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Diabetes stigma and weight stigma among physicians treating type 2 diabetes: Overlapping patterns of bias

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ABSTRACT

Aims: Adults with type 2 diabetes (T2D) report experiencing stigma across multiple settings, including stigmatizing interactions with their healthcare providers. However, research examining physician biases toward patients with T2D is scarce. Identifying stigma-related barriers in diabetes care is essential to prevent providers' biases from impairing health care delivery. This study assessed attitudes towards individuals with T2D and obesity among physicians who treat T2D. *Methods:* Physicians specializing in internal medicine or endocrinology (n = 205) completed a series of online questionnaires assessing their attitudes towards patients with T2D and obesity, and their attributions of controllability and blame of individuals with T2D and obesity. *Results:* While 85% of physicians felt professionally prepared and confident to treat patients with T2D, 1/3 reported being repulsed by patients with T2D and view them as lazy (39%), lacking motivation (44%), and non-compliant with treatment (44%). Many witnessed professionals in their field making negative comments about patients with T2D (44%). Physicians endorsed worse levels of bias towards patients with obesity than T2D, but differences were small.

Conclusions: Findings highlight the need for stigma reduction interventions for physicians addressing both T2D and obesity. Research assessing the effects of T2D stigma on quality of patient care and health outcomes is needed.

1. Introduction

The importance of improving quality of life for people with type 2 diabetes (T2D) [1] has increased attention to diabetes stigma in this population, leading to national and international calls for increased efforts to address stigma in clinical management of diabetes and as a research priority. The International Diabetes Federation has identified stigma as a priority and urgent problem to address [2], and the American Diabetes Association has prioritized the need to eliminate diabetes stigma and discrimination in their Health Equity Bill of Rights [3]. These declarations reflect the recognition that diabetes stigma is present and potentially harmful to people with diabetes, and reiterate the need for research to address this problem. To date, emerging research in this field has primarily investigated the nature and health correlates of diabetes stigma experienced among patients with T2D. Empirical evidence from Australia [4–7], Japan [8–11], and the U.S. [12–15] collectively document the prevalence and harmful health consequences of diabetes stigma for adults with T2D. For example, recent U.S. research suggests that more than half of individuals with T2D perceive social stigma for having diabetes [13], and experience multiple forms of diabetes stigma including blame and judgement, differential treatment, and self-stigma [12]. Adults with T2D who report these stigmatizing experiences are more likely to engage in unhealthy eating behaviors, like binge eating and eating to cope with stress [15]. Additionally, adults who internalize diabetes stigma have higher diabetes-related distress, worse diabetes self-management, poorer quality interactions with doctors, and more unhealthy eating behaviors compared to those who do not internalize stigma [14,15]. Taken together, these findings point to the potential harms of diabetes stigma and the need to address this problem in clinical care.

Adding complexity to diabetes stigma is obesity, which commonly co-occurs with T2D [16]. Obesity itself is a highly stigmatized condition; prevalence rates of weight discrimination are as high as 41% among adults with obesity [17]. Thus, in addition to facing stigma due to their diabetes, people with T2D are also at risk of facing weight stigma at high body weights. There has been little acknowledgement of the

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vulnerability to weight stigma among people with T2D [18–20], despite extensive evidence that weight stigma is present in the healthcare setting and that physicians are one of the most common perpetrators of weight stigma reported by adults with obesity [21–23]. Recent evidence suggests that physician bias may extend to T2D, with 44% of adults with T2D reporting they feel stigmatized about their weight by doctors [12]. Further, experiencing weight stigma contributes to cardiometabolic risk factors that promote development of T2D, including elevated oxidative stress [24], C-reactive protein [25], increased risk of metabolic syndrome [26], weight gain [27], and elevated blood pressure [28] and blood glucose (HbA1c) [29]. Thus, weight stigma may not only undermine healthcare but also worsen health for people with T2D.

