KQ, JN, TP, MS; acknowledgements TG, JM, AG) who collated aggregate feedback and provided it to students before the end of the course.

Table 1. Enrollment in M2 Musculoskeletal Skin Unit, Rate of Submission by Academic Year

	2020–2021 n (%)	2021–2022 n (%)	2022–2023 n (%)	All Years n (%)
Complete submission to Qualtrics	244 (96.8)	241 (88.6)	253 (93.7)	738 (93.0)
Brightspace submission	251 (99.6)	265 (97.4)	269 (99.6)	785 (98.9)
Enrolled in course	252 (100)	272 (100)	270 (100)	794 (100)

Abbreviation: M2, second-year medical student.

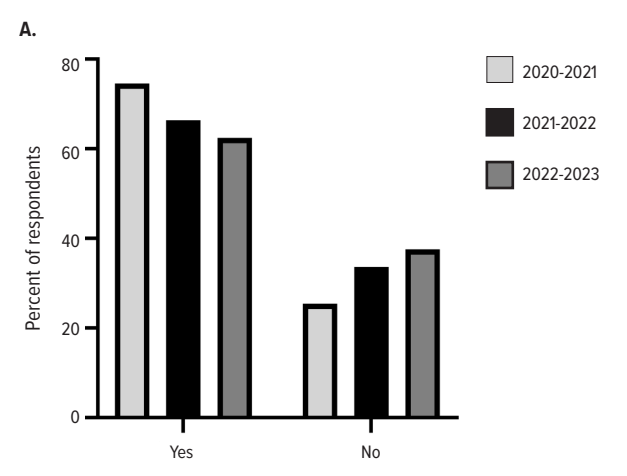
Table 2. Frequency of Reflection Submission Format in Each Academic Year

	2020–2021 n (%)	2021–2022 n (%)	2022–2023 n (%)	All Years n (%)
Written Narrative	226 (92.6)	225 (93.4)	230 (90.9)	681 (92.3)
Image	13 (5.3)	5 (2.1)	16 (6.3)	34 (4.6)
Poem	3 (1.2)	11 (4.5)	6 (2.4)	20 (2.7)
Video	2 (0.8)	0 (0.0)	0 (0.0)	2 (0.3)
Audio	0 (0.0)	0 (0.0)	1 (0.4)	1 (0.1)
Total Submissions	244 (100)	241 (100)	253 (100)	738 (100)

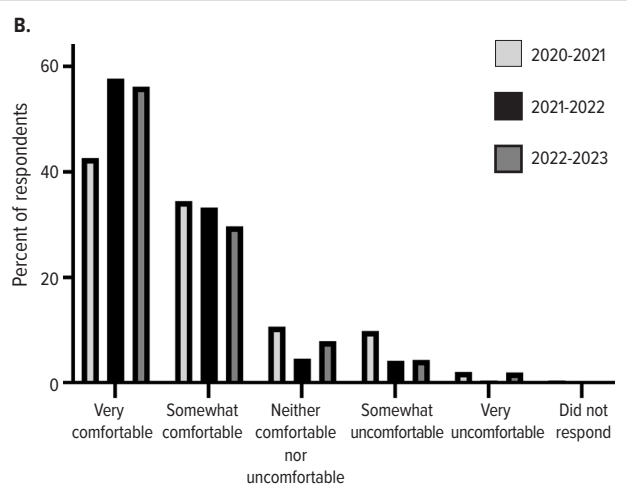
Analysis of Submissions

Constructivist thematic analysis was performed retrospectively on content of all submitted reflections from academic year (AY) 2020-2021.[18-20] First, a team of staff and faculty (authors KQ, JN, TP, MS; acknowledgements TG, JM, AG) performed inductive analysis of all written reflections to develop an initial coding scheme. Together, this group reviewed all reflections and agreed on 11 initial codes describing all the submissions. Subsequently, 3 authors (ED, MT, TP) performed deductive analysis beginning with the initial 11 codes and identified 2 additional codes. The final 13 codes fell into 2 major themes, described below. Subthemes were applied to each submission, and consensus was reached based on group discussion. Subthemes were confirmed by an independent fourth coder (GR). Most reflections encompassed multiple subthemes, though each subtheme was counted

