Advances in Medical Education and Practice

Dovepress
Taylor & Francis Group

Open Access Full Text Article

ORIGINAL RESEARCH

Defensive Responses to Implicit Association Tests and Bias Awareness in an Implicit Bias Mitigation Training

Janice Sabin[1], Eric Mick[2], Ethan Eisdorfer[3], Majid Yazdani[4], Maria M Garcia[4], Janet Fraser Hale[5], Jill Terrien[5], Geraldine Puerto[2], Vennesa Duodu[2], Valerie Zolezzi-Wyndham[6], Joshua Rumbut[2], Joanne Calista[7], Olga Valdman[3], Stacy Potts[3], Jeroan Allison[2], Michele Pugnaire[3], Jennifer Tjia[2]

[1]Department of Biomedical Informatics and Medical Education, University of Washington, Seattle, WA, USA; [2]Department of Population and Quantitative Health Sciences, UMass Chan Medical School, Worcester, MA, USA; [3]Department of Family Medicine, UMass Chan Medical School, Worcester, MA, USA; [4]Department of Medicine, UMass Chan Medical School, Worcester, MA, USA; [5]Tan Chingfen Graduate School of Nursing, UMass Chan Medical School, Worcester, MA, USA; [6]Promoting Good, Worcester, MA, USA; [7]Center for Health Impact, Worcester, MA, USA

Correspondence: Jennifer Tjia, Department of Population and Quantitative Health Sciences, UMass Chan Medical School, 55 N Lake Avenue, AS6-2065, Worcester, MA, 01605, USA, Tel +1 774-455-3538, Email jennnifer.tjia@umassmed.edu

Background: Implicit bias education that utilizes the Implicit Association Test (IAT) to raise self-awareness of bias can induce defensiveness.

Objective: To describe clinical learners' bias awareness, self-perceptions of bias relative to colleagues (better-than-average), implicit and explicit biases and defensive response to the IATs.

Design: Cross-sectional study.

Participants: Internal medicine and family medicine residents, and Doctor of Nursing Practice students at a public medical and nursing school affiliated with a disproportionate share hospital and who completed an implicit bias recognition and mitigation educational program (including didactics, IATs, and communication skills training and practice with standardized patients) in 2018–2019.

Main Measures: We measured implicit and explicit attitudes and stereotypes, reactions to IAT results (defensive or not defensive), better-than-average perceptions, bias awareness and participants' characteristics. We examined associations between defensive responses to the IAT and participant characteristics, self-reported explicit biases, bias awareness within self, society, and healthcare, and IAT scores.

Key Results: Of N=61 respondents, 57% were female and 59% White. We found moderate implicit bias favoring White people versus Black people, weak bias favoring White people versus Hispanic/Latinx people and moderate bias favoring White people on both race and ethnicity medical compliance stereotype IATs. Participants demonstrated awareness of bias in society and healthcare, but not within self. Eighteen percent were defensive regarding their IAT results. Perceptions of own bias (self) were always of their having less bias than their colleagues, and they were better-than-average. There were no statistically significant associations between IAT scores and participant demographics and no interaction effect between implicit bias, defensiveness and better-than-average scores.

Conclusion: Clinical learners hold moderate implicit biases, believe they have less bias than others, and almost 1-in-5 have a defensive response to IAT feedback. It is important to design implicit bias educational interventions to include reflection on personal bias and provide a safe environment to minimize defensiveness.

Keywords: implicit bias, defensiveness, implicit association test, educational program, healthcare bias

Introduction

Health and healthcare disparities exist within a system of structural racism that advantages some and disadvantages others. A multilevel approach must be used to remediate health inequities, from the policy and institutional level to individual level interventions.[1,2] Evidence suggests that healthcare clinicians hold negative implicit and explicit biases

Received: 30 August 2024
Accepted: 25 February 2025
Published: 19 March 2025

toward marginalized groups and other disadvantaged populations,[3–8] which can affect clinical decision-making,[5,9] interpersonal communication and patient care.[10] Implicit biases are "attitudes or stereotypes that affect our understanding, decision-making, and behavior, without our even realizing it."[11] In contrast, explicit biases reflect attitudes and beliefs that an individual holds which are available for introspection and which they can report. Research shows that implicit and explicit attitudes may coexist, even among egalitarian individuals.[10] Research shows that becoming aware of personal bias is an important first step toward mitigating the impact of bias in healthcare[12,13] and can result in being more receptive to bias feedback.[14]

Given the widespread social structural pathways to inequities, individuals may feel powerless to make a difference. However, increasing awareness of bias, coupled with communication skills training is a promising individual level strategy for narrowing healthcare disparity gaps for racially, ethnically, and socio-economically disadvantaged persons.[15] Implicit bias education for clinicians often focuses on a bias recognition and management model to mitigate the impact of clinician bias on healthcare delivery.[16] Implicit bias education for clinicians can increase awareness of bias,[17] and represents one component of a multilevel approach to address healthcare inequities.[1]

The Implicit Association Test (IAT)[18] with feedback on results is often used as a tool in health professions education to stimulate reflection on personal biases.[16] Personal bias awareness can result in greater receptivity to feedback and recognizing acts of subtle bias as acts of racial discrimination.[14] However, the use of the IAT needs to be done with care and an understanding of how learners may react to learning about their biases.[19] Howell et al, 2017 found that when people believe they are less biased than others, a common phenomenon, they may mount a defensive response when confronted with evidence of their implicit bias.[20] Greater understanding about how healthcare clinicians react to implicit bias education that includes the IAT with personal feedback is needed.