Collectively, this evidence indicates that adults with T2D perceive diabetes stigma in their healthcare experiences and are vulnerable to stigma stemming from both their diabetes and body weight. However, to date, scant research has studied stigmatizing attitudes, beliefs, or stereotypes expressed by healthcare providers about patients with T2D. An accurate understanding of diabetes stigma in healthcare cannot be achieved without first identifying the nature and extent of diabetes stigma expressed by healthcare providers, including their attributions and beliefs about diabetes and obesity that underlie their attitudes and behaviors toward patients with T2D. While evidence has documented weight stigma expressed by medical professionals toward patients with obesity [21,23], this work has not been extended to the diabetes field to assess diabetes stigma endorsed by healthcare providers treating patients with T2D. Identifying stigma-related barriers in diabetes care is essential to improve clinical practices that support patients with T2D in their diabetes self-management and lifestyle behaviors, and to prevent providers' biases from impairing health care delivery. Attitudes and biases of healthcare providers must be studied to inform the development of effective stigma-reduction interventions in healthcare.

To begin to address this research gap, the present study assessed diabetes stigma and weight stigma among physicians who treat patients with T2D. We aimed to identify the nature and extent of their stigmatizing attitudes and biases about patients with T2D, including physician characteristics associated with higher levels of stigmatizing attitudes. We predicted that physicians would express a moderate level of stigmatizing attitudes about patients with T2D, and that stigmatizing attitudes would be stronger towards patients with obesity than patients with T2D.

2. Materials and methods

2.1. Participants and procedures

The target sample for this study was physicians specializing in internal medicine or endocrinology who treat T2D. Participants were recruited by Interviewing Service of America (ISA), a national healthcare-oriented market research firm, with over 25,000 physicians enrolled in their U.S. panel. ISA panelists are required to provide validated geographic and demographic information to maintain membership. ISA validates their physician panelists through license numbers and National Provider Identifier (NPI) numbers. The panel management team verifies information entered by panelists including their qualifications and specialties by checking all publicly available information. Post validation, ISA sends internal surveys to the panelists about their specialties and checks answers for consistency. Any panelists who are highlighted for data quality issues are red flagged and those with persistent data quality issues are barred from taking any future surveys.

For the present study, ISA sent approximately 2100 email invitations to a random subsample of physicians (specializing in internal medicine or endocrinology) in their national physician panel. Participants who consented to participate were provided with the study survey link to complete a Qualtrics-hosted online screening questionnaire which assessed their training background, medical specialty, and clinical care of patients with diabetes. Participants who met eligibility criteria (a currently practicing physician in internal medicine or endocrinologist in the U.S. and treating patients with T2D) continued to the remaining set of questionnaires which assessed their attitudes towards patients with obesity and T2D, perceptions about providing treatment to these patients, beliefs about the causes of obesity and T2D, and sociodemographic backgrounds. Participants received a $30 gift card for survey completion from ISA. Data collection occurred in January 2023. This study received approval from the University of Connecticut Institutional Review Board.

2.2. Measures

Demographic Information and Professional Experience. Participants were asked to report their age, gender, race/ethnicity, height, and weight. Participants also indicated their training background, specialty area of medicine, work setting (e.g., inpatient, outpatient, etc.), years in practice, and the number and percentage of patients they see who have T2D in a typical week. All measures assessing primary variables (described below) were presented in a counterbalanced order to control for potential confounds created by order or sequence effects.

Attitudes toward patients with obesity. Participants completed the Attitudes about Treating Patients with Obesity Scale (ATPOS) [30,31], a 22-item measure that assesses healthcare provider attitudes about treating patients with obesity (e.g., "*I dislike treating with patients with obesity,*" and "*I feel confident that I can provide quality care to patients with obesity*"). Participants provided their level of agreement to each statement on a 5-point scale, ranging from 1 = strongly disagree to 5 = strongly agree. An average score was calculated using the full 22-item scale ($\alpha = 0.94$). Average scores were also calculated for three out of four subscales identified in previous research [32]: 1) dislike caring for patients with obesity (10 items; ($\alpha = 0.93$); 2) lack of empathy (5 items; $\alpha = 0.71$); and 3) perceived negative norms regarding patients with obesity (3 items; $\alpha = 0.84$). The fourth subscale, preparedness to treat obesity, was excluded from analyses due to a low internal consistency ($\alpha = 0.35$).

Mirroring the question format of the ATPOS, participants were asked an additional five questions to assess their perceptions of the extent to which patients with obesity are compliant with treatment recommendations, motivated to improve their diet, successful in making behavior changes, able to maintain weight loss, and how much they enjoy counseling these patients. This subscale of items was labeled as "perceptions of patient compliance". Items were rated on a 5-point scale (1 = not at all, 3 = somewhat, 5 = very much) and a mean score was calculated ($\alpha = 0.75$).

