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Are Medical Students Aware of Their Anti-Obesity Bias?

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Abstract

Purpose—Anti-obesity prejudices affect the quality of care obese individuals receive. The authors sought to determine the prevalence of weight-related biases among medical students and whether they were aware of their biases.

Method—Between 2008 and 2011, the authors asked all third-year medical students at Wake Forest School of Medicine to complete the Weight Implicit Association Test (IAT), a validated measure of implicit preferences for “fat” or “thin” individuals. Students also answered a semantic differential item assessing their explicit weight-related preferences. The authors determined students’ awareness of their biases by examining the correlation between students’ explicit preferences and their IAT scores.

Results—Of 354 medical students, 310 (88%) completed valid surveys and consented to participate. Overall, 33% (101/310) self-reported a significant (“moderate” or “strong”) explicit

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anti-fat bias. No students self-reported a significant explicit anti-thin bias. According to the IAT scores, over half of students had a significant implicit weight bias: 39% (121/310) had an anti-fat bias and 17% (52/310) an anti-thin bias. Two-thirds of students (67%, 81/121) were unaware of their implicit anti-fat bias. Only male gender predicted an explicit anti-fat bias (odds ratio 3.0, 95% confidence interval 1.8 – 5.3). No demographic factors were associated with an implicit anti-fat bias. Students' explicit and implicit biases were not correlated (Pearson r = 0.03, *P* = .58).

Conclusions—Over one-third of medical students had a significant implicit anti-fat bias; few were aware of that bias. Accordingly, medical schools' obesity curricula should address weight-related biases and their potential impact on care.

The prevalence of anti-obesity bias is on the rise in the United States.[1] Obese individuals are frequent targets of inappropriate humor and discrimination,[2–4] and Americans often associate obese individuals with negative attributes and laziness.[5] On average, physicians share the general population's strong anti-obesity bias.[6] Over half of primary care physicians in one study, for example, reported viewing obese individuals as "awkward, unattractive, ugly, and noncompliant with therapy."[7] Even physicians who specialize in treating obese patients possess unconscious anti-obesity attitudes.[8,9]

Physician's prejudice in general and their anti-obesity bias specifically can damage the physician-patient relationship and influence treatment decisions, thus affecting the quality of patient care. Medical students have reported that obese individuals are frequent objects of derogatory humor by their peers, residents, and faculty physicians.[10] Additionally, physicians and medical students are less likely to respect obese patients than normal weight patients, and they are more likely to view obese patients negatively.[11–14] Obese patients have reported that they notice these negative attitudes, describing that they receive derogatory comments from health professionals.[15] This anti-obesity stigma contributes to obese individuals avoiding public exercise and seeking fewer preventive medicine services.[16–20]

A prerequisite to combating prejudice is first acknowledging its existence. However, we do not know to what extent medical students possess an anti-obesity bias and whether they are aware of that bias. To find that medical students possess significant anti-obesity biases would have important implications for medical educators developing curricula to equip students with the skills they need to prevent and manage obesity, a condition that now affects one-third of Americans.[21]

To that end, we first must distinguish between the two types of biases: explicit and implicit.[22,23] Individuals are consciously aware of their explicit biases, which researchers can measure through individuals' responses to survey items. In contrast, implicit biases operate on an unconscious level. An implicit bias can be seen in an individual's first reaction or elicited emotion to a person, before conscious thought mediates the situation. Prior research shows that explicit and implicit biases are related but distinct constructs, and models that measure both are superior to models that attempt to capture preferences in general.[24]

Social scientists argue that most of our behaviors arise from automatic, unconscious (or implicit) reactions to stimuli in the environment.[25–27] These implicit reactions derive from our past experiences, cultural norms, and values.[26] Once we have the impulse to act, our conscious mind evaluates the impulse and chooses either to accept, reject, or modify it. Although both implicit and explicit biases guide behavior and are possible targets for educational interventions, implicit bias appears to be a better predictor of prejudice and discrimination.[28] We conducted a three-year survey study to determine the prevalence of

implicit (unconscious) weight-related biases among medical students and whether they were aware of those biases.

Method

Study setting and participants

We conducted our study at the Wake Forest School of Medicine. As part of an obesity management educational grant from the National Cancer Institute, we asked all third-year medical students to complete the Weight Implicit Association Test (IAT) during their family medicine clerkship. Three consecutive classes of students completed the survey between 2008 and 2011. The Wake Forest Baptist Health institutional review board approved the study protocol, and all participants provided informed consent.

