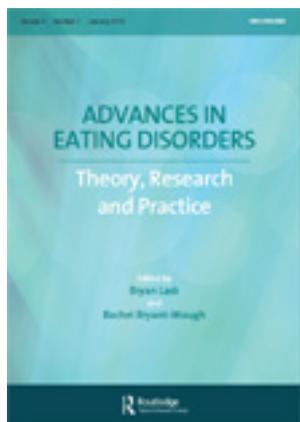


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Clinical correlates of the Weight Bias Internalization Scale in overweight adults with binge and purge behaviours

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Objective: The present study explored the clinical correlates of the Weight Bias Internalization Scale (WBIS). **Method:** Participants were 656 overweight and obese (mean body mass index (BMI): 34.3 ± 7.7) adults who completed the WBIS and measures of disordered eating behaviors and attitudes via an online survey. **Results:** Based on both the Eating Disorder Examination Questionnaire (EDE-Q) and Questionnaire on Eating and Weight Patterns – Revised ($n = 442$), 9.7% and 22.2% of participants were classified into a binge/purge (B/P) and binge eating (BE) group, respectively. WBIS scores were significantly higher among those with binge and/or purge behaviors compared to those without eating pathology, and higher degree of internalized weight bias was predictive of the presence of B/P behaviors (OR = 2.408, 95% CI: 1.727–3.359, $p < .001$) and BE (OR = 1.459, 95% CI: 1.224–1.739, $p < .001$). Partial correlations, controlling for BMI, revealed positive correlations between WBIS score and number of weight fluctuations, depression, and all EDE-Q subscales (Restraint, Eating Concern, Shape Concern, and Weight Concern) and a negative correlation with age at overweight onset. **Discussion:** These novel findings suggest an association between weight bias internalization and clinical eating pathology among overweight adults. The associations between internalization of weight bias and depression, weight instability, and eating pathology have important implications for healthcare providers working with overweight patients.

Keywords: weight bias; overweight; binge eating disorder; bulimia nervosa

Introduction

Despite the fact that the majority of Americans are overweight (Flegel, Carroll, Ogden, & Curtin, 2010), stigma against obese individuals remains highly prevalent. Obese and overweight individuals are the targets of stigma and prejudice in multiple domains, including employment, education, healthcare, and media portrayal (Muennig, 2008; Myers & Rosen, 1999; Puhl & Heuer, 2009). The prevalence of weight discrimination has increased by 66% since 1995 (Andreyeva, Puhl, & Brownell, 2008) and is now on par with rates of racial discrimination, especially among overweight women, who are targeted most frequently (Puhl, Andreyeva, & Brownell, 2008). Driving such discrimination and bias are stereotypes that overweight individuals are sloppy, lazy, unmotivated, incompetent, and solely to blame for their weight status (Brownell, Puhl, Schwartz, & Rudd, 2005).

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One notable difference between overweight individuals and other frequently stigmatized groups is a lack of 'in-group' favoritism (Crandall, 1994). Whereas other stigmatized and minority groups tend to favor 'in-group' members (Hewstone, Rubin, & Willis, 2002), obese individuals fail to demonstrate such preferences. More specifically, anti-fat attitudes have been well documented among overweight and obese adults and children, and overweight individuals endorse anti-fat attitudes that are comparable to those of normal weight individuals (Puhl, Moss-Racusin, & Schwartz, 2007; Wang, Brownell, & Wadden, 2004). Thus, overweight individuals may be the target of discrimination from both 'out-group' as well as 'in-group' members.

The lack of favorable 'in-group' attitudes observed among overweight individuals may be a result of the prevalence and social acceptability of weight bias, which may cause overweight individuals to internalize common weight-based stereotypes and adopt anti-fat attitudes (Puhl et al., 2007; Wang et al., 2004). The internalization of weight bias appears to be a distinct construct from anti-fat attitudes. While anti-fat attitudes reflect weight-based attributions made about others (e.g. *I have a hard time taking fat people too seriously* (Crandall, 1994)), weight bias internalization involves attributions made about oneself (e.g. *I hate myself for being overweight; Because of my weight, I don't understand how anyone attractive would want to date me* (Durso & Latner, 2008)). Thus, weight bias internalization reflects the belief that negative weight-based stereotypes apply to oneself. To assess weight bias internalization specifically among overweight and obese individuals, Durso and Latner developed the Weight Bias Internalization Scale (WBIS) (Durso & Latner, 2008), an 11-item Likert-scale questionnaire, derived from an original 19-item scale, that assesses the degree to which respondents apply negative weight-based attributions to themselves. Durso and Latner proposed that negative weight-based attributions made about oneself may contribute to negative psychological outcomes among overweight and obese individuals above and beyond the effects of excess adiposity. Indeed the authors found that weight bias internalization accounted for variance in measures of psychopathology, body dissatisfaction, and self-esteem above and beyond the effects of anti-fat attitudes and body mass index (BMI), which were not associated with these outcomes (Durso & Latner, 2008).