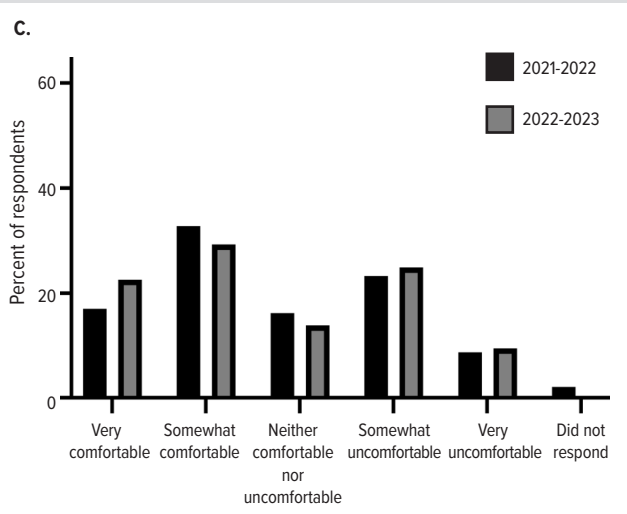
Figure 1. Student Survey Responses



Frequency of student permission to share reflection with a wider audience shown as percent of respondents within each academic year.



Level of comfort being honest in this anonymous reflection format within each academic year.



Level of comfort being honest if they had to identify themselves in academic years 2021-2022 and 2022-2023.

only once per submission, even if repeated multiple times. Results from a follow-up survey were compiled and analyzed using GraphPad Prism (San Diego, California).

RESULTS

Of 794 total second-year learners enrolled in the Musculoskeletal Skin course in AY 2020-2021, 2021-2022 and 2022-2023, 785 students uploaded a blank document to Brightspace (98.9%), and 738 complete submissions were uploaded to Qualtrics (93.0%) (Table 1). During the submission process, students were asked for permission to share their reflection anonymously with a wider audience. Across the 3 academic years, 500 respondents gave permission to share their response (67.7%) while 238 did not (32.3%); however, the rate of those giving permission to share declined progressively from AY 2020-2021 to AY 2022-23 (Figure 1A).

While the majority of students submitted written responses (92.3%), some respondents submitted images (4.6%), poetry (2.7%), video (0.3%), or audio (0.1%) (Table 2). Examples of visual and poetry submissions are included in the Appendix. One of the visual submissions was later submitted by the student and accepted for publication in the *Wisconsin Medical Journal*.[21] Regardless of submission type, many learners showed creativity and investment in the topic. Certain formats were more common in different years. For example, poetry was more popular in AY 2021-2022 than the other 2 academic years.

A student feedback survey was included as part of the Qualtrics submission form. Here, students were asked to provide feedback regarding the reflection paradigm itself. Across the 3 years, most students (624/738, 84.6%) reported feeling very or somewhat comfortable expressing themselves honestly within the anonymous structure, and relatively few (56/738, 7.6%) reported feeling uncomfortable or very uncomfortable (Figure 1B). In written comments, many expressed relief in being given a platform to delve into personal thoughts. In AY 2021-2022 and AY 2022-2023, students also were asked to gauge how comfortable they would have felt expressing themselves honestly in this assignment if they had to identify themselves. Interestingly, only half of the students (251/494, 50.8%) would have felt very or somewhat comfortable being honest, while a third (164/494, 33.2%) would have felt uncomfortable or very uncomfortable (Figure 1C).

> *"Thank you for letting us do this anonymously. Even though I trust that we are in a safe space, I feel that especially in these moments anything can be misconstrued or taken out of context and being able to think and write about this freely allowed me to be honest."*
>
> –Student in AY 2020-2021

To better understand learner perspectives, thematic analysis was performed on submissions from AY 2020-2021 (n = 244 submissions). The authors identified 13 final codes that fell into 2

Table 3. Frequency and Representative Quotes of Each Subtheme Within Submissions From Consenting Students

