

Size Does Matter: Perceptual Distortion of Body Size in Females and the Relationship Between BMI, Depression and Body Dissatisfaction

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Abstract

Body dissatisfaction research has primarily focused on either young children or adolescent populations and individuals with clinical eating disorders. The relationship between body dissatisfaction and lifestyle behaviors has been demonstrated, however this link has only been explored in adolescents. The aim of this study was to examine the relationship between BMI, depression, anxiety, stress and lifestyle behaviors in levels of body dissatisfaction and perceptual distortion in female adults ($N = 121$). Depression was found to be a significant predictor of body dissatisfaction, however body dissatisfaction was not affected by BMI, anxiety or stress. Lifestyle behaviors did not significantly predict body dissatisfaction levels. Perceptual distortion was found to exist in a high proportion of females (81.8%). This study suggests that depression is a predictor of body dissatisfaction. These findings will assist in the treatment of body dissatisfaction in females.

Key Words: body dissatisfaction, women, depression, perceptual distortion, BMI

Background

Western women have never been more consciously aware than they are today of society's expectations and the importance placed on the prescribed thin feminine ideal (e.g., thin, tubular female body) and this is resulting in increased levels of body dissatisfaction (Evans et al., 2013). Negative attitudes towards body shapes that do not fit the 'ideal' are communicated throughout high income societies, with the belief that extreme thinness is desirable, beautiful and equated with personal success, popularity and attractiveness (Alves, Regidor, Baraño, Pablo, & Izaga, 2012; Phillips & de Man, 2010; Jaworowska & Bazylak, 2009). Intense focus on media and the associated copious images of unrealistically thin female bodies are deemed to be crucial in the development of body dissatisfaction (Glauert, Rhodes, Byrne, Fink, & Grammer, 2009; Martijn, Vanderlinden, Roefs, Huijding, & Jansen, 2010; Myers & Crowther, 2009).

Australia is one country that fosters a sociocultural ideal of thinness. Research has shown that 46% of young Australian females are highly dissatisfied with their bodies and over a third reported that their body image was of utmost concern (Buckley et al., 2012). Body dissatisfaction is reported to be higher in young women (42.7%) than young men (19.3%; Buckley et al., 2012). This gender difference in an Australian sample is consistent with the literature which reflects that female youth report significantly higher body dissatisfaction than males in both cross-sectional studies and over the course of their lifespan (Bucchianeri, Arikian, Hannan, Eisenberg, & Neumark-Sztainer, 2013; Esnaola, Rodriguez, & Goñi, 2010; Pingitore, Spring, & Garfield, 1997).

Body dissatisfaction is a multi-faceted concept, defined as the discrepancy between an individual's current and ideal body shape and/or the degree of negative feelings associated with body shape, body parts and/or body weight (Catikkas, 2011). Body dissatisfaction is a core component of an individual's conceptualization of their body image, which is an internalized representation of one's own weight, shape and appearance (Allen, Byrne, McLean, & Davis, 2008; Sira & Ballard, 2009). Though the prevalence of body dissatisfaction is significantly high in females, it should not be labeled as 'normal' or minimized, as research indicates that body dissatisfaction is associated with depression, body dysmorphic disorder, low self-esteem, health-compromising behaviors and the development and

perpetuation of eating disorders (Campbell & Hausenblas, 2009; Paxton, Eisenberg, & Neumark-Sztainer, 2006; Glauert et al., 2009; Hausenblas & Fallon, 2006; Martijn et al., 2010; Sira & Ballard, 2009; Stice & Whitenton, 2002).

Limited studies have investigated the role of age in level of body dissatisfaction (Ferraro, Muehlenkamp, Painter, Wasson, Hager, & Hoverson, 2008). Recently, researchers have identified body dissatisfaction in children as young as six years old, indicating an awareness of body shape, size and physical attributes in some children from a very early age (Phillips & de Man, 2010; Tucci & Peters, 2008). With an increase in body size occurring throughout middle age, it would be expected that body dissatisfaction would also increase with age. However, research indicates that during middle age, women's preferred body size increases proportionately with the importance placed on physical appearance, thereby moderating this effect (Runfola et al., 2013). Throughout the lifespan, women's bodies change significantly, with adolescence, pregnancy and middle age being the most crucial periods of change. Research undertaken by Tiggerman and McCourt (2013) found that body dissatisfaction was negatively associated with age, therefore the older a woman is, the less body dissatisfaction they are experiencing.