Internalized weight bias has been found to be associated with myriad harmful outcomes, including increased BE and refusal to diet, depression, low self-esteem, and body dissatisfaction among overweight individuals (Durso & Latner, 2008; Durso et al., 2012; Puhl et al., 2007; Wang et al., 2004). Importantly, internalized weight bias may persist even after an obese individual has successfully lost weight, resulting in long-term negative psychological effects irrespective of body weight (Levy & Pilver, 2012). Internalized weight bias was also found to correlate with eating psychopathology (e.g. overvaluation of shape and weight) in a treatment-seeking sample of overweight and obese adults with binge eating disorder (BED) (Durso et al., 2012). However, internalized weight bias was not associated with BMI or frequency of BE. Among overweight individuals in a weight loss program, the internalization of weight bias was associated with poorer self-monitoring, decreased energy expenditure, greater caloric intake, greater rates of attrition, and ultimately less weight loss (Carels et al., 2009).

Although research has shown that the internalization of weight bias is common among overweight individuals (Crandall, 1994; Durso & Latner, 2008; Puhl et al., 2007; Wang et al., 2004), little research has examined the relationship between internalized weight bias and different types of eating pathology; to our knowledge, no study to date has explored the relationship between internalization of weight bias and bulimia nervosa (BN), despite data suggesting an increase in the co-occurrence of obesity/overweight and eating disorders (Darby et al., 2009). Thus, the aims of the present study were to extend previous work by examining internalized weight bias among individuals with behavioral features of BN and BED, and to investigate the clinical correlates of internalized weight bias among individuals with and without binge/purge (B/P) behaviors. We hypothesized that individuals with B/P behaviors would score higher on the WBIS

compared to participants without B/P behaviors. We also hypothesized that higher scores on the WBIS would be associated with greater depression, lifetime weight instability, and earlier age at overweight onset. Finally, we hypothesized that WBIS score would be associated with eating pathology and greater likelihood of meeting classification criteria for the B/P and BE groups.

Methods and procedures

Participants

Participants were 656 overweight and obese adult community volunteers who were selected from a sample of 1720 volunteers. Only those participants who were overweight or obese ($BMI \geq 25 \text{ kg/m}^2$) and who had completed the WBIS in full were selected for the present study. The study was advertised on Craigslist classified advertisements in different cities throughout the USA (for instance, New York, Boston, Baton Rouge, Tulsa, Austin, Oklahoma City, Seattle, and San Francisco). The advertisement requested volunteers to respond to a questionnaire on 'dieting', 'eating habits', 'health behaviors', or 'weight control'.

Procedures

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. Participants were offered a 1 in 20 chance to win a \$50 gift certificate in exchange for participation. No personal identifying information was collected. This study received approval of the institutional review board.

Measures

Classification of disordered eating groups

Since questionnaire methods may yield greater rates of disordered eating behaviors than interview methods (Greeno, Marcus, & Wing, 1995), patients were classified as having behavioral features of BN or BED based on the convergence of the core behavioral features of eating disorders reported on both the Eating Disorder Examination Questionnaire (EDE-Q) and Questionnaire on Eating and Weight Patterns – Revised (QEWP-R). Thus, to ensure consistency of reporting and to protect against over reporting of BE and purging behaviors, participants must have met the core behavioral criteria on both measures to be assigned a disordered eating classification in the present study. Purging behaviors included self-induced vomiting, use of laxatives or use of diuretics to control weight. Individuals were classified into one of three groups: B/P, BE, and no binge/purge (NBP) based upon self-reported BE and/or purging once weekly. This frequency threshold was used based on the proposed Diagnostic and Statistical Manual for Mental Disorders (DSM)-V diagnostic criteria, which is supported by research suggesting that a once weekly cutoff may improve the reliability of a BED diagnosis (Sysko et al., 2012) and that those who engage in B/P behaviors weekly versus biweekly, appear to be clinically similar (APA, 2013; Crow, Stewart Agras, Halmi, Mitchell, & Kraemer, 2002; Roberto, Grilo, Masheb, & White, 2010). However, to be conservative, all analyses were also repeated with the current Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) criteria of twice weekly.