Attitudes toward patients with type 2 diabetes. To assess provider attitudes about patients with T2D, participants were provided with a modified version of the Attitudes about Treating Patients with Obesity Scale (described above), in which each item was revised to refer to patients with T2D instead of patients with obesity. This scale is referred to as the Attitudes about Treating Patients with Diabetes Scale (ATPDS). All other content of the original items was retained, and participants provided their level of agreement to each statement on a 5-point scale, ranging from 1 = strongly disagree to 5 = strongly agree. An average score was calculated using the full 22-item scale ($\alpha = 0.93$). Mean scores were also calculated for the three subscales described above: 1) dislike caring for patients with T2D (10 items; ($\alpha = 0.92$); 2) lack of empathy (5 items; $\alpha = 0.73$); and 3) perceived negative norms regarding patients with T2D (3 items; $\alpha = 0.83$). The fourth subscale, preparedness to treat T2D, was excluded from analyses due to low internal consistency ($\alpha = 0.31$).

Participants were also asked the same additional five questions to assess their perceptions of treatment compliance among patients with T2D instead of obesity. Items were rated on a 5-point scale (1 = not at all, 3 = somewhat, 5 = very much) and an average score was calculated ($\alpha = 0.71$).

Perceived controllability and blame of people with obesity and type 2

diabetes. Participants' beliefs regarding attributions of personal responsibility and blame of people with obesity were assessed using three questions previously tested [33] for assessing perceived blame of persons with stigmatized conditions, originally adapted from other scales [34,35]. Specifically, participants were asked to what extent they believe 1) obesity is controllable (1 = not at all under personal control to 5 = completely under personal control), 2) obesity is a person's fault (1 = no, not at all to 5 = yes, completely), and 3) an individual is personally responsible for having obesity (1 = not at all responsible to 5 = completely responsible). An average score was calculated (α = 0.66). To assess perceived controllability and blame for people with T2D, participants responded to modified versions of these three questions which referred to T2D instead of obesity, with all other item content remaining identical. An average score was calculated (α = 0.62).

Willpower subscale of the AFA Questionnaire. Participants completed the 3-item Willpower Subscale of the Anti-Fat Attitudes (AFA) scale [36], which assesses the extent that people believe obesity is attributed to lack of personal willpower. Items are rated on a 10-point Likert scale (0 = very strongly disagree, 9 = very strongly agree), with higher scores indicating stronger attributions that people with obesity lack willpower. An average score was obtained for this subscale (α = 0.70). To assess attributions of willpower among people with T2D, these three questions were modified to refer to people with T2D instead of focusing on body weight, with all other item content identical. (α = 0.68).

2.3. Statistical analysis

Means, standard deviations, and frequencies were calculated for participant demographic characteristics, training background, and all measures of bias. Item-level and subscale-level differences between endorsement of weight stigma and T2D stigma were compared using paired samples t-tests. Next, the overall frequency of biased attitudes was examined by calculating the percentage of agreement across items of the bias scales. Lastly, relationships between measures of bias and participant characteristics were examined using correlations. Specifically, the relationships between endorsement of biased attitudes and age, body mass index (BMI), percent of patients with diabetes, number of patients with T2D, and years in practice were examined.

3. Results

3.1. Sample characteristics

In total, 379 participants completed the consent form and agreed to participate. Fifty-eight participants were excluded because they were not physicians, 32 were excluded because they did not treat diabetes, and 23 were screened out because they did not specialize in internal medicine or endocrinology. Thirteen participants were lost to attrition before they completed the screening questionnaire. Of the 253 eligible responses, an additional 48 were excluded based on improbable responses on demographic characteristics (e.g., age < 26).

The final sample included 205 physicians. Table 1 presents a summary of the sample characteristics. In total, 72% (n = 148) were men, 79% (n = 162) were White, and the average age was 40.33 (*SD* = 7.57). The mean BMI was 22.72 (*SD* = 3.91). Participants described their training background as MD (56%), Resident (27%), DO (15%), and Fellow (2%). Most specialized in internal medicine (68%) and 32% specialized in endocrinology. Almost half (48%) reported 5–10 years in their profession, followed by 10–15 years (30%), 15 + years (11%), and 1–5 years (10%). Working in an inpatient setting was most common (43%), followed by both inpatient and outpatient settings (37%) and outpatient only (20%). Most commonly, participants reported that 30–39% of their patients had T2D. On average, participants reported seeing 24 patients (*SD* = 19.87) with T2D per week.