Subtheme	n (% out of 244)	Representative Quote
Responsibility of the individual	165 (67.6)	"Implicit biases are real and are present in everyone. Localizing these biases in myself and countering them with actions that results in the better treatment is the first step."
Responsibility of the medical system overall	151 (61.9)	"So, this question addresses a big problem for physicians today, which is how are we going to get rid of the current system? so that we can create a system in which 'skin tone' is not a risk factor."
People of color experience increased stress within the medical system	115 (47.1)	"There's a long history of oppression, injustice, mistreatment, and bias that's bound to skin tone. There's a huge emotional burden and mistrust carried by Black and Brown patients. I've seen it in patients I've talked to these past few months. And, knowing the history of how the profession has abused and used Black bodies for research, the racial disparities in health outcomes, the lack of representation and broken pipelines – knowing this adds weight to those observations."
Importance of treating people of color with compassion	101 (41.4)	"I do not want to be a physician who is 'colorblind' because I think that takes away from seeing the patient as a whole person which includes your skin tone and your culture which, as we know, play fundamental parts in the manifestation of health conditions."
Lack of representation in training leads to downstream disparities	99 (40.6)	"We're not training to see the effects of skin tone, so we practice blind to the differences. We look for clinical patterns like erythema migrans that are apparent on light-skinned bodies but might be missed or absent on darker-toned bodies. This isn't seeing patients."
Responsibility of the medical training process	99 (40.6)	"A lot of work has to be done within the medical school curriculum to prepare me and my classmates for the diverse world that we have taken an oath to serve. During my first year, I was very disappointed to find a lack of representation of Black skin when demonstrating clinical correlations."
Responsibility of society and the community	97 (39.8)	"…but our society has deemed people with different skin colors as less than since its inception, and these scars perpetuate almost every aspect of our lives, whether it is apparent or not."
Current lack of comprehensive educational resources (websites, textbooks)	51 (20.9)	"What we learn in our medical textbooks with pictures of White patients does not accurately reflect our patient populations … It seems like such an obvious problem that can be easily fixed by including images of pathologies on all skin types in our medical textbooks."
Description of specific discrepancy in health care for people of color	43 (17.6)	"In a climate where maternal mortality is 3 to 4 times more likely for Black women and where racial bias in pain assessment is rampant, skin tone is not a barrier, but a potential death sentence."
Has personally experienced or witnessed an instance of racism in a medical setting	25 (10.2)	"As an African American woman, I have experienced physicians and health care providers display nervousness when I have presented as a patient with a dermatological concern. I could feel their nervousness in the exami nation room. These experiences continuously made me wonder if I was alone in these uncomfortable interac tions. Many individuals of deeper skin tones echo [these] sentiments."
Minimization or denial of racism in health care system	17 (7.0)	"I believe that privilege is real and noteworthy, but very few people are racist."
Minimization or denial of racism within self	12 (4.9)	"I don't plan to treat my patients different because of their skin tone. Why would I? Some will say there is implicit or inherent bias in every person, especially White people. Assuming that's accurate, who says that will affect how I treat my patients?"
Combative comment or comment supporting racist ideology	8 (3.3)	"My ability to control my behavior based on what I believe to be right and true and good is what makes me a person. So get out of my face with this ***."