EDE-Q (Fairburn & Beglin, 1994), the self-report version of the EDE (Fairburn, 1993), assesses eating disorders and their features, including objective binge episodes (eating unusually

large amounts of food while experiencing a subjective sense of loss of control) and purging behaviors (self-induced vomiting, laxative misuse, and diuretic misuse). The EDE-Q also generates four subscales: restraint, eating concern, shape concern, and weight concern, as well as a global composite score. The EDE-Q has received psychometric support, including adequate test–retest reliability and good convergence with the EDE in studies with diverse disordered eating groups (Grilo, Masheb, & Wilson, 2001; Mond, Hay, Rodgers, Owen, & Beumont, 2004; Reas, Grilo, & Masheb, 2006). In the present study, the subscales of the EDE-Q showed adequate internal consistency (restraint $\alpha = .801$; eating concern $\alpha = .831$; shape concern $\alpha = .886$; and weight concern $\alpha = .731$).

QEWPR (Spitzer, Yanovski, & Marcus, 1993) assesses both past and present eating and weight-related variables including symptoms of BED, as well as history of weight cycling (defined as the number of times that an individual has lost and re-gained >20 lb) and age at overweight onset. The *QEWPR* has received psychometric support for aspects of its validity (Nangle, Johnson, Carr-Nangle, & Engler, 1994).

WBIS (Durso & Latner, 2008). The original 19-item self-report scale was used in the present study. This scale measures the degree to which a respondent believes that negative stereotypes about overweight and obese persons are applicable to him or herself. Responses are measured on a 7-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’. The items are averaged to produce an overall score. Total score ranges from 1 to 7; higher scores indicate a greater degree of weight bias internalization. Excellent reliability and validity of the scale were demonstrated in an Internet community sample of overweight and obese participants (Durso & Latner, 2008), as well as in the present sample ($\alpha = .896$).

Beck depression inventory (BDI-II) (Beck, Steer, & Carbin, 1988) is a 21-item scale that assesses current symptoms of depression. It is widely used in diverse populations, and has demonstrated excellent reliability and validity (Reynolds & Gould, 1981). Scores range from 0 to 63; higher scores indicate greater levels of depression. The BDI showed excellent internal consistency in the present sample ($\alpha = .914$).

Participants also provided basic demographic information, including self-reported height and weight.

Statistical analysis

All analyses were conducted using SPSS for Windows version 19 (SPSS, Inc., Chicago, IL). *P*-values were considered significant if they were <.05 and all tests were two-tailed.

An analysis of covariance controlling for BMI and followed by Bonferroni Hochberg post-hoc tests was conducted to examine differences in *WBIS* scores among those with BN, BED, and no eating disorder. Differences in *WBIS* scores between men and women were also examined with independent samples *t*-tests and differences among racial/ethnic groups were evaluated with an analysis of variance. Clinical correlates of the *WBIS* were examined using partial correlations controlling for BMI and logistic regression analyses were performed to assess whether *WBIS* scores predicted a diagnosis of B/P or BE, while controlling for depression and BMI.

Results

Participant characteristics

The mean age of the present sample was 37.62 ± 12.39 years and the mean BMI was 34.28 ± 7.74 kg/m² (range: 25.04–69.23). Thirty-six percent of the present sample was overweight, while 64%

was obese. The sample was predominantly female (85.7%) and the racial/ethnic distribution was: 78.4% Caucasian, 7.9% Black, 6.9% Hispanic, 2.9% Asian, and 3.5% 'other'.

Participants were classified into three groups (B/P, BE, and NBP) using the combined responses from diagnostic questions of the EDE-Q and the QEWP-R ($n = 442$). Only objective BE episodes were included as binge episodes in accordance with DSM-5 diagnostic criteria (<http://www.dsm5.org/proposedrevision/Pages/FeedingandEatingDisorders.aspx>), and only the presence or absence of such behavior was used in the current classification. Purge behaviors included self-induced vomiting, as well as laxative and diuretic abuse in accordance with DSM-5 diagnostic criteria (<http://www.dsm5.org/proposedrevision/Pages/FeedingandEatingDisorders.aspx>). Employing a frequency threshold of at least once per week, and a duration threshold of 28 days for B/P behaviors, 9.7% of the sample ($n = 43$) was classified in the B/P group and 22.2% ($n = 98$) in the BE group. The remainder of the sample ($n = 301$) did not report any binge or purge behaviors (NBP). When using the DSM-IV-TR criterion of twice per week for B/P behaviors, 5.4% of the sample ($n = 20$) met behavioral criteria for the B/P group and 12.5% ($n = 46$) met criteria for the BE group. It should be noted that categorization of B/P or BE was determined based on behavioral features only (i.e. frequency of BE and purging) and did not include determination of cognitive features (such as undue influence of body shape and weight in self-evaluation) or qualitative information derived from the QEWP.