Table 1
Sample Characteristics (N = 205).

	n	%
Gender		
Female	57	27.8
Male	148	72.2
Other	0	0.0
Race/Ethnicity		
White, non-Hispanic, non-Latino	162	79.0
Black or African American	17	8.3
American Indian or Alaska Native	1	0.5
Asian or Pacific Islander	15	7.3
Mexican-American Latino or Hispanic	9	4.4
Other	1	0.5
Training Background		
MD	115	56.1
DO	30	14.6
Resident	55	26.8
Fellow	5	2.4
Specialty Area		
Internal Medicine	140	68.3
Endocrinology	65	31.7
Percentage of their patients that have T2D		
0–19 %	11	5.4
20–39 %	60	29.2
40–59 %	38	18.6
60–79 %	61	29.8
80–100 %	35	17.1
Years in Practice		
1–5 years	20	9.8
5–10 years	99	48.3
10–15 years	62	30.2
More than 15 years	23	11.2
Work setting		
Hospital or Inpatient	88	42.9
Outpatient	41	20.0
Both Inpatient and Outpatient	75	36.6

	M	*SD*	Min	Max
Age	40.33	7.57	26	72
BMI	22.72	3.91	16	38.16
Number of weekly patients with T2D	23.56	19.87	1	100

3.2. Hypothesis testing

Table 2 presents the descriptive findings of the primary measures of bias towards patients with obesity and patients with T2D. The mean score on the Attitudes about Treating Patients with Type 2 Diabetes Scale was 2.63 (*SD* = 0.79), which is significantly lower than the mean score of the Attitudes about Treating Patients with Obesity Scale (*M* = 2.78, *SD* = 0.80), $p < .001$. This pattern was consistent across subscales; participants endorsed significantly greater biased attitudes towards patients with obesity than patients with T2D (Range $p < .001$ to $p = .020$; Table 2). The mean score on the Perceived Controllability and Blame of People with Type 2 Diabetes was 3.64 (*SD* = 0.76), which was significantly lower than the mean score on the Perceived Controllability and Blame of People with Obesity (*M* = 3.74, *SD* = 0.71), $p = .029$, with both being indicative of biased attitudes. The pattern was consistent on other scales assessing participant beliefs about patients' treatment compliance; participants believed that individuals with obesity were significantly less likely to be compliant with treatment recommendations than individuals with T2D, $p = .006$. Mean scores for the AFA-Willpower subscale were also indicative of biased attitudes for both patients with obesity and patients with T2D, with significantly greater bias towards patients with obesity, $p < .001$.

Table 3 summarizes participants' agreement with individual items of the Attitudes about Treating Patients with Type 2 Diabetes Scale. Overall, participants endorsed feeling professionally prepared (n = 177; 86%) and confident (n = 174; 85%) in their abilities to provide quality care to patients with T2D. Additionally, participants reported they feel that it is important to treat patients with T2D with compassion and

Table 2
Descriptive Statistics for Outcome Variables (N = 205).

	Obesity				Type 2 Diabetes				Differences
	M	*SD*	Min	Max	*M*	*SD*	Min	Max	
Attitudes about Treating Patients with Obesity/T2D Scale	2.78	0.80	1.00	4.18	2.63	0.79	1.05	4.14	$t(203) = -5.60$, $p < .001$
Lack of Empathy Subscale	2.82	0.84	1.00	4.40	2.68	0.90	1.00	4.40	$t(204) = -3.53$, $p = .001$
Dislike of Caring for Subscale	2.93	1.01	1.00	4.80	2.71	0.96	1.10	4.70	$t(203) = -5.77$, $p < .001$
Perceived Negative Norms Subscale	3.02	1.17	1.00	5.00	2.90	1.16	1.00	5.00	$t(204) = -2.35$, $p = .020$
Perceptions of Patient Compliance	3.81	0.64	1.40	5.00	3.88	0.61	1.80	5.00	$t(200) = 2.78$, $p = .006$
Perceived Controllability and Blame	3.74	0.71	1.67	5.00	3.64	0.76	1.00	5.00	$t(202) = -2.20$, $p = .029$
AFA-Willpower Subscale	6.24	1.72	0.67	9.00	5.94	1.80	0.33	9.00	$t(204) = -3.75$, $p < .001$

