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Body dissatisfaction, internalized weight bias and quality of life in young men and women

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Abstract

Purpose We examined the relative importance of body dissatisfaction (BD) and internalized weight bias (IWB) in accounting for variance in quality of life (QoL) impairment in an ethnically diverse sample of college students ($n = 630$) and potential moderation of these associations by sex.

Methods Participants completed an online survey that included established measures of BD, IWB and QoL. Regression models were used to examine the relative contributions of BD and IWB in accounting for variance in physical and mental QoL impairment.

Results BD and IWB were highly correlated with bivariate analysis in both women ($r = .76$) and men ($r = .60$). In multivariable analysis, IWB was found to be associated with both physical ($b = -1.33$, 95% CI −1.93, −0.72) and mental ($b = -2.58$, 95% CI −3.45, −1.72) QoL impairment, whilst BD was not associated with impairment in either physical ($b = -0.29$, 95% CI −0.68, 0.09) or mental ($b = -0.48$, 95% CI −1.03, 0.07) QoL. While levels of both BD and IWB were higher for women than for men, sex did not moderate the association between either BD or IWB and either physical or mental QoL.

Conclusions The findings support the view that IWB warrants greater attention in interventions seeking to reduce the adverse impact of BD in both women and men and both normal-weight and overweight individuals.

Keywords Body image · Weight-related discrimination · Quality of life · Sex differences

Introduction

Body dissatisfaction (BD) may be defined as an individual's negative subjective evaluation of his or her body, including body weight, shape, muscularity and tone, typically involving a discrepancy between one's actual body and one's ideal body [1]. BD has been common in young women for decades, is increasingly common in young men and is associated with a range of adverse outcomes, including low self-esteem, depressive mood, eating-disordered behavior and impairment in both physical- and mental-health-related quality of life (QoL) domains. These associations are observed even after controlling for body weight [2–4]. Further, BD is a potent mediator of the association between obesity and impairment in various aspects of psycho-social functioning in both women and men and both adults and adolescents [5, 6].

A second construct that is increasingly featured in discussions of the health and well-being of young people, overweight and obese individuals in particular, is that of internalized weight bias (IWB) [7, 8]. IWB refers to the application of stigmatizing beliefs about overweight and obese individuals to the self, resulting in self-deprecation linked to body weight/entails the application of negative weight-based stereotypes to oneself and engaging in self-blame for one's weight status [7, 8]. Similar to BD, IWB has been found to be associated with a range of adverse psycho-social outcomes, including eating-disordered behavior and quality of life impairment, in both clinical and non-clinical samples [9–11]. As with BD, IWB

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is more common among overweight and obese individuals than underweight and normal-weight individuals, although not uncommon in the latter [8, 9, 12]. Hence, it is reasonable to hypothesize that IWB may also play a role in mediating the association between obesity and psycho-social impairment, and there is evidence to support this hypothesis [13–16]. Finally, and also consistent with research bearing on adverse health outcomes associated with BD, evidence suggests that IWB is more strongly associated with mental health impairment than physical health impairment, after controlling for body weight and other potential covariates [e.g., 10, 11, 17]. Evidence in this regard is more variable, however, and body weight has not always been controlled for in studies exploring these associations.

One difficulty in interpreting current evidence concerning adverse effects of IWB on well-being, however, is that IWB and BD are likely to be highly correlated, so it is unclear whether and to what extent adverse outcomes associated with IWB reflect the influence of BD. It has been suggested that IWB and BD are distinct constructs, the former relating to one's belief in the negative social stereotypes about weight and the resulting devaluation of the self and identity, the latter to one's negative evaluation of body weight or shape specifically [7]. However, evidence on the magnitude and nature of the association between these variables is limited because research addressing the correlates of BD has typically not included assessment of IWB and vice-versa. While both BD and IWB were assessed in Durso and Latner's [7] study, these authors considered IWB as a predictor of BD and other outcomes, when controlling for BMI, rather than considering the relative importance of IWB and BD as predictors of other outcomes. In this study, the correlation between BD (as measured by the Body Shape Questionnaire) and IWB (as measured by the Weight Bias Internalisation Scale—WBIS [7]) was 0.75. In the only other study, we are aware of in which both IWB (as measured by the WBIS) and BD (as measured by the weight and shape subscales of the Eating Disorder Examination Questionnaire—EDEQ) were assessed, controlling for BMI and depression symptomology, a similarly high positive correlation of approximately 0.7 was observed in a large, general population sample of overweight and obese men and women in the USA [18].