Relationships with psychopathology

The total score on the WBIS is an average of the items, with possible scores ranging from 1 to 7. The mean WBIS score of the sample was 4.74 ± 1.40 , which was higher than the mean observed in Durso and Latner's (2008) original community sample (3.95 ± 1.28). Individuals categorized in the B/P and BE groups had the highest WBIS scores (5.79 ± 1.03 ; 5.17 ± 1.13 , respectively) compared to those in the NBP group (4.26 ± 1.42). The B/P group had significantly higher WBIS scores than those categorized as BE, and both groups scored significantly higher than the NBP group on total WBIS score ($p's \leq .05$) (Figure 1). Group differences remained significant after controlling for BMI ($F(3, 440) = 34.750, p < .001, \eta^2 = .01$). When using

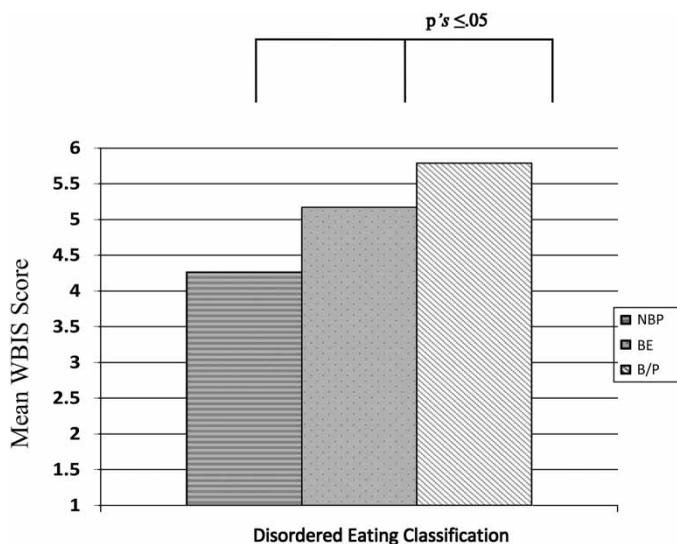


Figure 1. Mean WBIS Score (Controlling for BMI).

DSM-IV-TR twice per week diagnostic thresholds, those categorized as B/P ($n = 20$) no longer differed significantly from those with BE ($n = 46$) on WBIS score (means = 5.72 ± 1.15 , 5.35 ± 1.17 , respectively) though both groups still scored significantly higher than those with NBP (p 's < .001).

Higher WBIS scores were significantly associated with a higher BMI in the full sample ($r = .172$, $p < .001$), but not among individuals categorized as B/P or BE ($r = -.019$, $p > .05$). Consistent with prior research indicating that women are more vulnerable to weight bias (Puhl & Heuer, 2009), women endorsed greater internalized weight bias than men (4.81 ± 1.37 and 4.31 ± 1.46 , respectively; ($t(648) = 3.196$, $p = .001$)). Racial/ethnicity groups did not differ on WBIS scores.

Controlling for BMI, partial correlations revealed that among the full sample, WBIS score was significantly associated with all EDE-Q subscales (Restraint: $r = .301$, $p < .001$; Eating Concern: $r = .560$, $p < .001$; Shape Concern: $r = .716$, $p < .001$; Weight Concern: $r = .673$, $p < .001$; Global EDE-Q: $r = .666$, $p < .001$), depression ($r = .566$, $p < .001$), and number of lifetime weight fluctuations (of at least 20 pounds) ($r = .188$, $p < .001$). WBIS score was negatively associated with age at overweight onset ($r = -.115$, $p = .005$) and current age ($r = -.112$, $p = .007$). See Table 1 for the full correlation matrix. When B/P and BE groups were analyzed separately from those with NBP, WBIS score was no longer associated with current age or age at overweight onset (r 's = $-.139$, $-.048$, respectively, p 's > .05).

Logistic regression analyses

Logistic regression analyses revealed that WBIS scores were predictive of classification in the B/P (OR = 2.408, 95% CI: 1.727–3.359, $p < .001$) and BE (OR = 1.459, 95% CI: 1.224–1.739, $p < .001$) groups. The WBIS remained a significant predictor of B/P (OR = 1.881, 95% CI: 1.300–2.722, $p = .001$) and BE (OR = 1.31, 95% CI: 1.060–1.623, $p = .012$), after controlling for depression and BMI (Table 2). Additionally, these relationships remained significant when using the diagnostic frequency threshold of twice per week for BE and purging.

