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1 **ABSTRACT.**

2 **Background:** Education to increase awareness of the impact of bias in healthcare should be included in all
3 health professions training programs. This report describes the implementation and outcomes of an interactive,
4 interprofessional pilot seminar on racial bias in healthcare for health professions students.

5 **Methods:** Forty students across the University of Nebraska Medical Center's six health profession colleges
6 participated in a 3-part, 1-hour seminar, including a video vignette depicting examples of bias in the hospital,
7 facilitated interprofessional small group discussions, and interaction with a health equity expert panel. We
8 analyzed the results of participants' Ethnic Perspective-Taking (EP) and Implicit Bias Knowledge scale (IBKS)
9 scores before and after the seminar.

10 **Results:** There was a statistically significant increase ($p < 0.001$) in the average post-seminar EP scores (30.6
11 post-seminar vs 27.8 pre-seminar). For the adapted IBKS, there were significant improvements in participant
12 knowledge, skills to identify, and ability to explain the impact of implicit biases ($p < 0.05$). Participants highlighted
13 the importance of including education about bias in healthcare training, and some suggested mandatory
14 education. All facilitators agreed that learners gained a deeper appreciation for the effect of bias and racism on
15 health outcomes and participants understood how bias and racism affect patient care and clinician experience
16 after the seminar.

17 **Conclusion:** Health professions training often lacks integrated interprofessional and health equity education.
18 This seminar addresses both, engaging community voices without heavy resources. Despite low participation,
19 results show the benefits of interactive sessions on health equity, helping students grasp their role in equitable
20 care and influencing future practice.

21

22 **Key Words:**

23 interprofessional education; implicit bias; racial bias; undergraduate medical education

24

1 **INTRODUCTION.**

2

3 Unconscious or implicit biases may manifest as either a prejudice (negative evaluation) or stereotype
 4 (attribute) that one associates with people who share a particular characteristic.^{1,2} Implicit biases exist in
 5 healthcare workers, placing minoritized communities at a greater risk for poor health outcomes due to
 6 inequities in healthcare access and delivery.³⁻⁸ The Liaison Committee on Medical Education (LCME) has
 7 identified standards addressing health inequities and structural/cultural competency in medical schools with a
 8 requirement that “medical curriculum provides opportunities for medical students to learn to recognize and
 9 appropriately address biases in themselves, in others, and in the health care delivery process.”⁹ Healthcare
 10 training programs have included components of bias training to address structural racism and bias in their
 11 curriculum, but these efforts primarily have been siloed in individual professions such as medicine, nursing, or
 12 dentistry.¹⁰⁻¹⁴ Quality healthcare delivery, however, is not insulated between professions in this manner.
 13 Therefore, a curriculum designed and delivered in an interprofessional setting to interdisciplinary students is
 14 essential to creating a structural competency curriculum, and addressing the social determinants of health that
 15 lead to health inequities in clinical settings.^{15,16}

16

17 Our institution’s Interprofessional Education (IPE) Curriculum Committee designs activities engaging students
 18 and faculty from its different colleges to incorporate interprofessional education into their programs. While a
 19 structural competency curriculum exists in the College of Medicine at our institution,¹² there is no similar
 20 education incorporated into the existing IPE curriculum. This report aims to describe the implementation and
 21 outcomes of an interactive seminar designed to educate interprofessional health professions students to
 22 recognize the effect of racial bias on patient care and discuss strategies for mitigating bias in clinical settings.
 23 We propose a framework that transcends conversation between academic health disciplines, to include
 24 community partners that our health system serves. A review of IPE within colleges suggests that there is a
 25 limited commitment to community and patient partner involvement in health profession education; this report
 26 highlights the transformative influence in health profession students’ appreciation of health inequities among
 27 those we serve.¹⁷

28

1 METHODS

2 *Setting and Participants*

3 The event was held in March 2022. We recruited students via email, electronic newsletters, social media
4 announcements, and word of mouth. Participation was limited to enrolled students from one of the six health
5 professions colleges across our institution. We incentivized voluntary, in-person attendance with
6 complimentary lunch, and Zoom conferencing allowed participation from remote campuses. In 2021, 2.8%
7 and 4.9% of our institution's students self-identified as Black or Hispanic, respectively. These two racial/ethnic
8 groups represent 12.1% and 11.3% of residents where most of our institution's colleges are based.