In particular, no study has examined the relative importance of BD and IWB in accounting for variance in QoL impairment. Research of this kind would have implications for health promotion and prevention programs for both eating disorders and obesity, such as which of these variables warrants greater attention in seeking to reduce the public health burden of these conditions [11, 19, 20]. There may also be implications for the clinical management of eating disorders and obesity [14, 18, 21]. This follows from the fact that improvement in QoL is a key indicator of success in the clinical management of both eating disorders and obesity [22, 23].

Whether and how the relative importance of BD and IWB in accounting for variance in QoL impairment might differ by sex is also unclear, since it is only in the past few years that researchers have begun to examine sex differences in the occurrence and correlates of IWB [8, 18]. In several studies, only women have been included [e.g., 24], whilst in other studies, men have been included but the number of male participants has been too small to permit confidence in the findings relating to sex differences [e.g., 25]. Further, much of this research has been conducted in treatment-seeking samples, which is not ideal when considering associations with variables, including QoL, that predict help-seeking [8, 26]. However, there is evidence to suggest that IWB, like BD, is more common in overweight and obese individuals than normal-weight individuals [8, 9] and more common in women than in men irrespective of body weight [8, 9]. There is also some, albeit preliminary, evidence that IWB is more closely associated with impairment in psycho-social functioning in women than in men [18], whereas recent, population-based studies have found little evidence for sex differences in the associations between BD and QoL impairment [2, 3]. Evidence bearing on sex differences in the relative importance of BD and IWB in accounting for variance in QoL would also have implications for health promotion programs and clinical practice [11, 18].

With these considerations in mind, the goal of the current study was to examine the relative importance of BD and IWB in accounting for variance in QoL impairment in young people. It was hypothesized, first, that BD and IWB would be highly correlated and that both would contribute independently to variance in QoL impairment. It was further hypothesized that associations between both BD and IWB and QoL impairment would be stronger for the mental health QoL domain ("mental QoL") than for the physical health QoL domain ("physical QoL"), when controlling for body weight and other potential covariates. A second aim of the current research was to examine potential moderation of the associations between BD and IWB and QoL by sex. While the available evidence did not permit any firm a priori hypotheses in this regard, it would be reasonable to expect sex differences in the strengths of the associations between BD and/or IWB and QoL, given that scores on all three of these measures, considered individually, differ by sex and given preliminary evidence that IWB is more closely associated with QoL impairment in women.

Method

Participants

Participants were undergraduate psychology students recruited from a large, North American Pacific public university who participated in exchange for course credit during the 2013 fall and 2014 spring semesters. As has been detailed elsewhere [27, 28], data were collected by means of an online survey and participation was open to all undergraduate students in psychology classes during the semesters concerned. While the number of students who declined to register for the recruitment database could not be determined, the vast majority of students (96%) who did so completed the survey. The research was approved by the University of Hawaii Institutional Review Board.

Measures

BD

BD was assessed using two items of the Weight/Shape Concerns subscale of the Eating Disorder Examination Questionnaire (EDE-Q) [29], a commonly used measure that assesses participant's dissatisfaction with weight and shape and related constructs, such as preoccupation with weight or shape and overvaluation of weight or shape, during the past 28 days [5, 6]. The two items assessing dissatisfaction with weight and shape are: "During the past four weeks", … "How dissatisfied have you felt about your weight" and "How dissatisfied have you felt about your shape". Responses are made on a 7-point Likert-type scale and range from "0" (not at all) to "6" (markedly), with higher scores indicating greater BD. As in previous, population-based studies [2, 4, 30], scores on these items were highly correlated ($r = .84$) and were therefore averaged, to create a single BD item.

IWB

Internalized weight bias was assessed using a modified version of the Weight Bias Internalization scale (WBIS) [7]. The WBIS is an 11-item, self-report measure of the internalization of negative weight-related stereotypes, attitudes and commentary. Respondents rate their agreement with statements such as "my weight is a major way that I judge my value as a person", with possible responses ranging from "1" (strongly disagree) to "7" (strongly agree) and higher scores signifying greater internalization of bias. The modified version of the scale employed in the current study entailed minor changes to the wording of certain items in order to make these items more accessible to individuals in different weight categories. For example, the item "I feel anxious about being overweight because of what people might think of me" was changed to "I feel anxious about being my weight because of what people might think of me" and the item "As an overweight person, I feel that I am just as competent as anyone" was changed to "At my weight, I feel that I am just as competent as anyone". Both the original measure and the modified version employed in the current study (WBIS-R) have very good psychometric properties [7, 31]. Cronbach alpha values in the present study sample were 0.79 for men and 0.82 for women.