Discussion

This study explored the clinical correlates of the WBIS in an online community sample of overweight adults with and without binge and purge behaviors. The findings revealed that those who endorsed binge and/or purge behaviors scored higher on a measure of internalized weight bias, suggesting that these individuals might be more susceptible to the negative effects of weight stigma. Internalized weight bias was also predictive of clinically significant BE and purging. The novel finding that WBIS is significantly predictive of purge behaviors suggests that the internalization of weight bias may not only contribute to BE, but also to more severe eating pathology and compensatory behaviors. The association between the internalization of weight bias and self-induced vomiting, laxative, and diuretic abuse warrants further attention in both research and clinical settings, as it indicates that the internalization of weight bias may be an important risk factor for severe eating pathology. This finding also lends support for the increasing co-occurrence of obesity and eating disorders (Darby et al., 2009). It is possible that overweight and obese individuals with eating disorders are more likely to internalize weight bias given their more intense preoccupation with shape and weight relative to overweight and obese individuals without eating disorders, although the directionality of this association is uncertain. For example, it may also be that individuals with greater internalized weight bias are more likely to restrict intake in an effort to lose weight, which may ultimately lead to disinhibited eating and purging behaviors (Stice, 2002). Therefore, it may be helpful for clinicians working with overweight

Table 1. Correlations and partial correlations for WBIS and psychological variables.

	Age	BMI	BDI	Restraint	Concern subscale (EC)	Shape concern (SC)	Weight concern (WC)	No. weight (Wt) fluctuations	OW Onset
Age	1								
BMI (kg/m ²)	.144**	1							
BDI	-.021	.225**	1						
EDEQ restraint subscale	-.025	.005	.183**	1					
EDEQ EC subscale	-.073	.148**	.478**	.466**	1				
EDEQ SC subscale	-.054	.128**	.486**	.458**	.667**	1			
EDEQ WC subscale	-.113*	.125**	.494**	.435**	.681**	.894**	1		
Lifetime Wt fluctuations (≥20 lbs)	.226**	.350**	.218**	.142**	.289**	.226**	.237**	1	
Age of overweight onset (OW onset)	.404**	-.229**	-.081*	-.058	-.086*	-.073	-.116*	-.218**	1
WBIS	-.083*	.187**	.538**	.271**	.561**	.717**	.663**	.236**	-.142**
WBIS partial correlations controlling for BMI	-.111*	-	.518**	.275**	.549**	.712**	.656**	.186**	-.106*

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

**Correlation is significant at the .001 level (two-tailed).

patients with BN, BED, and subthreshold eating pathology to address feelings of self-blame and internalized weight bias during treatment.

Similar to previous findings, the WBIS was associated with greater general and eating disorder psychopathology in the present sample (Durso & Latner, 2008; Durso et al., 2012). More specifically, WBIS score was positively associated with depression, number of lifetime weight fluctuations (≥20 lbs), restraint, and eating, shape, and weight concerns. Though WBIS correlates with shape dissatisfaction and drive for thinness (Durso & Latner, 2008; Durso et al., 2012), the WBIS reflects a distinct construct assessing internalization of weight-based stereotypes. Additionally, prior research has found that WBIS does not correlate with BMI (Durso & Latner, 2008; Durso et al., 2012), indicating that the extent of weight bias internalization is not contingent upon the degree of one’s overweight. Importantly, a previous study found that despite reductions in internalized weight bias following weight loss treatment, internalized weight bias remained extremely high among participants (Carels et al., 2010), indicating that additional therapeutic intervention is needed to combat internalized weight bias even among individuals who have successfully lost weight. More research is warranted to assess whether the internalization of weight bias is attenuated following weight loss. Thus, it appears that the WBIS reflects a distinct psychological construct that may be predictive of clinically significant eating pathology above and beyond the effects of BMI and body dissatisfaction.

Among the full sample, WBIS was also negatively associated with age at overweight onset, such that those with higher WBIS scores reported a younger age at which they became overweight. While in prior studies, the degree of internalized weight bias did not vary as a function

Table 2. (a). Odds ratios (ORs), 95% confidence intervals (CIs) and *p* values for logistic regression analyses and (b) logistic regression analyses controlling for BMI and depression (BDI).