The purpose of this study was to explore the "I am better-than-average" (better-than-average) effect described in detail by Howell et al, 2017, and defensiveness to IAT feedback[20] among residents in internal medicine (IM) and family medicine (FM) and Doctor of Nursing Practice (DNP) students (hereafter referred to as 'clinical learners') engaged in a multi-component implicit bias recognition and mitigation educational program, COmmuNity-engaged SimULation Training for Blood Pressure Control (CONSULT),[21] as part of their required curriculum. In this report we examine the prevalence of defensive response to IAT feedback, personal characteristics associated with defensiveness, perceptions of being better than other clinicians (less bias), and awareness of bias within self, healthcare, and society among clinical learners. We also examine the relationship between better-than-average, defensiveness and IAT scores, as well as the relationship between defensiveness and awareness of bias within self, society and healthcare. Based on our prior research, we hypothesize that the better-than average effect and defensive responses to IAT feedback exists in among clinical residents.

Methods

Study Design

We conducted a cross-sectional study of self-reported implicit bias, explicit bias, and defensiveness to IAT feedback within the context of the CONSULT cluster randomized trial. (ClinicalTrials.gov: NCT 03375918). Details of the CONSULT educational program are described elsewhere.[21] Briefly, the intervention's core elements were: a) National Institute of Minority Health and Health Disparities-funded e-learning modules to build knowledge about health disparities, implicit bias, and patient-centered communication skills;[22] b) IAT with feedback to raise learners' personal bias awareness;[18] and c) bias-mitigating communication skills training with practice in clinical simulations with standardized patients who were drawn from the local community.[23]

Study Setting and Data Collection

Study Setting

CONSULT was integrated into the IM and FM residency programs and DNP curriculum at a medical and nursing school affiliated with a disproportionate share hospital. The patient population of the medical center included ~27% non-White

and 21% Hispanic/Latinx persons; ~34% of the medical center's surrounding county's residents do not speak English at home and 43% were low income.

Eligibility Criteria

Training programs assigned their own learners to participate in CONSULT. Participants provided informed consent for use of their data for outcomes analysis.

Measures

Implicit Association Test (IAT)

We asked participants to complete two race and ethnicity IATs [Black/White, Hispanic-Latinx/White][18] and two Race and Medical Compliance IATs [Black/White, Hispanic-Latinx/White].[24] Corresponding explicit bias questions (described below) were presented as per the standard protocol of Project Implicit, the IAT vendor. The Race Attitude IAT[18] measures implicit attitudes about race. The Race and Medical Compliance IAT[24] measures implicit beliefs about race and ethnicity and patient medical compliance. The IAT asks participants to pair facial images or representative words with value categories of good versus bad, positive versus negative.

Defensiveness

We asked three questions from Howell & Ratliff, 2017,[20] about participants reaction to the IAT, assessed on a 4-point scale (Strongly Disagree, Disagree, Agree, Strongly Agree) to measure degree of defensiveness after taking the IAT. The defensiveness questions are: "The IAT does not reflect anything about my thoughts or feelings unconscious or otherwise", "Whether I like my IAT score or not, it captures something important about me" and "The IAT reflects something about my automatic thoughts and feelings concerning this topic."[20]

Explicit Bias Measures

As per the standard protocol of Project Implicit when administering the IAT, participants were also asked about their own explicit beliefs.[25] We collected the following explicit measures to fully characterize our sample's attitudes and beliefs. Participants indicated their personal explicit attitude on a scale ranging from 1 = I Strongly Prefer Black [Hispanic-Latinx] People to White People to 7 = I Strongly [prefer White People to Black People] with a mid-point of "I like White People and Black [Hispanic-Latinx] People equally". We asked explicit race and ethnicity (Black [Hispanic-Latinx]) medical compliance questions, "In general, members of which group are more likely to be regarded as compliant patients?"

Better-Than-Average

In addition, we asked the same explicit questions that corresponded with the content of each IAT for "other health care providers" and calculated a difference score [Others minus Self] for better-than-average.[20,26] A positive score greater than zero demonstrates participant's perception that others have more bias than they do, or that they are 'better-than-others'.

Bias Awareness Scale

Trainees were asked to complete a 7-item Bias Awareness Scale, with items assessed on a 6-point scale (strongly agree to strongly disagree); higher scores indicate high levels of bias awareness in the domains of society, healthcare, and within oneself.[27]

Data Analysis

We used descriptive statistics (means, standard deviations, and frequencies) to characterize the clinician sample, mean scores for defensiveness, and item responses for the bias awareness scale. The IAT D effect was calculated using the standard IAT scoring algorithm.[28] The IAT D score ranges from −2 to +2, with zero indicating no relative preference between White people and Black [Hispanic or Latinx] people. An IAT D score that differs positively from zero some

degree of implicit preference for White people. Cohen's *d*, a standardized effect size measure, was calculated for each of the implicit and explicit measures. Cohen's *d* is interpreted as *d* of 0.20 = small effect, *d* of 0.5 = medium effect, and *d* of 0.80 = large effect.[29]

For the explicit measure we coded the seven-point response scale to range from −3 to +3, with zero indicating no relative preference for White people over Black [Hispanic-Latinx] people. An explicit measure mean that differs positively from zero indicates an explicit preference for White people over Black [Hispanic-Latinx] people. We compared means for the implicit and explicit measures for the complete sample of participants and by defensive/not defensive. We calculated the defensiveness score according to Howell, 2017 by averaging the three items.[26] Higher scores signified greater defensiveness.

