Does Unconscious Bias Affect How Pediatricians Manage Their Patients?

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ABSTRACT

Background: Both implicit bias—referred to as unconscious bias—and explicit bias affect how clinicians manage patients. The Implicit Association Test (IAT) has incremental predictive validity relative to self-reports of unconscious bias. Few studies have uniquely specified the impact of unconscious bias in pediatric practices.

Objective: We aimed to assess the influence of unconscious bias on decision-making in the faculty in a pediatric academic center using the IAT, in addition to and separately applying clinical vignettes with racial and socioeconomic class associations in both tools as it relates to clinicians' race, gender, years in practice, education achieved by the clinician's parents, and language spoken.

Methods: We conducted a prospective quality control evaluation of faculty in an academic center's pediatrics department. An anonymous online tool was used to gather IAT responses, clinical vignette responses, demographics, and explicit bias questions.

Results: Of 295 faculty members (73% females), 230 completed the questionnaire, at least in part. Faculty reported on the explicit bias questions, neutral feelings when comparing the demands of educated vs noneducated patients, African American vs European American patients, and patients in the upper vs lower socioeconomic class. Of the approximately two-thirds who answered the IAT, faculty showed preference for European American and upper socioeconomic class. However, the clinical vignettes revealed no differences in how faculty responded to patients based on race or socioeconomic status when stratified by factors listed above, except physicians who favor upper socioeconomic class over lower socioeconomic class were more likely to give a detailed explanation of options if the patient's parent was upper socioeconomic class ($P = 0.022$).

Conclusions: Pediatricians exhibit racial and socioeconomic unconscious bias that minimally affects decision-making, at least based on vignette responses.

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BACKGROUND

According to the Institute of Medicine's (IOM) Unequal Treatment report, health systems offer unequal quality of care, affecting some racial/ethnic groups.[1] Medical practitioners may have unconscious biases that influence their practice of medicine, although most will not demonstrate overt prejudice against certain group of patients.[1] The IOM in 2002 described many disparities in medical care, underscoring the need to understand how clinicians' bias, stereotyping, and prejudices contribute to health care disparities.[2] Unconscious bias may be more significant when clinicians are tired, overloaded with information, and have limited time to spend with patients.[3,4] Clinicians in these circumstances may be more likely to make assumptions based on previous experiences and stereotypes.[5-7]

Self-reporting of biases is unreliable, mainly because of the desire for social acceptance and difficulties with introspection.[8] Few tools are available for measuring unconscious bias. The most frequently used tool is the Implicit Association Test (IAT). Other methods are available but are either experimental[9] or difficult to implement in large cohorts, such as the priming method.[8]

IAT is a priming method that evaluates the automatic associations between an object, race, socioeconomic class, and an attribute (good, bad, dangerous, safe). The IAT was developed to assess unconscious bias, with 2 types of objects being associated. One

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is an attitude object, like ugly and beautiful; the other is a target object of bias, such as race or socioeconomic class. In the target set, there may be a picture of a European American or African American face. Depending on the speed of clicking the keyboard—the association between the attitude set and the target set—a value is obtained, which is used to derive the IAT D score. People tend to respond faster to items they like when paired with positive attitude and items they dislike when paired with negative attitude.[11] The validity of the IAT has been assessed in many settings, including race, sex, and nationality.[11] Based on the speed of response, a score is generated.[10] IAT scores are reported based on a Cohen *d* score, which normalizes by comparing means and dividing by the standard deviation.[12] The higher the score, the higher the unconscious bias. However, there are some concerns around IAT. Participants can develop strategies to pair the 2 sets of items or attempt to slow down the association of an attitude object with a pleasant attribute. Despite these concerns, the IAT is currently the tool of choice to assess unconscious bias.[8] Cunningham et al demonstrated that the IAT is consistent across time and measures.[13]

