






Short Communication

Weight bias among public health trainees

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Abstract

Objective: To explore explicit beliefs about the controllability of *obesity* and the internalisation of negative weight-related stereotypes among public health trainees.

Design: Cross-sectional online survey assessing explicit beliefs about the controllability of *obesity* using the Beliefs About Obese Persons Scale (BAOP) and internalisation of weight bias using the Modified Weight Bias Internalization Scale (WBIS-M). Bivariate associations between BAOP and WBIS-M scores and demographic characteristics were examined using *t* tests or ANOVA with *post hoc* Tukey's tests.

Setting: School of Public Health at a large, Midwestern University.

Participants: Public health students (*n* 322).

Results: Relative to students who identified as male, those who identified as female had a stronger belief that *obesity* is not within the control of the individual ($P = 0.03$), yet had more internalisation of weight bias ($P < 0.01$). Greater weight bias internalisation was also seen among students who perceived themselves to be of a higher weight status ($P < 0.001$) and those who were at risk for food insecurity ($P < 0.01$).

Conclusions: Public health trainees may be more attuned to the complexities of weight relative to trainees in other health-related fields, but are still susceptible to internalisation of negative weight-related stereotypes.

Keywords
Weight bias
Public health
Workforce development

Weight bias is widespread and poses a significant threat to both physical and psychological health, yet is under recognised as a public health issue^(1–4). Experiencing weight stigma is physiologically stressful, undermines the self-regulation resources needed to engage in health-promoting behaviours and contributes to poor mental health outcomes such as depression, anxiety, substance abuse and eating disorders^(1–4). Despite research highlighting the complexity of the biological, genetic and sociocultural factors influencing weight, as well as the physiological adaptations following weight loss that promote weight regain, public health messages often focus on personal responsibility and frame weight as highly controllable⁽³⁾. Such messaging perpetuates negative weight-based stereotypes and, thereby, threatens core ethical and humanistic public health values^(3,5) and ultimately harms the intended recipients of the public health message.

The presence of weight bias among healthcare trainees and professionals across a range of disciplines has been well described⁽⁶⁾. To our knowledge, however, no research to date has examined weight bias among the public health workforce. Understanding beliefs about the controllability of weight among public health trainees could inform workforce development initiatives that aim to reduce weight bias in public health practice. Furthermore, characterising the extent to which public health trainees internalise weight-biased beliefs could provide insight into how exposure to weight-biased content during training may negatively impact the trainees themselves. Accordingly, the aim of this study was to explore explicit beliefs about the controllability of *obesity* and the internalisation of negative weight-related stereotypes among public health trainees.

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Methods

Participants were students of all levels at a Council on Education for Public Health-accredited School of Public Health at a large, Midwestern University. In October 2019, students were invited to complete a Qualtrics survey examining 'beliefs and experiences of public health students on nutrition-related topics such as weight bias and food insecurity' via emails from school-wide listservs. Students who completed the survey were entered to win one of fifty \$25 gift cards. Only students who indicated they were 18 years of age or older and those who agreed their data could be reported were included in the analysis.

Participants completed the Beliefs About Obese Persons Scale (BAOP)⁽⁷⁾, an eight-item measure designed to assess explicit beliefs about causes and controllability of *obesity*. The BAOP uses a six-point scale (−3 to 3, not including 0), with a possible score range of 0–48 (items summed plus 24) and higher scores indicating a stronger belief that *obesity* is not within the control of the individual. To examine how beliefs about negative weight-related societal stereotypes apply to oneself, participants completed a modified version of the eleven-item Weight Bias Internalization Scale (WBIS-M)⁽⁸⁾, which is applicable to individuals across different body weight statuses. The WBIS-M uses a seven-point scale (1–7) that is averaged (possible score range of 1–7) with higher scores representing greater internalisation of weight bias. Students also provided responses to demographic questions assessing self-identified gender, race/ethnicity, perceived weight status, risk of food insecurity using two-items adapted from the USDA Core Food Security Module⁽⁹⁾, degree programme and academic department. Bivariate associations between BAOP and WBIS-M scores and demographic characteristics were examined using *t* tests or ANOVA with *post hoc* Tukey's tests.