BMI and Body Dissatisfaction

One of the most robust findings in the literature regarding body dissatisfaction is the significant positive relationship to [Body/Mass Index (BMI). BMI is a value derived from the mass (weight) and height of an individual. The BMI is defined as the body mass divided by the square of the body height, and is universally expressed in units of kg/m², resulting from mass in kilograms and height in metres. A higher BMI is associated with higher levels of dissatisfaction (Bucchianeri et al., 2013; Phillips & de Man, 2010; Goldfield, Moore, Henderson, Buchholz, Obeid, & Flament, 2010). Research indicates that women with a heavier than normal body weight (i.e., overweight and obese BMI categories) are more likely than those in the normal, underweight and emaciated BMI categories to prefer a smaller ideal body shape (Bully & Elousa, 2011; Kennet & Nisbet, 1998).

Perceptual Distortion

Inaccurate estimation of a women's own body size and shape in accordance with their corresponding BMI status is common (Feero & Steadman, 2010; Stock, Küçük, Miseviciene, Petkeviciene, & Krämer, 2004). Body image disturbance is divided into an estimation component (difficulty in estimating one's own size) and an affective component (body dissatisfaction (Holder & Keates, 2006; Tovèe, Benson, Emery, Mason, & Cohen-Tovèe, 2003). Research has shown that how an individual perceives and conceptualizes their own body weight is more important than their actual weight and shape (Gaskin, Pulver, Branch, Kabore, James, & Zhang, 2013). A study by Kim and Lee (2010) illustrates that 42% of female university students described themselves as "fat" even though they were within the healthy weight range.

Both body dissatisfaction and the misperception of actual body weight in women are very common and widespread phenomena (Jawarowska & Bazylak, 2009; Martijn et al., 2010). A European study on 1,681 women university students explored the relationship between perceived body shape and BMI, revealing that 43% of the sample perceived their body shape to be significantly different to what their BMI suggested (Stock et al., 2004). A total of 26.8% of the sample overestimated their body shape, with another 27% perceiving themselves either as too fat or 'just right' even if they were of a normal or underweight BMI (Stock et al., 2004). Although this study replicates the findings made in many other studies, a threat to construct validity is noted due to poor operationalization of the Likert scale used in the estimation of weight perception.

A more psychometrically sound and commonly used assessment for misperception of body size is the silhouette-matching task (Gardener & Brown 2010; Peterson, Ellenberg, & Crossan, 2003).

Silhouette-matching tasks typically employ five to 12 silhouettes that represent differing anthropomorphic shapes based on the formula of hip-to-waist ratio of BMI's (Peterson et al., 2003). Participants are asked to choose the image that best represents their current body size and shape, along with the image that represents their ideal body (Peterson et al., 2003). Use of the Stunkard Figure Rating Scale (SFRS; Stunkard et al., 1983) has revealed the women surveyed mostly had a preferred body size that was one figure smaller (one BMI unit) than their current body size and that 91% did not correctly chose the figure corresponding with their BMI, with those in the obese category demonstrating the highest level of body dissatisfaction (Runfola et al., 2013).

Depression and Anxiety in Body Dissatisfaction Levels

Higher levels of both depression and anxiety have been linked to higher levels of body dissatisfaction in adolescent girls and women university students; however, little of this research has considered non-clinical populations (Paxton et al., 2006; Ivarsson, Svalander, Litlere, & Nevonen, 2006; Rodgers, Salès, & Chabrol, 2010; Wiederman & Pryor, 2000). Rodgers et al. (2010) assessed mood dimensions such as depression and anxiety on body dissatisfaction in women students and found that over 80% of individuals aspired to have a thinner body shape than they actually had, confirming that BMI plays a significant role in body dissatisfaction. Although depression and anxiety both correlated positively with body dissatisfaction, only anxiety was a significant unique predictor of body dissatisfaction. Despite the large overlap of depression and anxiety, Rodgers et al. (2010) concluded that anxiety was a stronger predictor of body dissatisfaction within non-clinical populations.