In the United States, biases against patients of color are significant. Physicians having different racial/ethnic backgrounds are more verbally dominant with African American patients than with European American patients and engage less in communication with patients of color.[14] Clinicians are positively biased towards European American patients and negatively towards young women[5] and often are biased against African American and Hispanic patients.[15-18] This bias against African American patients is similar for any ages, including children,[19] and has been found at all levels of pediatric faculty, from leadership to people involved in recruitment.[20] Sadly, unconscious bias against African American patients affects outcomes.[5] For example, when pediatric patients are seen in the emergency department (ED) for abdominal pain, African American patients are less likely to receive analgesics.[21] Interestingly, unconscious bias affecting patient management was not observed when caring for obese children.[22]

Our study was conducted in a medical center in Milwaukee, Wisconsin. In 2006, the city of Milwaukee ranked as worst in health outcomes compared to all 72 Wisconsin counties.[23] In 2019, Milwaukee was described as one of the most impoverished and racially segregated urban centers in the nation.[24] In Milwaukee, the ZIP codes with the lowest socioeconomic class (LC) had a > 2.0 increased risk ratio when compared to the upper socioeconomic class (UC) in sexually transmitted diseases, no health insurance, lack of health care, smoking during pregnancy, and physical inactivity. Ten of approximately 26 ZIP codes in the city of Milwaukee meet the criteria for LC.[23] Given the significant poverty and racial issues in Milwaukee, the aim of this quality improvement project was to understand the racial and socioeconomic bias of pediatricians and determine if this bias affected how they managed their patients. This topic has been explored minimally, with only 2 studies looking at unconscious biases toward race[25,26] and, to the best of our knowledge, none looking at unconscious biases regarding socioeconomic class. If we want to make changes, it is critical that we understand the problem and have baseline information prior to implementing potential interventions. With this in mind, we developed a proposal to obtain baseline information regarding a potential problem in the pediatrics department of an academic center in Wisconsin. We postulated that pediatric faculty are biased against LC African American patients, but that this bias would not affect patient management. We also hypothesized that female faculty and faculty with a diverse background, measured by speaking more than 1 language or being born outside the US, would be less biased than male faculty, faculty born in the US, and/or only English-speaking faculty.

METHODS

We designed a survey to prospectively understand implicit bias in our faculty on a deidentified basis. Since this was considered a quality improvement project, our institutional review board (IRB) determined that it did not qualify as research or human subject research and, therefore, did not require an IRB submission. The evaluation was performed in the pediatrics department in November and December, 2018, prior to starting an intervention training to raise awareness about unconscious bias.

With an online tool providing anonymity, unconscious bias was assessed by the racial and socioeconomic associations in IAT, and clinical judgement was assessed through 2 possible sets of clinical vignettes that differed only by the description of the socioeconomic condition or a picture of a pediatric European American or African American. This methodology was modified and adapted for pediatrics from Haider, et al.[27] Answers to the vignettes were scored as acceptable, neutral, and unacceptable. The questions and answers were developed by the authors, who agreed which answers were acceptable, neutral, and unacceptable. The questions addressed informed consent, trust, and reliability. We also included questions assessing gender; race; continent of birth, if not born in the US; language spoken; education achieved by parents of professionals to assess cross-generational impact; income; ZIP codes where the faculty resides; and questions regarding explicit bias. Explicit bias was assessed by asking the faculty how they felt towards statements regarding different group of patients (Tables 1 and 2). They would rate their reaction from 0 to 10, with 0 being cold, 5 being neutral, and 10 being warm. The vignettes described a clinical scenario and had either a picture of a European American patient or a patient of color. Other questions described the same scenario in a family of upper socioeconomic class and in a family of lower socioeconomic class, with the same answer, hoping to determine if there was bias toward one group or the other regarding patient management or credibility.

All pediatric department faculty received via email an online link with a brief explanation of the goal of this instrument:

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As part of the DOP (Department of Pediatrics) Diversity and Inclusion Assessment, I would ask you to complete as best as you can these questions, vignettes and the association of items at the end. This is completely anonymous and will be administered via third party (Project Implicit at Harvard University). We will only have access to aggregate data and will not know your individual answers, therefore no identifiers will be shared with DOP officials. I really appreciate your help in this Assessment.