Independent Variable	B/P OR (95% CI)	<i>p</i>	BE OR (95% CI)	<i>p</i>
(a)				
WBIS	2.408 (1.727–3.359)	<.001	1.459 (1.224–1.739)	<.001
(b)				
BMI	.953(.906–1.002)	.061	1.026 (.997–1.056)	.077
BDI	1.054 (1.017–1.093)	.004	1.020 (.993–1.048)	.143
WBIS	1.881 (1.300–2.722)	.001	1.312 (1.060–1.623)	.012

of BMI (Durso & Latner, 2008; Durso et al., 2012; Roberto et al., 2012), in the current study, WBIS score was associated with BMI among the full sample, indicating that the heaviest individuals also reported the greatest internalization of weight bias. It is possible that the large proportion of obese respondents (64%) may account for these discrepant results. However, among those respondents reporting clinically significant behavioral features of an ED (B/P and BE), there was no association between WBIS and BMI, indicating that the internalization of weight bias was not dependent on degree of overweight among these individuals. Future research should further examine internalized weight bias among individuals with a range of BMI as it may be that endorsement of weight bias internalization at a lower BMI is associated with greater pathology. No differences in WBIS scores were detected across race/ethnicity categories, although the sample was predominantly Caucasian, potentially limiting the power to detect such differences. Lack of racial differences in weight bias internalization has been supported by some (Carr, 2005), but not all (Carels et al., 2010; Latner, Stunkard, & Wilson, 2005) prior studies. Research with more diverse samples is warranted to further illuminate the roles of gender, race, and ethnicity in the internalization of weight bias.

This study has several limitations, including its reliance on self-reported height and weight, which may be unreliable or biased (Rowland, 1990). However, research has shown that self-reported BMI is an adequate proxy for measured BMI, even among overweight and obese groups (Stunkard, 1981; White, Masheb, Burke-Martindale, Rothschild, & Grilo, 2007; White, Masheb, & Grilo, 2010). This study sample is also predominately female and Caucasian, limiting the generalizability of the conclusions drawn to more diverse samples. Another limitation of the study is that eating pathology was assessed via self-report questionnaires, rather than a clinical interview and disordered eating groups were classified based on behavioral diagnostic criteria only. However, for certain behaviors such as purging, the anonymity of questionnaire assessment methods may yield more candid responses than interviews (Lavender & Anderson, 2009). An additional limitation is that all responses were collected over the Internet, thus results may not be generalizable to those individuals who do not have access to a computer. Furthermore, recruiting participants via Craigslist for a study specifically on health behaviors, dieting, and/or weight might have introduced a selection bias resulting in a sample of participants with high levels of eating psychopathology and/or weight concerns as compared to other community samples. Finally, the cross-sectional and correlational nature of the data preclude causal interpretations.

Despite these limitations, the study has a number of strengths including a large sample size of non-treatment-seeking individuals with and without significant eating pathology, a large proportion of overweight/obese participants and the use of anonymous, self-report questionnaires to assess disordered eating behaviors such as purging, which are sometimes minimized during interview assessments.

This study makes an important contribution to the extant literature by identifying a novel association between the internalization of weight stigma and behavioral features of BN and BED in non-treatment-seeking overweight/obese individuals. This study also provides further evidence that internalization of weight bias is associated with negative clinical indicators and eating pathology. These findings are consistent with prior research suggesting that overweight individuals who internalize weight bias and believe negative stereotypes to be true are more likely to engage in BE and are more likely to report coping with stigma by refusing to diet and consuming more food (Puhl et al., 2007). Additionally, the internalization of weight bias predicts less energy expenditure, increased attrition, and overall poor outcomes in a weight loss program (Carels et al., 2010). Thus, weight bias internalization may promote BE and attenuate energy expenditure, thereby increasing unhealthy behaviors that may contribute to overweight, obesity, and eating-related psychopathology. Research has shown that when healthcare providers sensitively addressed the topic of weight bias with their overweight patients, weight loss efforts were bolstered and psychological distress was reduced (Lillis, Hayes, Bunting, & Masuda, 2009). Taken together, these findings suggest that clinicians should discuss internalized weight bias when working with overweight clients with eating pathology. The associations between the internalization of weight bias and depression, weight instability, and eating pathology have important implications for healthcare providers working with overweight patients in clinical practice. More specifically, providers should be aware that internalization of weight bias may be associated with increased energy intake, purging behaviors, and increased distress, potentially even after a patient has lost weight (Levy & Pilver, 2012). Addressing both external and internal experiences of weight bias and discussing appropriate coping strategies may serve as a useful tool to help patients challenge negative weight-based stereotypes, and potentially reduce maladaptive eating patterns.