Psychological stress, a result of the transaction between an individual and their environment, where events are deemed to threaten one's well-being, has also been considered to link with body dissatisfaction. However, it has received little empirical attention (Murray, Rieger, & Bryne, 2013). Although studies on the link between stress and body dissatisfaction are scarce, Murray et al., (2013) identified a unidimensional relationship between stress and body dissatisfaction after controlling for gender (Murray et al., 2013). This indicated that stress plays a predictive role in increased levels of body dissatisfaction over a one-year period; however, body dissatisfaction did not predict stress (Murray et al., 2013).

Thin Ideal Internalisation Theory

A prominent theory that attempts to explain both the development and rising prevalence of body dissatisfaction is the thin-ideal internalization model (Stice & Shaw, 1994). The thin-ideal internalisation model refers to the extent in which individuals accept and adopt socially defined ideals of attractiveness, with those who internalize these ideals associating thinness with positive attributes such as happiness, high social status and desirability (Jeffers, Cotter, Snipes, & Benotsch, 2013; Mitchell, Petrie, Greenleaf, & Martin, 2012; Nouri, Hill & Orrell-Valante, 2011; Wojtowicz & von Ranson, 2012). Evidence suggests that exposure to unrealistic media images and internalization of the thin-ideal has a detrimental effect on females' body satisfaction (Fitzsimmons-Craft, Harney, Koehler, Danzi, Riddel, & Bardone-Cone, 2012). There has been some contradictory evidence, such as Wojtowicz and von Ranson's (2012) research, which suggests that the thin-ideal internalization is not a significant risk factor in body dissatisfaction over time, however this research suffered from several limitations such as the use of an untested measure and too few measurements. Overall, research suggests strong support for greater body dissatisfaction in women who are more exposed to the thin-ideal image (Grabe, Ward, & Hyde, 2008; Nouri et al., 2011).

Lifestyle and Body Dissatisfaction

Lifestyle is defined as the way in which individuals chose to live their lives and encompasses attitudes, values, belief systems and behaviours that are reflected in their lifestyle choices (Wang, Worsley, & Cunningham, 2009). Previous research has demonstrated that both weight perceptions

and body dissatisfaction are associated with risky lifestyle behaviours and poor health outcomes, for example smoking, drug use, physical inactivity and eating disorders (Antin & Paschall, 2011; Gaspar, Amaral, Oliveira, & Borges, 2011). Lifestyle behaviours are often divided into four main categories including; physical activity, dietary practices, smoking habits and alcohol consumption.

Participation in physical activity has been shown to be a protective factor against increased levels of body dissatisfaction (LePage & Crowther, 2010; Olive, Byrne, Cunningham, & Telford, 2012). However, it is argued that many young women frequently exercise under the motive of weight control and physical appearance rather than for the health benefits (Tiggemann & Williamson, 2000). Women who engage in physical activity for appearance related motives along with those who are physically inactive have higher levels of body dissatisfaction (Wojtawitz & von Ranson, 2012).

Dietary intake of both healthy foods such as fruit and vegetables and unhealthy foods such those containing high levels of sugar and fat can be influenced by levels of body dissatisfaction (Wang et al., 2009). In general, the consumption of foods that are perceived as 'unhealthy' are more likely to produce both negative mood states and higher levels of body dissatisfaction (Hayes, D'Anci, & Kanarek, 2011). Research has suggested that there exists a significant relationship between fruit and vegetable intake and levels of body dissatisfaction. Further research into this link would be beneficial in understanding how different foods both affect states of body dissatisfaction and conversely how body dissatisfaction affects dietary behaviors. Unhealthy lifestyle behaviors such as smoking have been found to be associated with higher levels of body dissatisfaction (Clark et al., 2005; King, Matacin, Marcus, Bock, & Tripolone, 2000).

