

The Experience of Weight Stigma Among Gym Members With Overweight and Obesity

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Persons with obesity face frequent instances of weight-related victimization and discrimination. To date, however, no research has assessed weight stigma within fitness facilities among a sample of gym members with overweight and obesity. Given the role of exercise in mitigating the health risks of obesity, it is vital to assess the presence of weight stigma within exercise facilities. We therefore assessed weight stigma within fitness facilities, factors affecting motivation to exercise, and factors that are important when selecting a gym. U.S. adult gym members with overweight and obesity completed online self-report measures of gym use, experiences of stigma within fitness settings, barriers to exercise, and gym preferences. Participants also completed measures of health and psychological functioning. Three hundred eighty-nine individuals (75% female, 53% White, 74% with obesity) participated. Adjusting for covariates, stigma at the gym was associated with negative attitudes toward the gym, maladaptive behaviors to cope with stigma, weight bias internalization, unhealthy weight control practices, and poorer self-reported physical and emotional health ($ps < .05$). Stigma at the gym was unrelated to self-reported frequency of gym use ($p > .05$). Experiences of weight stigma at the gym are associated with poor emotional and physical health among individuals with overweight and obesity. Respondents also indicated that provision of a shame-free environment is an important consideration when selecting a gym. Results may help to determine whether new gym policies to promote exercise among individuals with overweight and obesity are warranted.

Keywords: weight stigma, fitness facilities, exercise, obesity, gym

There is a wealth of data demonstrating pronounced antifat attitudes among educators, medical students, health care providers, and psychologists (Berryman, Dubale, Manchester, & Mittelstaedt, 2006; Epling, Morley, & Ploutz-Snyder, 2011; Puhl, Peterson, & Luedicke, 2013; Sabin, Marini, & Nosek, 2012; Schwartz, Chambliss, Brownell, Blair, & Billington, 2003; Wear, Aultman, Varley, & Zarconi, 2006). Existing data have also documented weight stigma among those in professions relating to exercise and fitness. Both exercise science and physical education students have strong negative implicit biases against persons with obesity (Chambliss, Finley, & Blair, 2004; O'Brien, Hunter, &

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Banks, 2007). Physical education students were also found to have significantly greater negative implicit biases against persons with obesity compared with students in other majors who were matched for age, education, and body mass index (BMI [kg/m²]; National Heart, Lung, and Blood Institute, 1998). In addition, third-year physical education students had greater antifat biases compared with first-year students, indicating that antifat attitudes may be culturally sanctioned and exacerbated during schooling (O'Brien et al., 2007). In a study of 70 fitness center employees, explicit antifat attitudes fell below the midpoint of the Antifat Attitudes Test; however, respondents demonstrated moderately strong implicit antifat attitudes (Dimmock, Hallett, & Grove, 2009), indicating that social desirability may prevent those in the fitness industry from expressing antifat attitudes openly. In contrast, a sample of 57 fitness professionals and 56 regular exercisers from the United Kingdom endorsed both strong explicit and implicit antifat attitudes (Robertson & Vohora, 2008). Antifat attitudes were particularly pronounced among those who had never been overweight and those who believed that personal responsibility is a strong determinant of weight status.

Individuals with overweight and obesity face frequent instances of stigma and prejudice in multiple domains, including employment, education, health care, the legal system, and the media (Hebl & Xu, 2001; Puhl, Gold, Luedicke, & DePierre, 2013; Puhl & Heuer, 2009; Puhl, Peterson, Depierre, & Luedicke, 2013; Puhl, Peterson, & Luedicke, 2013; Schvey, Puhl, Levandoski, & Brownell, 2013). Importantly, individuals with overweight and obesity who are the victims of weight stigma are at increased risk for adverse psychological outcomes, including depression, anxiety, negative body image, reduced self-esteem, and suicidality (Ashmore, Friedman, Reichmann, & Musante, 2008; Durso, Latner, White, et al., 2012; Friedman, Ashmore, & Applegate, 2008). In addition, exposure to weight stigma may promote unhealthy behaviors, such as binge eating, increased caloric consumption, and reluctance to diet (Ashmore et al., 2008; Friedman et al., 2008; Puhl & King, 2013; Schvey, Puhl, & Brownell, 2011). Existing data among youth and adults demonstrate that

the experience of weight stigma may also attenuate the desire to exercise. For instance, among youth, weight-based teasing is a significant barrier to participation in physical activity and is associated with preferences for sedentary activities (Bauer, Yang, & Austin, 2004; Hayden-Wade et al., 2005; Zabinski, Saelens, Stein, Hayden-Wade, & Wilfley, 2003). Among adults, both stigma consciousness and negative weight-based stereotype priming predict lower exercise self-efficacy, intention to exercise, and perceived exercise competence (Schmalz, 2010; Seacat & Mickelson, 2009). The experience of weight stigma is also associated with avoidance of exercise altogether (Vartanian & Shaprow, 2008). Thus, the experience of weight stigma may contribute to obesogenic behaviors that might stymie weight loss efforts and promote weight gain.