Future research should seek to understand the link between weight bias internalization and the onset and maintenance of BN and BED. It will be especially critical to understand whether reducing weight bias internalization may also improve disordered eating outcomes. Existing research has shown that the reduction of weight bias internalization was associated with the reduction of depression, body image dissatisfaction, and BE during treatment (Carels et al., 2010), but this has not yet been studied among overweight individuals with BN. In addition, the temporal nature of these relationships is not yet understood. Future research should also examine how policies aimed at combatting weight-based discrimination might impact internalized weight bias and in turn reduce disordered eating among overweight individuals.

Notes on contributors

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References

American Psychiatric Association (APA). (2013). Feeding and eating disorders. Retrieved from <http://www.dsm5.org/proposedrevision/Pages/FeedingandEatingDisorders.aspx>

- Andreyeva, T., Puhl, R., & Brownell, K. (2008). Changes in perceived weight discrimination among Americans: 1995–1996 through 2004–2006. *Obesity, 16*, 1129–1134.
- Beck, A., Steer, R., & Carbin, M. (1988). Psychometric properties of the beck depression inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77–100.
- Brownell, K., Puhl, R., Schwartz, M., & Rudd, L. (2005). *Weight bias: Nature, consequences, and remedies*. New York, NY: The Guilford Press.
- Carels, R., Young, K., Wott, C., Harper, J., Gumble, A., Oehlof, M., & Clayton, A. (2009). Weight bias and weight loss treatment outcomes in treatment-seeking adults. *Annals of Behavioral Medicine, 37*(3), 350–355.
- Carels, R. A., Wott, C. B., Young, K. M., Gumble, A., Koball, A., & Oehlhof, M. W. (2010). Implicit, explicit, and internalized weight bias and psychosocial maladjustment among treatment-seeking adults. *Eating Behaviors, 11*(3), 180–185.
- Carr, D. F. M. (2005). Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States. *Journal of Health and Social Behavior, 46*, 244–259.
- Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology, 66*, 882–894.
- Crow, S. J., Stewart Agras, W., Halmi, K., Mitchell, J. E., & Kraemer, H. C. (2002). Full syndromal versus subthreshold anorexia nervosa, bulimia nervosa, and binge eating disorder: A multicenter study. *International Journal of Eating Disorders, 32*(3), 309–318.
- Darby, A., Hay, P., Mond, J., Quirk, F., Buttner, P., & Kennedy, L. (2009). The rising prevalence of comorbid obesity and eating disorder behaviors from 1995 to 2005. *International Journal of Eating Disorders, 42* (2), 104–108.
- Durso, L. E., & Latner, J. D. (2008). Understanding self-directed stigma: Development of the Weight Bias Internalization Scale. *Obesity, 16*(S2), S80–S86.
- Durso, L. E., Latner, J. D., White, M. A., Masheb, R. M., Blomquist, K. K., Morgan, P. T., & Grilo, C. (2012). Internalized weight bias in obese patients with binge eating disorder: Associations with eating disturbances and psychological functioning. *International Journal of Eating Disorders, 45*(3), 423–427.
- Fairburn, C., & Beglin, S. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16*(4), 363–370.
- Fairburn, C. G. (1993). *CZTEDE*, 12th edn. The eating disorder examination, In: Fairburn CG WG, (Ed.), *Binge eating: nature, assessment, and treatment* (12th edn.) (pp. 317–360). New York, NY: Guilford Press.
- Flegel, K., Carroll, M., Ogden, C., Curtin, L. (2010). Prevalence and trends in obesity among US adults, 1999–2008. *Journal of the American Medical Association, 303*, 235–241.
- Greeno, C. G., Marcus, M. D., & Wing, R. R. (1995). Diagnosis of binge eating disorder: Discrepancies between a questionnaire and clinical interview. *International Journal of Eating Disorders, 17*(2), 153–160.
- Grilo, C., Masheb, R., & Wilson, T. (2001). A comparison of different methods for assessing the features of eating disorders in patients with binge eating disorder. *Journal of Consulting and Clinical Psychology, 69*(2), 317–322.
- Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup bias. *Annual Review of Psychology, 53*, 575–704.
- Latner, J. D., Stunkard, A. J., & Wilson, G. T. (2005). Stigmatized students: Age, sex, and ethnicity effects in the stigmatization of obesity. *Obesity, 13*(7), 1226–1231.
- Lavender, J. M., Anderson, D. A. (2009). Effect of perceived anonymity in assessments of eating disordered behaviors and attitudes. *International Journal of Eating Disorders, 42*(6), 546–551.
- Levy, B. R., Pilver, C. E. (2012). Residual stigma: Psychological distress among the formerly overweight. *Social Science & Medicine, 75*(2), 297–299.
- Lillis, J., Hayes, S. C., Bunting, K., & Masuda, A. (2009). Teaching acceptance and mindfulness to improve the lives of the obese: A preliminary test of a theoretical model. *Annals of Behavioral Medicine, 37*(1), 58–69.
- Mond, J. M., Hay, P. J., Rodgers, B., Owen, C., & Beumont, P. J. V. (2004). Validity of the Eating Disorder Examination Questionnaire (EDE-Q) in screening for eating disorders in community samples. *Behaviour Research and Therapy, 42*(5), 551–567.
- Muennig, P. (2008). The body politic: The relationship between stigma and obesity-associated disease. *BMC Public Health, 8*(1), 128–138.
- Myers, A., & Rosen, J. (1999). Obesity stigmatization and coping: Relation to mental health symptoms, body image, and self-esteem. *International Journal of Obesity, 23*, 221–230.