The decision to administer this tool though a third party (Project Implicit, Harvard University) was secondary to faculty expressing concerns about potential consequences if their data would be known to department leadership. We divided the IAT D score into 3 categories due to sample size:[27] (1) ≥ -2 and ≤ -0.15 are equal to "any preference for African American over European American" or "any association for LC with Approach and UC with Avoid;" (2) > -0.15 and <0.15 are equal to "little to no preference between European American and African American" or "little to no association between UC and LC with Approach and Avoid;" (3) ≥ 0.15 and ≤ 2 are equal to "any preference for European American over African American" or "any association for UC with Approach and LC with Avoid." Explicit bias was assessed by asking about cold/warm ratings as described in Tables 1 and 2 as well as how they felt towards Hispanic, European American, poor, uneducated, educated, and wealthy patients.

Statistical analysis was performed utilizing SAS 9.4 and SPSS 24.0. Chi-square or Fisher exact tests were used for comparing categorical variables (ie, categories of IAT D scores), and results were reported as number (%). Cochran-Armitage trend test was used to compare the trend of proportions between categorical variables (ie, survey A vs B) as the levels of ordinal variable increases (ie, vignette answers from "unacceptable" to "neutral" to "acceptable"). Nonparametric Kruskal-Wallis and Mann-Whitney U tests were used to compare continuous variables (ie, IAT D score), and results were reported as median (interquartile range). Spearman correlation summarized the relationship between continuous variable (ie, IAT D score) and ordinal variables (0-10 Likert scale conscious bias ratings). We compared proportions of IAT scores ≥ 0.15 to 50% using a 1-sample test of proportions, and results were reported as percentage (95% CI). Missing data patterns were examined by comparing responses for those who answered and those who did not and, where they may not be missing at random, are described. An unadjusted *P* value <0.05 is reported as statistically significant.

Table 1. Ratings for Explicit Bias to Statements

Please rate how cold or warm you feel in relation to the following statements (0 = coldest; 5 = neutral; 10 = warmest): Median (IQR)	Total (N=213)
Educated patients are more demanding than less educated patients	5 (5-6)
Less educated patients are more demanding than educated patients	5 (3-5)
Caucasian patients are more demanding than African-American patients	5 (5-5)
African-American patients are more demanding than Caucasians	5 (3-5)
Poor patients require much more attention than wealthy patients	5 (3-5)
Wealthy patients require much more attention than poor patients	5 (3-5)
Wealthy patients are more demanding than poor patients	5 (5-6)
Poor patients are more demanding than wealthy patients	5 (3-5)
Missing	N = 17

Abbreviation: IQR, interquartile range.

Table 2. Ratings for Explicit Bias of Patients by Socioeconomic Factors

Please rate how cold or warm you feel in relation to the following patients (0=coldest; 5=neutral; 10=warmest): Median (IQR)	Total (N=213)
Hispanic non-Caucasian patients	5 (5-8)
Caucasian patients	5 (5-7)
Poor patients	5 (5-8)
Uneducated patients	5 (5-8)
Educated patients	5 (5-8)
Wealthy patients	5 (5-7)
Missing	N=17

Abbreviation: IQR, interquartile range.

RESULTS

Demographics

Of 295 total department faculty members, 230 (166 females [73%], 61 males [27%], 3 unidentified) completed part or all the questionnaire, IAT, and vignettes (Table 3). Most of the respondents had a medical or doctoral degree (n = 173 [76%]), 52 (23%) had a master's degree, and 3 (1%) were advanced nurses or physician assistants. Only 10 (4%) reported themselves as Hispanic. Eighty percent (n = 184) reported being married, 19 (8%) single, 15 (7%) living with a partner, and 11 (5%) divorced/separated. Most respondents reported themselves as White/Caucasian (n = 183 [83%]), followed by Asian (n = 26 [12%]), and most were born in the US (n = 187 [83%]) or Asia (n = 23 [10%]). The majority had lived in the US for ≥ 20 years (n = 214 [94%]), with 220 (96%) being US citizens, 4 (2%) had permanent residence, and 4 (2%) had a temporary visa. Approximately one third of respondents had been practicing for >19 years (n = 72 [31%]) while one fourth had been practicing 0 to 4 years (n = 55 [24%]). Sixty-seven percent (n = 155) only spoke English at home, and 75 (33%) spoke other languages. Most respondents' parents had an advanced degree (n=120 [53%]) or undergraduate degree (n = 54 [24%]); 39 (17%) of the respondents' parents had a high school diploma or an associate degree (n = 13 [6%)]. Five (2%) respondents lived in ZIP codes designated as LC.