We computed a "better-than-average" index from the implicit bias and explicit bias measures. Specifically, we subtracted people's pro-White estimates for themselves from their pro-White estimates for 'other health professionals'.[20] To the extent that people indicated that they had less anti-Black [Hispanic-Latinx] bias than did 'others', we considered them to be demonstrating the better-than-average effect. We calculated the Wilcoxon Rank Sum for each comparison of implicit and explicit measures between self and others to identify whether the difference was statistically significant.

We then examined the association between defensiveness and IAT scores, as well as between defensiveness and measures of bias awareness [personal, societal and in healthcare], using t-tests. The study was reviewed and approved by the UMass Chan Medical School Institutional Review Board (IRB). This study complies with the Declaration of Helsinki.

Results

By September 1, 2019, 125 trainees were assigned to the CONSULT training, and 61 enrolled and completed all assessments.

Defensiveness

We found that 18.0% of participants had a defensive response to feedback on their IAT scores. (Table 1) Characteristics of participants by defensiveness is shown in Table 2. There was no significant difference in participant characteristics by defensiveness except for age; those who were not defensive were younger than those who were defensive (34.7 years

Table 1 Feedback to the IAT Defensiveness Measure (N=61)

	Total			Defensive			Not Defensive			P value
	N	Mean	SD	N	Mean	SD	N	Mean	SD	
Implicit										
Q1. This IAT does not reflect anything about my thoughts or feelings unconscious or otherwise	61	2.57	0.78	11	3.45 Strongly agree	0.52	50	2.38	0.70	1.07E-05
Q2. Whether I like my IAT score or not, it captures something important about me (reverse coded)*	61	2.20	0.77	11	3.45 Strongly disagree	0.52	50	1.92	0.49	3.30E-13
Q3. The IAT reflects something about my automatic thoughts and feelings concerning this topic (reverse coded)*	61	2.16	0.76	11	3.36 Strongly disagree	0.50	50	1.90	0.51	3.58E-12
Average Post IAT Score	61	2.31	0.67	11	3.42	0.50	50	2.07	0.39	3.86E-14

Notes: Question 1: 4= Strongly Agree,3= Agree, 2= Disagree, 1= Strongly Disagree.*Questions 2 and 3: 1= Strongly Agree, 2= Agree, 3- Disagree, 4= Strongly Disagree (Howell, 2017).

Table 2 Characteristics of Trainee Participants (N=61)

Characteristic	Total	Defensive	Not Defensive	P value
	N (%)	N (%)	N (%)	
Age, mean (SD)	30.7(5.2)	34.7 (3.0)	29.8 (0.4)	0.0039
Sex				
Male	26 (41)	6 (55)	20 (40)	0.377
Female	35 (57)	5 (45)	30 (60)	
Specialty Program				
Family Medicine	9 (15)	1 (9)	8 (16)	0.298
Graduate School of Nursing	21(34)	6 (55)	15(30)	
Internal Medicine	31 (51)	4 (36)	27 (54)	
Race				
White	36 (59)	7 (64)	29 (58)	0.746
Asian (East Asian or South Asian)	9 (15)	2 (18)	7 (14)	
Black or African American	7 (11)	2 (18)	5 (10)	
Multi-Racial	3 (5)	0 (0)	3 (6)	
Other	6 (10)	0 (0)	6 (12)	
Ethnicity				
Hispanic / Latinx	6 (10)	0 (0)	6 (12)	0.046
Country of Birth				
US	41 (67)	8 (73)	33 (66)	0.667
Non-US	20 (33)	3 (27)	17 (34)	
Fluent in another language				
Yes	31 (51)	5 (45)	26 (52)	0.694
Number of IATs				
0	37 (61)	7 (64)	30 (60)	0.948
1	10 (16)	2 (18)	8 (16)	
2	6 (10)	1 (9)	5 (10)	
3–5	5 (8)	1 (9)	4 (8)	
6+	3 (5)	0 (0)	3 (6)	

versus 29.8 years, p= 0.004). There were no Hispanic-Latinx people in the defensive group compared to 12% of the not defensive group were Hispanic-Latinx people (p= 0.046).

Implicit Attitudes

We found weak to moderate implicit attitudes favoring White people on the Black/White and Hispanic-Latinx/White race attitude IATs and beliefs about race and medical compliance endorsing White people as more medically compliant (Cohen's d range: d=0.37– d= 0.63 respectively). (Table 3) We found no difference in any implicit bias measures by defensive and not-defensive to feedback on IAT scores.

Explicit Attitudes

Participants reported little explicit preference for Black versus White people, and Hispanic-Latinx versus White people (Cohen's d=0.22 and d=0.20) respectively. (Table 3) They ascribed strong explicit race and ethnicity bias to "other health professionals" (Cohen's d=1.11 and d=1.24) respectively. On the medical compliance IATs, participants reported that both they and other health professionals hold a strong association of White people as more compliant than Black and Hispanic-Latinx people, with Cohen's ds ranging from d= 0.78 to d=1.24. Those who were defensive held a moderate explicit association of White patients as more medically compliant than Hispanic-Latinx patients, compared to strong bias expressed among those who were not defensive (Cohen's d=0.50, and d= 0.91, p= 0.048). (Table 3) The same pattern held true for perceptions of medical compliance among other clinicians (Cohen's d=0.67, and d= 1.22, p= 0.01). Those participants who were defensive reported that