- Nangle, D., Johnson, W., Carr-Nangle, R., & Engler, L. (1994). Binge eating disorder and the proposed DSM-IV criteria: Psychometric analysis of the questionnaire of eating and weight patterns. *International Journal of Eating Disorders, 16*, 147–157.
- Puhl, R., Andreyeva, T., & Brownell, K. (2008). Perceptions of weight discrimination: Prevalence and comparison to race and gender discrimination in America. *International Journal of Obesity, 32*, 992–1000.
- Puhl, R., & Heuer, C. (2009). The stigma of obesity: A review and update. *Obesity, 17*(5), 941–964.
- Puhl, R., Moss-Racusin, C., & Schwartz, M. (2007). Internalization of weight bias: Implications for binge eating and emotional well-being[ast]. *Obesity, 15*(1), 19–23.
- Reas, D. L., Grilo, C. M., & Masheb, R. M. (2006). Reliability of the eating disorder examination-questionnaire in patients with binge eating disorder. *Behaviour Research and Therapy, 44*(1), 43–51.
- Reynolds, W., & Gould, J. (1981). A psychometric investigation of the standard and short form Beck Depression Inventory. *Journal of Consulting and Clinical Psychology, 49*, 306–307.
- Roberto, C. A., Grilo, C. M., Masheb, R. M., & White, M. A. (2010). Binge eating, purging, or both: Eating disorder psychopathology findings from an internet community survey. *International Journal of Eating Disorders, 43*(8), 724–731.
- Roberto, C. A., Sysko, R., Bush, J., Pearl, R., Puhl, R. M., Schvey, N. A., & Dovidio, J. F. (2012). Clinical correlates of the Weight Bias Internalization Scale in a sample of obese adolescents seeking bariatric surgery. *Obesity, 20*(3), 533–539.
- Rowland, M. (1990). Self-reported weight and height. *American Journal of Clinical Nutrition, 52*, 125–133.
- Spitzer, R. L., Yanovski, S. Z., & Marcus, M. D. (1993). The Questionnaire on Eating and Weight Patterns-Revised (QEWP-R, 1993). (Available from the New York State Psychiatric Institute, 722 West 168th Street, New York, NY 10032).
- Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin, 128*(5), 825–848.
- Stunkard, A. J. (1981). The accuracy of self-reported weights. *The American Journal of Clinical Nutrition, 34*(8), 1593.
- Sysko, R., Roberto, C. A., Barnes, R. D., Grilo, C. M., Attia, E., & Walsh, B. T. (2012). Test–retest reliability of the proposed DSM-5 eating disorder diagnostic criteria. *Psychiatry Research, 196*(2–3), 302–308.
- Wang, S. S., Brownell, K. D., & Wadden, T. A. (2004). The influence of the stigma of obesity on overweight individuals. *International Journal of Obesity and Related Metabolic Disorders, 28*(10), 1333–1337.
- White, M. A., Masheb, R. M., & Grilo, C. M. (2010). Accuracy of Self-reported weight and height in binge eating disorder: Misreport is not related to psychological factors. *Obesity, 18*(6), 1266–1269.
- White, M. A., Masheb, R. M., Burke-Martindale, C., Rothschild, B., & Grilo, C. M. (2007). Accuracy of self-reported weight among bariatric surgery candidates: The influence of race and weight cycling. *Obesity, 15*(11), 2761–2768.