Explicit Bias

In relation to explicit bias, median ratings reported by faculty were neutral when comparing the demands of educated to less-

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educated patients, African American to European American patients, and LC to UC patients (Tables 1 and 2).

Vignettes

For the vignettes, we did not find any difference in how faculty responded to an African American or European American picture in relation to informed consent ($P = 0.22$) and patient trust ($P = 0.11$). Neither did the faculty show a difference in how they responded to social class vignettes that were assessed for patient reliability ($P = 0.51$), informed consent ($P = 0.18$), and patient trust ($P = 0.91$).

Responses to Vignettes By Those Who Did vs Did Not Complete IAT

Twelve faculty did not respond to the clinical vignettes. Of the remaining 218 respondents, only 146 (67%) completed the racial IAT, and 165 (76%) completed the socioeconomic IAT. We compared answers to the clinical vignettes for those who completed the IAT and those who did not. There were no significant differences in response to the clinical vignettes, except by the Cochran-Armitage trend test (not the chi square or Fisher exact test). Those who did not complete the racial IAT had a nonsignificant response between both sets of clinical vignettes ($P = 0.75$), whereas those who did complete the racial IAT had a borderline significant result (Cochran-Armitage trend $P = 0.047$) when comparing the proportions of vignette answers regarding patient trust. Faculty who completed the racial IAT were more likely to believe the patient's story behind cause of injury if the patient was African American and less likely if the patient was European American.

The IAT D score for racial bias had a median of 0.319 (95% CI, 0.064-0.590); for socioeconomic bias, the median was 0.609 (95% CI, 0.334-0.820). Of the 146 faculty who completed the IAT for racial bias, 100 (68%) had an IAT D score ≥0.15, while 29 (20%) were neutral (IAT D score > -0.15 and < 0.15, Table 4). Similarly, of the 165 faculty who completed the IAT for socioeconomic bias, 139 (84%) had an IAT D score ≥ 0.15, while only 18 (11%) had a neutral feeling. The proportions of racial IAT D score ≥ 0.15 (68% [60%-76%], $P < 0.0001$) and socioeconomic IAT D score ≥ 0.15 (84% [78%-89%], $P < 0.0001$) were significantly higher than by chance (50%). Thus, on the IAT, more than half of the respondents showed a preference for European Americans vs African Americans, as well as a preference for UC over LC.

Comparison of IAT D Scores and Vignettes

When we compared the vignette response in relation to informed consent, patient trust, and patient reliability with the IAT for race and socioeconomic class, we did not find any association in 4 of the 5 vignettes (Figures 1 and 2). In the vignette regarding informed consent, if a patient's parent is UC, physicians who favor UC over LC (socioeconomic IAT ≥ 0.15) are more likely to give a more detailed explanation of options, but those who favor

Table 3. Demographics of Department of Pediatrics Faculty

Demographics	Total (N = 230)
Gender: N (%)	
Female	166 (73.13)
Male	61 (26.87)
Missing	3
Highest educational attainment: N (%)	
Doctoral degree (DO/MD/PhD)	173 (75.88)
Master's degree	52 (22.81)
Advanced nurse/assistant	3 (1.32)
Missing	2
Marital status: N (%)	
Married	184 (80.00)
Single	19 (8.26)
Living with a partner	15 (6.52)
Widow/widower	1 (0.43)
Divorced/separated	11 (4.78)
Ethnicity: N (%)	
Non-Hispanic	220 (95.65)
Hispanic Caucasian	8 (3.48)
Hispanic non-Caucasian	2 (0.87)
Race: N (%)	
African American	3 (1.36)
Asian	26 (11.76)
Caucasian	183 (82.81)
Pacific Islander	3 (1.36)
African American and Caucasian	1 (0.45)
Caucasia and Native American	5 (2.26)
Missing	9
Region/continent of birth: N (%)	
United States	187 (82.74)
Africa	1 (0.44)
Asia	23 (10.18)
Central America	2 (0.88)
Europe	10 (4.42)
Other North American country	1 (0.44)
Pacific Islands	1 (0.44)
South America	1 (0.44)
Missing	4
Years lived in the United States: N (%)	
< 5 years	2 (0.88)
5-9 years	5 (2.19)
10-14 years	2 (0.88)
15-19 years	5 (2.19)
20 years or more	214 (93.86)
Missing	2
Citizenship status: N (%)	
US citizen	220 (96.49)
Permanent resident	4 (1.75)
Temporary visa	4 (1.75)
Missing	2
Other languages: N (%)	
Yes	75 (32.61)
No	155 (67.39)
Years in practice: N (%)	
0-4 years	55 (24.02)
5-9 years	44 (19.21)
10-14 years	30 (13.10)
15-19 years	28 (12.23)
>19 years	72 (31.44)
Missing	1
Parent's highest degree: N (%)	
High school diploma	39 (17.26)
Associate degree	13 (5.75)
Undergraduate degree	54 (23.89)
Advanced degree	120 (53.10)
Missing	4