Results

Among the 322 students in our analytic sample, the mean (SD; range) BAOP and WBIS-M scores were 22.89 (7.79; 6.0–42.0) and 3.12 (1.39; 1.0–7.0), respectively. Internal consistency of the BAOP in this sample was acceptable ($\alpha = 0.72$), and the internal consistency of the WBIS-M was excellent ($\alpha = 0.93$).

Descriptive characteristics of the sample and results of bivariate analyses are shown in Table 1. We observed significant differences in BAOP and WBIS-M scores according to gender. Relative to students who identified as male, those who identified as female had a stronger belief that *obesity* is not within the control of the individual (BAOP: 23.25 *v.* 20.68, $P = 0.03$), yet had more internalisation of weight bias (WBIS-M: 3.19 *v.* 2.63, $P < 0.01$). Greater internalisation of weight bias was also seen among students who perceived themselves to be of a higher weight status

(4.12 *v.* 2.74, $P < 0.001$) and those who were at risk for food insecurity (3.53 *v.* 3.02, $P < 0.01$). No significant differences in BAOP or WBIS-M scores were seen according to race/ethnicity.

We observed significant differences in beliefs about the controllability of *obesity* according to degree programme ($P = 0.04$) and across academic departments ($P < 0.001$), with *post hoc* tests revealing a stronger belief that *obesity* is not within the control of the individual among students in the undergraduate public health programme (relative to those pursuing a MS or 'other' Master's degree) and students studying Health Behavior and Health Education (relative to those studying Epidemiology, Health Management and Policy and Biostatistics). There were no significant differences in weight bias internalisation across programme or department.

Discussion

Among public health trainees, we observed differences in beliefs about the controllability of *obesity* according to gender, degree programme and academic department. Higher weight bias internalisation was seen among students who identified as female, those who perceived themselves to have a high weight status and those who were food insecure.

Findings from the present study should be considered relative to the literature documenting weight bias among other healthcare trainees and the general population. Mean BAOP scores in our sample of public health trainees (22.9) indicated a stronger belief that *obesity* is driven by genetic/environmental causes, as opposed to a lack of personal control, relative to a study of student nurses (17.4) in Turkey⁽¹⁰⁾, a Mexican study of psychology (18.6) and medical (16.6) students⁽¹¹⁾ and a study of nursing students (17.2) at a US university⁽¹²⁾. Scores were similar to those seen among social work students (23.9) in the same US-based study⁽¹²⁾. This finding may reflect qualities of students who choose to study public health *v.* other health-related careers, such as a natural orientation towards population level *v.* individual approaches to health promotion. Public health students also appear to be more likely to recognise genetic/environmental drivers of obesity than the general population. The original reliability study of the BAOP reported mean scores of 16.7 and 14.8 among undergraduate and graduate students, respectively⁽⁷⁾, and a general sample of college-aged students in the United Kingdom reported a mean BAOP score of 14.2⁽¹³⁾. WBIS-M scores in our sample were similar to those reported in a large study of undergraduate university students from Australia, in which students with higher body weights and female students were particularly vulnerable to weight bias internalisation⁽¹⁴⁾. The observed relationship between perceived weight status and internalisation of weight bias is consistent with past literature documenting that weight

Table 1 Sample characteristics and bivariate associations with controllability of obesity and weight bias internalisation (*n* 322)

	<i>n</i>	Beliefs About Obese			Modified Weight Bias Internalization		
		Persons Scale (BAOP)	Mean (sd) ^a	<i>P</i> -value ^c	Scale (WBIS-M)	Mean (sd) ^b	<i>P</i> -value ^c
Gender ^d				0.03			< 0.01
Male	49	20.68	6.96		2.63	1.28	
Female	268	23.25	7.81		3.19	1.37	
Race/ethnicity ^e				0.65			0.12
White, non-Hispanic	191	22.85	7.86		3.19	1.38	
Black, non-Hispanic	31	22.69	7.37		3.47	1.44	
Hispanic	16	25.25	8.60		2.92	1.64	
Asian	81	22.57	7.50		2.84	1.31	
Perceived weight status				0.73			< 0.001
'Underweight'/'normal weight'	233	22.98	7.61		2.74	1.18	
'Overweight'/'very overweight'	89	22.65	8.30		4.12	1.39	
At risk for food insecurity				0.26			< 0.01
No	256	22.64	7.90		3.02	1.32	
Yes	66	23.85	7.34		3.53	1.57	
Degree programme				0.04 ^h			0.11
Undergraduate	51	24.97	6.44		3.33	1.20	
MPH	191	22.96	8.19		3.13	1.46	
MS or other Master's degree ^f	40	20.25	7.18		2.65	1.14	
PhD	37	22.43	7.34		3.28	1.43	
Academic department ^g				< 0.001 ⁱ			0.12
Biostatistics	24	19.29	5.77		2.62	1.34	
Environmental Health Sciences	20	22.30	7.55		2.74	0.95	
Epidemiology	68	21.34	7.90		3.38	1.54	
Health Behavior and Health Education	63	25.90	8.43		3.23	1.48	
Health Management and Policy	39	19.38	5.95		2.93	1.28	
Nutritional Sciences	42	23.55	9.02		2.89	1.23	