Research indicates that persons with obesity are less likely to exercise compared with their lean peers (Kruger, Galuska, Serdula, & Jones, 2004). Given the prevalence of antifat attitudes among exercise professionals (Chambliss et al., 2004; Dimmock et al., 2009; O'Brien et al., 2007; Robertson & Vohora, 2008) and the association between weight stigma and exercise avoidance, it is plausible, therefore, that perceived weight stigma at the gym may, in part, account for this discrepancy. However, experiences of weight stigma within fitness facilities have not yet been assessed. As physical activity and exercise have been shown to attenuate obesity, bolster weight maintenance, and reduce related medical comorbidities (Anderson, Konz, Frederich, & Wood, 2001; Kasumov et al., 2015; Nassis et al., 2005; Ross et al., 2004; Slentz et al., 2004), it is imperative that potential stigma-related barriers to exercise be identified. As individuals with obesity are already vulnerable to numerous health consequences (Flegal, Graubard, Williamson, & Gail, 2005; Guh et al., 2009; Must et al., 1999), the avoidance of exercise may confer additional risk to health and well-being. Thus, the aims of the present study were to assess experiences of weight stigma within fitness facilities, elucidate factors that impede motivation to exercise and factors that are important when selecting a gym, and explore the associations between weight stigma within

fitness facilities and indices of health among persons with overweight and obesity. We hypothesized that weight-related stigma at the gym would be associated with negative attitudes toward the gym, avoidance of gym use, unhealthy behaviors, and poor self-reported health. We also hypothesized that individuals with obesity would report greater weight-related stigma within fitness facilities than individuals with overweight.

Method

Participants and Procedures

Participants were U.S. adults (≥ 18 years) with overweight or obesity ($\text{BMI} \geq 25$; National Heart, Lung, and Blood Institute, 1998) who currently or recently (within the past 5 years) belonged to a gym or fitness facility. The study was advertised on Craigslist classified advertisements in major cities throughout the United States in an attempt to sample from a variety of geographic regions (for instance, New York, Boston, Baton Rouge, Tulsa, Austin, Oklahoma City, Seattle, and San Francisco). Flyers were posted in the tri-state area of Maryland, the District of Columbia, and Virginia at grocery stores, gyms, and public spaces. The advertisement queried, "Are you overweight and at least 18 years old? Do you belong to a gym?"

Participants completed all self-report questionnaires anonymously through an online data-gathering website (SurveyMonkey; <http://www.surveymonkey.com>). Survey Monkey is a research-based web server with secure 128-bit data encryption. Participants were required to confirm willingness to participate and to provide informed consent prior to accessing the questionnaires. Individuals were compensated with a \$5.00 electronic gift card in exchange for study participation. No personal identifying information was collected. This study received approval of the Uniformed Services University Institutional Review Board. Data were collected between April and October of 2015.

Measures

Demographic information. Participants provided basic demographic information, the name of the gym to which they belong (or

recently belonged), as well as self-reported height and weight.

Short-Form 36 Health Survey (SF-36; Ware, 2000). The SF-36 is a self-report measure of emotional and physical health. The SF-36 consists of eight subscales (Physical Functioning, Role Limitations due to Physical Health, Role Limitations due to Emotional Problems, Energy/Fatigue, Emotional Well-Being, Social Functioning, Pain, and General Health) rated on a 5-point scale. All subscales demonstrated acceptable to excellent reliability ($\alpha = .70$ to $.90$) in the current sample.

Current weight loss efforts. Current weight loss efforts were assessed using 11 items selected and adapted from prior studies of weight loss efforts (Klem, Wing, McGuire, Seagle, & Hill, 1997; Ogden, 2000; Wing & Phelan, 2005). Participants were queried as to whether they were currently using various common weight-loss strategies. Responses were coded along a 6-point scale ranging from *never* to *very often*. A confirmatory factor analysis using OBLIQUE rotation revealed two factors (eigenvalues > 1): Healthy Weight Loss Behaviors (six items; e.g., eliminating sugar-sweetened beverages, exercising, reducing portion sizes, increasing fruits/vegetables; $\alpha = .83$) and Unhealthy Weight Loss Behaviors (five items; e.g., taking diet pills, using laxatives, using diuretics, going on a juice cleanse; $\alpha = .86$).