QoL

QoL was assessed using the 12-item version of the Medical Outcomes Study Short Form Survey (SF-12) [32]. This 12-item scale measures perceived impairment in role functioning associated with physical and psychological health problems. Items are weighted across two subscales; a Physical Component Summary scale (PCS) and a Mental Component Summary scale (MCS). The PCS and MCS are scored to have a mean of 50 and a standard deviation of 10, with lower scores indicating higher levels of impairment. The SF-12 has demonstrated sound psychometric properties in numerous study populations [32]. Cronbach alpha values in the present study sample for the PCS were 0.52 and 0.63 for men and women, respectively, and 0.72 and 0.75 for men and women, respectively, for the MCS.

Demographic Characteristics

Participants were also asked to provide their age, sex, ethnicity, and native-language (English, other). Body mass index (BMI, kg/m^2) was calculated from self-reported height and weight.

Statistical Analysis

Statistical analysis was conducted using IBM's Statistical Package for Social Sciences (SPSS) version 24.0, and an alpha level of 0.05 was employed for all analyses. Pearson product moment correlations were conducted to examine the associations between variables separately for men and women. Independent samples t-tests were used to test for differences between men's and women's mean scores on key variables. Chi-square tests were used to examine differences in the proportion of men and women in each of the four commonly used BMI categories (underweight, normal weight, overweight and obese). Regression modelling procedures were then used to examine the relative contributions of BD and IWB in accounting for physical and mental QoL impairment and to test for moderation of these associations

by sex, using the macros provided by Hayes (2018) [33]. For this analysis, categorical covariates were dummy coded, and continuous covariates and predictors were mean-centered, the latter being used for all two- and three-way interaction terms. Covariates included in this analysis were age, BMI, native-language spoken and ethnicity. Following recommended procedures [33], the three-way interaction (IWB by BD by sex) was tested first. If the three-way interaction was nonsignificant, then the two-way interactions (IWB by BD, IWB by sex, BD by sex) were tested. If the two-way interactions were nonsignificant, then the main effects (IWB, BD, sex) were interpreted.

Results

Completed surveys with no missing data on key study variables (BD, IWB, sex, PCS, MCS) were available for 630 participants aged 16 to 44 years, of whom 200 were male. Missing data on covariates, which ranged from 1% for age for both males and females to 12% for BMI for females (native-language spoken: 1% males, 0.2% females; ethnicity: 2% for both males and females; BMI for males: 5%), were handled by means of listwise deletion. Approximately half of participants (51.3%) identified as Asian American, Asian, or Pacific Islander, 20.3% as European American or Caucasian, 16.2% as biracial or multiracial, 5.4% as Native Hawaiian, Native American or American Indian, 3.2% as Hispanic and 3% as African American or other. Comparison of these figures with those of normative data indicated that Asian Americans were over-represented among study participants when compared with all undergraduate students at the University of Hawaii but not when compared with the total Hawaiian population [34, 35].

Mean age, BMI and scores on measures of IWB, BD and QoL for male and female participants are shown in Table 1. As can be seen, women scored significantly lower on BMI and mental QoL, and significantly higher on IWB and BD, than men. Female participants were more likely than male participants to be normal-weight (73.1% vs. 64.2%; $\chi^2 = 4.76$, $p = .03$), whereas male participants were more likely than female participants to be overweight (23.7% vs. 14.0%; $\chi^2 = 8.35$, $p < .01$). The tendency for female participants to be more likely to be underweight than male participants (7.1% vs. 3.2%) approached statistical significance ($\chi^2 = 3.64$, $p = .06$), whereas the prevalence of obesity did not differ by sex (males: 8.9%; females: 5.8%; $\chi^2 = 1.96$, $p = .16$).

As can be seen in Table 2, bivariate correlations indicated, for both males and females, a strong positive association between BD and IWB, and small to moderate negative associations with physical QoL for both BD and IWB. Small negative correlations with mental QoL for both BD and IWB were observed for men, whilst moderate negative correlations were observed between these variables for women.