https://doi.org/10.2147/AMEP.S492884

Table 3 Implicit and Explicit Measures and Defensiveness

	Total				Defensive				Not Defensive				
	N*	**Mean**	**SD**	**Cohen's *d******	**N**	**Mean**	**SD**	**Cohen's *d***	**N**	**Mean**	**SD**	**Cohen's *d***	**P value#**
Implicit**													
Black-White	57	0.28	0.45	0.63	11	0.23	0.42	0.55	45	0.30	0.47	0.64	0.67
Hispanic/Latinx-White	56	0.18	0.50	0.37	10	0.28	0.60	0.46	45	0.17	0.48	0.36	0.56
Compliance: Black-White	58	0.24	0.45	0.53	10	0.14	0.59	0.24	47	0.25	0.41	0.60	0.50
Compliance: Hispanic/Latinx-White	57	0.20	0.46	0.45	8	0.19	0.48	0.39	48	0.21	0.47	0.45	0.92
Explicit**													
Self Black-White	58	0.09	0.39	0.22	11	0.09	0.30	0.30	46	0.09	0.41	0.21	0.98
Others Black-White	58	0.91	0.82	1.11	11	0.45	0.82	0.55	46	1.02	0.80	1.27	**0.04**
Self Hispanic/Latinx-White	57	0.12	0.63	0.20	10	0.20	0.42	0.47	46	0.09	0.66	0.13	0.61
Others Hispanic/Latinx-White	57	1.21	0.98	1.24	10	0.90	0.74	1.22	46	1.33	0.97	1.37	0.20
Compliance: Self Black-White	58	0.74	0.87	0.85	10	0.50	0.85	0.59	47	0.79	0.88	0.89	0.35
Compliance: Others Black-White	58	1.05	0.85	1.24	10	0.80	0.79	1.01	47	1.09	0.86	1.27	0.34
Compliance: Self Hispanic/Latinx-White	58	0.78	0.99	0.78	9	0.22	0.44	0.50	48	0.92	1.01	0.91	**0.048**
Compliance: Others Hispanic/Latinx-White	58	1.02	1.05	0.97	9	0.33	0.50	0.67	48	1.21	0.99	1.22	**0.01**

Notes: *N's less than 61 due to missing data **Implicit and Explicit Measures: negative numbers favor Black, Hispanic/Latinx, positive numbers favor White ***Cohen's *d*: effect size, strength of bias [M – 0/SD], Cohen's *d*, interpreted as: d = 0.2 is considered a "small" effect size, d = 0.5 a "medium" effect size, and d = 0.8 a "large" effect size (Cohen, 1988) #P value: difference between defensive/not defensive Bold indicates statistically significant at P < 0.05.

other clinicians held moderate explicit preference for White people and those who were not defensive reported that others held strong explicit race bias (Cohen's d=1.27, and d= 0.55, p= 0.04).

Better Than Average Beliefs

On all measures of explicit bias of "self" and "other healthcare professionals (others)" participants rated their own attitudes and stereotypes less biased than those of "others." Participants believe that they are "better-than-average", regardless of their defensiveness to feedback on their IAT scores.