10 *Seminar Development and Implementation*

11 This interprofessional seminar aimed to help students apply strategies to increase awareness and mitigate
12 racial bias in clinical cases. **Box 1A** outlines the learning objectives reflecting the Values/Ethics and
13 Teams/Teamwork domains of the core competencies for the Interprofessional Education Collaborative
14 (IPEC).²¹ As with prior curricular innovations in our institution, community stakeholders were included as an
15 integral part of the team to assist with seminar planning, implementation, and follow up.¹² Other team
16 members included students, faculty, and staff representing various health professions colleges from our
17 institution. The 60-minute seminar included a pre-recorded video vignette (11 minutes), facilitated small group
18 discussions (25 minutes), and a 15-minute discussion panel (**Box 1B**).

20 *Video Vignette Creation*

21 We utilized the five-stage framework originally described by Hillen et al.¹⁸ to create our video vignette, which
22 has been used in several other studies.¹⁹⁻²⁰ This process involves (1) deciding if video vignette is appropriate;
23 (2) developing a script; (3) developing valid manipulations; (4) converting the script to video; (5) administering
24 the videos. Video vignettes are often used in health communications studies and was chosen in for this
25 seminar to portray true-to-life examples of bias in healthcare (incorporating non-verbal and verbal
26 communication) for those with minimal experience in clinical setting, and to facilitate better participant
27 engagement.¹⁷

28
29 The scenario depicted racial bias in an interaction between a nurse and a patient with sickle cell disease
30 (SCD) experiencing a pain crisis.²² Volunteer actors were recruited from our institution and another local
31 college. It would be unethical to intentionally subject real patients to hurtful language and actions; therefore, a
32 vignette was an appropriate choice for our chosen topic and audience. The script was created based on real
33 interactions and experiences, and was edited by subject experts, real prior patients, and a professional
34 filmmaker. We utilized both real healthcare professionals from our institution and actors recruited from a local
35 college to create the scenes, which were filmed in simulated patient rooms. The third person camera view
36 (rather than first person) captured the full range of verbal and nonverbal interactions between the characters.
37 A professional film director edited the film, which was reviewed by our multidisciplinary advisory team for
38 feedback. The video was viewed in a group setting but with cinematic viewing conditions (a large screen and
39 in darkness), as this was more practical than individual viewing but still allowed for better immersion into the
40 scenarios.

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Facilitator Training

Seminar facilitators included faculty members recruited from several colleges and across multiple campuses, representing both clinical and academic expertise; community leaders also served as facilitators and expert panelists. Facilitators participated in a one-hour training session two days prior to the event, which included viewing the video scenario followed by walking through the Facilitator Guide (**Supplemental Figure 1**), Small Group Discussion Guide (**Supplemental Figure 2**), and the open-ended discussion prompts (**Box 1B**). Small groups consisted of 4-6 students from various health programs per facilitator, with 12 facilitators total.

Program Evaluation

Our institution's Institutional Review Board deemed this a program evaluation and not human subjects research. To gauge the effectiveness of the program, the Kirkpatrick Evaluation Model's framework was used, incorporating scales to measure knowledge of unconscious bias and evaluating learning. Open ended questions with qualitative results provided insight into participants' reactions. Facilitator observations of students helped to further assess behavior and results. Voluntary, anonymized, web-based surveys were disseminated to participants in the three days before and after the seminar (**Supplemental Figure 3**). Each participant was assigned a unique code to link pre-and post-seminar survey responses. The surveys assessed (1) participant demographics, (2) perceptions and interest in learning more about bias through examples of bias in healthcare, (3) knowledge and awareness of bias using adapted scales, and (4) seminar strengths and opportunities for improvement. An additional post-evaluation survey assessed facilitator perceptions of learner knowledge, skills, and attitudes following the training (**Supplemental Figure 4**).

Scales to measure knowledge of unconscious bias

To align with the seminar objectives, the effectiveness of the program was characterized based on improvement in ethnic perspective-taking scores and implicit bias knowledge of participants pre- and post-seminar. Ethnic perspective-taking is the process of individuals seeking and actively considering the thoughts, experiences, and feelings of racial/ethnic outgroups.²³⁻²⁴ Studies have demonstrated the interrelation between perspective-taking as an antecedent to racial bias.²⁵⁻²⁷ The Ethnic Perspective-Taking (EP) subscale of the Scale of Ethnocultural Empathy (SEE) assessed participants' "effort to understand the experiences and emotions of people from different racial and ethnic backgrounds."² This is a 7-item subscale with 6-point Likert-type responses ranging from '1' being 'strongly disagree' to '6' being 'strongly agree' (Figure 1). A total score was computed and compared for each participant pre- and post-seminar. A higher score corresponds to greater ethnic perspective-taking. The original instrument's internal consistency was 0.90.