Note: Each scale and subscale score are the average of the relevant items.

respect (n = 159; 78%), enjoy counseling patients with T2D (n = 159; 78%), and find it professionally rewarding (n = 157; 77%). However, a considerable percentage of participants also reported that treating patients with T2D was more emotionally draining (n = 90; 44%), stressful (n = 78; 38%), and frustrating (n = 75; 37%) than treating a patient without diabetes. Further, approximately 1/3 of participants reported it is difficult to feel empathy for patients with T2D (n = 65; 32%) and being repulsed by treating patients with T2D (n = 68; 33%). A substantial percentage of participants also endorsed negative stereotypes about patients with T2D including views that they lack motivation to make lifestyle changes (90; 44%), tend to be lazy (n = 79; 39%), and are often non-compliant with treatment recommendations (n = 90; 44%). Many also reported that they have heard or witnessed other professionals in their field make negative comments about patients with T2D (n = 90; 44%).

Similar patterns emerged across items assessing attitudes towards treating patients with obesity; participants felt prepared (n = 175; 85%) and confident (n = 180; 88%) in their abilities to provide care but endorsed negative stereotypes about patients with obesity. Over half of physicians viewed patients with obesity as lazy (n = 116; 57%), lacking motivation to make lifestyle changes (n = 112; 55%), and often non-compliant with treatment recommendations (n = 108; 53%). Almost half reported that they have heard or witnessed other professionals in their field make negative comments about patients with obesity (n = 93; 45%).

Overall, participants tended to endorse higher bias towards patients with obesity than towards patients with T2D. Specifically, on approximately half of the items on the attitude measures, physicians endorsed significantly greater weight-related bias than T2D-related bias (Table 3). This included higher endorsement of negative stereotypes about patients with obesity, greater skepticism that patients with obesity would be compliant with treatment recommendations, and greater endorsement of negative personal feelings about treating these patients (i.e., feeling disgust, frustration, etc.) compared to patients with T2D. Notably, there were no items on these measures in which physicians endorsed significantly greater bias towards individuals with T2D than individuals with obesity.

Table 4 summarizes participants beliefs about the controllability of T2D and obesity. Most participants endorsed beliefs that individuals with T2D could lose at least some part of their weight through a little exercise (n = 187; 91%), are personally responsible for developing T2D (n = 144; 70%), and that some people have T2D because they have no willpower (n = 144; 70%). Participants responded in a similar pattern to individuals with obesity; high percentages of participants endorsed beliefs that individuals with obesity could lose at least come part of their weight through a little exercise (n = 181; 88%), are personally responsible for 'becoming obese' (n = 146; 71%), and that some people have obesity because they lack willpower (n = 155; 76%).

Finally, Table 5 summarizes associations between participant characteristics and their endorsement of bias towards individuals with T2D and individuals with obesity. Age was significantly negatively correlated with several bias-related outcomes such that younger physicians endorsed worse overall attitudes towards patients with T2D ($p = .007$), greater lack of empathy ($p = .020$), more dislike of caring for patients with T2D ($p = .003$), and poorer attitudes from people in their field ($p = .010$). These patterns were the same for obesity; younger age was associated with worse overall attitudes towards patients with obesity ($p = .016$), greater lack of empathy ($p = .025$), more dislike of caring for patients with obesity ($p = .017$), and poorer attitudes from people in their field ($p = .004$). Younger age was also significantly associated with greater belief that T2D is controllable ($p = .040$).

There were also several significant relationships related to participant level of experience in the field. Fewer years in practice was significantly associated with worse overall attitudes towards patients with T2D ($p < .001$), greater lack of empathy ($p = .001$), more dislike of caring for patients with T2D ($p < .001$), and poorer attitudes from people in their field ($p = .006$). Similarly, years in practice was significantly negatively associated with attitudes towards patients with obesity ($p = .007$), lack of empathy ($p = .012$), dislike of caring for patients with obesity ($p = .006$), belief that individuals with obesity lack willpower ($p = .030$), and witnessing negative attitudes from people in their field ($p = .008$).