Research investigating the different aspects of lifestyle choices on body dissatisfaction is scarce. However, a large scale longitudinal study investigating an association between body satisfaction and behavioral outcomes such as weight control behaviors, physical activity, smoking and BMI was conducted in an adolescent population (Neumark-Sztainer et al., 2006). This study revealed a strong and consistent relationship between body satisfaction levels and health-related behaviors five years later, suggesting that areas of lifestyle behaviours (intake of fruit and vegetables, [physical activity levels motivated by weight control and physical appearance rather than for the health benefits, and smoking frequency) are possible predictors of body dissatisfaction. Specifically, results demonstrated that adolescent girls who had higher levels of body dissatisfaction engaged in higher levels of dieting, unhealthy weight behaviors and binge eating along with lower levels of physical activity and fruit and vegetable intake (Neumark-Sztainer et al., 2006). Similar results were obtained when BMI was accounted for in the analyses, although the patterns were weaker and less consistent, suggesting that the association between body dissatisfaction and health behaviors are [associated with BMI (Neumark-Sztainer et al., 2006).

Present Research

The first aim of this research was to explore the complex nature of body dissatisfaction and to identify whether lifestyle choices (including diet, exercise, alcohol consumption, smoking and stress) are unique predictors of body dissatisfaction. To date, there is little research examining whether lifestyle choices are unique predictors of body satisfaction, nor is there sufficient research assessing the relationship between lifestyle choices and body dissatisfaction.

Second, the current study aims to further clarify and validate previous research on the relationship between BMI status, depression and body dissatisfaction. There is a lack of research exploring a general, healthy population, with a wide range of ages, BMI statuses and non-clinical levels of depression.

The last aim of the current study was to evaluate individuals' ability to identify a pictorial figure that corresponded with their self-reported BMI status to explore the prevalence of perceptual distortion of body size and shape among women.

It was hypothesized that individuals who engaged in healthier lifestyles, who presented with lower levels of depression and had BMI levels within the underweight to normal range, would display lower levels of body dissatisfaction. This is in comparison to those who did not engage in healthier lifestyles. Specifically it was predicted that:

- H1. Individuals who engaged in healthier lifestyles would differ from those who did not engage in healthy lifestyles in levels of total body dissatisfaction, over and above the effect of BMI, depression, anxiety and stress.
- H2. Individuals that had a BMI in the underweight and normal range would report lower levels of body dissatisfaction compared to individuals who had a BMI in the overweight and obese range.
- H3. Individuals who indicated higher levels of depression, anxiety and stress would show higher levels of body dissatisfaction over and above the effects of BMI.

Methods

Participants

A convenience sample of 152 women were selected from the adult population. Women were the focus of this study due to well-documented research that demonstrates body dissatisfaction has a more serious impact on women and is more prevalent among women. Participants were recruited online through Facebook, living in Australia, and from undergraduate university students studying in Australia. Participants within the sample had a mean age of 25.98 ($SD = 8.36$) years and majority of participants were in a relationship (49%), with the remaining identifying themselves as either single (34.6%) or divorced (1.3%). Participants' highest level of completed education included high school certificate or equivalent (26.1%), TAFE or college (22.2%), and tertiary qualifications (40%). Participants were employed full-time or part-time (38%) or students (30%). Participants mean kilogram weight was 67.00 ($SD = 15.26$) and mean centimeters height was 164.43 ($SD = 18.78$), from which individual BMI's were subsequent calculated at $M = 24.20$ ($SD = 4.79$). Participation was voluntary and no incentives were provided with the exception of undergraduate psychology students who, on completion of the study, were provided with one credit point towards a requirement for their university subjects.

Materials

Demographics

Participants were asked to enter basic demographic information at the beginning of the survey. Participants recorded their age, ethnicity, relationship status, highest level of education completed, current work status, their height and their weight.

The Simple Lifestyle Indicator Questionnaire (SLIQ; Goodwin et al., 2008). The SLIQ was used to assess individual participants' level of health-promoting behaviors, including physical activity, diet, alcohol consumption, smoking and perceived everyday stress.