Coping with Weight Stigma Questionnaire. The Coping with Weight Stigma Questionnaire is a 17-item scale that was shortened from a 28-item measure used in a prior study of weight stigma (Puhl & Luedicke, 2012). Items were selected from the original measure that captured one of five constructs: negative affect (e.g., "I felt badly about my body"; "I felt less confident in myself"), avoidance strategies (e.g., "I avoided physical activity"; "I attempted to hide my shape with baggy clothes"), health behaviors (e.g., "I tried eating healthier to lose weight"; "I started exercising more"), increased eating responses (e.g., "I ate more food"; "I ate my favorite foods to make myself feel better"), or enlisting help (e.g., "I reported it to a supervisor"; "I talked to supportive friends"). Respondents indicate their answer on a 5-point scale ranging from *never* to *very often*. Item-total correlations were calculated and items were removed if the item-total correlation was ≤ 0.40 (Smith & McCarthy, 1995). The

resulting measure consisted of 10 items (full scale $\alpha = .89$). An exploratory factor analysis using OBLIQUE rotation and visual analysis of the scree plot revealed two factors (eigenvalues >1): Maladaptive Coping Responses (eight items; $\alpha = .90$) and Ignoring/Laughing It Off (two items; $\alpha = .62$). Given the questionable reliability of the latter scale, only the Maladaptive Coping subscale was used in subsequent analyses. This factor included items such as “I ate more food,” “I felt badly about my body,” and “I tried to lose weight quickly (e.g., using diet pills, saunas, body wraps).” The subscale score was derived from the mean of the eight items.

Weight Bias Internalization Scale-Modified (Durso & Latner, 2008; Pearl & Puhl, 2014). The Weight Bias Internalization Scale-Modified is a validated measure that assesses the degree to which a respondent believes that negative stereotypes about persons with overweight and obesity are applicable to him or herself (e.g., “I hate myself for my weight”; “My weight is a major way that I judge my value as a person”). The modified version (Pearl & Puhl, 2014) was adapted to assess weight bias internalization across weight strata (whereas the original was designed for only respondents with overweight). The mean score (ranging from 1 to

7) is used for analysis; higher scores indicate a greater degree of weight bias internalization ($\alpha = .82$).

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI-II consists of 21 items that assess depressive symptoms (e.g., “I feel utterly worthless”) on a scale from 0 to 3. Higher scores reflect more severe levels of depression. The BDI-II has demonstrated high internal consistency in both psychiatric and community samples (mean coefficient = .87). The BDI-II has also shown strong test-retest reliability and high construct validity (Beck, Steer, & Garbin, 1988). The BDI-II demonstrated good reliability in the current sample ($\alpha = .93$).

Gym Survey. The Gym Survey was created for the present study and consists of 13 items to assess satisfaction with the gym to which the participant belongs/belonged, and stigmatizing experiences (see Table 1). Prior to dissemination, the measure was completed and evaluated by members of the research team for ease of comprehension and clarity. Items are answered along a 7-point Likert scale ranging from *strongly disagree* to *strongly agree*. This measure demonstrated good reliability (full scale $\alpha = .91$) in the

Table 1
Gym Survey Scale Items

Scale item	Item mean \pm standard deviation	Item-total correlation	Factor loading
1. I prefer to exercise elsewhere ^a	3.73 \pm 1.93	.65**	.67
2. Gym staff members (or personal trainers) have commented negatively on my weight ^c	2.49 \pm 1.81	.64**	.80
3. People stare or give me dirty looks at my gym ^c	3.21 \pm 1.99	.76**	.85
4. I am satisfied with my gym ^{b,d}	4.50 \pm 1.72	.62**	.74
5. I feel comfortable going to my gym ^{b,d}	4.50 \pm 1.85	.69**	.75
6. I feel negatively judged at my gym ^c	3.47 \pm 2.02	.80**	.73
7. I feel self-conscious at my gym ^a	4.41 \pm 2.05	.75**	.89
8. The other members are all in better shape than I am ^a	4.85 \pm 1.75	.57**	.60
9. The equipment (e.g., stationary bicycle, elliptical machine) at my gym feels too small for me ^c	2.63 \pm 1.65	.48**	.55
10. I prefer not to exercise at my gym ^b	3.32 \pm 1.91	.80**	.79
11. I enjoy going to my gym ^{b,d}	4.44 \pm 1.74	.68**	.82
12. I dread going to my gym ^b	3.57 \pm 1.86	.74**	.63
13. I feel embarrassed by my weight at my gym ^a	4.60 \pm 1.96	.69**	.73

^a Factor #1: Self-Consciousness at the Gym. ^b Factor #2: Negative Attitudes Towards the Gym. ^c Factor #3: Stigma at the Gym. ^d Reverse scored.

** Correlation is significant at the .01 level.

current sample. All item-total correlations were $>.40$ (Smith & McCarthy, 1995); thus, all 13 items were retained in the final scale. An exploratory factor analysis using OBLIQUE rotation and visual analysis of the scree plot revealed three subscales (eigenvalues >1) accounting for 68% of the variance: Self-Consciousness at the Gym (three items: "I feel self-conscious at my gym"; "I feel embarrassed by my weight at the gym"; "The other members are all in better shape than I am"; $\alpha = .79$), Negative Attitudes Toward the Gym (six items: e.g., "I dread going to my gym"; "I prefer not to exercise at my gym"; $\alpha = .88$), and Stigma at the Gym (four items: "Gym staff members have commented negatively on my weight"; "People stare or give me dirty looks at my gym"; "I feel negatively judged at my gym"; "The equipment [e.g., stationary bicycle, elliptical machine] at my gym feels too small for me"; $\alpha = .83$). In addition, participants were asked to indicate on an eight-item frequency scale (from *never* to *every day*) how often they typically go to the gym. They also indicated the length of their current gym membership.