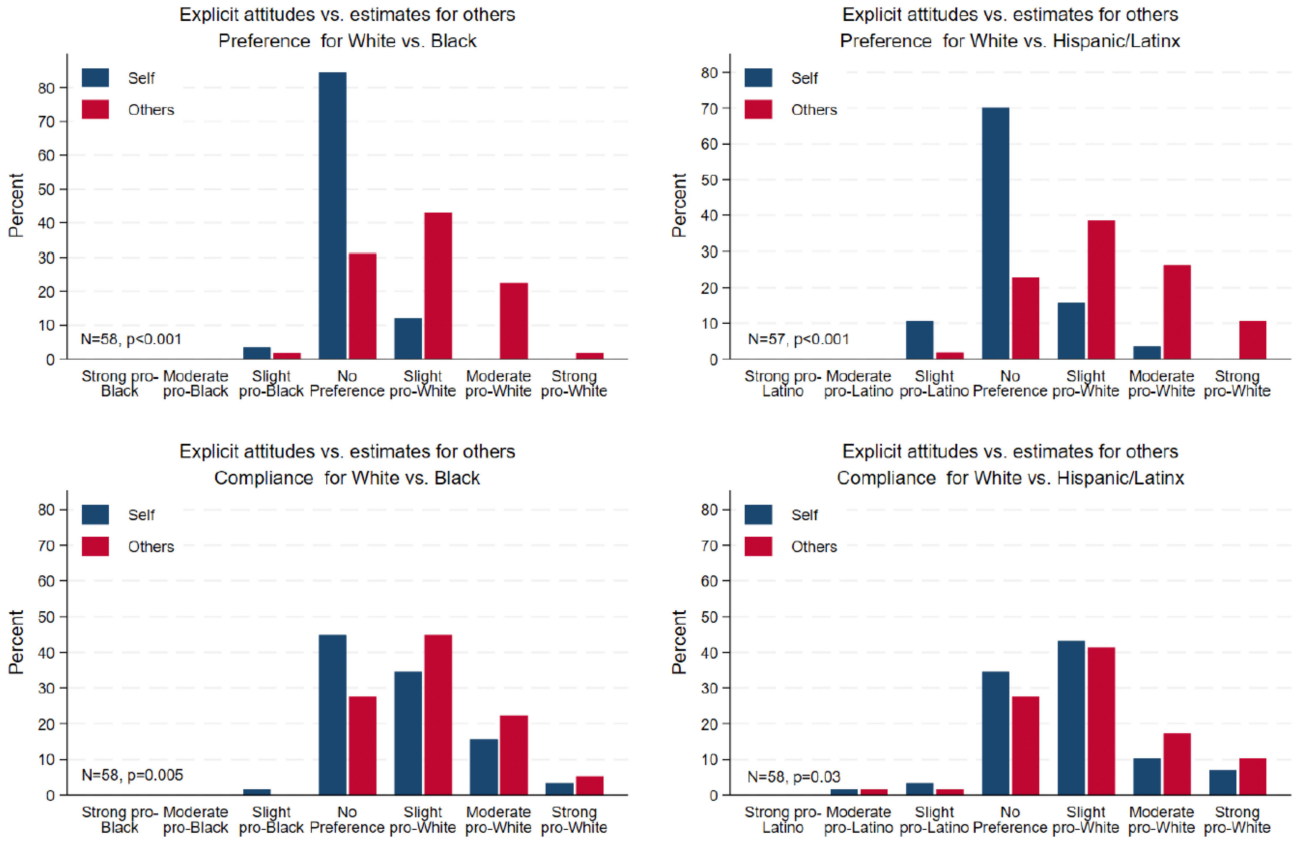

Figure 1 Better than Average beliefs, by 4 types of IAT assessments. For each IAT assessed, explicit bias is also measured. The better than average measure is based on a comparison of respondents' self-reported explicit attitudes of bias (blue bars) compared to their perception of explicit attitudes of bias among their peers (red bars). The figure shows better than average beliefs by each of the 4 IATs assessed, including White/Black bias, White/Hispanic-Latinx bias, White/Black compliance bias, and White/Hispanic Latinx compliance bias.

Figure 1 shows the distributions of explicit self-reports and expectations for others among participants in the study for four assessments: White vs Black, White vs Hispanic-Latinx; Medical Compliance among White vs Black, and Medical Compliance among White vs Hispanic-Latinx.

Bias Awareness

On the bias awareness scale,[26] participants were aware that there is bias in society and in healthcare. However, participants agreed that they are objective in their decision making, indicating they held very little awareness of possible personal bias. There was no significant difference in any bias awareness category between those who demonstrated defensiveness to feedback and those who did not (Table 4).

Interaction of IAT Scores, Defensiveness and Better-Than-Average

There were no statistically significant interactions, between IAT scores, defensiveness, and better-than-average for Race and Medical Compliance IATs (p=0.9 and p=0.7, respectively for the Black and Hispanic-Latinx conditions) or for Race Attitude IATs (p=0.4 and p=0.5) (Figure 2).

Discussion

In implicit bias education, a gap exists between what is either empirically or theoretically known to be effective, and what is actually delivered in the course of educational program implementation, particularly in the important but charged domain of implicit bias in healthcare. Awareness of personal bias may be a key step toward addressing the issue.[13] In the context of CONSULT, we examined whether clinical learners believed that they were less biased than their et.al (better-

Table 4 Defensiveness to Feedback on the IAT and Bias Awareness

	Total			Defensive			Not Defensive			
	N	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**P value**
Self										
In most situations, I am objective in my decision making	61	2.28	0.84	11	2.55	0.93	50	2.22	0.82	0.25
Biases do not usually influence my decision-making	61	3.00	1.24	11	2.45	0.93	50	3.12	1.27	0.11
Society										
People in today's society tend to treat people of different social groups (ie race, gender, class) equally	61	4.33	1.71	11	3.55	1.81	50	4.50	1.66	0.09
Society has reached a point where all people, regardless of background, have equal opportunities for achievement	61	5.15	1.08	11	5.09	1.04	50	5.16	1.09	0.85
Healthcare										
In healthcare bias against others is no longer a problem in the area of patient care.	61	5.16	0.84	11	4.91	1.04	50	5.22	0.79	0.27
In healthcare bias against others is no longer a problem in the area of training.	61	4.87	1.10	11	4.64	1.29	50	4.92	1.07	0.44
In healthcare bias against others is no longer a problem in the area of a diverse workforce.	61	4.97	1.05	11	4.82	1.33	50	5.00	0.99	0.61
Composite Score (Average)	61	4.25	0.74	11	4.00	0.62	50	4.31	0.76	0.22
Personal Bias	61	2.64	0.82	11	2.50	0.71	50	2.67	0.85	0.54
Societal Bias	61	4.74	1.19	11	4.32	1.06	50	4.83	1.21	0.20
Health Care Bias	61	5.00	0.92	11	4.79	1.12	50	5.05	0.88	0.40

Notes: Bias awareness score: 1 = strongly agree, 2 = moderately agree, 3 = slightly agree, 4 = slightly disagree, 5 = moderately disagree, and 6 = strongly disagree.

than-average), their bias awareness, and determined whether they had a defensive response to their IAT feedback. Recognition and acceptance of personal bias can be an emotionally uncomfortable experience for some.[12] If an individual accepts responsibility for holding implicit bias their discomfort can result in behavior and attitude change. If they do not accept personal responsibility for their feedback the result can be defensiveness.[12]

Almost one-fifth of our sample demonstrated defensiveness. Defensive responses to personal implicit bias are a barrier to engaging in implicit bias education and reduction of defensiveness should be attended to in education design. Vitriol & Moskowitz (2021) found that defensiveness to implicit bias feedback can be reduced by education that increases perceptions that bias can be controlled, reducing blame and moral threat.[30] If defensiveness does occur, one study found a paradox, that despite discrediting personal feedback on the IAT, medical residents reported that taking the IAT would impact the way they practice.[31] Thus, although positive reactions to IAT feedback are ideal, it appears that negative reactions to IAT feedback may motivate some individuals to engage in anti-bias education.