The three-way interaction between BD, IWB and sex was nonsignificant for both physical ($p = .96$) and mental QoL ($p = .58$). Two-way interactions (IWB by BD, IWB by sex, BD by sex) were therefore tested in separate models. For example, the IWB by BD interaction was tested using the appropriate model [33] and including covariates. All two-way interactions were nonsignificant (p-values > 0.05).

Table 1 Mean (SD) scores on key study variables stratified by sex

	Men ($n = 200$) M (SD)	Women ($n = 430$) M (SD)	t	p
Age (years)	20.39 (3.84)	19.83 (3.42)	1.82	0.070
BMI	24.12 (4.31)	22.72 (4.15)	3.75	< 0.01
Internalized weight bias (IWB)	2.59 (1.01)	3.11 (1.22)	− 5.66	< 0.01
Body dissatisfaction (BD)	1.28 (1.56)	2.46 (1.98)	− 8.12	< 0.01
QoL—physical (PCS)	51.77 (5.28)	50.89 (6.23)	1.72	0.086
QoL—mental (MCS)	48.45 (8.62)	45.75 (8.86)	3.59	< 0.01

Table 2 Correlations between key study variables by sex (data for men is italic values)

	Age	BMI	IWB	BD	PCS	MCS
Age (years)	–	*0.149**	*0.049*	*0.187***	*0.030*	*0.001*
Body mass index (BMI)	0.290**	–	*0.303***	*0.360***	*− 0.141*	*0.054*
Internalized weight bias (IWB)	0.076	0.381**	–	*0.602***	*− 0.356***	*− 0.218***
Body dissatisfaction (BD)	0.133**	0.386**	0.763**	–	*− 0.269***	*− 0.142**
QoL—physical (PCS)	− 0.118*	− 0.136**	− 0.299**	− 0.281**	–	*0.397***
QoL—mental (MCS)	− 0.079	0.002	− 0.382**	− 0.313**	0.432**	–

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

The main effects models were therefore interpreted and are shown in Table 3. As can be seen, for both men and women, IWB was independently associated with impairment in both physical and mental QoL, whilst BD was not independently associated with impairment in either physical or mental QoL. Additionally, higher BMI was associated with better mental QoL, i.e., lower levels of impairment, in multivariable analysis.

Discussion

The goal of the current study was to examine the relative importance of BD and IWB in accounting for variance in QoL impairment in young people. It was hypothesized, first, that BD and IWB would be highly correlated and that both would contribute independently to variance in QoL impairment; and second, that associations between both BD and IWB and QoL impairment would be stronger for mental health functioning than for physical health functioning, when controlling for body weight and other potential covariates. These hypotheses were partially confirmed. Thus, BD and IWB were highly correlated, and small to moderate negative correlations between both variables and both physical and mental QoL were observed, in bivariate analysis. In multivariable analysis, IWB was independently associated with both physical and mental QoL impairment and this association was stronger for mental QoL than for physical QoL. BD was not independently associated with mental or physical QoL impairment in multivariable analysis, however.

A second aim of the current research was to examine potential moderation of the associations between BD, IWB and QoL impairment by sex. While the available evidence did not permit any firm a priori hypotheses in this regard, it was reasonable to expect sex differences in the strengths of the associations between BD and/or IWB and QoL, given that scores on all three of these measures, considered individually, differ by sex and given preliminary evidence that IWB is more closely associated with QoL impairment in women. There was no support for this hypothesis, however. Specifically, sex did not moderate the association between either BD or IWB and either physical or mental health functioning.

Two other findings of the current research warrant mention. First, there was a *positive* association between BMI and mental QoL in multivariable analysis. That is, higher BMI was associated with better mental health functioning after controlling for BD, IWB and other covariates. While this finding might appear counterintuitive, in that, in women as least, higher BMI is generally assumed to be associated with poorer mental health [26, 36], the same finding has been observed in at least three previous studies in non-clinical samples [37–39]. It likely reflects the fact that impairment in psycho-social functioning associated with higher body weight, where this is observed, is due largely to the influence of BD (and/or IWB) [37, 39]. Hence, it may not be surprising to find that higher BMI is associated with better perceived mental health when the influence of BD and IWB is statistically controlled.