Participant implicit bias knowledge was assessed with an adapted Implicit Bias Knowledge Scale (IBKS)²⁹. The original scale included 18 items. To shorten the survey and increase completion rates, our adaptation removed 8 items and revised two items to replace juvenile justice text with healthcare text (e.g., "*Youth of all races and ethnicities are treated the same in local schools*" was reworded to "*People of all races and ethnicities are treated the same in healthcare*") for a total of 10-items administered in our survey. The adapted set of questions was reviewed by subject matter experts (content validation). The participants responded to the statements as either 'True' or 'False.' The internal consistency of the original scale was 0.74. Given our

1 small sample size and the nature of the questions themselves, we did not analyze the results as a scale and
2 calculate Cronbach's alpha, but rather, looked at answer changes to individual questions.

3

4 *Analyses*

5 We conducted the Kolmogorov-Smirnov test for normality, and because data were normally distributed, we
6 conducted a paired-samples *t*-test to compare EP scores for matched pre- and post-surveys using a significance
7 level of 0.05 as reference. For the adapted IBKS, we used descriptive statistics and the Chi-squared test to
8 describe the differences in participant response to each question at pre- and post-seminar. We conducted an
9 inductive thematic analysis of open-ended survey responses.³⁰ Two researchers (MR and NT) independently
10 analyzed the responses by identifying codes and corresponding themes, with subsequent revision and
11 agreement by two senior researchers (KK and TG). The researchers met to discuss their individual codes and
12 themes until they reached consensus.

1 RESULTS.

3 *Student evaluation*

4 Of the 45 registered student participants, 40 attended including 10 (25.0%) attending virtually. Eighty percent
5 (n=32) self-identified as women and 57.5% (n=23) aged 25 to 30 years (**Table 1**). Sixty-five percent of the
6 students self-identified as White, 10.0% as Asian, 7.5% as Black/African American, 7.5% as Hispanic/Latino,
7 and 7.5% as Multiracial. Almost half (47.5%) were third- or fourth-year students, and most participants came
8 from the College of Medicine (35.0%). Half (n=20, 50.0%) of the participants completed the pre- and post-
9 seminar surveys; these results were compared for the EP and adapted IBKS.

11 For the EP scale, there was a statistically significant increase in the mean post-seminar score ($M = 30.6$, SD
12 $= 5.6$, $p < 0.001$, 95% CI [4.33, 1.27], $d = .86$; range 22-42), compared with the pre-seminar score ($M = 27.8$, SD
13 $= 6.8$; range 17-39), demonstrating learning (**Figure 1**). Furthermore, post-seminar scores skewed higher than
14 pre-seminar scores, with a majority of the post-seminar responses higher than the pre-seminar score median.
15 For the adapted IBKS, there was a significant improvement in knowledge and ability to address implicit biases
16 (**Table 2, Figure 2**). At the end of the seminar, 19/20 participants vs. 10/20 pre-seminar felt they had the
17 **skills** to identify solutions to their implicit biases ($p < 0.001$); 20/20 vs 15/20 felt **knowledgeable** about implicit
18 bias ($p < 0.05$); and 16/20 vs 6/20 felt qualified to explain the impact of implicit bias to others ($p < 0.001$).

20 **Table 3** reports three overarching themes and eight subthemes from the open-ended question responses with
21 illustrative quotes and reactions. Almost all participants stressed the importance of including education about
22 bias in healthcare training underscoring the relevance to their future practice. Some suggested that programs
23 like this be mandated for every student. The use of a video vignette with a real example and the inclusion of
24 an expert panel and small group discussions were described as major strengths of the seminar. Critiques
25 highlighted a desire for a longer seminar with additional time allotted for the small group discussions and
26 expert panel, and provision of resources for future reference.

28 Table 4 shows the joint display integrating qualitative and quantitative results, drawing from participants'
29 responses to open-ended survey questions. Participants agreed that implicit bias was present in most people
30 and that training to enable students to understand it and its negative effects on healthcare delivery is
31 essential.

