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Research Article

Determinants Of Perceptions Of Eating Disorder Symptoms.

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INTRODUCTION

Eating disorders (EDs) are the second-leading cause of death among psychiatric illnesses, following only opioid use [1]. Eating disorders are notoriously difficult to treat [2]. Unfortunately, access to proper and adequate treatment continues to be a problem for those who are struggling with eating disorders [3]. Lack of access holds true particularly for those who live in larger bodies, as they face weight stigma from their primary care providers and treatment team. Although a stereotype exists that people with eating disorders mostly struggle with low weight Anorexia Nervosa (AN), most people with eating disorders live in bodies of normal to higher weight [4].

Those living in larger bodies face weight stigma in multiple areas of their life every day, and research linking weight stigma and perceptions about which bodies can struggle with an eating disorder is scarce. Indeed, Atypical Anorexia Nervosa (AAN), a diagnosis in the OSFED category that fits the DSM-5 criteria for AN in all ways except for the low BMI criteria, has only begun to be researched (Allison & Lundgren, 2018; Walsh et al., 2016).

Weight discrimination is a tolerated form of oppression that affects most of those who live in larger bodies (Ambwani et al., 2021; Puhl & Heuer, 2009). Rates of weight discrimination in the United States are close to those of racial discrimination [9]. Studies have linked weight stigma to poor treatment in healthcare overall. Providers caring for patients in larger bodies use less patient-centered communication, have less respect for the patient, and spend less time educating the patient about health [10]. Providers also place blame on the patient by making it seem like it is easy to control weight through diet and exercise, even though there are more contributing factors to a higher weight than diet and exercise. The most frequent negative behaviors toward those in larger bodies by providers in one study were: mocking appearance, looks of disgust and repulsion, lack of reaction to colleagues' offensive remarks, scaring the patient with the necessity to lose weight, and limiting access to dedicated medical equipment [11].

Not only are the effects of weight stigma harmful, but body mass index (BMI) is not always an indicator of risk for adverse health effects, i.e., increased morbidity and mortality [12]. In fact, weight stigma itself may be linked with the health concerns that those in larger bodies experience. A lack of adequate treatment by providers was correlated with an increase in cortisol [12]. Weight stigma has physical effects on health, including the dangers of weight-cycling [13]. In addition, weight stigma is positively related to unhealthy behaviors and negatively related to healthy behaviors [14]. Weight discrimination has also been linked with mortality [13]. Therefore, weight stigma is directly harmful and results in poor health outcomes.

These data concerning weight stigma and the experience of people in larger bodies with the healthcare system indicate the importance of examining the effects of weight stigma for those with larger bodies with eating disorders. While we understand certain generalities concerning weight stigma and healthcare, we have yet to explore how this weight stigma affects those in larger bodies with undiagnosed eating disorders. Given the gap in the literature surrounding weight stigma, the present study set out to link weight stigma with diagnostic impressions and treatment recommendations.

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METHODS

Ethical approval for this study was granted by the Center for Psychological Science Institutional Review Board, protocol 20230022, title "Determinants of Perceptions of Eating Disorder Symptoms". The purpose of the present study is to examine the relationship between observed body size and perceived eating disorder symptoms in others. We hypothesized that: 1) people in larger bodies will be less likely to be viewed as using weight control behaviors and that they will be assumed to have loss of control behaviors; 2) both explicit weight beliefs and implicit weight stigma will account for the relationship between body size and estimates of perception of weight-related behaviors; and 3) these effects will be replicated within a healthcare provider subsample.

Participants

Power analysis was conducted to evaluate the sample size needed; in the pilot study (n= 111), the interaction between body size and weight stigma controlling for the direct effects of each was R2 change=0.04. For power=0.80, 199 subjects would be needed. Therefore, this study aimed to recruit 200 participants. Participants were recruited from Prolific. Prolific removes bots from data collection by tracking IP addresses, examining internet service providers, checking VPN or proxy usage, and verifying participants email and phone number.

Procedures

Data was collected in 2023. Consenting participants were asked series of demographic questions and were then directed to a randomized picture of a person in small, medium, or large body (**Fig. 1**) followed by a set of questions regarding perceived eating disorder symptoms (weight control and loss of control behaviors), a validated measure of explicit bias, and a validated measure of implicit bias.