Our findings show that clinical learners are aware that bias in society and healthcare exists. Fewer acknowledged that bias can influence their own decision making. This lack of awareness of personal bias underscores the importance of the didactic component of the CONSULT educational program that aimed to increase knowledge and awareness of disparities in healthcare and the complex interplay between implicit bias and clinical decision-making. For the implicit medical compliance and Hispanic-Latinx stereotype, we found that participants who were not defensive reported a stronger explicit belief of White patients rather than Hispanic-Latinx patients being more medically compliant than did defensive participants. We speculate that these non-defensive participants may have been more willing to admit their personal bias than those who were defensive.

To our knowledge, ours is first study to measure the phenomenon of "better-than-average"[20] in regard to racial and ethnic attitudes and race/medical compliance beliefs among clinical learners. We found that the majority of participants perceived themselves as less biased than other health professionals. This finding is consistent with prior studies of other individuals who feel that their personal racial bias is not as strong as that of their peers.[20,27] Future research should

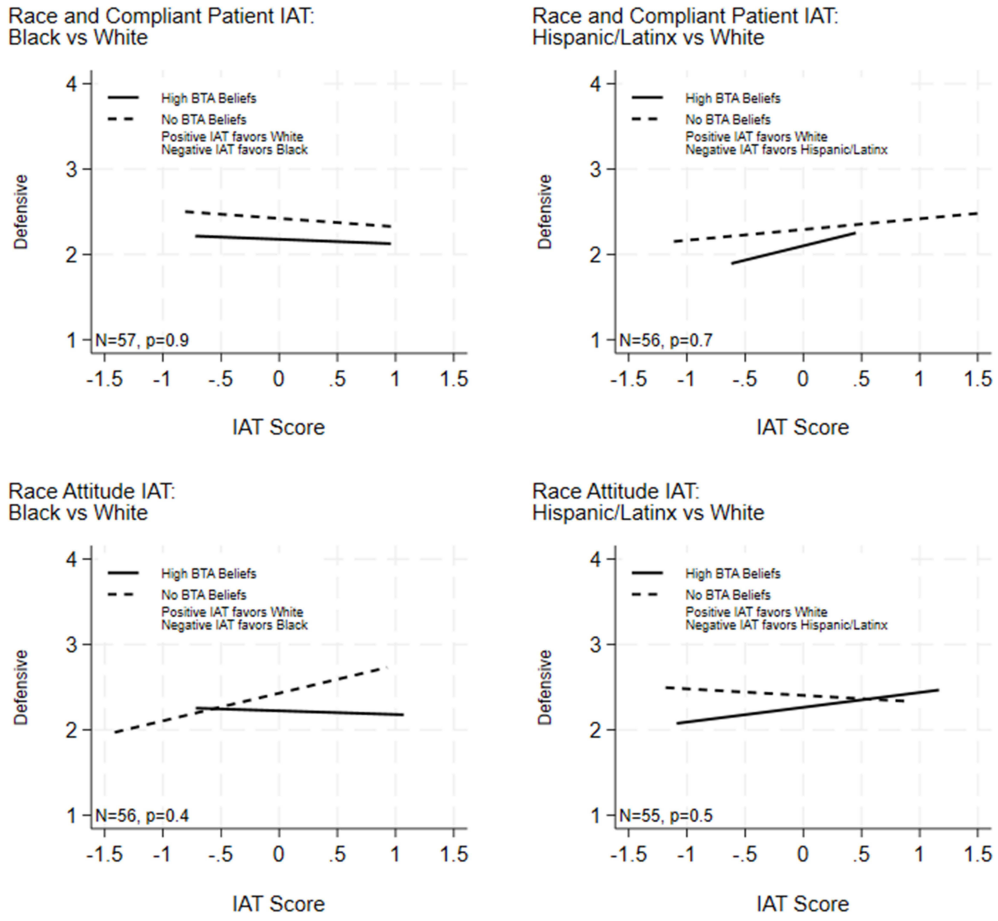

Figure 2 Relationship between Better-than-Average, defensiveness and IAT scores, by 4 types of IATs.Better-than-average Measure: [Bias Other Healthcare Professionals – Bias Self].These figures compare those with high better-than-average to those with no better-than-average. A positive score greater than zero demonstrates participant's perception that they are less biased or "better" than others.

examine the impact of learners' better-than-average beliefs and clinician's response to implicit bias educational interventions, clinicians' receipt of feedback on personal bias, and patient reported experiences in the health care system.

Taken together, our findings underscore the importance of proactively addressing clinical learner defensiveness to feedback on their biases, incorporating mitigation of defensiveness, and understanding better-than-average beliefs into educational interventions to mitigate bias in clinical encounters. Since this study was originally conducted, and in response to feedback from learners and faculty and in light of growing awareness of the need to address learner defensiveness in implicit bias education,[16] we re-designed the subsequent CONSULT educational program to reduce the number of IATs requested and we made the IAT an optional component.[32] This work leads us to question what constitutes best practice for designing an implicit bias recognition and mitigation program that allows for and addresses clinical learner defensiveness?