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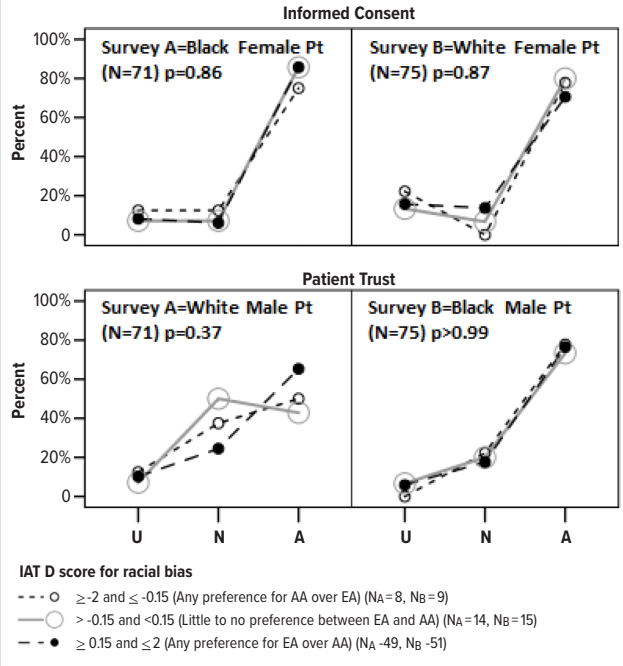
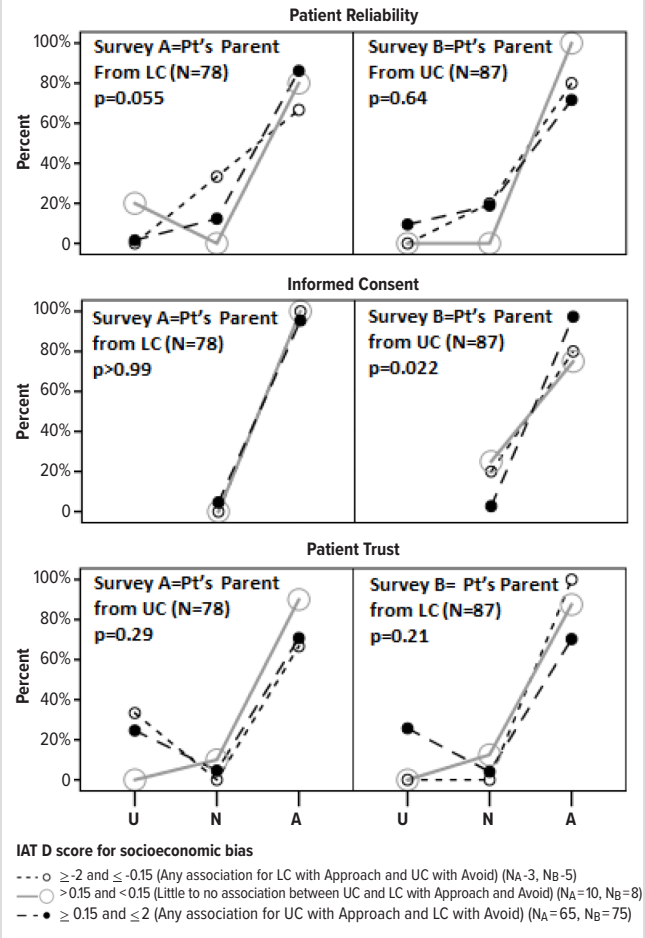
Figure 1. Responses to Clinical Vignette by IAT D Score for Racial Bias