Figure 1. Body Image.



Measures

Demographics

Participants were asked their age, race/ethnicity, education level, gender, and if they were a healthcare practitioner. If they were a healthcare practitioner, they were asked if they work with people with eating disorders in a professional capacity.

Eating Disorder Symptoms

No validated measure of weight control or loss of control behaviors were found. Therefore, items from the EDE-Q were modified to be used in the context of rating someone else's symptoms, such as in the images in this study. These items were chosen as they would be accessible to an observer. Items used the weight control scale included words that indicated possible food restriction, such as "limit," "control," "skips," "compensate," and "exclude." Items used in the loss of control scale included words and phrases that indicated possible binge eating, such as "large(r)," "not physically

hungry," "cannot stop," and "uncomfortably full." One item on the loss of control behaviors scale was added from the binge-eating disorder from the DSM-V given its importance in diagnosing binge-eating disorder although absent from the EDE-Q (Supplementary Material, **Table 1)**, which also identifies where to find each item in the EDE-Q). Participants were asked 11 items rated on a 5-point Likert scale related to their perceptions of that person's eating disorder symptoms Items included questions such as "I suspect that this person consumes an unusually large amount of food in a short amount of time." Answers on the scale ranged from "Definitely not" to "Definitely yes."

Universal Measure of Bias-Fat

UMB-F contains 20 items aimed to assess the intensity of explicit weight beliefs participants have towards people who live at higher weights. The UMB consists of the measurement of four constructs including negative judgement, discomfort with proximity or distance, attraction, and equal rights. Each item uses a 1-7 Likert scale ranging from "I strongly agree" to "I strongly disagree" regarding participants' perceptions of people who are at higher weights. For example, one item on this scale is, "I do not like to sit next to fat people." The scale demonstrated good internal consistency as well as good convergent validity with the Antifat Attitudes (AFA) scale (α=0.87, r=0.62, respectively; Latner et al., 2008).

Implicit Association Test

The purpose of the weight IAT is to measure the strength of association between concepts, which is a way of determining an individual's implicit bias. The IAT score is the comparison of the time it takes for respondents to sort words combining categories of concepts (fat people/thin people) with categories of evaluation words (good/bad) versus when the categories are combined in the opposite way. This comparison shows the strength of prior associations between weight- (or body-shape) related and evaluative constructs. The weight IAT demonstrates good reliability (α=0.81; Nosek & Smyth, 2007), although convergent validity between implicit and explicit measures of weight bias was not significant in the original study (r=0.13; Nosek & Smyth, 2007).

RESULTS

A total of 237 participants accessed the study website through Prolific. Nineteen participants discontinued following consent; one participant discontinued following the demographic questions; one participant discontinued following the eating disorder questionnaire; four participants did not answer one question on the eating disorder questionnaire, and seventeen participants discontinued following the UMB-F. The final n reached for data analysis was 195 participants, of whom about half (n = 97) identified as healthcare practitioners and 19% (n = 38) reported working professionally with people who have eating disorders. Attrition rate was 16.0%.

One item was removed from the attraction subscale of the UMB-F during analysis due to the fact that it reduced internal consistency and thus, correlations with other scales. The item removed was "Fat people are a turn-off."

Demographic Results

The mean age of the sample was 39.26 years with a range of 20 to 77 years. Other demographic characteristics can be found in **Table 1**.

Table 1. Demographic Characteristics.

Characteristic	n	%
Gender		
Male	76	39.0
Female	117	60.0
Non-binary/ third gender	2	1.0
Race		
White	132	67.7
Black/ African American	21	10.8
Asian	19	9.7
Latino/Hispanic	16	8.2
Biracial/multiracial	6	3.1
American Indian/ Alaska native	1	0.5
Education		
Some high school	2	1.0
High school/GED	14	7.2
Some college	34	17.4
College degree	69	35.4
Some graduate school	15	7.7
Graduate school degree	60	30.8
Prefer not to answer	1	0.5
Employment		
Healthcare practitioner	97	49.7
ED practitioner	39	20.0