Barriers to Exercise. Barriers to Exercise is a 22-item measure created for the present study to assess factors that impact motivation to attend the gym. Participants were asked to indicate along a 5-point scale ranging from *a great deal* to *not at all* to what extent certain factors affect their motivation to use the gym. Whereas the Gym Survey subscales assess actual experiences at the gym, the Barriers to Exercise subscales assess the extent to which specific concerns affect motivation to use the gym. All item-total correlations were $>.40$; thus, all 22 items were retained prior to the factor analysis (Smith & McCarthy, 1995). One item (Lacking Willpower/Self-Discipline) comprised its own factor, and thus was omitted. The final measure (scale $\alpha = .94$) comprised three factors: Self-Consciousness Concerns (11 items: e.g., "Worrying that other people will laugh at me or judge me," "Not wanting to wear tight-fitting clothing in front of others,"; $\alpha = .95$), Physical Concerns (seven items: e.g., "Being afraid of injury," "Minor aches and pains," "Fearing that I will break or damage equipment because of my weight"; $\alpha = .85$), and Logistics Concerns (three items: "Having to travel too far from

home," "Not having enough time," "Being unable to afford membership"; $\alpha = .66$). Given the questionable reliability of the Logistics Concerns subscale, only the Self-Consciousness Concerns and Physical Concerns subscales were investigated in subsequent analyses. This measure is available upon request.

Gym Preferences. Gym Preferences is a 17-item measure created for the present study to assess which factors are most important when selecting a gym. Participants indicated, along a 5-point scale ranging from *not at all important* to *extremely important*, which factors (e.g., "equipment and machines that are sized for larger bodies"; "staff who are overweight and/or who have lost weight") are most important. Four items had item-total correlations $<.40$ and were thus omitted (Smith & McCarthy, 1995). Exploratory factor analysis revealed three factors accounting for 67% of the variance (full scale $\alpha = .91$): Specialization for Members with Overweight (seven items: e.g., "Other members that are also overweight," "Equipment and machines that are sized for larger bodies," "Staff who are overweight and/or who have lost weight"; $\alpha = .87$), Shame-Free Environment (three items: e.g., "Shame/embarrassment-free environment," "Nonjudgmental staff,"; $\alpha = .83$), and Gym Offerings (three items: e.g., "Group fitness classes," "Weight-loss counseling"; $\alpha = .74$). This measure is available upon request.

Data Analytic Plan

All analyses were conducted using SPSS for Windows Version 22 (SPSS, Inc., Chicago, IL). Data were examined for outliers, skewness, and kurtosis. Skewed variables were log-transformed to satisfy assumptions of normality. Outliers ($<6\%$ of all data points) were adjusted to fall 1.5 times the interquartile range below the 25th percentile or above the 75th percentile. To determine associations between variables, bivariate correlations were conducted among all key variables. Multiple regressions were performed to determine the associations of the Stigma at the Gym subscale with gym attendance, indices of psychosocial functioning, and self-reported health, after controlling for variables selected a priori that have been shown to

be associated with fitness level and energy expenditure (sex, race, BMI, age, and depressive symptoms, as assessed by the BDI-II; Skinner et al., 2001). Multiple regressions were also used to determine the association between Stigma at the Gym and Barriers to Exercise and Gym Preferences. To test for moderation, BMI and mean score from the Stigma at the Gym subscale were mean-centered and multiplied to create an interaction term, which was then entered into the regression model. All variables were entered into the model in a single step. To compare individuals with obesity to those with overweight, multiple analyses of covariance were conducted, controlling for sex, race, age, and depressive symptoms. Differences were considered significant when p values were $\leq .05$. All tests were two-tailed.

Results

Three hundred eighty-nine men (25%) and women (75%) with overweight ($25 \leq \text{BMI} < 30$; 26%) and obesity ($\text{BMI} \geq 30$; 74%) participated. Average age was 32.98 ± 11.29 years, and mean BMI was 35.59 ± 7.66 . The racial distribution of the sample was 53% White, 25% Black, 6% Asian, 6% Multiracial, 1% Native American, 9% Other/Unknown. The ethnic distribution, as defined by the United States Census Bureau (1999), was 11% Hispanic or Latino and 89% non-Hispanic. Table 2 provides additional demographic information. The mean length of gym membership was 3.47 ± 1.66 years. Participants primarily belonged to national and regional gym franchises (76%) and community center recreation facilities (16%). The remainder of respondents belonged to college or high school fitness centers (5%), specialty gyms (1%), and multiple fitness centers (2%). Table 3 provides the full bivariate correlation matrix.