Abbreviations: IAT, Implicit Association Test; Pt, patient; U, unacceptable; N, neutral; A, acceptable; AA, African Americans; EA, European Americans; N_A, sample size for Survey A; N_B, sample size for Survey B.

P values, calculated using Fisher exact test, examined association between vignette answers with categories of IAT D score for racial bias.

Figure 2. Vignette Responses by IAT D Score for Socioeconomic Bias



Abbreviations: IAT, Implicit Association Test; Pt, patient; LC, lower class; UC, upper class; U, unacceptable; N, neutral; A, acceptable; N_A, sample size for Survey A; N_B, sample size for Survey B.

P values, calculated using Fisher exact test, examined association between vignette answers with categories of IAT D score for socioeconomic bias.

LC (IAT ≤ -0.15) or have no preference (-0.15 < IAT < 0.15) are less likely ($P = 0.022$).

Comparison of IAT D Scores and Demographics

We did not find any association between IAT D score for socioeconomic bias and speaking other languages ($P = 0.29$), IAT D score for socioeconomic bias and parents of faculty's education achievement ($P = 0.49$), and faculty gender and IAT D score for racial bias ($P = 0.75$). The race of faculty also had no association with the IAT D scores for racial bias ($P = 0.43$). There was no difference for racial ($P = 0.61$) and socioeconomic ($P = 0.68$) IAT D scores based on years in practice (<5, 5-9, 10-14, 15-19, and >19), and after regrouping years in practice as <10 and >10, we still did not find any difference for racial ($P = 0.40$) and socioeconomic D score ($P = 0.38$). Due to the small sample size, we divided place of birth into 4 categories: US, Asia, Europe, and other (Africa, Central America, other North American country, Pacific Islands, and South America). Again, there was no significant difference in the racial ($P = 0.65$) and socioeconomic IAT D score ($P = 0.22$).

Comparison of IAT D Scores and Explicit Bias Ratings

Unconscious bias evaluated through the IAT (race and socioeconomic class) also was not related to the explicit bias reported by the faculty (data not shown).

Table 4. Categories of Unconscious Racial and Socioeconomic Bias by Pediatric Faculty

Demographics	Total (N=230)
IAT D score for racial bias: N (%)	
≥-2 and ≤-0.15 (Any preference for AA over EA)	17 (11.64)
>-0.15 and <0.15 (Little to no preference between EA and AA)	29 (19.86)
≥0.15 and ≤2 (Any preference for EA over AA)	100 (68.49)
Missing	84
IAT D score for socioeconomic bias: N (%)	
≥-2 and ≤-0.15 (Any association for LC with Approach and UC with Avoid)	8 (4.85)
>-0.15 and <0.15 (Little to no association between UC and LC with Approach and Avoid)	18 (10.91)
≥0.15 and ≤2 (Any association for UC with Approach and LC with Avoid)	139 (84.24)
Missing	65

Abbreviations: IAT, Implicit Association Test; AA, African Americans; EA, European Americans; LC, lower class; UC, upper class.

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DISCUSSION

Our study revealed significant findings: (1) pediatric faculty in the department is highly biased in favor of UC and European American individuals; (2) their unconscious bias was not related to faculty gender, race, number of languages spoken, place of birth, years in practice, and education of the faculty member's parents; (3) there was little evidence that unconscious bias affected how faculty managed patients evaluated by clinical vignettes, except faculty who favor UC were more likely to give detailed explanations of options if a patient's parent is UC than faculty who favor LC or have no preference; (4) unconscious bias did not relate to explicit bias; (5) answers to clinical vignettes did not vary between faculty who did and did not complete the IAT, except faculty who completed the racial IAT were more likely to believe the patient's story behind cause of injury if the patient was African American and less likely if European American.