Levels of Bias and Perceptions of Weight-Related Behaviors

Levels of Weight-Related Behaviors

On the scale of Intensity of Weight Control Behaviors, the mean score for the smallest body size was 3.72 out of a possible 5.0 with a range of 1.0 to 5.0; for the medium body size, the mean score was 2.46 out of a possible 5.0 with a range of 1.0 to 3.86 and for the largest body size, the mean score was 1.73 out of a possible 5.0 with a range of 1.0 to 5.0. A one-way ANOVA found a significant difference in Intensity of Weight Control Behaviors among the body sizes ($F(2, 192)=128.60$, $p<0.001$). On the scale of Intensity of Loss of Control Behaviors, the mean score for the smallest body was 2.46 out of a possible 5.0 with a range of 1.0 to 3.25; for the

medium body size, the mean score was 1.96 out of a possible 5.0 with a range of 1.0 to 4.25; and for the largest body size, the mean score was 4.02 out of a possible 5.0 with a range of 2.0 to 5.0. A one-way ANOVA found a significant difference in Intensity of Loss of Control Behaviors among the body sizes ($F(2, 192)=188.45$, $p<0.001$).

Levels of Intensity of Explicit Weight Beliefs

On the Adverse Judgement scale, the mean score was 2.51 out of a possible 7.0, with a range of 1.0 to 6.0. On the Social Distance scale, there was a mean score of 2.21 out of a possible 7.0, with a range of 1.0 to 6.6. On the Equal Rights scale, the mean score was 2.36 out of a possible 7.0 with a range from 1.0 to 7.0. On the modified attraction scale, the mean score was 4.42 out of a possible 7.0, with a range of 1.0 to 7.0. While the mean scores on each of the explicit weight stigma domains show low levels of intensity of explicit weight beliefs, they are similar to scores of a sample of undergraduate students using the UMB-F [17].

Main Results

Relationships Between Body Size and Weight-Related Behaviors in the General Public and in Healthcare Providers

Both the general public and healthcare providers showed a relationship between body size and perceived weight control behaviors ($F(2,95)=92.33$, $p<0.001$; $F(2,94)=49.80$, $p=0.001$), respectively. As body size increased, the perception of weight control behaviors decreased so that people perceived individuals in smaller bodies as using the most weight control behaviors and individuals in larger bodies as using the least weight control behaviors. A second relationship was found between attraction and perceived weight control behaviors in healthcare providers ($r(95)=-0.26$, $p=0.01$; **Table 2**). There was no relationship found between implicit weight stigma and perceived weight control behaviors in either the general public or healthcare providers (**Table 2**). In addition, there were no significant difference in perceptions of weight control behaviors between the general public and healthcare providers ($t(193)=1.28$, $p=0.20$).

Table 2. Correlations between Perceived Weight Control Behaviors and Explicit and Implicit Weight Stigma in the General Public and Healthcare Providers.

	General Public (n=98)	Healthcare Providers (n=97)
Loss of Control Behaviors	-.744**	-.557**
Adverse Judgment	.009	.019
Social Distance	-.045	-.026
Equal Rights	.098	-.067
Attraction	-.196	-.258*
Implicit Bias	.018	.090

***Correlation is significant at the .01 level (2-tailed)*

** Correlation is significant at the .05 level (2-tailed)*

Both the general public and healthcare providers showed a relationship between body size and perceived loss of control behaviors ($F(2,95)=86.42$, $p<0.001$; $F(2,94)=101.32$, $p<0.001$), respectively. As body size increased, the perception of loss of control behaviors increased so that people perceived individuals in smaller bodies as reflecting loss of control behaviors the least and individuals in larger bodies as reflecting loss of control behaviors the most. There was no relationship found between either explicit weight beliefs or implicit weight stigma and perceived loss of control behaviors in either the general public or healthcare providers (**Table 3**). In addition, there was no significant difference in perceptions of loss of control behaviors between the general public and healthcare providers ($t(193)=-0.58$, $p=0.56$).

Table 3. Correlations between Perceived Loss of Control Behaviors and Explicit and Implicit Weight Stigma in the General Public and Healthcare Providers.