Depression, Anxiety and Stress Scale-21 (DASS -21; Lovibond & Lovibond, 1995). The DASS-21 is a 21-item self-report questionnaire used to assess the negative emotional states of depression, anxiety and stress.

Photographic Figure Rating Scale (PFRS; Swami, Salem, Furnham, & Tovee, 2008). The PFRS is based on the Contour Drawing Figure Rating Scale (CDFRS; Thompson & Gray, 1995) as a method for allowing individuals to visually match how they perceive their body shape with that of BMI correct shapes.

Body Appreciation Scale (BAS; Avalos, Tylka, & Wood-Barcalow, 2005). The BAS is a 13-item self-report questionnaire that measures aspects of positive body image including acceptance of favourable opinions towards and respect of the body.

Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987). The BSQ-34 is a 34-item self-report questionnaire that measures the antecedents and consequences of body shape concerns in order to assess body dissatisfaction.

The Marlowe-Crowne Social Desirability Scale (MCSDS; Crowne & Marlow, 1960). The MCSDS is used to measure the extent of social desirability bias in participants and to assess if responses were confounded by the participants tendency to respond in a socially desirable way.

Body Mass Index (BMI). BMI assesses the percentage of body fat in individuals. It is based on the mathematical formula of weight (kilograms) divided by height (centimeters) squared to obtain an overall score that is placed into pre-defined categories (Nihiser et al., 2007).

Procedure

The online survey was created on the *PsychData*. Questions and scales used within this survey were identical to those on the original inventories, with the exception of SLIQ. Minor alterations regarding the wording of the SLIQ were implemented in order to allow full comprehension of the questions being asked (i.e., for Australian sample).

Results

Data diagnostics

After data screening, the sample size was above that required for Simple and Hierarchical Regression ($N = \geq 104 + m$) with a remaining sample size of $N = 121$ (Tabachnick & Fidell, 2013). Descriptive statistics for the sample can be found in Table 1.

Table 1. Mean, Standard Deviation, and Bivariate Correlations for Key Variables

	Mean	Standard Deviation	Social Desirability	Age	BMI	Lifestyle Behaviours	Depression	Anxiety	Stress
Social Desirability	6.46	2.84							
Age	25.80	7.93	.086						
BMI	24.14	4.91	.119	.269*					
Lifestyle Behaviours	21.66	7.22	.207*	-.146	-.091				
Depression	11.00	4.34	-.163	-.027	.052	-.214*			
Anxiety	10.52	3.90	-.181*	-.224*	.056	-.081	.628**		
Stress	13.92	4.79	-.284**	-.027	.039	-.148	.676**	.691*	
Body Dissatisfaction	114.26	47.20	-.297**	-.086	.157	-.138	.361**	.289*	.289**

Note: * $p < .05$, ** $p < .001$

Regression analysis

A regression analysis was undertaken to assess whether BMI, depression, anxiety, stress and lifestyle choices significantly predicted body dissatisfaction. A hierarchical multiple regression was undertaken to assess whether lifestyle behaviors predicted body dissatisfaction over and above the effect of Social Desirability, age, BMI, and the DASS. The predictor variables were entered into the regression based on prior research, with lifestyle behaviors entered at the final step due to this being the primary predictor of interest. In step 1, social desirability and age accounted for 8% of the variance in body dissatisfaction, and social desirability a negative significant predictor, $\Delta F(2, 116) = 5.06$, $p = .008$ reflecting that as socially desirable responding increased, so too did body dissatisfaction. Age did not make a significant unique contribution to body dissatisfaction. At step 2, BMI accounted for 4.7% of the variance $\Delta F(1, 115) = 6.17$, $p = .014$. BMI was a significant positive predictor of body dissatisfaction, reflecting that as female BMI levels increased, body dissatisfaction levels also increased. At step 3, depression, anxiety and stress were added to the regression. Collectively, the four predictors (BMI, depression, anxiety and stress) accounted for a statistically significant proportion of variance, $\Delta F(3, 112) = 4.02$, $p = .009$. BMI, depression, anxiety and stress predicted a large (21.2%) proportion of variance, with depression, anxiety and stress making a unique contribution of 8.5%. However, when BMI was controlled for only depression it uniquely predicted a significant variance in body dissatisfaction ($\beta = .269$, $p = .030$). In step 4, lifestyle behaviors were added to the regression. Collectively the six predictors (social desirability, age, BMI, depression, stress and lifestyle behaviors) accounted for a significant proportion of variance, $F(7, 118) = 4.28$, $p < .001$. When lifestyle was added to the model and analyzed as a separate predictor of body dissatisfaction, with all other predictors controlled for, it accounted for a very small unique variance of .01% and accounted for a non-significant proportion of variance $\Delta F(1, 111) = .09$, $p = .767$. Therefore, when controlling for BMI, depression, anxiety and stress, those who engaged in healthy lifestyle behaviors did not differ on levels of body dissatisfaction (see Table 2). Social desirability, BMI and depression were significant predictors and uniquely contributed 4.0%, 1.9% and 2.9% respectively. Age, anxiety, stress and lifestyle behaviors were not significant predictors of body dissatisfaction in females.