33 *Facilitator Evaluation*

34 All 12 facilitators responded to the evaluation questionnaire, and 100.0% **agreed or strongly agreed** that
35 learners gained a deeper appreciation for the effect of bias and racism on health outcomes. Most facilitators
36 also noted that students' knowledge (58.0% of facilitators, n=7) and skills indicating behavioral change and
37 desired results (75.0% of facilitators, n=9) improved due to the seminar. They all **strongly or very strongly**
38 **agreed** that participants understood how bias and racism affect patient care and clinician experience. Fifty-
39 eight percent (n=7) thought that using a video vignette and guided discussion prompts for facilitators
40 effectively promoted student engagement and thoughtfulness in the small group discussions. They highlighted
41 the mix of panel discussion and small group discussions as unique, saying "*Small group structure allowed for*

1 *open discussion of bias. Students were open and willing to discuss. It was evident from discussion [that]*
2 *students identified salient points on recognizing and dealing with bias.”*

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DISCUSSION.

It is important to address bias in healthcare given its negative impacts on patient outcomes and the potential for perpetuation among healthcare professionals. Sun *et al.* reported that Black patients had 2.54 times the odds of having a negative descriptor in their medical record compared with White patients.³¹ Exposure to stigmatizing language through the medical record was associated with more negative attitudes towards patients³²⁻³³ and less aggressive pain management in patients with sickle cell disease.³⁴ Whether bias manifests through written records or verbal handoffs, these studies highlight the need for further anti-bias training in interprofessional settings to mitigate these behaviors and avoid inequitable treatment.

As a university with several health professions programs, IPE has been an important initiative for several years at our institution.³⁵ Although structural competency education is now required of many health professions degrees, this was not previously incorporated into the IPE curriculum, rather, addressed by individual colleges within their specific curricula. This student-developed "Bias in Healthcare" Seminar successfully introduced interdisciplinary health professions students to a realistic clinical scenario and provided a framework to navigate racial bias in healthcare. As a pilot study, one of the main goals was to trial this structure (video, discussion, panel) as an effective way to learn about this topic. Based on responses to the surveys, students agreed that it was, and encouraged interdisciplinary bias training to be included into the mandatory curriculum. The seminar addressed gaps in structural competency curricula in an engaging way while building interprofessional relationships.

The seminar evaluation indicated a significant increase in participant empathy towards people of racial/ethnic backgrounds different from their own, as well as increased knowledge of and ability to address the impact of implicit bias. The varied learning modalities promoted increased participant engagement. The video vignette provided specific examples for those with limited clinical experience and provided a foundation for further discussion. Interprofessional small groups provided a safe environment to reflect with peers in a setting similar to the interdisciplinary clinical team. The expert panel permitted students to learn about others' experiences with bias directly and through several lenses, including community concerns and institutional challenges. The sum of these experiences allowed students personal and professional growth by providing knowledge and opportunities for reflection and interaction with peers and community members.

Incorporating community members' voices is necessary when crafting viable solutions to healthcare challenges, including creating educational content.³⁶⁻⁴⁰ They offer valuable insight to students by allowing participants to hear directly from the people they will serve. This provides an understanding of the impact of their care in a way that traditional classroom lectures cannot. This seminar prioritized community engagement from project conception and production to implementation to ensure a more effective training and realistic experience for students. Other institutions should consider incorporating community voices into student training where feasible.

1 *Limitations*

2 This program was an optional, single-session student seminar implemented and evaluated at a single
 3 institution with a small sample size, which may limit generalizability. Conducting similar studies at multiple
 4 institutions could enhance generalizability. Strategies to improve participation could include additional
 5 participant incentives and adjusting the timeframe of the seminar to allow for strategic survey completion in-
 6 person before and after the seminar using QR codes. There was also no control group; inclusion of this could
 7 strengthen findings. Voluntary seminar participation may have led to a self-selection bias towards individuals
 8 who already exhibit baseline knowledge and empathy regarding bias in healthcare. While we obtained both
 9 pre- and post-seminar evaluations, these did not assess the long-term impact of the seminar on participants,
 10 and unmatched post-seminar evaluations limited assessments of change of evaluation scores for 50.0% of
 11 participants. Future research should include longitudinal assessments to measure the lasting impact of the
 12 seminar. The seminar was planned and executed during the COVID-19 pandemic, resulting in unique
 13 challenges with volunteer participation and partial virtual participation. Lastly, as a pilot the seminar's scope
 14 was limited to racial bias and does not represent the full spectrum of bias patients may experience in
 15 healthcare.