	General Public (n=98)	Healthcare Providers (n=97)
Control Behaviors	-.744**	-.557**
Adverse Judgment	.045	.061
Social Distance	.133	-.010
Equal Rights	-.084	-.122
Attraction	.098	.092
Implicit Bias	.020	-.180

***Correlation is significant at the .01 level (2-tailed)*

** Correlation is significant at the .05 level (2-tailed)*

Relationships Between Body Size and Weight-Related Behaviors in Non-Eating Disorder Healthcare Providers and Eating Disorder Providers

Both the ED providers and the non-ED healthcare providers showed a relationship between body size and perceived weight control behaviors ($F(2,36)=14.33$, $p<0.001$; $F(2,55)=44.70$, $p<0.001$), respectively. As body size increased, the perception of weight control behaviors decreased so that people perceived the largest body size to use weight control behaviors the least and the smallest body size to use weight control behaviors the most. A relationship was also found between control behaviors and attraction in non-ED healthcare providers ($r(58)=-0.37$, $p=0.004$; **Table 4**). There was no relationship found between explicit weight beliefs and weight control behaviors in eating disorder practitioners (**Table 4**). There was also no relationship found between implicit weight stigma and perceived weight control behaviors in either ED providers or non-ED healthcare providers (see Table 4). There were no significant differences in perceptions of weight control behaviors between ED providers and non-ED healthcare providers ($t(97)=1.19$, $p=0.24$).

Table 4. Correlations between Perceived Weight Control Behaviors and Explicit and Implicit Weight Stigma in Non-ED Providers and ED Providers.

	Non-ED Providers (n=58)	ED Providers (n=39)
Loss of Control Behaviors	-.550**	-.570**
Adverse Judgment	-.112	.080
Social Distance	-.012	-.105
Equal Rights	-.192	-.024
Attraction	-.370**	-.140
Implicit Bias	.138	-.001

***Correlation is significant at the .01 level (2-tailed)*

** Correlation is significant at the .05 level (2-tailed)*

Both the ED providers and the non-ED healthcare providers showed a relationship between body size and perceived loss of control behaviors ($F(2,36)=34.63$, $p<0.001$; $F(2,55)=64.85$, $p<0.001$), respectively. As body size increased, the perception of loss of control behaviors also increased so that people perceived the largest body size to exhibit loss of control behaviors the most and the smallest body size to exhibit loss of control behaviors the least. There was no relationship found between either explicit weight beliefs or implicit weight stigma and perceived loss of control behaviors in either ED providers or non-ED healthcare providers (**Table 5**). There were no significant differences in perceptions of loss of control behaviors between ED providers and non-ED healthcare providers ($t(97)=-0.43$, $p=0.67$).

Table 5. Correlations between Perceived Loss of Control Behaviors and Explicit and Implicit Weight Stigma in non-ED Providers and ED Providers.

	Non-ED Providers (n=58)	ED Providers (n=39)
Control Behaviors	-.550**	-.570**
Adverse Judgment	-.019	.175
Social Distance	-.099	.123
Equal Rights	-.035	-.222
Attraction	.160	.005
Implicit Bias	-.185	-.163

***Correlation is significant at the .01 level (2-tailed)*

** Correlation is significant at the .05 level (2-tailed)*

DISCUSSION

The current study was concerned with evaluating the relationship of body size and eating disorder perceptions.

Hypothesis One: Relationship between Body Size and Perceived Eating Disorder Behaviors in the General Public

As expected, the person in the larger body was assumed to use more loss of control behaviors than the smaller body and the person in the smaller body was assumed to use more weight control behaviors than the larger body in the general public, indicating the importance of weight stigma in determining perceptions of weight-related behaviors.

These findings show that people in the general public may look at someone who lives in a larger body and automatically assume that they use binge eating or other uncontrolled behaviors. They may also look at someone who lives in a smaller body and automatically assume that they use restrictive eating or other over-controlled behaviors. This finding is the result of size stigma.

Hypothesis Two: Accounting for the Relationship between Body Size and Perceived Eating Disorder Behaviors in the General Public

Explicit weight beliefs partially accounted for the relationship between body size and estimates of perceptions of eating disorder symptoms in the general public, but only for perceived weight control behaviors on the attraction subscale. Perceptions of weight control behaviors were not related to other subscales of explicit weight beliefs and perceptions of loss of control behaviors were not related to explicit weight beliefs. Contrary to expectations, implicit weight stigma did not explain the relationship between body size and estimates of perceptions of eating disorder symptoms.