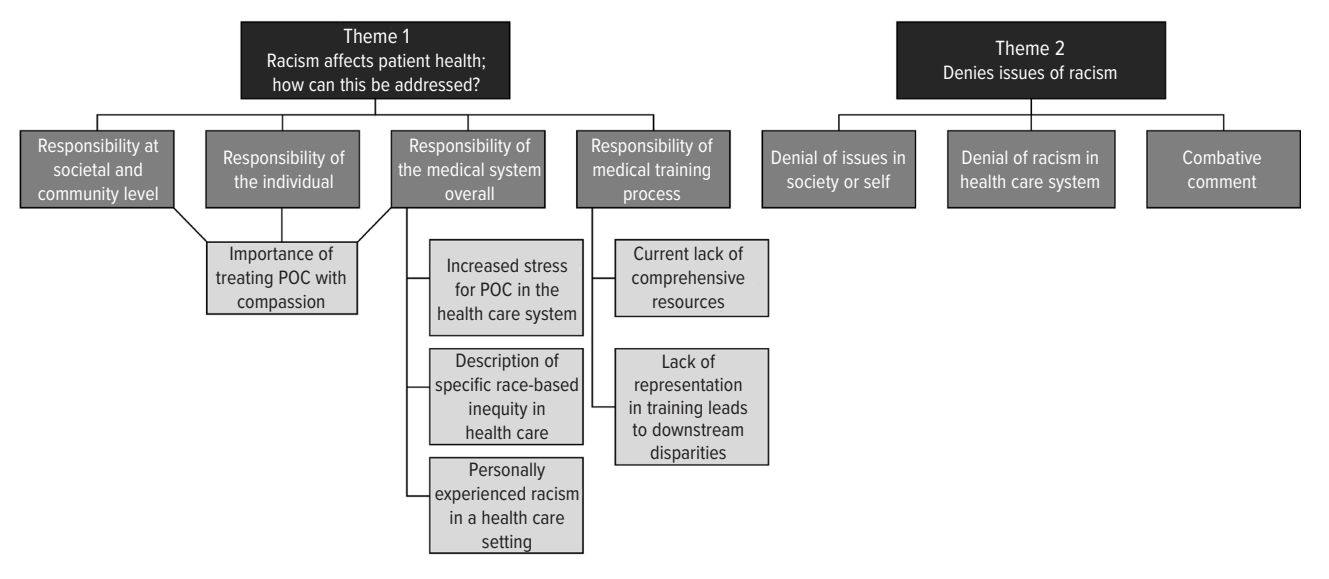
major themes: (1) description of the complexity of racial disparities in health care and responsibility for change, and (2) trivialization or denial of racism in health care (Figure 2, Table 3). Students addressed multiple topics within their reflections, with a mean of 4.08 (SD = 1.77) subthemes identified per submission. Within theme 1, most subthemes focused on various elements of racism in health care and brainstormed how individual students or larger systems could help. In theme 2, subthemes included attributing problems to individuals rather than a larger issue or denying the existence of these problems altogether (Figure 2).

The most frequent subtheme was responsibility of the individual (165/244, 67.6%, Table 3). Many discussed issues with systemic racism at the societal and community level, calling for changes at a public level to address racial equity (97/244, 39.8%, Table 3).

Issues of racism in medicine that must be fixed at a medical systems level was another notable subtheme (151/244, 61.9%, Table 3). Related to this subtheme, many described particular examples of racism in the health care system (43/244, 17.6%, Table 3). Additionally, 25 respondents (10.2%) provided examples where they personally witnessed or experienced racism in a health care setting (Table 3). Nearly half of respondents (115/244, 47.1%) described how people of color experience increased levels of stress and discomfort within the health care system, both as patients and trainees (Table 3). Correspondingly, many discussed the importance of treating people of color with empathy and compassion, including listening to the patient's individual story, learning individual barriers the patient faces to access care, and acknowledging the shared humanity among us all (101/244, 41.4%, Table 3).

Of importance were descriptions of how medical training programs are accountable for training culturally competent physi-

Figure 2. Model of Relationship Between Themes and Subthemes Within Reflection Submissions



Abbreviation: POC, people of color.

Within their reflections, respondents incorporated reputable evidence to support their understanding that institutional racism is/is not present in the health care system and in the world at large. Theme 1 further categorizes respondent perceptions on current issues at all levels of health care – individual level (patients, providers), societal level (social environment, exposure to violence/ trauma/ food deserts), and government level (health policy, health care coverage) within the medical system. Theme 2 reviews respondent submissions related to denying racism in self, society, and the health care system; a separate categorization in Theme 2 also acknowledges combative responses in respondents' efforts to deny racism.

cians and supporting diversity in the health care space (99/244, 40.6%, Table 3). As students were learning to discern various dermatological conditions, many utilized third-party resources and subsequently described difficulty finding comprehensive resources showing examples of disease on pigmented skin, such as textbooks or web searches (51/244, 20.9%, Table 3).[21] Students often went on to describe how lack of representation of people of color in medicine, either in training resources or among clinicians leads to downstream health care disparities for people of color (99/244, 40.6%, Table 3).

There were relatively fewer submissions minimizing or denying the existence of racism in medicine (Table 3, Figure 2). These included comments that treating everyone equally in medicine is the expectation and that while individuals may fail, there is not a problem with racism in the health care system (17/244, 7.0%, Table 3). Some submissions expressed a general discomfort acknowledging racism in general, denying issues of racism within themselves or society, preferring the term "discrimination" to describe racist actions, or denying the existence of implicit bias in themselves (12/244, 4.9%, Table 3). Finally, some submissions included comments that were combative or seemed to be propagating racist ideas (8/244, 3.3%, Table 3).