Table 2. Hierarchical Multiple Regression Analysis Predicting Body Dissatisfaction from Social Desirability (SD), Age, Body mass Index (BMI), Depression, Anxiety, Stress Scale (DASS) and Lifestyle Behaviours (LB)

Predictor		B	SEB	β	R ²	Adjusted R ²	ΔR^2
Step 1	Constant	154.63**	16.45				
	SD	-4.53*	.52	-.27	.28	.08	.06
	Age	-.41	.53	-.07			
Step 2	Constant	113.82**	22.01				
	SD	-4.90**	1.50	-.29	.36	.13	.10
	Age	-.76	.54	-.13			
	BMI	2.16 *	.87	.23			
Step 3	Constant	75.17*	26.44				
	SD	-4.11*	1.49	-.24	.46	.21	.17
	Age	-.63	.54	-.11			
	BMI	1.89*	.85	.20			
	Depression	2.98*	1.29	.28			
	Anxiety	.59	1.54	.05			
	Stress	-.17	1.30	-.02			
Step 4	Constant	79.76 *	30.74				
	SD	-4.02*	1.53	-.24	.46	.21	.16
	Age	-.65	.55	-.11			
	BMI	1.87*	.85	.20			
	Depression	2.91*	1.32	.27			
	Anxiety	-.62	1.55	.05			
	Stress	-.17	1.31	-.02			
	LB	-.17	.58	-.03			

Note. * $p < .05$, ** $p < .001$

Perceptual distortion

Descriptive statistics were explored to identify whether individuals were able to correctly select a BMI based silhouette that corresponded with their current BMI status through the use of the Photographic Figure Rating Scale (PFRS: Swarmi et al., 2008). Investigation of the descriptive statistics revealed that 18.2% ($N = 22$) individuals were able to correctly identify their corresponding BMI based body shape and size, while 44.6% ($N = 54$) underestimated and 34.7% ($N = 42$) overestimated their body shape and size. These statistics highlighted that a small percentage of individuals were able to correctly identify, with the majority demonstrating perceptual distortion.

Discussion

The aim of this study was to explore the relationship between lifestyle behaviors, depression, anxiety, stress and body mass index (BMI) in perceived levels of body dissatisfaction in women throughout the adult lifespan.

The results support previous literature that found depression to be a positive correlate of body dissatisfaction and that a significant amount of perceptual distortion is found within women regarding their own body size. However, contradictory results were found as to the role of BMI in body dissatisfaction, with findings suggesting that higher levels of BMI did not significantly predict higher levels of body dissatisfaction. Results did not support the role of lifestyle behaviors as a unique predictor of body dissatisfaction, suggesting that lifestyle behaviours may not be one of the more important constructs in conceptualising body dissatisfaction.