These results indicate that explicit weight beliefs and implicit weight stigma do not have as significant of an effect on perceptions of eating disorder behaviors in the general public as hypothesized. Even though participants endorsed certain questions indicating some levels of biased explicit weight beliefs, particularly on the attraction subscale, there was little overall relevance of explicit weight beliefs to the relationship between body size and perceptions of eating disorders symptoms, and certainly less than the effect of body size.

Hypothesis Three: Differences in Relationships between Groups

The larger body was assumed to use more loss of control behaviors than the smaller body and the smaller body was assumed to use more weight control behaviors than the larger body by healthcare providers, both as a whole and separately for non-ED and ED groups. There was no significant difference in perceptions of weight-related behaviors between the general public and healthcare providers or between ED providers and non-ED providers. Explicit weight beliefs and implicit weight stigma partially explained the relationship between body size and estimates of perceptions of eating disorder symptoms in both groups of healthcare providers, for perceived weight control behaviors on the attraction subscale in the healthcare providers group as a whole, but not when split into non-ED providers and ED providers. Other subscales of explicit weight beliefs were not related to perceptions of

weight control behaviors or perceptions of loss of control behaviors, and no perceptions of eating disorder behaviors were related to implicit weight stigma.

These results for healthcare providers, as a whole and in both non-ED and ED subgroups, are similar to the results found in the general public, particularly in terms of the relationship between body size and perceptions of eating disorders symptoms. The results for healthcare providers as a whole were also similar to the general public in terms of the effect of attraction on the relationship between body size and perceived weight control behaviors. As in the general public, these results indicate that body size is the most important factor in the perception of eating disorder symptoms for healthcare providers as a whole and when split into non-ED and ED subgroups. Thus, even if explicit weight beliefs and implicit weight stigma do not account for the relationship between body size and perceptions, body size stigma does drive judgements on the types of weight-related behaviors that individuals use, regardless of professional expertise or experience.

Theoretical and Methodological Considerations

While explicit weight beliefs only accounted for some of the relationship between body size and perceived weight behaviors, specifically stigma around attraction, and implicit weight stigma did not account for any of the relationship, body size had a significant relationship with perceived behaviors. This result means that people judge someone's weight behaviors simply based on looking at their body size. Healthcare providers also held that same bias. An individual living in a larger body could be experiencing restrictive eating symptoms and could be prescribed weight loss treatments only because they live in a larger body. It is particularly concerning that this relationship held true for healthcare providers who work with people with eating disorders. Providers who are trained to recognize symptoms of eating disorders in all body types and who must provide appropriate treatment recommendations seem to be significantly influenced by their client's body size when detecting eating disorders.

The relationship between body size and perceived eating disorder behaviors in healthcare providers is consistent with findings by Veillette et al. (2018) that showed that mental health providers prescribed fewer therapy sessions to a client when they were described either as "normal weight" or "overweight" than when they were described as "underweight."

It makes sense that attraction could account for part of the relationship between body size and perceptions of weight control behaviors more than other measures of explicit weight beliefs because the attraction subscale was based on the looks of someone in a larger body. The more explicit weight beliefs that someone held in terms of attraction to the person based on their body size, the more they perceived the person to use or not use weight control behaviors, respectively. Body size has been linked with attraction in the literature, with smaller bodies being considered more attractive [19]. Therefore, it is possible that attraction could partially explain the relationship between body size and perceptions of eating disorder behaviors.

These findings on the lack of a relationship between holding weight (vs. size) stigmatizing beliefs and negative treatment of those in larger bodies are inconsistent with much of the current literature. It is possible that our participants did not want to be perceived as perpetuators of bias when they respond to questions about equal rights, social distance, and judgment of those in marginalized groups. Indeed, it has been found that survey methods of measuring weight bias are often subject to under-reporting due to social desirability (Ruggs et al., 2010). One study of weight bias in post-graduate health students found that even though participants were reluctant to endorse statements about making derogatory jokes about people in larger bodies themselves, a high percentage (40-65%) reported noticing peers, students, instructors, and health providers making these negative comments about them [21]. Therefore, it is possible that even if participants in the current study did not exhibit high explicit weight beliefs, it is due to reluctance to endorse these items rather than a lack of holding weight stigmatizing beliefs.