16

17 *Future Seminars/Next Steps*

18 Based on post-seminar feedback, future seminars will be expanded to 1.5 hours with a goal of full
 19 incorporation into the IPE curriculum which would make the seminar mandatory, leading to a more diverse
 20 participant pool and mitigating self-selection bias. Further emphasis on illustrating strategies to address bias
 21 in situations within a power differential as the subordinate would be beneficial for the student population.
 22 Longer-term goals include offering seminars to faculty and staff excluded from this pilot, which focused on
 23 student learners. Data could be gathered of student performance in the clinical setting relating to treatment of
 24 patients with or without bias, months or years post-seminar to determine the longer-term impact/results of
 25 seminars (Kirkpatrick Model's level 4). Furthermore, the program produced high-quality videos that can be
 26 directed for use in on-demand learning on this topic.

27

28 Anti-bias curricula for health professions students are an important part of the educational experience, as the
 29 reality of downstream health implications for patients may not be easy to envision for students with limited
 30 clinical experience if this is not explicitly addressed. Building on interactive, interprofessional approaches with
 31 realistic examples can allow students with limited clinical experience to improve their delivery of care.
 32 Understanding these topics and how to address them is key to being a well-rounded clinician who provides
 33 patient-focused care. Institutions should build on this framework as they create content for both anti-bias and
 34 interprofessional training.

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1 **SUMMARY - ACCELERATING TRANSLATION**

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3 This report discusses the successful implementation and outcomes of an interactive, interprofessional pilot
4 seminar addressing racial bias in healthcare for health professions students. The seminar aimed to raise
5 awareness and provide strategies to mitigate bias in healthcare, contributing to the broader goal of fostering
6 equitable patient care.

7

8 In the seminar, 40 students participated in a 1-hour session comprising a video vignette, interprofessional small
9 group discussions, and interaction with a health equity expert panel. Pre- and post-seminar assessments
10 measured Ethnic Perspective-Taking (EP) and an adapted Implicit Bias Knowledge Scale (IBKS) to evaluate
11 the impact on participant empathy and knowledge. Qualitative feedback was gathered to further assess the
12 effectiveness of the seminar.

13

14 The findings revealed a significant increase in post-seminar EP scores, indicating improved empathy towards
15 racial and ethnic diversity. The adapted IBKS demonstrated significant enhancements in participant knowledge
16 in certain areas regarding implicit bias. Participants advocated for the inclusion of bias education in healthcare
17 training, emphasizing the seminar's effectiveness in promoting awareness and understanding of bias.
18 Facilitators reported that learners developed a deeper appreciation for the effects of bias and racism on health
19 outcomes. Most facilitators observed improvements in student knowledge and skills, highlighting the seminar's
20 success in achieving its educational objectives.

21

22 The seminar addressed the critical need for both interprofessional and health equity education in health
23 professions training. By incorporating community voices and realistic examples, the seminar engaged students
24 effectively without requiring significant resources for those who would replicate this experience.

25

26 Limitations of the study include its single-session format and a focus on racial bias. Future seminars plan to
27 expand in duration, address power differentials, and target faculty and staff. The high-quality videos produced
28 during the program offer valuable resources for on-demand learning on this critical topic.

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30 In conclusion, this interactive, interprofessional seminar effectively promotes understanding of the impact of
31 bias on patient care, fostering awareness and promoting equitable care delivery in health professions education.

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1 **FIGURES AND TABLES.**

2 **Box 1. Seminar Learning Objectives and Schedule/Implementation**

1A. Learning Objectives (LOs) addressed with the Interprofessional Bias in Healthcare Webinar

(LO1) Describe the effect of bias and race-based healthcare on patient care.

(LO2) Create an environment of inclusive excellence by listening actively and encouraging the ideas and opinions of other team members.

(LO3) Discuss how to recognize and react to bias in yourself and others.

(LO4) Recognize appropriate language for having discussions about bias in health care.

1B. Seminar Schedule/Implementation

12:00 – 12:10 pm: Welcome remarks/ Session overview/ Lunch distribution

12:10 – 12:20 pm: Viewing of video vignette (large group)

12:20 – 12:45 pm: Facilitated small group discussions (eight groups in person [one of these at a satellite campus]; five virtual group meetings via Zoom conferencing). Below are some of the discussion questions used to guide conversation:

- Can you identify examples of bias in this video?
- Discuss examples of bias in healthcare you've experienced (or witnessed)?
- What could you learn from the discussion about bias in the last scene?
- Should Dr. J have specifically pointed out the comment about Black people having a higher pain tolerance? What would that conversation look like?
- Is it important to use the word "racism" when you see it happen? Are there situations that would be more or less appropriate to do this? Why or why not?