Self-Reported Frequency of Gym Use

When queried as to how frequently they attend the gym, 42% reported going to the gym at least 3 days/week, 19% reported attending the gym once per week, 17% reported one to three times per month, and 22% reported going once per month or less. Self-reported frequency of gym use was not associated with weight status, $F(1, 344) = .02$, $p = .88$ or sex, $F(2, 340) = 1.19$, $p = .30$.

Gym Survey

Adjusting for covariates, individuals with obesity reported significantly higher scores on the Self-Consciousness at the Gym subscale, $F(1, 217) = 5.01$, $p = .03$, $\eta^2 = .02$, compared with their counterparts with overweight. There were no differences between those with obesity and those with overweight in the Stigma at the Gym or Negative Attitudes Toward the Gym subscales ($ps > .05$). In addition, there were no sex differences with regard to any of the Gym Survey subscales ($ps > .05$).

Stigma at the Gym, Gym Attendance, and Psychosocial Functioning

The Stigma at the Gym subscale was not associated with self-reported frequency of gym attendance ($p > .05$), after adjusting for relevant covariates. Stigma at the Gym was, however, associated with the Maladaptive Coping Behaviors subscale (e.g., “avoiding physical activity,” “wearing baggy clothing to hide shape/weight; $\beta = .41$, $p < .001$) and the internalization of weight bias ($\beta = .20$, $p = .007$). The Stigma at the Gym subscale was significantly associated with unhealthy weight loss behaviors (e.g., juice cleanses, diet pills, purging; $\beta = .23$, $p = .001$), but not with healthy weight loss behaviors ($p > .05$). None of the associations between weight stigma at the gym and indices of psychosocial functioning were moderated by weight status or BMI (see Figure 1).

Stigma at the Gym and Indices of Health

The Stigma at the Gym subscale was negatively associated with physical and emotional health, as assessed by all eight subscales of the Short Form Health Survey ($\beta s = -.16$ to $-.32$, $ps < .007$), after adjusting for BMI and educational status. None of the associations between stigma at the gym and physical and emotional health were moderated by BMI or weight status.

Barriers to Attending the Gym

After adjusting for previously specified covariates, individuals with obesity reported that physical concerns affect their motivation to attend the gym significantly more than individuals with overweight, $F(1, 201) = 4.85$, $p = .029$, $\eta^2 = .02$. Greater scores on the Stigma at

Table 2
Participant Demographics and Key Variables

Measure	Overweight		Obese		<i>F</i>	Total sample				
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%			
Sex					.24					
Male	23	23	72	25		95	25			
Female	79	78	211	74		290	75			
Transgender	0	0	1	<1		1	<1			
Race					.28					
White	58	57	148	52		206	53			
Black	18	18	78	27		96	25			
Asian	11	11	11	4		22	6			
Native American	1	1	4	1		5	1			
Multiracial	6	6	16	6		22	6			
Unknown/Other	7	7	28	10		35	9			
Ethnicity					.31					
Hispanic	10	9	34	12		44	11			
Non-Hispanic	91	91	251	88		342	89			
Gym attendance frequency					.01					
5–7 times/week	10	11	26	10		36	10			
1–3 times/week	45	51	130	51		175	51			
1–3 times/month	15	17	43	17		58	17			
Never/Very rarely	19	21	56	22		75	22			
Education level					7.95**					
Postgraduate degree or higher	19	19	41	14		60	16			
College degree	47	46	86	30		133	34			
Some college or 2-year degree	26	26	118	41		144	37			
High school or GED	7	7	39	14		46	12			
Less than high school	2	2	2	1		4	1			
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	
Age	31.06	10.65	88	33.63	11.45	264	3.44	32.98	11.29	352
BMI	27.75	1.39	102	38.37	7.02	287	230.34***	35.59	7.66	389
Depressive symptoms (range = 0–63) ^b	7.00	9.75	64	7.53	8.44	196	.18	7.40	8.76	260
Length of gym membership (years)	3.91	1.73	88	3.31	1.60	238	8.70**	3.47	1.66	326
Gym survey (range = 1–7)										
Stigma at the gym	2.71	1.39	93	3.03	1.55	265	3.11	2.95	1.51	358
Self-consciousness at the gym	4.16	1.59	93	4.77	1.59	264	10.19**	4.61	1.61	357
Negative attitudes towards the gym	3.24	1.36	93	3.62	1.44	264	4.87*	3.52	1.43	357
Barriers to motivation (range = 1–5)										
Self-consciousness concerns	2.71	1.02	81	2.99	1.20	245	3.66	2.92	1.16	326
Physical concerns	2.14	.79	81	2.44	1.01	245	5.88*	2.37	.96	326
Gym preferences (range = 1–5)										
Specialization for members with overweight	2.36	1.02	77	3.02	1.02	236	24.19***	2.86	1.05	313
Shame-free environment	3.85	1.04	76	4.16	.96	236	6.01*	4.09	.99	312
Gym offerings	2.68	1.12	77	3.01	1.13	236	5.17*	2.93	1.14	313
Maladaptive coping (range = 1–5)	2.89	.95	30	3.23	1.00	141	2.29	3.17	.99	171
Healthy weight loss behaviors	4.28	.97	72	4.35	1.08	216	.17	4.33	1.05	288
Unhealthy weight loss behaviors	1.76	1.04	72	2.01	1.24	216	2.20	1.95	1.19	288
Weight bias internalization (range = 1–7)	4.30	1.32	72	4.57	1.34	217	2.37	4.41	1.34	289
General health (range = 0–100) ^c	62.42	18.16	77	52.16	17.86	235	18.97***	54.69	18.45	312
Emotional well-being (range = 0–100) ^c	57.69	22.07	77	54.92	23.05	235	.85	55.61	22.81	312