Measurements

The IAT is a validated instrument that measures latent response times to determine individuals' implicit (unconscious) biases.[29–31] Several versions of the IAT are available to examine individuals' implicit biases related to race, age, gender, and sexuality, among other topics. The IAT has been used in numerous previous research studies examining bias.[28,30]

The Weight IAT asks students to pair images of "thin" or "fat" people with negative or positive words using a computer keyboard. The IAT is based on the principle that individuals can group similar items more rapidly than they can disparate items. Therefore, if an individual associates a particular group with negative attributes, it will be harder for that person to rapidly pair members of that group with positive words. By measuring latent response times over multiple pairings (or "trials"), the IAT estimates an individual's implicit preferences for one group over another (i.e., fat people vs. thin people). Individuals complete a series of practice trials followed by 64 timed trials, which together require approximately 7 to 8 minutes to complete.

The IAT *D* score reflects the standardized mean difference in latency timings between groups of pairings. The *D* score can range from −2 to 2 but typically ranges from −1 to 1. Based on prior published studies, we used students' *D* scores to stratify their implicit preferences as neutral (−0.15 to 0.15), slight (−0.16 to −0.35 or 0.16 to 0.35), moderate (−0.36 to −0.65 or 0.36 to 0.65), and strong (<−0.65 or > 0.65).[32,33] We considered a student's bias to be significant if his or her *D* score was "moderate" or "strong." We considered IATs with an error rate of at least 30% on repeated measures invalid and excluded them from our analysis.[34]

Students also completed a semantic differential item assessing their explicit preferences for fat or thin individuals with possible answers on a seven-point Likert scale ranging from "I (strongly) (moderately) (slightly) prefer fat people to thin people" to "I like thin people and fat people equally" to "I (slightly) (moderately) (strongly) prefer thin people to fat people." This semantic differential item is routinely included in IATs to measure explicit preferences.[29] Scores for this item ranged from −3 (I strongly prefer fat people) to +3 (I strongly prefer thin people).

Data analysis

To determine which factors, if any, predicted a significant anti-obesity bias, we created logistic regression models for the outcomes of having a significant implicit (unconscious) anti-obesity bias and a significant explicit (conscious) anti-obesity bias. We included as covariates age (as a continuous variable), gender, race/ethnicity, and time in the academic year when the survey was taken (beginning of third year, middle of third year, end of third

year). We conducted all analyses using SPSS software, version 19 (IBM Corporation, Armonk, New York) with two-sided tests and an alpha of .05.

We examined whether students were aware of their implicit bias in three ways. First, we compared students' self-reported biases to their implicit (unconscious) biases (prefer fat, slight or no preference, prefer thin) using chi-square tests. Second, we used the Pearson correlation coefficient to determine if students' self-reported biases (measured on the seven-point Likert scale) predicted their implicit biases (measured by the difference in latency times from the IAT). Third, we re-ran our multivariate logistic regression model for implicit bias, including students' explicit bias as a predictor variable to obtain the beta coefficient and significance level for explicit bias.

Results

The three third-year medical school classes (2008–2009, 2009–2010, and 2010–2011) that we surveyed included 354 geographically diverse students, representing at least 25 different states and 12 countries outside the United States. Of those 354 students, 324 took the IAT and consented to let us use their data (response rate of 92%). Response rates for individual classes ranged from 88% (106/121) in 2010–2011 to 96% (114/119) in 2009–2010. We excluded 14 students' surveys--four were incomplete and 10 had too many errors--yielding a final sample size of 310 students (effective response rate of 88%). See Table 1 for complete demographics data.

Explicit (conscious) bias

The majority of students (72%, 223/310) reported that they preferred "thin" people to "fat" people, and approximately one-third (33%, 101/310) reported this preference was moderate or strong. In comparison, only 1% (4/310) of students reported any preference for fat people, and this preference was no greater than a slight preference. Only gender was associated with students' preferences, with males being twice as likely as females to report a significant anti-fat bias ($P < .001$). See Table 2 for complete data.

Implicit (unconscious) bias

The majority of students (56%, 173/310) had a moderate or strong implicit weight-related bias. Overall, 39% (121/310) had an anti-fat bias, and 17% (52/310) had an anti-thin bias. The presence of an implicit weight-related bias did not vary by gender, race, age, clerkship timing, or academic year. See Table 3 for complete data.

Awareness of bias

Among the students with a significant weight-related bias, only 23% (40/173) were aware of that bias. Two-thirds of students (67%, 81/121) with a significant anti-fat bias thought they were neutral, and all students (100%, 52/52) with an anti-thin bias thought they were neutral or had an anti-fat bias. We found no significant correlation between students' stated bias and their implicit bias when examining the entire sample (Pearson correlation coefficient 0.03, $P = .58$) or individual subgroups by gender, age, or race. Similarly, an explicit weight-related bias was not a significant predictor of an implicit bias in our logistic regression model ($\beta = -0.14$, $P = .30$).