12:45 – 1:00 pm: Healthcare Equity Experts panel and dismissal

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1 **Table 1. Bias in Healthcare Seminar Participant Characteristics (N=40)**

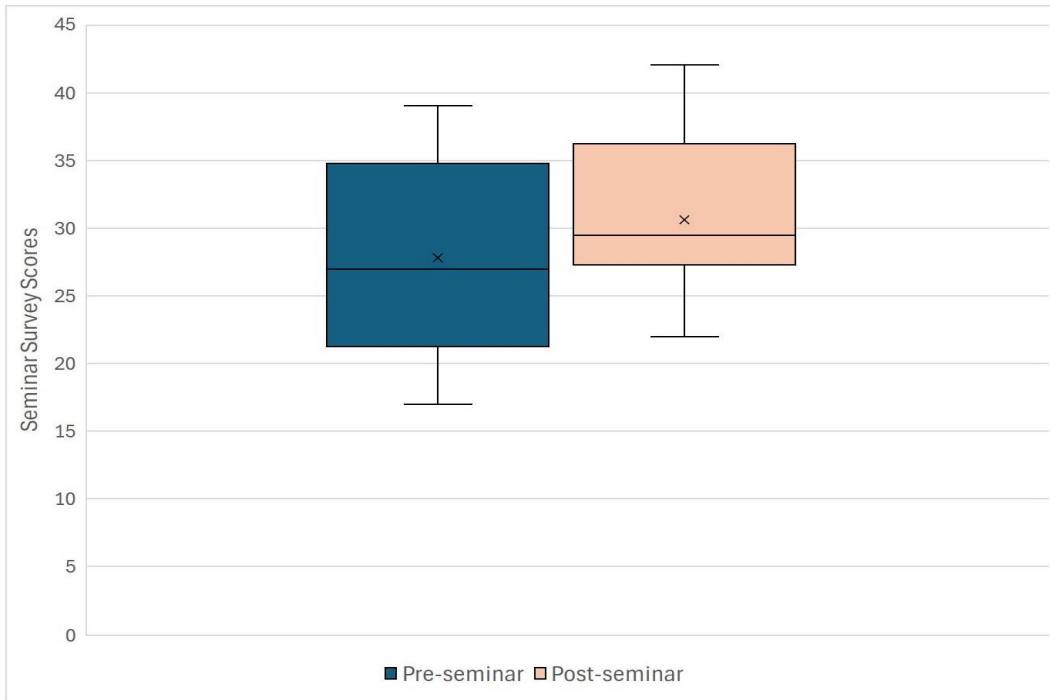
	N (%)
Age	
18-24	14 (35.0)
25-30	23 (57.5)
31-40	3 (7.5)
Gender	
Woman	32 (80.0)
Man	8 (20.0)
Nonbinary/other	0
Racial/ethnic identity	
Asian	4 (10.0)
Black/African American	3 (7.5)
Hispanic/Latino	3 (7.5)
White	26 (65.0)
Multiracial/Biracial	3 (7.5)
No disability	39 (97.5)
Member of the LGBTQ+ community	8 (20.0)
Year in school	
1	9 (22.5)
2	10 (25.0)
3	12 (30.0)
4	7 (17.5)
College affiliation	
CAHP	8 (20.0)
COD	3 (7.5)
COM	14 (35.0)
CON	1 (2.5)
COP	3 (7.5)
COPH	2 (5.0)
Graduate Studies	6 (15.0)
Others*	4 (9.6)

*Others include MD-PhD scholars

College of Allied Health Professions (CAHP), College of Dentistry (COD), College of Graduate Studies (CGS), College of Medicine (COM), College of Nursing (CON), College of Pharmacy (COP), and College of Public Health (COPH)

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1 **Figure 1. Ethnic Perspective-Taking Score Comparisons (N=20)**



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	Pre-seminar scores	Post-seminar scores
Mean (SD)	27.8 (6.8)	30.6 (5.6)***
Median (3 rd quartile-1 st)	27.0 (34.7-21.5)	29.5 (36.2-27.2)
Range (max-min)	22 (39-17)	20 (42-22)