Note. Statistical test conducted: one-way analysis of variance. BMI = body mass index.

^a Assigned according to National Heart, Lung, and Blood Institute (1998) standards (obese: BMI \geq 30; overweight: 29.9 \geq BMI \geq 25). ^b As assessed by the Beck Depression Inventory. ^c As assessed by the Short Form Health Survey; higher values indicate better health.

* $p < .05$. ** $p < .01$. *** $p < .001$.

the Gym subscale were associated with higher scores on the Self-Consciousness Concerns and Physical Concerns subscales, such that the more an individual agreed with experiencing stigma

at the gym, the more an individual reported that concerns about self-consciousness (e.g., “Worrying that other people will laugh at me or judge me”) and physical risk (e.g., “Fearing that I will

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Table 3
Bivariate Correlations for Key Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1. Sex	—																							
2. Race	-.05	—																						
3. Ethnicity	-.02	.68**	—																					
4. Education Level	.10*	-.05	-.09	—																				
5. Age	-.06	-.07	-.06	.24**	—																			
6. BMI	-.07	-.02	.03	-.13*	.14**	—																		
7. Depressive symptoms ^a	.01	.02	.07	-.05	-.04	-.01	—																	
8. Length of gym membership	-.04	-.01	.05	.26**	.18**	-.15**	-.05	—																
9. Gym attendance frequency	-.05	.14**	.13*	.01	-.03	.00	-.16*	.09	—															
10. Stigma at the gym ^b	-.05	.11*	.11*	-.11*	-.02	.13*	.02	-.04	.03	—														
11. Self-consciousness at the gym ^b	.04	.02	.03	-.10	-.14*	.13*	.09	-.08	.00	.62**	—													
12. Negative attitudes towards the gym ^b	.05	.01	-.03	-.01	-.08	.10	.03	.11*	-.11	.56**	.56**	—												
13. Self-consciousness concerns ^c	.14*	.03	.11*	-.11	-.14*	.19**	.10	-.06	-.02	.53**	.67**	.54**	—											
14. Physical concerns ^c	.02	.07	.11	-.02	-.00	.25**	.02	-.00	.08	.41**	.36**	.30**	.68**	—										
15. Specialization for members with overweight ^d	.01	.12*	.15**	-.31**	-.11	.31**	.03	-.14*	.05	.42**	.36**	.26**	.46**	.47**	—									
16. Shame-free environment ^e	.16**	.10	.08	-.13*	-.07	.11	.12	-.14*	-.05	.11	.23**	.08	.28**	1.7***	.43**	—								
17. Gym offerings ^d	.07	.13*	.14*	-.21**	-.07	.17**	.01	-.09	.09	.20**	.15**	.05	.23**	.35**	.62**	.35**	—							
18. Maladaptive coping	.16*	.03	.14	-.18*	-.08	.02	.07	-.06	-.15	.25**	.37**	.13	.33**	.04	.22*	.19*	.02	—						
19. Healthy weight loss behaviors	-.01	.07	.06	.04	.11	-.03	-.08	.06	.14*	-.10	-.14*	-.23**	-.13*	-.08	.02	.01	.09	.08	—					

(table continues)

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Table 3 (continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
20. Unhealthy weight loss behaviors	-.02	.21**	.13*	-.21**	-.17**	.07	.02	-.10	.12	.24**	.01	.01	.10	.24**	.32**	-.09	.26**	.04	.14**	—	—	—	—	—
21. Weight bias internalization	.13*	-.06	.00	-.03	-.06	.14*	.12	-.09	.02	.19**	.41**	.23**	.44**	.15*	.21**	.18**	.09	.59**	-.02	-.01	—	—	—	—
22. General health ^c	-.01	-.02	-.16**	.09	-.01	-.26**	-.18**	.12*	-.04	-.33**	-.36**	-.29**	-.43**	-.41**	-.27**	-.10	-.09	-.22**	.28**	-.07	-.36**	—	—	—
23. Emotional well-being ^e	-.15**	.07	.03	.15**	.16**	-.00	-.08	.10	.08	-.24**	-.35**	-.25**	-.45**	-.21**	-.11	-.10	-.03	-.28**	.13*	-.06	-.57**	.39**	—	

Note. BMI = body mass index.