Prejudice involves an attitude or prejudgment towards a group. This usually originates from previous experiences.[28] In our study, we used the IAT to assess racial and socioeconomic bias among pediatric faculty. Given that individuals' unconscious bias was probably developing since early childhood, our initial hypothesis was that faculty with more international background would have less unconscious bias. We also hypothesized that females would be less biased. Thus, we were surprised that none of these factors affected unconscious bias.

Clinical vignettes are accepted as a reliable measurement to assess clinical practice decisions.[29,30] Although the faculty showed racial and socioeconomic bias, this bias was not translated into how they managed patients. This finding was also reported in an extensive review of the literature by Maina et al,[31] who reported on 12 studies using vignettes. Out of the 12 studies, 8 found no association between the unconscious bias and how respondents managed patients.[31] One of the studies showing that unconscious bias affected patient care was a pediatric study by Sabin and Greenwald, who found that pediatricians' unconscious bias affected how they manage pain.[32] This seems to be the exception. In the few other pediatric studies reported, clinicians' bias was seldom reflected in patient management. A study of pediatricians in an urban academic center evaluating the treatment recommendations through clinical vignettes divided by patient's race for pain control, urinary tract infection (UTI), attention deficit hyperactivity disorder, and asthma control, found that the median IAT D racial score was 0.18 (95% CI, -0.26 to 0.62).[25] In our study, the racial bias (0.32 [95% CI, 0.06-0.59]) was slightly higher than that found in the previous referenced study, which differed from ours in that both faculty (41%) and resident/fellows (59%) were included, while we only included faculty. The study demonstrated a difference in the management of UTIs between European American and African American patients. European American patients were more often admitted to the hospital for treatment (unnecessary hospitalization). The authors did not find other significant differences in the management of the other disorders.[25]

Another study by Puumala et al performed in 5 EDs in urban and rural areas serving Native American Indian (NAI) children utilizing clinical vignettes and race IAT with pictures of NAI and European American children and adults found an unconscious bias preference for European American patients (average IAT score = 0.54, 95% CI, 0.47-0.62).[33] Furthermore, when the authors compared the pictures of children to those of adults, the mean IAT score for the child picture IAT was higher than that of adults. In this study, most clinicians were family practitioners, but nurses and advance practice providers wer also included. Interestingly, older providers (≥ 50 years) had lower unconscious bias than those who were middle aged (30–49 years) ($P = 0.01$). In relation to the correlation between clinical vignettes and race, the authors did not find any difference in the faculty regarding asthma treatment and pain control. Nurses were biased in declining to offer a work note to European American patients.

In contrast, in our study we did not find any difference regarding years in practice for unconscious bias. Furthermore, we only included advance practice providers who had faculty appointments. We did not look at age in relation to unconscious bias, but we did assess years in practice, which presumably would be related strongly to age. We also did not find any correlation between years in practice and unconscious bias. We are unclear why there is this difference between the Puumala study and ours. As individuals get older, racial biases may increase, perhaps due to failure to self-regulate.[34] This was obviously not the finding in either study.[33]

Unlike pediatrician studies, those involving adult medicine clinicians have shown that unconscious bias affects how they manage their patients. An extensive literature review described 17 studies that used the IAT tool, with at least 9 showing that unconscious bias against African Americans and in favor of European Americans was also reflected in the patient interaction.[5]

Our study and the literature review show that although pediatricians are biased in favor of European American patients, they are less likely to allow their biases to affect how they manage patients. In Milwaukee specifically, despite the fact that most of the faculty who provided their ZIP codes live in areas associated with UC (data not shown), and despite their bias against LC and African American people, their bias was minimally reflected in how they managed patients. Interestingly, we received a few emails from faculty complaining that the IAT was offensive, and several faculty members did not complete the IAT. We can speculate that, given the emails we received and some personal communications, some faculty would be uncomfortable answering the IAT. This is reflected in the difference we found between those who did and did not completed the IAT. Faculty who completed the racial

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IAT were more likely to believe the patient's story behind cause of injury if the patient was African American and less likely if European American, perhaps showing less bias against African American patients.