Emerging evidence from another program called "African American Community Speaks" (AACS), a program that aims to present community member generated lessons about racism and end-of-life communication challenges within a clinician communication training, offers an alternative strategy for raising learners' awareness of bias while creating space for defensiveness and allowing it to dissipate.[33] AACS has been delivered to more than 189 clinicians from 38 institutions and has an increasing demand for use.[34] Some main differences between CONSULT and AACS is that: 1) AACS does not use the IAT as an awareness-building experience, and 2) AACS is designed based on Kolb's experiential learning theory, which has a holistic perspective that includes experience, perception, cognition and behavior.[35] Specifically, AACS uses the first stage of "experience" as an awareness-building experience by asking learners to reflect on a "cringe-worthy" encounter that may be evidence of their potential for biased behavior in care delivery. The AACS

https://doi.org/10.2147/AMEP.S492884

trainer then asks learners to hold that "experience", while hearing external information about the stories of bias from community-members, and then ask the learners to reinterpret their existing experiences in light of new information. Kolb's learning cycle has four stages: concrete learning, reflective observation, abstract conceptualization and active experimentation. Early AACS findings suggest that defensiveness dissipates during the trainings and often transforms to gratefulness for learning new skills. (Personal communication) Future research needs to identify evidence-based bias defensiveness mitigation strategies.

Our study has several limitations. First, this was completed at a single academic institution, which limits generalizability. Second, this was completed in 2019, before the George Floyd tragedy ignited a groundswell of racism awareness and diversity, equity, and inclusion programs to address its effects. Third, the trial from which these data were collected was powered to examine clinical outcomes for patients of the participating clinicians who are presented in this manuscript. Since many participants did not provide consent to use their data for this analysis, our findings may be underpowered. Finally, our learner participants were racially, ethnically, and linguistically diverse; this sample may not be widely generalizable to other training programs. Mitigating this, our study is the first to examine better-than-average reactions and defensiveness in clinical learners in the contact of IAT use.

Conclusion

While the etiology of healthcare disparities are multifactorial and embedded in systems of inequity, there have been extensive efforts to combat contributing factors such as differential access to care, differences in healthcare outcomes for racial, ethnic and poor populations persist.[15] Working at the individual level, our effort was to implement theoretically sound and novel approaches to building clinician skills to mitigate bias and enhance patient-clinician communication across intercultural differences. The integration of IATs and bias awareness is increasing in healthcare system education, knowledge of how to efficiently and effectively engage learners in all stages of their career in efforts to be aware of and work on mitigating their implicit biases in a psychologically safe and respectful way are still largely unknown. Our paper provides additional areas of attention such as clinicians' defensiveness to feedback and personal bias awareness when designing implicit bias recognition and mitigation education.

Data Sharing Statement

The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research supporting data is not available.

Ethics Approval and Consent to Participate

The study was reviewed and approved by the UMass Chan Institutional Review Board (IRB) protocol #H00012160. All participants were asked to provide informed consent for inclusion of data for outcomes analysis.

Acknowledgments

We thank the clinical learners and community members who participated in this study and without whom this work would not have been possible.

Funding

Research reported in this research R01 MD011532. The funding was supported by the National Institute of Minority Health and Health Disparities of the National Institutes of Health under award number organization was not involved in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; or decision to submit the manuscript for publication.

Disclosure

Dr Jill Terrien reports personal fees from Pri-Med LLC and Glaxo Smith Kline, outside the submitted work. The authors have no other conflicts of interest in this work.