Table 3 Results of regression analysis examining the relative contributions of BD and IWB to variance in QoL

Predictor/covariate	Model 1[a]				Model 2[b]			
	b (S[c])	β[d]	*t*	*p*	*b* (S[c])	β[d]	*t*	*p*
Constant	51.20 (0.48)		106.02	< 0.001	47.09 (0.70)		67.56	< 0.001
Age (years)	− 0.07 (0.07)	− 0.05	− 1.08	0.280	− 0.14 (0.10)	− 0.06	− 1.40	0.163
Body mass index (BMI)	− 0.01 (0.06)	− 0.01	− 0.17	0.866	0.40 (0.09)	0.19	4.30	< 0.001
English first Language (Y/N)	− 1.07 (0.72)	− 0.06	− 1.50	0.135	0.37 (1.04)	0.01	0.35	0.723
Ethnicity[e]	0.15 (0.19)	0.03	0.78	0.435	− 0.27 (0.27)	− 0.04	− 0.99	0.321
Body dissatisfaction (BD)	− 0.29 (0.19)	− 0.09	− 1.52	0.130	− 0.48 (0.28)	− 0.10	− 1.72	0.086
Internalized weight bias (IWB)	− 1.33 (0.31)	− 0.26	− 4.33	< 0.001	− 2.58 (0.44)	− 0.34	− 5.86	< 0.001
Sex	− 0.03 (0.55)	0.00	− 0.06	0.956	− 0.46 (0.79)	− 0.03	− 0.58	0.559
R^2		0.126				0.172		

[a]Outcome variable is physical quality of life, as measured by the Physical Component Summary (PCS) of the Short Form 12 Health Status Questionnaire (SF-12)

[b]Outcome variable is mental quality of life, as measured by the Mental Component Summary (MCS) of the SF-12

[c]Standard error of *b* (unstandardized)

[d]Standardized Beta

[e]Dummy coding of ethnicity was as follows: 0 = Asian American, Asian, Pacific Islander; 1 = European American, Anglo, Caucasian; 2 = Biracial, Multi-racial; 3 = Native Hawaiian, Native American, American Indian; 4 = Hispanic American, Latino(a), Chicano(a); 5 = African American, Other

Second, levels of both BD and IWB were significantly higher for women than for men in the current study. In the case of BD, this finding is consistent with findings of at least two recent, population-based studies suggesting that, while the prevalence and adverse impact of BD may be increasing in men, BD remains significantly more common in young women than in young men [2, 3]. Evidence bearing on sex differences in the prevalence and correlates of IWB is more limited, but the available evidence suggests that IWB, like BD, is more common among women than men [8, 9]. Findings from the above-mentioned, population-based studies also suggest that adverse effects of BD on quality of life and related outcomes do not differ by sex, whereas evidence bearing on sex differences in the associations between IWB and impairment in psycho-social functioning is limited. The current findings add to this evidence base and suggest that for IWB, like BD, adverse effects on quality of life may be similar for women and men.

Study implications

To our knowledge, this is the first study to examine the relative importance of BD and IWB in accounting for variance in QoL impairment and possible moderation of this association by sex. The finding that only IWB was independently associated with QoL impairment in multivariable analysis is important given the focus on BD in programs designed to reduce the population health burden of eating-disordered behavior [4, 20, 40]. This finding suggests that, to the extent that improving QoL is a key outcome of health promotion and prevention programs, IWB may need to be given equal if not more attention in these programs. Findings from recent studies suggesting that IWB, like BD, is strongly associated with eating-disordered behavior [12, 18], strengthen this argument.

There may also be implications for obesity prevention programs and for programs seeking to integrate eating disorders and obesity prevention messages [41, 42]. To date, recognition of the need to address body image issues in obesity prevention programs has been largely confined to the assessment of BD as a secondary outcome, i.e., in order to assess whether and to what extent the obesity prevention messages might be conducive to increased levels of BD [4–6]. More recently, it has been suggested that weight-management-related outcomes might be improved by specifically addressing body image issues, including both BD and IWB, in obesity prevention and health promotion programs [4, 11, 19]. This will likely be a key issue for researchers seeking to develop integrated prevention and health promotion programs for eating disorders and obesity.

Finally, there may be implications for the clinical management of eating disorders and obesity, the treatment of individuals who struggle with both overweight and eating-disordered behavior in particular [21, 41, 43]. It has been suggested that treatments for these individuals might be improved by a greater focus on factors that prevent or reduce both BD and IWB, such as by fostering body acceptance and functionality, positive self-image, self-compassion and self-acceptance [19, 21]. Fostering these strengths might reduce the likelihood that weight bias will be internalized, despite its widespread societal acceptance. Evidence is accumulating for the benefits of this approach in improving QoL among obese individuals [19, 41, 44]. Any clinical implications of the current findings are tentative, however, given that the study population was comprised primarily of normal-weight and overweight individuals.