Logistic regression

In our multivariate logistic regression model, only male gender predicted an explicit anti-fat bias (odds ratio [OR] 3.0, 95% confidence interval [CI] 1.8 – 5.3). Students' explicit anti-fat bias decreased with age, but this finding was not statistically significant (OR 0.9 for each

one year increase in age, $P = .18$). Similar to the results of our bivariate analyses, no demographic or clerkship timing factors were associated with an implicit anti-fat bias in our multivariate model.

Discussion

We found that the majority of medical students had a significant weight-related bias, and most students were unaware of their bias. This lack of awareness is not unexpected given that a much larger study of the general population using the Weight IAT found only a weak correlation between implicit and explicit weight bias ($r = 0.20$).[6]

Because the literature confirms that obese individuals face discrimination in the general population,[5] our main interest was to determine whether medical students possessed an anti-obesity bias and whether they were aware of that bias. We did find that approximately 40% of students had a moderate or strong implicit anti-fat bias, yet few were aware of it. While male gender was associated with an explicit anti-fat bias, no demographic factors predicted an implicit bias. Because one prior study[35] found that medical residents were more likely to express anti-fat attitudes as they progressed through training, we looked for a similar effect in medical students over the course of their third year. We found that the prevalence of an anti-fat bias remained consistent throughout the year.

Although anti-fat was the most common bias we observed, 17% of medical students had an anti-thin bias of which they were unaware, and some students who reported an explicit anti-fat preference actually had no significant implicit weight-related bias. This discordance may arise from students recognizing the current anti-fat societal norms and believing that they too hold those norms. Alternatively, medical students who are learning about the adverse health effects of obesity may assume that they should prefer thin people to fat people.

While we are not aware of prior studies that measured medical students' implicit weight-related biases, our results are consistent with previous studies that found a high prevalence of implicit anti-fat bias among university students.[36,37] Similarly, a separate study found that over half of internal medicine residents in their final year of training reported having negative reactions towards the appearance of obese patients.[35]

Given that anti-fat biases are prevalent and act as a significant barrier to physicians' treatment of obesity, teaching medical students to recognize and mitigate this bias is crucial to improving the care for the two-thirds of American adults who are now overweight or obese.[21] Researchers suggest that minimizing the effects of an implicit bias likely requires a multi-level approach.[38–41] First, students must acknowledge that the implicit bias exists. For this reason, we continue to require that all third-year medical students complete the online IAT during the family medicine clerkship, followed by an in-class discussion of implicit bias and students' experiences with bias. Second, students must accept that their bias could affect their actions. To accomplish this goal, we created an online educational module about obesity bias and stigmatization, which we have made freely available via the internet.[42] Lastly, students must reduce their bias and/or learn new strategies for mitigating it.

This final step, reducing bias, has been challenging. Anti-obesity prejudice has been linked to the belief that body weight is under an individual's control, and consequently, that the individual can be blamed for being obese.[43,44] While this would suggest that educating students about the genetic and environmental causes of obesity should decrease prejudice, this strategy has yielded mixed results.[45–47] Efforts to increase or evoke empathy have been reported to reduce bias in some interventions[48,49] but not in all.[45,50,51] Other suggested educational strategies have included viewing encounters with stigmatized groups as

opportunities to practice egalitarian goals, looking for counter-stereotypical attributes and commonalities, and altering views of social norms.[39,40] Other research has stressed that learning these new skills requires repeated opportunities for practice.[41]

The mixed results from these efforts to reduce bias highlight the need for more educational research to determine which strategies are most effective. Toward this goal, we have created a 30-minute video documentary of obese individuals describing their daily challenges and experiences with the health care system, including both positive and negative interactions with physicians. At our institution, we show this video to small groups of third-year medical students and follow the viewing with a debriefing activity. We are currently evaluating whether this strategy effectively evokes empathy, creates awareness, and changes attitudes in medical students.

Our study has a number of limitations. First, we conducted it at a single medical school. Although the students at our school originate from geographically diverse places, the prevalence of anti-fat bias may vary in different regions, thus affecting the generalizability of our findings. Second, we did not attempt to measure students' body weights, so we are unable to determine how students' personal weight classification affects their biases. While one may assume that obese students would be less likely to have an anti-fat bias, other studies have found that an anti-fat bias is prevalent in both normal weight and obese populations.[52,53] Even obese physicians demonstrate on average a moderate anti-fat bias.[6]

Conclusions

In conclusion, we found that over one-third of medical students have a significant anti-fat bias, and few were aware of that bias. To prevent anti-fat biases from compromising patient care, medical schools should develop curricula to address weight-related biases in a comprehensive manner. Such a curriculum should include educating students about the impact of implicit biases on patient care and giving students multiple opportunities to reflect on their biases and practice strategies for minimizing the impact of those biases on their patient interactions and treatment decisions. Further research is needed to determine which educational strategies are most effective in reducing weight-related biases.