The first hypothesis, that individuals who engaged in healthier lifestyle behaviours would show lower levels of body dissatisfaction, over and above the effects of age, BMI, depression, anxiety and stress was not supported in this study. These findings are in direct contrast to the findings of Nuemark-Sztainer, Paxton, Hannan and Story (2006), that demonstrated a strong and consistent relationship between body dissatisfaction levels and health related behaviors.

Despite the majority of current research suggesting there is a significant positive relationship between BMI and body dissatisfaction, the analysis suggests that BMI was not a significant predictor of body dissatisfaction. Therefore, the second hypothesis that individuals within lower BMI categories would report lower levels of body dissatisfaction was not supported, despite strong previous research supporting the role of BMI. This may reflect a limitation of the study regarding self-report measures for BMI, which may be inconsistent with the participants' actual measurements. Further research is required regarding BMI, utilizing more objective methods for obtaining height and weight data.

The third hypothesis of the study that higher levels of depression, anxiety and stress would predict higher levels of body dissatisfaction was partially supported. Depression was found to be both a significant predictor within the model as a whole and as a unique contributor to higher levels of body dissatisfaction. However, anxiety and stress were found to be non-significant predictors of body dissatisfaction. A follow-up analysis concluded that individuals within the severely depressed group reported higher levels of body dissatisfaction than the moderately depressed group and that individuals within the extremely severe group indicated higher levels of body dissatisfaction than the moderate group. However, there were no differences between individuals in the severe or extremely severe depression categories. This suggests that as depression levels increase, so too does body dissatisfaction, until a certain point (i.e., severely depressed), at which level of depression no longer results in increasing levels of body dissatisfaction. However, anxiety and stress did not significantly predict levels of body dissatisfaction, as either part of the overall model or as unique predictors.

Depression, anxiety and stress are all negative affective components of psychological health, however, in this study it is the depression component that has been demonstrated to be positively

associated with higher levels of body dissatisfaction. These results partially support those of Rodgers et al. (2010) who found that both depression and anxiety were positively correlated with body dissatisfaction. A major difference is that in the current study, depression was found to significantly predict levels of body dissatisfaction whereas anxiety was not found to be a significant predictor. The sample tested for this study demonstrated higher levels of depression, stress and anxiety than would be expected within a normal population, with zero participants categorized as normal and mild in the depression and anxiety categories. Thus the majority were either moderately, severely or extremely severely depression, anxious or stressed. The findings would possibly be different in a more normalized sample.

The frequency of perceptual distortion observed was much greater than was first hypothesized. The findings indicate that 81.8% of the sample demonstrated perceptual distortion and were unable to correctly identify their own body size from the PFRS (Swarmi et al., 2008) silhouettes. These findings are significantly higher than those proposed by Stock et al., (2004) whose results suggested that 43% of females perceived their body shape to be significantly different to their BMI. However, the findings of this study did support those stated by Runfola et al. (2013) who reported that 91% of their sample did not correctly choose their corresponding BMI-based silhouette. The findings of this study support the notion of perceptual distortion in adult women and provide support for this perceptual distortion occurring in the majority of women.

Specifically, in the underweight category, all participants overestimated their body weight, demonstrating perceptual distortion and the fact that they viewed themselves to be larger in size than they actually were. This is possibly due to these participants internalizing the thin-ideal, within which, although considered underweight, these individuals compare themselves to unrealistically thin media models, thereby distorting their perception of themselves. In the obese BMI category, all participants underestimated their body size. This may be the opposite to what causes underweight individuals to think they are larger, with obese individuals rejecting internalization of the thin-ideal, and instead having a distorted view as to how they compare with smaller body sizes, believing they are smaller than they are in reality. In both the normal and overweight categories, the proportion of individuals who demonstrated perceptual distortion was evenly divided between those who underestimated and those who overestimated. This may again be a reflection of the divide between those who have and those who have not internalized the thin-ideal. Individuals who have underestimated their body size may have done so due to a reflection of the increasing BMI of society in general, and the distortion as to the size a normal BMI reflects (Walls et al., 2010). In the normal BMI category, a quarter of individuals showed no perceptual distortion, while 12.5% of those in the overweight category also showed no perceptual distortion. These figures are low and highlight the extent to which perceptual distortion affects adult women. Further research is required to explore both the role of perceptual distortion in body dissatisfaction and to understand ways in which this distortion can be reduced.