^a As assessed by the Beck Depression Inventory. ^b As assessed by the Gym Survey. ^c As assessed by the Barriers to Motivation Survey. ^d As assessed by the Gym Preferences Survey. ^e As assessed by the Short Form Health Survey.

* $p < .05$. ** $p < .01$.

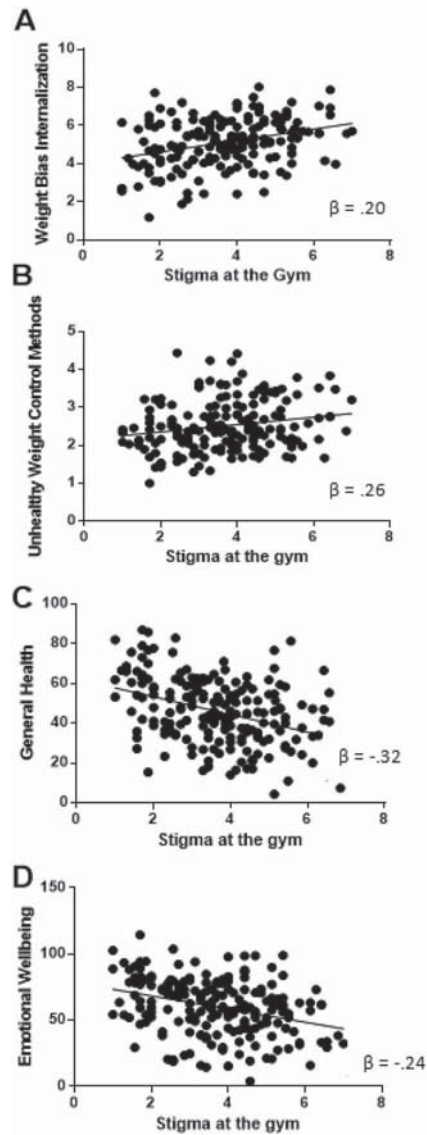


Figure 1. Association of stigma at the gym with indices of mental and physical health. Weight stigma at the gym was significantly associated with (A) weight bias internalization ($p = .007$), (B) unhealthy weight control methods ($p < .001$), (C) physical health (as assessed by the Short Form Health Survey-General Health subscale; $p < .001$), and (D) emotional well-being (as assessed by the Short Form Health Survey – Emotional Well-Being subscale; $p = .001$). Unstandardized residuals are shown, controlling for covariates as specified in the Method section.

break or damage equipment because of my weight”) affected motivation to attend the gym ($\beta = .53, p < .001$; $\beta = .35, p < .001$).

Gym Preferences

Adjusting for relevant covariates, individuals with obesity had significantly higher scores on the Specialization for Members with Overweight and Shame-Free Environment subscales, compared with individuals with overweight, $F(1, 196) = 10.94, p = .001, \eta^2 = .05$, and $F(1, 195) = 4.21, p = .04, \eta^2 = .02$, respectively. Greater scores on the Stigma at the Gym subscale were associated with greater preference for Specialization for Members with Overweight ($\beta = .36, p < .001$) and a Shame-Free Environment ($\beta = .17, p = .02$).

Discussion

In this sample of men and women with overweight and obesity, experiences of weight stigma at the gym were associated with negative attitudes toward the gym, maladaptive coping behaviors, weight bias internalization, unhealthy weight control practices, and poorer self-reported physical and emotional health. Stigma at the gym was also associated with identifying self-consciousness and physical barriers as considerable impediments to gym attendance. In addition, stigma at the gym was associated with greater preferences for a shame-free gym and one that is specialized for members with overweight and obesity.

These data expand upon previous research indicating that weight-based stigma is associated with poor psychological and physical health (Carels et al., 2009; Durso, Latner, & Hayashi, 2012; Sutin, Stephan, & Terracciano, 2015; Tomiyama et al., 2014). More specifically, the current study demonstrated that weight stigma and weight-related self-consciousness occur within fitness facilities and that stigma experienced at the gym may be a psychological stressor for persons with overweight and obesity. In accordance with some (Puhl, Moss-Racusin, Schwartz, & Brownell, 2008), but not all (Puhl, Andreyeva, & Brownell, 2008; Puhl & Brownell, 2006), prior studies investigating differences in stigmatizing experiences between those with and without obesity, experiences of stigma at the gym did

not differ between those with obesity and those with overweight. These findings indicate that even individuals with a modest degree of overweight may be vulnerable to weight stigma at the gym. In contrast, individuals with obesity reported greater self-consciousness at the gym and expressed stronger preferences for specialized, shame-free fitness facilities.