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Table 1

Characteristics of 310 Third-Year Medical Students Who Completed the Weight Implicit Association Test, Wake Forest School of Medicine, 2008–2011

Characteristic	No. (%)
Gender, no. (% of 297)	
Male	165 (56)
Female	132 (44)
Race/ethnicity, no. (% of 293)	
Hispanic/Latino	10 (3)
White	215 (73)
Black	18 (6)
Asian/Pacific Islander	35 (12)
Multiracial/other	15 (5)
Age, no. (% of 305)	
<25 years	131 (43)
25–28 years	145 (48)
>28 years	29 (10)
Academic year, no. (% of 310)	
2008–2009	99 (32)
2009–2010	110 (35)
2010–2011	101 (33)

Table 2

Explicit (Conscious) Preferences of 310 Third-Year Medical Students Who Completed the Weight Implicit Association Test, Wake Forest School of Medicine, 2008–2011

Characteristic	Moderately/strongly prefer fat	Slight or no preference	Moderately/strongly prefer thin	*P* value
Gender				<.001
Male, no. (% of 165)	0 (0)	96 (58)	69 (42)	
Female, no. (% of 132)	0 (0)	104 (79)	28 (21)	
Race/ethnicity				.64
Hispanic/Latino, no. (% of 10)	0 (0)	6 (60)	4 (40)	
White, no. (% of 215)	0 (0)	141 (66)	74 (34)	
Black, no. (% of 18)	0 (0)	14 (78)	4 (22)	
Asian/Pacific Islander, no. (% of 35)	0 (0)	26 (74)	9 (26)	
Multiracial/other, no. (%of 15)	0 (0)	9 (60)	6 (40)	
Age				.69
<25 years, no. (% of 131)	0 (0)	85 (65)	46 (35)	
25–28 years, no. (% of 145)	0 (0)	101 (70)	44 (30)	
>28 years, no. (% of 29)	0 (0)	20 (69)	9 (31)	
Timing of clerkship *				.64
Beginning of year, no. (%of 109)	0 (0)	70 (64)	39 (36)	
Middle of year, no. (% of 101)	0 (0)	71 (70)	30 (30)	
End of year, no. (% of 100)	0 (0)	68 (68)	32 (32)	
Academic year				.998
2008–2009, no. (% of 99)	0 (0)	67 (68)	32 (32)	
2009–2010, no. (% of 110)	0 (0)	74 (67)	36 (33)	
2010–2011, no. (% of 101)	0 (0)	68 (67)	33 (33)	

* Beginning of year indicates months 1–4 of the academic year; middle of year, months 5–8; end of year, months 9–12.

Table 3

Implicit (Unconscious) Biases of 310 Third-Year Medical Students Who Completed the Weight Implicit Association Test, Wake Forest School of Medicine, 2008–2011

Characteristic	Moderate/strong antithin bias	Slight or no bias	Moderate/strong antifat bias	*P* value
Gender				.41
Male, no. (% of 165)	23 (14)	76 (46)	66 (40)	
Female, no. (% of 132)	26 (20)	56 (42)	50 (38)	
Race/ethnicity				.89
Hispanic/Latino, no. (% of 10)	1 (10)	5 (50)	4 (40)	
White, no. (% of 215)	35 (16)	93 (43)	87 (40)	
Black, no. (% of 18)	4 (22)	7 (39)	7 (39)	
Asian/Pacific Islander, no. (%of 35)	5 (14)	17 (49)	13 (37)	
Multiracial/other, no. (% of 15)	3 (20)	9 (60)	3 (20)	
Age				.88
<25 years, no. (% of 131)	22 (17)	56 (43)	53 (40)	
25–28 years, no. (% of 145)	22 (15)	65 (45)	58 (40)	
>28 years, no. (% of 29)	6 (21)	14 (48)	9 (31)	
Timing of clerkship *				.59
Beginning of year, no. (% of 109)	16 (15)	44 (40)	49 (45)	
Middle of year, no. (% of 101)	17 (17)	46 (46)	38 (37)	
End of year, no. (% of 100)	19 (19)	47 (47)	34 (34)	
Academic year				.84
2008–2009, no. (% of 99)	15 (15)	45 (45)	39 (39)	
2009–2010, no. (% of 110)	20 (18)	51 (46)	39 (35)	
2010–2011, no. (% of 101)	17 (17)	41 (41)	43 (43)	

* Beginning of year indicates months 1–4 of the academic year; middle of year, months 5–8; end of year, months 9–12.