Questions arise from these findings: (1) why are pediatricians different from adult care providers? and (2) can unconscious bias be changed through training? For the first question, we could postulate that pediatricians tend to be more acculturated to demonstrate compassion and empathy for the targeted population, although there is no data published that supports this hypothesis. Further research is needed to answer this question.

In relation to changing unconscious bias, a study from the University of Wisconsin-Madison demonstrated that unconscious bias in psychology students can be changed though interventions.[35] Investigators based their intervention on the premise that to improve, persons must be aware of their bias and also need to be concerned about the consequences that bias produces. The authors evaluated unconscious bias utilizing the race IAT at baseline and 4 and 8 weeks post intervention. During a training session, the investigators gave the subjects 5 strategies for recognizing their biases. The intervention group showed a decrease in the IAT score at 4 and 8 weeks post intervention.[35] Another study in an ED utilized the IAT and some discussion to increase awareness of unconscious bias and how it affects patient care without repeating the IAT after the intervention.[7]

To change unconscious bias in medical institutions, the change has to be at the organizational and the personal level.[36] The organization has to recruit a significant number of underrepresented individuals and provide the needed support and environment for those individuals to thrive. The change in recruitment has to involve the medical school admissions, as well as the faculty and staff. To achieve this, women, minorities, junior faculty, and students need to participate in the admission committees.[36] Furthermore, there is a need to decrease the emphasis on the Medical College Admission Test and grade point average and be blind to those scores during the interview process and focus more on a holistic assessment of the candidates.[37] This can only be accomplished with a change in the structure and culture of leadership. The institution needs to assess frequently how the training of unconscious bias and cultural humility is changing the sense of belonging, mainly among underrepresented groups. At an individual level, individuals need to self-reflect and recognize their biases to decrease their effect in admission interviews, patient care, and interaction with colleagues.[36] There is preliminary data incorporating a skill-based curriculum for medical students through role-playing to address unconscious bias when they perceive it in the learning space.[38]

Our pediatrics department has now developed training in unconscious bias with the goal of reassessing the same variables after most of the faculty undergo the training. Furthermore, we plan to repeat the same evaluation 2 and 4 years later to see if the changes are sustained. Our belief is that to change unconscious bias, clinicians will need to undergo frequent training and self-reflection, understand microaggressions and micro-affirmations, have discussions on White fragility, reflect on examples of bias or lack of inclusion in the workplace, and promote empathy for people who look different from us to produce a deep and permanent change. To achieve a change, automatic responses have to change. This requires habituation through repetition of controlled interventions.[39] As reported in the literature, we postulate that a "one shot" intervention will not affect unconscious bias.[39] An article in *Harvard Business Review* concludes that unconscious bias training to increase bias awareness does not change behaviors.[40] Some people would even argue that unconscious bias training may even produce the opposite effect, produce more discrimination.To produce a change, companies need a firm and long-term commitment to the changes in bias and behaviors and not just a "check-the-box" obligation. To produce positive results, unconscious bias training needs to provide specific tools to change behavior. Furthermore, the institution needs to monitor the changes and act on those areas where there is no improvement.[40] It is very important that the training send the message that we can change our biases, provide a safe environment for discussion, and never include shaming or activities that may create a defensive response.[41]

Study Limitations

Our study has several limitations. First, although vignettes are thought to represent how professionals treat patients, the stress and time constraints of the medical system are not present when answering clinical vignettes. In "real life," unconscious bias may play a bigger role than demonstrated in our model. A future study may require direct observation rather than vignettes. Second, the faculty was aware that these questions were related to a diversity and inclusion initiative within the department, which may have influenced how they answered the vignettes and the explicit bias. A third of the 230 faculty didn't complete the racial IAT, and 65 respondents (28%) didn't complete the social IAT. The lack of answering any part of the IAT could also be related to bias. Our analysis excluded missing data, which could bias our results, especially if the data are not missing completely at random. Third, there may have been some bias in that not every faculty member participated, allowing for the possibility that the most biased individuals may have opted not to complete the instrument.

CONCLUSIONS

Unconscious bias is present in our pediatric faculty, but based on clinical vignettes, it minimally affects patient care decisions. Unconscious bias is not significantly different between genders, country of birth, and is not associated with years in practice or parental education.

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