DISCUSSION

Students at our institution were acutely aware of health care inequities among people of color and supported changes at multiple levels to avoid perpetuating these inequities. They commented on current issues at all levels of health care, including the individual level (patients, clinicians), learning environment (training institution, learning resources), societal level (social environment, trauma, food deserts), and health systems level (health policy, health care coverage).[3]

Importantly, our study echoes previous findings that requiring students to identify themselves within emotionally rife reflections discourages honesty and authenticity.[17] Even with anonymous submission where credit was given entirely on the honor system and was worth minimal credit for the course overall (1% of the final grade), 93% of students participated meaningfully in this initiative. This level of engagement is numerically similar and mirrored the trend in submission rates for required reflection assignments where students were identified by name in other courses and where roughly 95% to 100% of students completed the homework on time depending on the course, cohort, and academic year (unpublished data gathered 2021-2023). Many specifically described appreciation for the anonymous nature, suggesting that students may not have participated as meaningfully if they were identified. Offering anonymity was a crucial aspect to obtaining honest reflections and should be considered when implementing an assignment that deals with difficult topics.

The most common subtheme amongst student submissions was personal responsibility, in which learners described their role as individual physicians in combating racial inequity. Many described the need to address implicit bias within themselves as

a first step. Students suggested the need for a group discussion in addition to the reflection assignment as utilized in other course initiatives relying on reflective formats.[22]

Students voiced frustration at the lack of representation of skin conditions across the skin tone spectrum in their learning resources (course materials, textbooks, and Google image searches). This phenomenon has been described previously at other institutions as well.[4,23] Any description of conditions affecting appearance of the skin, including terms like erythema and cyanosis or various rashes, should include example images across skin tones. Institutions can use publicly available resources like Mind The Gap[24] or subscription services like VisualDx (visualdx.com/diversity/) to provide representative images of clinical signs in deeply pigmented skin. Course resources at the authors' institution have since been audited and updated for representation. The authors have continued this instructional approach to meaningfully assess incoming student experiences and regularly refresh course materials.

In our study, learners described ways medical schools and the health care system at large are responsible for addressing inequities, including comprehensive training for current students as well as actively recruiting and supporting people of color into the medical field. Many went on to describe how a lack of these types of representation leads to further disparities. Students often included reputable evidence outside of course materials like journal citations to illustrate that institutional racism pervades health care systems and American culture at large.

Personal experiences of racism within a clinical setting also were noted in the submissions. Previous studies have shown that minoritized students perceived a higher lack of respect for diversity in role-modeling,[13] and students underrepresented in medicine have described more hostility and having less mentorship during training.[25] It is crucial for educators to realize students of color face barriers to practicing medicine that their white peers do not and provide ample support, safe spaces to process, and quality mentorship to encourage their success.

It is also important to note that a minority of students commented that there is not a problem with racism in the health care system. While relatively few students expressed this belief, it may be useful to explore these comments to determine where (and if) there is an area for improved education. While it was uncomfortable to read submissions with comments that do not align with the ideals of the authors' institution, it was evidence that students were being honest about their feelings and not merely writing what they thought instructors wanted them to say, which was the main purpose of the assignment. The presence of these comments, no matter how few, illustrates a persistent refusal to acknowledge bias. It indicates that teachers and learners alike must be aware of the contrasting views in our health care system. As we work towards improving implicit bias in health care, it is crucial to remain cognizant of this issue and actively address it in future education interventions.

This retrospective analysis was conducted at a single institution. These reflections were self-reported, completely anonymous, and did not collect demographic information. While this provided space for students to reflect honestly, authors were unable to correlate frequency of subthemes with learner demographics. While a few students self-identified as members of certain demographic groups in their submissions, the authors were unable to draw meaningful correlations between responses and demographics given the anonymous nature of the assignment.

CONCLUSIONS

Our analysis indicates that this reflection initiative provided a relatively safe outlet for students to grapple with a difficult topic internally. The anonymous, honor system-based reflection paradigm helped establish trust between the educator and student, encouraging meaningful participation, while educator review of reflections provided valuable insight into how students feel, their goals for making changes, and what tools they need from their training to accomplish those goals. The authors recommend performing such analyses at one's own institution to evaluate thoughts among their own students, as well as repeating them annually to monitor progress in meeting students' needs.

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Appendix: Available at www.wmjonline.org.

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