Cutting across these various implications is the finding that the associations between BD and IWB and QoL impairment did not differ by sex. Whereas efforts to reduce the public health burden of obesity have typically included both males and females, efforts to reduce the public health burden of eating-disordered behavior have been largely confined to selective prevention programs targeting the "high-risk" subgroups of adolescent and young adult women [cf. 20]. With increasing awareness of the adverse effects of BD and eating-disordered behavior on QoL among males [2, 3, 45], and of the different forms of weight-control behaviors observed in these different groups, prevention and health promotion programs for eating disorders continue to evolve [46]. The current findings provide further evidence that adverse effects of BD on QoL, where these exist, do not differ by sex, while extending this observation to adverse effects of IWB on QoL. In addition, since the current study sample comprised primarily normal-weight individuals, the findings provide further evidence that interventions designed to reduce the adverse impact of IWB on health and well-being should not be confined to overweight and obese individuals [8, 12].

Two additional implications follow from the high correlation between BD and IWB observed in the current research. First, this finding raises the possibility that research demonstrating adverse impacts of BD on QoL and related outcomes might reflect, in part, the influence of IWB. This may be important given increased attention to the adverse impact of BD on QoL in recent years [2–4]. Second, and following from this point, the current findings suggest that it would be prudent to include assessment of IWB in research addressing the occurrence and correlates of BD, in order to be able to isolate which construct might be more or less important in accounting for variance in any given outcome. It will be of interest to determine whether similarly high correlations between BD and IWB occur in other study populations, among obese individuals and individuals with eating disorders seeking treatment, for example.

Study limitations

Several limitations of the current research should be considered when interpreting the findings. First, since this was a cross-sectional study, any inferences concerning the directions of the observed associations are tentative. In the case of BD at least, associations with QoL impairment are likely to be bidirectional [47, 48]. Second, the recruitment of a college student sample, while of interest, may limit the generalizability of the findings. Third, relatively brief self-report measures were employed in assessing each of the key constructs considered in the current study—BD, IWB and QoL—and different findings might have been observed had different measures of one or more constructs been employed. Further, the internal consistency of the SF-12 subscales, the SF-12 PCS in particular, was somewhat lower in the current study than in previous studies [27]. Additionally, while a broad range of potential covariates were assessed in the current study, it is possible that some potentially relevant variables, i.e., variables known to be associated with BD, IWB and/or QoL, were not assessed, self-esteem for example [49]. Finally, in the current study, missing data were handled via listwise deletion, as opposed to a multiple imputation method. However, missing data for all variables other than BMI were minimal and relatively high levels of missing data for BMI are not uncommon in population-based studies. It should be noted that multiple imputation methods also have their limitations [50].

Concerning the assessment of IWB in particular, it should be noted that measures of IWB, including the WBIS, might be predisposed to show relatively strong associations with QoL impairment by virtue of the wording of certain items. Thus, several items of the WBIS (e.g., "Whenever I think a lot about being my weight, I feel depressed", "I don't feel that I deserve to have a really fulfilling social life, as long as I'm at my weight") explicitly assess impairment in psychosocial functioning associated with one's body weight. While this may be appropriate, given the nature of the construct of IWB, it may nevertheless lead to artificially inflated associations with items assessing psycho-social functioning such as those of the SF-12 MCS.

Finally, we chose to examine the relative contributions of BD and IWB to QoL impairment in a sample that included primarily normal-weight individuals. This decision was made because prior research suggests that IWB, like BD, is not confined to overweight or obese individuals [8, 9, 12]. The current findings are consistent with this research and support the view that adverse impacts of IWB should be examined across the weight spectrum [8].

Strengths of the current study, in addition to its novelty, include the recruitment of a relatively large and ethnically diverse sample of young people, the use of well-established measures of BD, IWB and QoL, and the examination of both associations between these constructs and potential moderation of these associations by sex.

Conclusion

The current findings suggest that IWB is a stronger predictor of QoL than BD in young people and that this is the case in both women and men and both normal-weight and overweight individuals. They support the view that IWB may warrant greater attention in interventions seeking to reduce the adverse impact of BD, including interventions for both eating disorders and obesity.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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