^aHigher BAOP scores represent the belief that obesity is not within the control of the individual.

^bHigher WBIS scores represent greater internalisation of weight bias.

^cBivariate associations between BAOP and WBIS-M scores and demographic characteristics were examined using *t* tests or ANOVA.

^dTo protect the anonymity of the small number of students who identified as a gender other than male or female (*n* 5), mean BAOP and WBIS-M scores for this group are not reported and are excluded from the bivariate analyses for gender.

^eStudents who wrote in their race/ethnicity as Middle-Eastern were classified as White, non-Hispanic; students who indicated they were both White/Caucasian and Hispanic were classified as Hispanic; students who indicated they were both White/Caucasian and Asian were classified as Asian.

^fOther Master's degrees included students in the Master of Health Services Administration and Master of Health Informatics degree programmes.

^gStudents from 'other' academic departments, including those in multiple departments and in the online MPH program, and those in the undergraduate programme were excluded from the bivariate analyses for academic department.

^h*Post hoc* Tukey's tests show a significant difference in BAOP scores among students in the undergraduate public health programme relative to those pursuing an MS or 'other' Master's degree; no other significant differences between groups were observed.

ⁱ*Post hoc* Tukey's tests show significant differences in BAOP scores among students studying Epidemiology, Health Management and Policy, and Biostatistics relative to those studying Health Behavior and Health Education; no other significant differences between groups were observed.

perception is related to susceptibility to weight bias^(15,16) and related outcomes such as disordered eating^(17–19). Our observation that students at risk for food insecurity had higher WBIS-M scores aligns with a previous study where food insecurity was associated with greater weight self-stigma among adult food bank clients⁽²⁰⁾. Because only public health trainees were recruited for this study, we were unable to directly compare beliefs of public health trainees with the general population. This limitation should be addressed in future studies.

This study was conducted among public health trainees at a single university and, as participation was voluntary, was susceptible to response bias. While these limitations impact the generalisability of our findings, this study is the first of its kind to examine weight bias among public health trainees and provides a foundation for future work examining approaches to address weight bias within public health training and practice. Findings from this study suggest that public health trainees may be more attuned to the

complexities of weight relative to trainees in other health-related fields, but are still susceptible to internalisation of harmful weight-biased beliefs.

Overall, there is limited evidence for effective approaches to reduce weight bias, in part due to the paucity of research efforts in this area⁽²¹⁾, highlighting the need for the development and rigorous testing of intervention strategies that target public health trainees. Significant improvement in explicit attitudes and beliefs towards people with obesity was seen in a study of trainee healthcare professionals who viewed brief, educational films that used a range of strategies to promote stigma reduction (e.g. attributions of weight controllability, empathy induction and debunking weight-based stereotypes)⁽²²⁾. Another recent study conducted among medical students showed that favourable interactions with higher-weight patients were significantly associated with less negative attitudes towards them⁽²³⁾. These studies underscore the importance of using a range of strategies to address issues of weight bias among



public health trainees. Course offerings or school-wide initiatives that raise awareness of size diversity or weight-inclusive health promotion, particularly those that centre individuals with lived experience, could be leveraged to reduce the internalisation of weight bias among the most vulnerable students (e.g. those with higher body weights). To help prepare the next generation of practitioners and scholars to effectively work with individuals with higher body weights, content on the multi-factorial aetiology of weight and on the harms of weight bias could be incorporated into foundational public health coursework.

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