This study has several limitations and we should be cautious in the interpretation of the results. While the study aimed to sample a wide age range of women, the mean age of the same was still very young (25.98), thus similar to previous research. This was possibly due to the nature of seeking university students and those engaged with social media. Another limitation of the study was that causation cannot be inferred because the research was correlational in nature. Additionally, the use of self-report measures to ascertain BMI category affiliation may have introduced the factor of social desirability in reporting of body weight. A preferred alternative would have been to objectively assess heights and weights, however, due to time constraints this was not an option for the current study. Finally, the community sample reflected high levels of pathology (e.g., depression and anxiety scores) and thus may not have been representative of the broader population (Lovibond & Lovibond, 1995).

The findings of this study that are consistent with previous findings have significance for clinical intervention. For example, the effect of depression in explaining body dissatisfaction levels is evident even when controlling for age. This is consistent with previous findings that depression is a predictor

of body dissatisfaction in a non-clinical sample and that age does not predict levels of body satisfaction (Paxton et al., 2006; Ivarsson et al., 2006; Runfola et al., 2013). An implication of this finding is that interventions aimed at reducing depressive symptomology in women with high, problematic levels of body dissatisfaction (i.e., eating disorders) can be used in individuals in a wide age range from 18 years and over and this should perhaps be mandatory rather than optional. This may decrease the time, effort and money required to develop differing interventions for different age groups (e.g., young adults, middle-age and older adults) across the adult lifespan. In light of the findings of this study and previous research regarding the high prevalence of perceptual distortion in women, it is suggested that underestimation of body size is implicated in those who have not internalized the thin ideal, whereas those who overestimated have internalized the thin ideal, highlighting the importance of this model (Glauert et al., 2009; Stice & Shaw, 1994). With these findings supporting the thin ideal internalization model, this theory can be used to underpin interventions aimed at decreasing perceptual distortion within individuals who internalize the thin-ideal, with a separate intervention to be developed aimed at those who have not internalized the thin-ideal. Further research is required to understand the mechanisms behind why some internalize the thin-ideal whereas others do not.

Findings of this study that were found to be inconsistent with previous findings require further investigation. For example, BMI was not found to predict body dissatisfaction as was expected, despite strong previous research supporting the role of BMI. This may reflect the self-report measures for BMI, which may be inconsistent with the participants' actual measurements. Further research is required regarding BMI, utilizing more objective methods for obtaining height and weight data. Furthermore, lifestyle behaviors were not found to be significant predictors of body dissatisfaction. Previous research exploring the relationship between lifestyle behaviors and body dissatisfaction is scarce and has not been conducted using the unique set of predictors employed within the current study. The results infer that lifestyle behaviors, whether healthy or unhealthy, do not predict body dissatisfaction. However, further research exploring lifestyle behaviors and their role in body dissatisfaction is warranted, using a more comprehensive measure of all constructs within lifestyle behaviors.

Despite its limitations, the current research contributes to the understanding of the conceptualization of body dissatisfaction in adult women. It is the first research to explore lifestyle behaviors in addition to depression, anxiety, stress and BMI status in adult women and has provided support that depression is a significant unique contributor, building on previous research pertaining to children and adolescents.

Future research needs to take into account methodological issues imposed by this study and refine the measurement utilized to assess lifestyle behaviors. Future research also needs to address both non-westernized countries to gain an understanding as to the impact of culture in body dissatisfaction levels and might also focus on Australia's Indigenous population. By gaining a greater understanding as to what factors increase levels of body dissatisfaction, especially when it manifests into eating disorders, more sophisticated and targeted interventions can aid in reducing body dissatisfaction levels in women adults. The real question to be answered is what, among the variables studied, is primary. Body dissatisfaction and the resulting changes in weight, overweight or obesity and the ensuing depression and lifestyle changes that occur are crucial in the design of routine interventions to combat depression and reduction of overweight or obesity long term.

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