There were several significant positive correlations between the percentage of patients (but not number of patients) with T2D and bias. Treating a greater percentage of patients with T2D was significantly associated with worse overall attitudes towards patients with T2D ($p = .034$), greater lack of empathy for both patients with T2D ($p = .001$) and patients with obesity ($p = .010$), and more dislike of caring for patients with T2D ($p = .034$). Additionally, treating a higher percentage of patients with T2D was significantly associated with higher endorsement of the personal controllability of both T2D ($p < .001$) and obesity ($p < .001$), as well as greater belief that patients with T2D lack willpower ($p = .020$). In contrast, treating a higher percentage of patients with T2D was significantly associated with greater belief that both patients with T2D ($p < .001$) and patients with obesity ($p < .001$) will be compliant with treatment recommendations. Finally, lower BMI among physicians was associated with greater belief that T2D is controllable ($p = .023$), obesity is controllable ($p = .014$) and that individuals with obesity lack willpower ($p = .027$).

4. Discussion

To our knowledge, this is the first study to systematically assess diabetes stigma among physicians treating patients with T2D. Overall, physicians endorsed feeling confident and prepared to treat patients with T2D, but consistently endorsed biased attitudes towards and negative stereotypes about these patients. At least 1/3 (39%-44%) of physicians viewed patients with T2D as lazy, non-compliant with treatment, and lacking motivation for making lifestyle changes. Additionally, more than 2/3 of physicians believed that patients have at least partial control over, or responsibility for, their development of T2D. Collectively, responses across measures indicate a moderate level of stigma towards individuals with T2D. These findings are consistent with prior evidence documenting that 40–60% of patients with T2D report

Table 3
Physician Attitudes about Treating Patients with Type 2 Diabetes and Patients with Obesity.

Scale Items Assessing Attitudes toward Patients with T2D and Obesity	Physician Agreement (%)		Item level differences[a]
	Obesity	Type 2 Diabetes	
Lack of Empathy Subscale[b]			
I feel that it is important to treat patients with obesity/type 2 diabetes with compassion and respect.	79.5	77.5	$t(204) = 0.62$, $p = .267$
Patients with obesity/type 2 diabetes lack motivation to make lifestyle changes.	54.6	43.9	$t(204) = -3.23$, $p < .001$
Patients with obesity/type 2 diabetes tend to be lazy.	56.6	38.6	$t(204) = -5.67$, $p < .001$
It is difficult to feel empathy for a patient with obesity/type 2 diabetes.	31.7	31.7	$t(204) = -0.62$, $p = .269$
Treating a patient with obesity/type 2 diabetes repulses me	32.2	33.2	$t(204) = 0.00$, $p = .500$
Dislike Caring for Subscale[b]			
Patients with obesity/type 2 diabetes are often non-compliant with treatment recommendations.	52.7	43.9	$t(204) = -2.60$, $p = .005$
Treating a patient with obesity/type 2 diabetes is more emotionally draining than treating a non-obese/non-diabetic patient	50.2	43.9	$t(204) = -3.75$, $p < .001$
Treating a patient with obesity/type 2 diabetes is more stressful than treating a non-obese/non-diabetic patient	44.9	38.0	$t(204) = -1.16$, $p = .124$
Treating a patient with obesity/type 2 diabetes is more frustrating that treating a patient without this disease.	41.0	36.5	$t(204) = -2.20$, $p = .015$
Patients with obesity/type 2 diabetes can be difficult to deal with.	40.0	35.1	$t(203) = -1.35$, $p = .089$
I would rather treat a non-obese/non-diabetic patient than a patient with obesity/type 2 diabetes.	36.6	33.7	$t(204) = -2.73$, $p = .003$
I often feel frustrated with patients who have obesity/type 2 diabetes	38.6	32.2	$t(204) = -3.19$, $p < .001$
I dislike treating patients with obesity/type 2 diabetes.	28.8	23.4	$t(204) = -4.39$, $p < .001$
I feel disgust when treating a patient with obesity/type 2 diabetes.	27.8	23.4	$t(204) = -3.31$, $p < .001$
I feel more irritated when I am treating a patient with obesity/type 2 diabetes than a non-obese/non-diabetic patient.	32.2	20.0	$t(204) = -4.20$, $p < .001$
Perceived Negative Norms Subscale[b]			
I have heard/witnessed other professionals in my field make negative comments about patients with obesity/type 2 diabetes.	45.4	43.9	$t(204) = -0.23$, $p = .410$
Health care providers feel uncomfortable when caring for patients with obesity/type 2 diabetes.	38.1	35.1	$t(204) = -2.14$, $p = .017$
My colleagues tend to have negative attitudes toward patients with obesity/type 2 diabetes.	37.1	34.6	$t(204) = -2.63$, $p = .005$
Profession-Related Attitudes about Obesity/Type 2 Diabetes Questions[b]			
I feel professionally prepared to effectively treat patients with obesity/type 2 diabetes.	85.4	86.3	$t(204) = -0.86$, $p = .196$
I feel confident that I provide quality care to patients with obesity/type 2 diabetes.	87.8	84.9	$t(204) = 1.54$, $p = .062$
Treating patients with obesity/type 2 diabetes is professionally rewarding.	74.1	76.6	$t(204) = 0.20$, $p = .422$
Other health providers in my field often have negative stereotypes toward patients with obesity/type 2 diabetes.	43.9	42.9	$t(204) = -1.35$, $p = .089$
Perceptions of Patient Compliance[c]			
How much do you enjoy/do you enjoy counseling and working with patients with obesity/type 2 diabetes?	73.2	77.5	$t(203) = 1.54$, $p = .062$
In general, how successful do you think patients with obesity/type 2 diabetes can be in making behavior changes?	68.8	70.7	$t(203) = 0.45$, $p = .325$
How much confidence do you have that patients with obesity/type 2 diabetes can maintain weight loss, once it is achieved?	59.5	66.8	$t(203) = 2.79$, $p = .003$
In general, how motivated do you think patients with obesity/type 2 diabetes are to change their diet?	59.0	63.9	$t(203) = 0.38$, $p = .352$
In general, how compliant do you think patients with obesity/type 2 diabetes are with treatment recommendations?	59.0	61.1	$t(204) = 1.33$, $p = .093$