It is possible that our sample size was too small to detect any relationship between the results of the IAT and perception of weight-related behaviors. In addition, the IAT typically measures evaluation ("liking") instead of motivation ("wanting"; Meissner et al., 2019), which is not a good predictor of behavior. Motivation instead is a better predictor of behavior. The IAT also measures associations rather than propositional beliefs and therefore is not as good a predictor of behavior (Meissner et al., 2019). Therefore, it is difficult to measure implicit bias in a way that has practical implications using available methods.

Overall, it is possible that these results showed that the relationship between body size and perceptions of weight-related behaviors is not accounted for by explicit weight beliefs and implicit bias not because they do not account for this relationship, but rather because of the difficulties inherent in measuring them. However, the results still highlight that people in larger bodies are much more likely to be perceived as using loss of control behaviors based on body size alone. Furthermore, even if explicit weight beliefs and implicit weight stigma do not account for the relationship between body size stigma and weight-related behaviors, the general public, non-ED healthcare providers, and ED healthcare providers still make decisions based on body size alone.

Limitations of the Study

Several scales that measure explicit weight beliefs all suffer from the fact that they are self-report measures and are

therefore subject to the risk of underreporting. We chose the UMB-F due to its adequate internal consistency and content validity as well as the fact that it is a widely used survey to look at explicit weight-related beliefs. As a self-report measure, it is possible that the UMB-F did not adequately assess the true level of intensity of held explicit weight-related beliefs in the current sample.

We were not able to analyze the results with the UMB-F scale as a whole because there was a lack of internal consistency for the total score. Instead, we used the subscales to look at explicit weight beliefs. Furthermore, we had to modify the attraction subscale by eliminating a question identifying "fat people [as] a turn off" because this item significantly reduced the subscale's internal consistency, thus limiting relationships with other variables in the study.

The current study may not be generalizable to other races and ethnicities. The sample was a majority white demographic. It is possible that other races and ethnicities might have different perceptions of those in larger bodies. In addition, the person depicted in the body picture in the study was a white silhouette. Results may have changed if the person was clearly of a different race. Previous research is mixed in terms of perceptions of larger bodies by different races. One study has shown that there are no ethnic differences in acceptable body size between Black, Hispanic, and white participants [23]. There was no difference between these groups in tolerance of larger body sizes. However, another study found that white women rate women in larger bodies lower on attractiveness, intelligence, job success, relationship success, happiness, and popularity than they rated the average or thin woman [24]. Black women did not show this bias toward women in larger bodies. Further research is needed on whether race and ethnicity affect the relationship between body size and perceptions of weight-related behaviors.

Finally, the body depicted in the picture in this study was a masculine body rather than a feminine body. It is possible that this choice affected the results as females are subject to the thin ideal, a body size perpetuated in media in western culture. The thin ideal is then internalized as females try to sculpt their body to match it. Furthermore, internalization of the thin ideal is linked to the development of eating disorders (Hawkins et al., 2004). Thus, it is possible that participants would have shown different levels of intensity of weight-related beliefs had they been shown a feminine body picture at the beginning of the survey.

Future studies could include vignettes about the individuals of different body types in the images. These vignettes could help determine the effects of body size stigma on perceptions of symptoms of the weight-related behaviors that are presented, which would allow the production of recommendations for the given symptoms and behaviors.

Clinical Implications

These results imply that healthcare providers, both ED and non-ED, are likely to look at a patient who lives in a larger body and assume that they are using binge-eating behaviors, based only on their body size. This assumption can lead to inappropriate treatment recommendations such as diet, exercise, and weight loss. Given the results regarding the impact of body size stigma on perceptions of weight-related behaviors, it is imperative that healthcare providers, both those who work directly with eating disorders and those who do not, reevaluate the way they look at body size and make assumptions about the behaviors. Furthermore, it seems that, not only is it important to adjust explicit weight beliefs, it is also important to adjust beliefs directly about body size, what behaviors the individual might exhibit, and treatment recommendations that should be made.