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4 Box plot showing the pre- and post-seminar responses to the Ethnic Perspective-taking survey questions. *t*-test
 5 = 3.83 (***) $p \leq 0.001$ when comparing pre- and post-seminar mean scores. Note that higher scores indicate
 6 greater ethnic perspective-taking.
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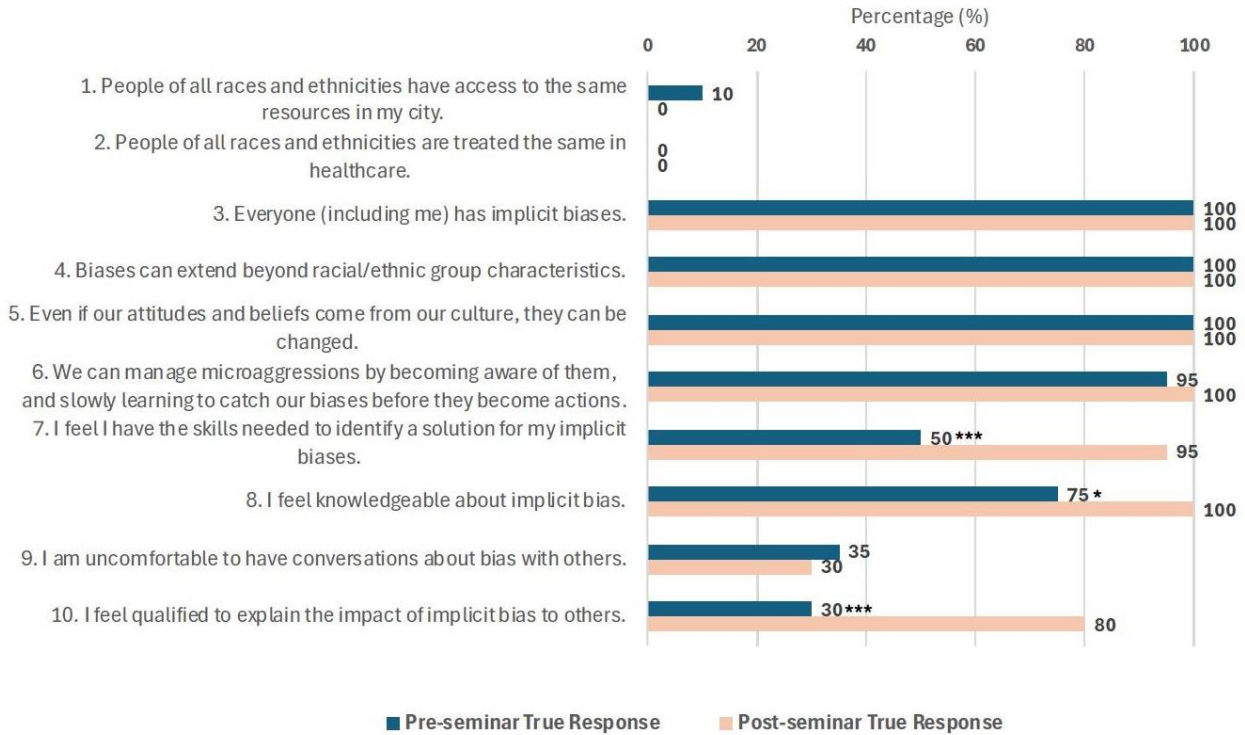
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Table 2. Adapted Implicit Bias Knowledge Scale Responses (N=20)

	Pre-seminar True Response	Post-seminar True Response	Difference	CI Lower Bound	CI Upper Bound	Effect Size
Question	N (%)	N (%)	N (%)			
1. People of all races and ethnicities have access to the same resources in my city.	2 (10.0)	0 (0.0)	2 (10.0)	2.1	.15	.32
2. People of all races and ethnicities are treated the same in healthcare.	0 (0.0)	0 (0.0)	0 (0.0)	-	-	-
3. Everyone (including me) has implicit biases.	20 (100.0)	20 (100.0)	0 (0.0)	-	-	-
4. Biases can extend beyond racial/ethnic group characteristics.	20 (100.0)	20 (100.0)	0 (0.0)	-	-	-
5. Even if our attitudes and beliefs come from our culture, they can be changed.	20 (100.0)	20 (100.0)	0 (0.0)	-	-	-
6. We can manage microaggressions by becoming aware of them, and slowly learning to catch our biases before they become actions.	19 (95.0)	20 (100.0)	1 (5.0)	1.0	.31	.22
7. I feel I have the skills needed to identify a solution for my implicit biases.	10 (50.0)	19 (95.0)	9 (45.0) ^{***}	10.2	.001	.71
8. I feel knowledgeable about implicit bias.	15 (75.0)	20 (100.0)	5 (25.0) [*]	5.7	.02	.53
9. I am uncomfortable to have conversations about bias with others.	7 (35.0)	6 (30.0)	1 (5.0)	.11	.74	.07
10. I feel qualified to explain the impact of implicit bias to others.	6 (30.0)	16 (80.0)	10 (50.0) ^{***}	10.1	.001	.71