[a] Paired sample t-tests were conducted using the full 1–5 Likert scale for each item.
[b] Agreement = Responses of "Agree" or "Strongly Agree"; [c] Agreement = Responses of "4" or "Very Much".

Table 4
Physicians' Attributions of Controllability and Blame of Patients with Type 2 Diabetes and Obesity.

Scale items	Percentage of Physicians (%)	
	Obesity	Type 2 Diabetes
Perceived Controllability and Blame of People with Obesity and Type 2 Diabetes		
In your opinion, how controllable is the cause of obesity/type 2 diabetes?	71.3	70.2
In your opinion, is an individual personally responsible for becoming obese/developing type 2 diabetes?	63.9	72.2
In your opinion, do you think it is a person's own fault that he/she is obese/has type 2 diabetes?	57.1	47.3
Willpower Subscale of the Anti-Fat Attitudes Scale		
People who weigh too much/with type 2 diabetes could lose at least some part of their weight through a little exercise.	88.4	91.1
Some people are obese/have type 2 diabetes because they have no willpower.	75.6	70.3
Obese people/People with type 2 diabetes tend to be obese/diabetic pretty much through their own fault.	76.1	68.8

Note: Percentage of Physicians = Responses of 4 or 5 (Completely) for the Perceived Controllability and Blame of People with Obesity and Type 2 Diabetes and Responses of 5–9 (Strongly Agree) for the Willpower Subscale of the Anti-Fat Attitudes Scale.

being stigmatized in a healthcare setting [12] and 44% feel stigmatized about their weight by their physician [12].

Our study also provides the first comparison of weight stigma and diabetes stigma among physicians. Results showed that physicians have moderate levels of bias against both patients with T2D and patients with obesity. While their endorsement of weight bias was generally worse than their biased attitudes about patients with T2D, the differences between the mean scale scores on these attitude measures were small. These findings may be explained by the overlap in stereotypes and beliefs about personal responsibility and controllability associated with both body weight and T2D. For example, because obesity is often viewed as a causal risk factor of T2D, it is possible that the weight-based

Table 5
Associations between Participant Characteristics and Endorsement of Weight Stigma and Diabetes Stigma.