There are ways individual providers can approach weight stigma to improve the lives of people who live in larger bodies. One review found several themes in effective strategies in reducing weight stigma in healthcare: education, causal information and controllability, and weight-inclusive approach [26]. These strategies could also be implemented in the general public with the goal of reducing stigma in society. Talumaa et al. (2022) found that ways to reduce stigma through education included the introduction of the idea that weight is not fully in personal control and that there are uncontrollable determinants of weight, as well as the discussion of social and cultural impacts of weight stigma. For example, one study found that among first-year medical students, a comprehensive educational obesity curriculum resulted in an increased knowledge in all aspects of obesity as well as a reduction in weight bias [27]. This reduction in bias was sustained through the fourth year. However, students still showed a moderate amount of weight bias overall.

In addition, teaching from a viewpoint that discusses the environmental and genetic determinants of weight could be helpful in reducing weight stigma. A strategy to reduce weight stigma among a sample of university students in Germany was followed by implementation among a population sample [28]. Results showed a decrease in the population attributing weight to personal characteristics and an increase in the population attributing weight to genetic characteristics, and these findings predicted lower weight bias. These findings continued four weeks post-intervention, indicating that this strategy was effective in the short term.

Reducing stigma through the weight-inclusive approach requires not assuming that weight loss is achievable, beneficial, safe, and necessary for everyone who lives in a larger body. Healthcare providers must be taught to frame weight-inclusive care as a human rights issue where people in larger bodies have a right to quality medical care and deserve to be treated with dignity and respect. A one-day workshop

with public health promoters that raised awareness of weight bias and its negative effects on health, ways to balance healthy weight messaging, and incorporating mental health into healthy weight messaging [29] showed a decrease in antifat attitudes and internalization of media stereotypes about those in larger bodies. Results also showed an increase in self-efficacy to combat weight bias as well as an increase in knowledge of personal weight bias.

Finally, other approaches to reduce weight stigma include legislation prohibiting discrimination and bullying based on weight, weight bias training for educators and employers, training for healthcare professionals and regulations for the physical environment of healthcare settings, and a media pledge to stop the use of weight-stigmatizing images, news content, and public health messages [30]. Overall, while these strategies may be promising ways to reducing weight stigma, results are mixed, and more research must be conducted to find effective approaches to combat weight stigma.

Summary and Conclusion

Body size was related in our study to perceptions about weight-related behaviors, including whether loss of control or overcontrol are perceived as more likely based on body size alone. This relationship was not accounted for by explicit weight beliefs, for the most part, or implicit weight stigma. This relationship was also present in healthcare providers, including those who work with patients with EDs.

Our findings have implications for clinicians' approach to treatment of eating disorders for those in larger bodies and for the assumption that those living in larger bodies only struggle with binge-eating symptoms but not restricting symptoms. It is important to further this research to more completely understand the effects of weight and size stigma on the treatment of those with AAN.

Supplementary Materials

Table 1. Eating Disorder Symptoms Questionnaire

Wording revised from the EDE-Q and the DSM-V to fit the different context of rating an image.

Please answer all of the following questions, using this scale:

1	2	3	4	5
Definitely Not	Leaning Towards No	Might or Might Not	Leaning Towards Yes	Definitely Yes

Do you suspect that this person regularly:

1. limits the amounts or types of foods that they eat?
2. eats an amount of food in a short period of time (e.g. within 2 hours) that is definitely larger than what most people would eat in the same time period?
3. makes themselves vomits in an attempt to control their weight?
4. uses laxatives, diuretics, or other substances in an attempt to control their weight?
5. skips meals?
6. eats large amounts of food when they are not physically hungry?
7. exercises intensely in order to compensate for the food that they eat?
8. feels as though they cannot stop eating once they start?
9. limits their consumption of calories?
10. excludes certain foods from their diet?
11. eats until they feel uncomfortably full?

Factors

I. Items 1,3,4,5,7,9,10 (~restricting symptoms; Weight control behaviors)
II. Items 2,6,8,11 (~binge eating symptoms; Loss of control behaviors)

Weight Control Behaviors

Item # in this scale	Item # on EDE-Q
1	1
3	16
4	17
5	2
7	18
9	4
10	3

Loss of Control Behaviors

Item # in this scale	Item # on EDE-Q
2	13
8	14

Items 6 and 11 on the Loss of Control behaviors scale were taken from the DSM-V criteria for binge-eating disorder ("The binge-eating episodes are associated with...eating large amounts of food when not feeling physically hungry (6); eating until feeling uncomfortably full (11)").

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