References

1. Evans MK, Rosenbaum L, Malina D, Morrissey S, Rubin EJ. *Diagnosing Treating Systemic Racism*. *N Engl J Med* 2020;383(3):274–276.
2. Williams DR, Cooper LA. Reducing racial inequities in health: using what we already know to take action. *Int J Environ Res Public Health*. 2019;16(4):606. doi:10.3390/ijerph16040606
3. van Ryn M, Burke J. The effect of patient race and socio-economic status on physicians' perceptions of patients. *Soc Sci Med*. 2000;50(6):813–828. doi:10.1016/S0277-9536(99)00338-X
4. Bogart LM, Catz SL, Kelley JA, Benotsch EG. Factors influencing physicians' judgments of adherence and treatment decisions for patients with HIV disease. *Med Decis Mak*. 2001;21(1):28–36. doi:10.1177/0272989X0102100104
5. Green AR, Carney DR, Pallin DJ, et al. Implicit bias among physicians and its prediction of thrombolysis decisions for black and white patients. *J Gen Intern Med*. 2007;22(9):1231–1238. doi:10.1007/s11606-007-0258-5
6. Sabin J, Nosek BA, Greenwald A, Rivara FP. Physicians' implicit and explicit attitudes about race by MD race, ethnicity, and gender. *J Health Care Poor Underserved*. 2009;20(3):896–913. doi:10.1353/hpu.0.0185
7. White-Means S, Zhiyong D, Hufstader M, Brown LT. Cultural competency, race, and skin tone bias among pharmacy, nursing, and medical students: implications for addressing health disparities. *Med Care Res Rev*. 2009;66(4):436–455. doi:10.1177/1077558709333995
8. Penner LA, Dovidio JF, West TV, et al. Aversive racism and medical interactions with black patients: a field study. *J Exp Soc Psychol*. 2010;46 (2):436–440. doi:10.1016/j.jesp.2009.11.004
9. Sabin JA, Greenwald AG. The influence of implicit bias on treatment recommendations for 4 common pediatric conditions: pain, urinary tract infection, attention deficit hyperactivity disorder, and asthma. *Am J Public Health*. 2012;102(5):988–995. doi:10.2105/AJPH.2011.300621
10. FitzGerald C, Hurst S. Implicit bias in healthcare professionals: a systematic review. *BMC Med Ethics*. 2017;18(1):19. doi:10.1186/s12910-017-0179-8
11. Kang J, Bennett MW, Carbado DW, et al. Implicit bias in the courtroom UCLA law review. *Hepato-Gastroenterology*. 2012;59(5):1126. doi:10.5754/hge11631
12. Howell JL, Lofaro N, Ratliff KA. Responding to feedback about implicit bias. *Soc Personal Psychol Compass*. 2024;18(1):e12926. doi:10.1111/spc3.12926
13. Kite J, Gale J, Grunseit A, Li V, Bellew W, Bauman A. From awareness to behaviour: testing a hierarchy of effects model on the Australian make healthy normal campaign using mediation analysis. *Prev Med Rep*. 2018;12:140–147. doi:10.1016/j.pmedr.2018.09.003
14. Perry SP, Dovidio JF, Murphy MC, van Ryn M. The joint effect of bias awareness and self-reported prejudice on intergroup anxiety and intentions for intergroup contact. *Cultur Divers Ethnic Minor Psychol*. 2015;21(1):89–96. doi:10.1037/a0037147
15. Institute of Medicine Committee on Understanding and Eliminating Racial and Ethnic Disparities. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Health CS, Bd SAY, Nelson AReditors. Washington (DC): National Academies Press (US); 2003.
16. Sukhera J, Watling C. A framework for integrating implicit bias recognition into health professions education. *Acad Med*. 2018;93(1):35–40. doi:10.1097/ACM.0000000000001819
17. Sukhera J, Watling CJ, Gonzalez CM. Implicit bias in health professions: from recognition to transformation. *Acad Med*. 2020;95(5):717–723. doi:10.1097/ACM.0000000000003173
18. Greenwald AG, McGhee DE, Schwartz JL. Measuring individual differences in implicit cognition: the implicit association test. *J Pers Soc Psychol*. 1998;74(6):1464–1480. doi:10.1037/0022-3514.74.6.1464
19. Sukhera J, Wodzinski M, Rehman M, Gonzalez CM. The implicit association test in health professions education: a meta-narrative review. *Perspect Med Educ*. 2019;8(5):267–275. doi:10.1007/S40037-019-00533-8
20. Howell JL, Ratliff KA. Not your average bigot: the better-than-average effect and defensive responding to Implicit Association Test feedback. *Br J Soc Psychol*. 2017;56(1):125–145. doi:10.1111/bjso.12168
21. Tjia J, Pugnaire M, Calista J, et al. COmmuNity-engaged simulation training for blood pressure control (CONSULT-BP): a study protocol. *Medicine*. 2021;100(5):e23680. doi:10.1097/MD.0000000000023680
22. Schaik EV, Howson A, Sabin J. Healthcare disparities. *MedEdPORTAL*. 2014;10.
23. Ziv A, Wolpe PR, Small SD, Glick S. Simulation-based medical education: an ethical imperative. *Simul Healthc*. 2006;1(4):252–256. doi:10.1097/01.SIH.0000242724.08501.63
24. Sabin JA, Rivara FP, Greenwald AG. Physician implicit attitudes and stereotypes about race and quality of medical care. *Med Care*. 2008;46 (7):678–685. doi:10.1097/MLR.0b013e3181653d58
25. Nosek BA, Smyth FL, Hansen JJ, et al. Pervasiveness and correlates of implicit attitudes and stereotypes. *Eur Rev Soc Psychol*. 2007;18(1):36–88. doi:10.1080/10463280701489053
26. Howell JL, Gaither SE, Raltliff KA. Caught in the middle: defensive responses to IAT feedback among whites, blacks, and biracial black/whites. *Soc Psych Personality Sci*. 2015;6(4):373–381. doi:10.1177/1948550614561127
27. Girod S, Fassiotto M, Grewal D, et al. Reducing implicit gender leadership bias in academic medicine with an educational intervention. *Acad Med*. 2016;91(8):1143–1150. doi:10.1097/ACM.0000000000001099
28. Greenwald AG, Nosek BA, Banaji MR. Understanding and using the implicit association test: i. *An Improved Scoring Algorithm J Pers Soc Psychol*. 2003;85(2):197–216. doi:10.1037/0022-3514.85.2.197
29. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. New York, NY: Routledge Academic; 1988.
30. Vitriol JA, Moskowitz GB. Reducing defensive responding to implicit bias feedback: on the role of perceived moral threat and efficacy to change. *J Exp Soc Psychol*. 2021;96:104165. doi:10.1016/j.jesp.2021.104165
31. Sukhera J, Wodzinski M, Milne A, Teunissen PW, Lingard L, Watling C. Implicit bias and the feedback paradox: exploring how health professionals engage with feedback while questioning its credibility. *Acad Med*. 2019;94(8):1204–1210. doi:10.1097/ACM.0000000000002782
32. Tjia J, Pugnaire M, Calista J, et al. Using simulation-based learning with Standardized Patients (SP) in an implicit bias mitigation clinician training program. *J Med Educ Curric Dev*. 2023;10:23821205231175033. doi:10.1177/23821205231175033
33. Elk R, Barnett M, Thompson M, Tate V, Nichols A. African American communities speak to palliative care clinicians: evaluation of an innovative community-developed communication skills training program (GP726). *J Pain Symptom Manag*. 2020;60(1):260–261. doi:10.1016/j.jpainsymman.2020.04.149

34. Elk R, Barnett MD, Tucker RO, et al. African Americans communities speak to healthcare providers: clinical practice outcomes (RP322). *J Pain Symptom Manag*. 2024;67:e558
35. Kolb DA, Boyatzis RE, Mainemelis C. Experiential Learning Theory: Previous Research and New Directions. Perspectives on Thinking, Learning, and Cognitive Styles. *Edu Psychol Series*;2001:227–247.