Scale	Obesity					Type 2 Diabetes				
	Age	BMI	% of patients with T2D	# of patients with T2D weekly	Yrs in Practice	Age	BMI	% of patients with T2D	# of patients with T2D weekly	Yrs in Practice
Attitudes towards patients with Obesity/T2D	−0.17**	0.05	0.11	−0.06	−0.19**	−0.19**	0.06	0.15*	−0.02	−0.25***
Lack of Empathy Subscale	−0.16**	−0.01	0.18**	−0.02	−0.18**	−0.16*	0.02	0.22**	0.06	−0.24**
Dislike of Caring for Subscale	−0.17**	0.08	0.12	−0.05	−0.19**	−0.21**	0.08	0.15*	−0.04	−0.27***
Perceived Negative Norms Subscale	−0.20**	0.03	0.05	−0.11	−0.19**	−0.18**	−0.01	0.05	−0.08	−0.19**
Perceptions of Patient Compliance	−0.01	−0.12	0.29***	0.05	0.02	−0.03	−0.08	0.26***	0.04	0.05
Perceived Controllability and Blame of People with Obesity/T2D	−0.11	−0.17*	0.27***	0.01	−0.12	−0.15*	−0.16*	0.28***	0.08	−0.11
AFA-Willpower Subscale	−0.07	−0.15*	0.09	0.06	−0.15*	−0.03	−0.10	0.16**	0.10	−0.10

stereotypes that physicians have about individuals with obesity extend to individuals with T2D. It may be difficult to separate these two types of bias as obesity and T2D frequently co-occur [16]. Given that both weight stigma and T2D stigma are associated with negative health outcomes [18,37], individuals with T2D may be at greater risk of being stigmatized by their healthcare provider for both their weight and diabetes, facing greater, and potentially multiplied, health risks.

Findings of our study identified several individual differences associated with endorsement of bias. First, biased attitudes towards individuals with T2D and obesity were worse among physicians who were younger with less experience. This finding is consistent with existing evidence of weight bias present among students in medical training [38] and highlights the need for early intervention among physicians, particularly in medical school and during residency. In addition to physician age and experience, the percentage of patients with T2D on a physician's caseload may be a relevant factor in endorsement of bias. Specifically, having a higher percentage of patients with T2D was associated with greater lack of empathy towards patients with T2D and obesity and greater belief that both obesity and T2D are controllable. These findings suggest that physician biases are not limited to those who inexperienced or new to treating diabetes. Other factors not examined in our survey, such as physician burnout with higher caseloads, warrant future exploration in the context of stigma toward patients with T2D.

There have been increasing calls for efforts to address weight stigma in the medical community at large [39–41]. Our study findings reiterate the importance of stigma reduction education and interventions for practicing medical providers. Further, they underscore the need for these interventions to target diabetes stigma in addition to weight stigma. Our findings highlight key steps for future research, while acknowledging several study limitations. First, while our sample of physicians reflects a random sub-sample of the ISA physician panel, it may not be representative of the panel or the broader population of U.S. physicians with these medical specialties. For example, the study participants were primarily White and male-identifying; this limits generalizability to the population of practicing primary care physicians in the U.S., which includes more women and greater racial and ethnic diversity [44,45]. Our sample composition thus precluded the ability to examine the impact of physician gender and race on endorsement of bias, and additional studies are needed to confirm the presence and prevalence of bias among larger and more diverse samples of physicians who treat T2D. Second, the present research was cross-sectional. More research is needed to study the impact of provider biases on patients with T2D. For example, it is important to understand how physician bias impacts the quality of care they provide for their patients with T2D and on other healthcare-related patient outcomes. For example, future research should consider whether physician bias is associated with greater healthcare avoidance among their patients with T2D. Patients with T2D already face a series of barriers to engaging in health-promoting behaviors including complicated medication regimes [42], lack of social support [43], and monetary expenses [43]. Therefore, it is crucial to better understand the role of stigma as an additional psychosocial barrier to diabetes care.

This study provides the first examination of provider biases towards patients with T2D and provides a direct comparison of these patterns to weight stigma. Our findings underscore the pervasive nature of weight stigma in healthcare settings and suggest that this stigma impacts individuals with T2D as well. These findings highlight the need for more research on diabetes stigma among physicians and how it affects patient health outcomes. More broadly, this study represents a clear rationale for addressing diabetes stigma by providing much-needed data on physician attitudes to inform stigma reduction efforts in healthcare.

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Declaration of Competing Interest

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