As physical activity is important in mitigating the health risks associated with obesity (Anderson et al., 2001; Kasumov et al., 2015; Ross et al., 2004; Slentz et al., 2004), it is notable that stigmatizing experiences at the gym were associated with poor self-reported health among those with overweight and obesity. Prior research suggests that biochemical stress may, in part, explain the link between weight stigma and poor health (Schvey, Puhl, & Brownell, 2014; Sutin, Stephan, Luchetti, & Terracciano, 2014; Tomiyama, 2014; Tomiyama et al., 2014), though future research is warranted to further elucidate the mechanism. In the current sample, experiences of stigma within fitness facilities were associated with unhealthy weight loss efforts, including juice cleanses and laxative misuse. In contrast to prior research among adolescents (King, Puhl, Luedicke, & Peterson, 2013), weight-based stigma was not, however, associated with healthy weight loss efforts. Furthermore, weight status did not moderate the association between stigma at the gym and health, indicating that weight stigma may adversely affect health irrespective of the degree of overweight. In light of these findings, the use of stigma as a motivating tool (Callahan, 2013) within fitness facilities should be called into question.

In contrast with our hypothesis, stigma at the gym was unrelated to self-reported frequency of gym use, despite the fact that stigma at the gym was related to negative feelings toward the gym. Given that only 20% of Americans meet physical activity recommendations (Centers for Disease Control and Prevention, 2013), and that persons with overweight and obesity engage in less frequent physical activity than their lean peers (Kruger et al., 2004), it is notable that over 40% of the current sample reported attending the gym at least three times per week. As previous research indicates that overreporting of exercise frequency is common (Jakicic, Polley, & Wing, 1998; Sallis & Saelens, 2000), and that web-based data collection may yield particularly high rates of overreported exercise behaviors (Brenner & DeLamater, 2014), it is plausible that self-reported exercise frequency

in the current study is inflated. Given that weight status was made salient at the outset of the current study by the recruitment language, it is also possible that social desirability (Brenner & DeLamater, 2014), and perhaps the effort to defy stereotypes that depict persons with obesity as lazy and sedentary (Brownell, Puhl, Schwartz, & Rudd, 2005), accounted for the high rate of self-reported gym attendance. In addition, limited variability in the frequency of reported gym attendance may be explained by the fact that our sample comprised only individuals who currently or recently belonged to a gym. Thus, our sample may not be representative of persons with overweight and obesity who do not belong to a gym, or who choose to exercise outside of fitness facilities. The lack of association between stigmatizing experiences and frequency of gym use should be considered in light of this caveat.

Study strengths include the use of a racially diverse sample of adults with overweight and obesity. The study is limited, however, by the lack of a nonoverweight comparison group. Nonetheless, in our comparisons of individuals with obesity with individuals with overweight, we found that those with obesity experienced significantly more weight-related self-consciousness at the gym. The groups did not differ, however, with regard to negative attitudes toward the gym and stigmatizing experiences reported. Elucidating whether the experience of gym members with overweight and obesity differs significantly from that of lean members, and whether the same associations between stigma at the gym and unhealthy thoughts and behaviors are present among nonoverweight individuals will be an important next step. Additional limitations of the study include the reliance upon self-reported height and weight, which may be unreliable or biased, though research indicates that self-reported BMI may be a reliable proxy for measured BMI (Stunkard & Albaum, 1981; White, Masheb, Burke-Martindale, Rothschild, & Grilo, 2007; White, Masheb, & Grilo, 2010). The reliance on self-reported gym attendance and stigmatizing experiences at the gym is another limitation. However, stigma consciousness, even in the absence of experiential stigma, may itself be a salient factor in the avoidance of exercise (Schmalz, 2010). Future research should utilize fitness attendance records in lieu of, or in addition to,

self-report. Three measures were also created for the present study; while reliability was good for the majority of the scales and subscales, these measures should be tested further among more heterogeneous samples to ensure adequate validity and psychometric properties. This study sample was also predominately female, which may limit the generalizability of the data.

Findings from the present study may have implications for policy and best practices within fitness facilities. It may be beneficial to assess antifat attitudes among gym personnel and staff members, and to implement training sessions to educate personnel about the complex causes of obesity and to reduce blame and bias. In addition, stigmatizing slogans and images often used to promote fitness facilities should be discontinued in favor of more health-focused campaigns (Puhl, Peterson, & Luedicke, 2012). Gym staff should be informed about the potential barriers to exercise among individuals with overweight and obesity, including fear of judgment and inadequate equipment to support a larger size. As some specialized gyms already exist (e.g., Downsize Fitness), and antistigma policies have been adopted by certain gyms (e.g., Planet Fitness's "Judgement Free Zone"), it will be beneficial to evaluate the effects of these policies on member attendance, attitudes toward exercise, and indices of health. Given that stigma at the gym was associated with greater preference for a shame-free environment and specialization for members with overweight and obesity, it will be important to research stigma-reduction measures implemented by fitness centers (e.g., larger sized equipment, staff members with overweight/obesity, dress codes) and to assess whether they affect member satisfaction and frequency of use. If these measures prove to be effective in reducing barriers to gym attendance, then it may be critical to promote policy changes within fitness centers to reduce stigma and bolster participation by individuals with overweight and obesity.

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