N= Number of "True" responses, which at times shows more or less implicit bias knowledge, depending on the question; ^{***}p<.001, ^{*}p<.05; "-" indicates constant values for the item

1 **Figure 2. Adapted Implicit Bias Knowledge Scale Responses (N=20).**



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Bar graph showing the percentage of true responses from seminar participants pre- and post-seminar (**p<.001, *p<.05). N= Number of "True" responses, which at times shows more or less implicit bias knowledge, depending on the question

Table 3. Themes of Student Perceptions Regarding Racial Bias and the Seminar

Themes Subthemes	Representative Comments (Participant Role/Number)
Existing inadequate or insufficient bias training	
Necessity of such programs in health professionals' training	"...It's essential that all students learn about bias in healthcare as many patients, particularly those of racial and ethnic minority groups, often do not receive quality care because their experiences are overlooked. Learning about bias can reduce negative experiences of all patients." (Student 19)
	"I think [bias in healthcare] is very important. I really think this type of experience should be mandated for future healthcare professionals. To help combat bias people need to first understand that they have bias (even if they don't realize it)." (Student 3)
Traditional health training does not address implicit bias	"I want more concrete examples of how bias manifests in healthcare settings...I want more opportunities to practice addressing my own implicit biases, because practice is going to be the only way I get better at acknowledging and working to change my implicit biases as I'm working as a health care provider." (Student 21)
Strengths of Seminar	
Video vignette provided tangible examples	"It was so helpful to have a video with specific examples to reflect on together, and it helped many people in our discussion group recall similar personal experiences that they shared." (Student 15)
Small focus group discussions	"The small group discussion and expert panel were the most helpful but also would not have been as helpful without the video vignette preceding them. Since these bias problems center around people-to-people interactions I think discussing and communicating with others is the best way to learn and grow in this area." (Student 3)
In-person experience	"For me, an in-person setting for this event in particular was so valuable. There was a level of connection and understanding between our group members that I feel would have been lost in an online format." (Student 15)
Suggested improvements to/expansion of seminar	
Increasing allotted time for certain training components	"I would have loved if there was more time for the discussion and the expert panel!" (Student 7)
Provide support material to participants with actionable steps	"Her verbiage was excellent. I would love a transcript of some of the phrases she used. That was something I felt this session lacked - there was an elevation of awareness, but I didn't feel I walked away with specific tools I could use in the real world." (Student 22)
Suggestions for expanding sessions	"I just think this should be expanded upon—a video vignette and conversation about 1) LGBTQIA patients, 2) Patients with strict cultural norms that we think of as "strange", 3) Low SES patients we may have a socioeconomic bias toward." (Student 18)

1 Participant comments categorized into themes and subthemes with examples.

2 **Table 4. Joint Display of Qualitative and Quantitative Results**

Key Quantitative Results	Key Related Qualitative Results	Interpretation
<p>“Everyone (including me) has implicit biases”</p> <p><i>No change in pre- and post-seminar responses</i></p>	<p><i>Increased awareness of implicit bias</i></p> <p>“My main takeaway was that implicit bias is present before we ever even meet the patient and that needs to be actively worked against.” (Student 6)</p>	<p>Participants recognized the existence of bias in themselves and others and noted that training such as the seminar should be integral to an education in healthcare.</p>
<p>“Biases can extend beyond racial/ethnic group” characteristics</p> <p><i>100% of respondents agreed both pre- and post-seminar. No change in pre- and post-seminar responses</i></p>	<p><i>Current bias training is inadequate, and participants were interested in learning more about potential biases.</i></p> <p>“Everyone did great. I just think this should be expanded upon—a video vignette and conversation about 1) LGBTQIA patients, 2) Patients with strict cultural norms that we think of as “strange”, 3) Low SES patients we may have a socioeconomic bias toward.” (Student 18)</p> <p>“I think we need programs like this more often, with greater variety of subject material covered...” (Student 18)</p>	<p>A participant called for bias training to extend beyond race and ethnicity to include other marginalized groups.</p>

1 Includes a selection of quantitative and qualitative results displayed jointly; qualitative results come from the
 2 Adapted Implicit Bias Knowledge Scale while the quotes are from the participants' responses to open-ended
 3 survey questions.
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