

Body image dissatisfaction among food-related degree students

ABSTRACT

Purpose

Current western society promotes a strong desirability to be thin. The majority of young females are unhappy with their body shape and wish to be thinner. This can lead to many health problems such as addictive exercising, depression and disordered eating. It is also established that certain groups tend to be more prone to body image dissatisfaction (BID) than others. The purpose of this study was to determine if there was a high prevalence of BID and/or disordered eating among students studying a food-related degree course.

Methodology

Students were recruited via e-mail. Subjects were weighed, measured and BMI calculated. A software package 'Anamorphic Micro' was used to measure BID and a validated questionnaire 'BITE' assessed for disordered eating.

Findings

Nutrition students had a low mean BMI of 21.8 kg/m². Despite this, the majority (90%) were dissatisfied with their body; with 83% wishing to be thinner and 60% overestimating their body size. The BITE questionnaire revealed that 30% scored for disordered eating and 10% scored for Bulimia Nervosa.

Value

This paper confirms that students studying food-related degree courses are at greater risk of developing eating disorders.

KEY WORDS: Nutrition students, body image dissatisfaction, eating disorders

PAPER TYPE: Research paper

Introduction

There has been a significant increase in interest in body image (BI) in the last 50 years (Grogan, 2008). The concept of BI is thought to consist of two components: body size perception and attitudes towards the body. It is how somebody perceives their appearance to be viewed by others, which in many cases may be dramatically different from their objective physical condition (Cash and Pruzinsky, 2004).

In contemporary Western cultures the societal standards for female beauty emphasize the desirability to thinness. Moreover, BI is a significant aspect of interpersonal and psychological development in adolescence, particularly for girls for whom it is an important component of self-esteem. It is known that approximately half of adolescent girls (40-70%) are dissatisfied with some aspects of their body and majority of them would like to be thinner (Cash and Pruzinsky, 2004). Grogan (2008), states that Body image dissatisfaction (BID) is evident from eight years of age. However, women of all ages are often dissatisfied due to the mass media presentation of the ideal body as thin (Grabe *et al.*, 2007). A number of studies have linked BID to problematic behaviors and negative emotions, such as: addictive exercising, depression and disordered eating (Ackard *et al.*, 2002; Skrzypek *et al.*, 2001; Akdevelioglu and Gumus, 2010).

Some people appear to be more prone to developing eating disorders than others. The prevalence of Anorexia Nervosa (AN) and Bulimia Nervosa (BN) is higher in certain groups, such as athletes, dancers, and beauty therapists as they may be pressured to be slim in order to compete in their career (Gilbert, 1989). Prevalence of eating disorders (ED) on college campus' and at universities is on rise (Latzer and Tzischinsky, 2005; Thorsteinsdottir and Ulfarsdottir, 2008; Akdevelioglu and Gumus, 2010). Studies have shown that students studying nutrition or dietetics can also be at increased risk and there is suspicion that students decide to study food because of their personal experiences with ED (Hughes and Deshbrow, 2005). Some studies illustrate that people "preoccupied with thoughts of food" (Worobey and Schoenfeld, 1992) and learning about food (Reinstein *et al.*, 1992) are at higher risk of suffering from ED and tend often to restrict their food intake in order to keep low weight (Korinth *et al.*, 2008; Fredenberg

et al., 1996). Hughes and Deshbrow (2005) found that one third of dietetic students were motivated to choose their career by personal experiences of ED or obesity. Worobey and Schoenfeld (1999) asked students from four various courses to complete a questionnaire about eating habits; dietetics and dance students gained the highest scores for disordered eating related variables. Drake (1989) surveyed dietetics students using a validated tool 'Eating Attitude Test' (EAT) and found that 24% of them met the criteria for Anorexia Nervosa (AN).

Other studies have opposite findings; Reinstein *et al.* (1992) and Korinth *et al.* (2008) measured the incidence of Bulimia Nervosa (BN) and AN in various groups of students but no differences in prevalence were observed. Moreover, both studies measured the impact of nutritional knowledge by comparing results between first year and higher levels students and found that nutritional education can have a positive impact on those affected by ED.

As the results of published literature tend to be inconsistent and as a relatively small number of studies appear to have been undertaken, there is a need to conduct more research in this area. Therefore, the purpose of this study was to ascertain if there is a high prevalence of BID and/or disordered eating among students studying a food related degree course.

Methodology

Ethical approval was obtained from Liverpool John Moores University faculty ethics committee. All students undertaking a food related degree course (either nutrition or home economics) were contacted by e-mail and invited to take part. An appointment was made with each volunteer to allow the researcher to take measurements of weight (in kg) and height (in m) in a private room. A digital photograph was taken of the participant's whole body against a white plain wall and downloaded into the Anamorphic Micro software.

Anamorphic Micro is a computerized body image assessment tool. It is an innovative, valid technique that enables the researcher to distort the image by up to 100% and the distortion may be set to make the picture either wider or narrower. The participants were asked to perform the estimation twice (once with a wider image and once with a narrower image) to provide a counter balancing effect, reducing any bias (Anamorphic User Guide, 2008). In this study the researcher used the standard settings to distort the picture; firstly by setting the image to 25% wider for the first trial and 25% narrower for the second trial. A distortion of 25% was chosen in order to avoid too much of a noticeable difference to the volunteers.

Each participant was left alone to self-administer the tests, to ensure privacy. During the test, the participant was presented with their 25% larger distorted self image (and the package informed them that the image was slightly distorted, but *not* whether it was wider or narrower). They were asked to use the wider and narrower option buttons to manipulate the image, firstly until the image of how they *think* they look was achieved, and then to show how they would *like* to look. The second trial involved exactly the same procedure but the image was distorted 25% narrower this time. The results were presented as three images shown in parallel: the true image size, the estimated size and the desired image of the volunteer (Symplex Software, 2008). Anamorphic micro then calculates the difference between both true image and estimated image (Body image perception, BIP) and true image and desired image (BID). BIP scores > 100 indicate an overestimation of size, whereas BID scores < 100 indicate a desire to be thinner. It has been stated by Freeman (1986) and Ferrer-Garcia et al. (2005) that this kind of discrepancy - between current body size (true size) and ideal body size (desired size) is a reliable and validated measure of body size dissatisfaction. Therefore, BID scores were used for the data analysis.

Each participant was then asked to complete the Bulimic Inventory Test (BITE), which is a validated questionnaire composed of 33 questions examining eating habits and attitudes towards food (Freeman & Henderson, 1987). Mean scores were calculated

and individual scores obtained for BID were then compared to BITE scores and age and BMI of participants to look for any associations. A BITE score above 25 indicates BN (Freeman & Henderson, 1987). Other studies confirm the reliability and validity of this method and it has been used nationally to determine the predisposition to BN (Kórház & Osztály, 2003; Freeman & Henderson, 1987). Moreover, this test is easy to administer, acceptable to subjects and simple to score (Freeman & Henderson, 1987).

Table 1: Explanation of interpreting total BITE Scores (Freeman & Henderson, 1987).

Total BITE Score	Indication of Bulimia Nervosa
0- 9	considered normal
10 - 25	assumed to reflect a subclinical group of subjects who have a disordered eating pattern
26 - 33	suggesting pathology

(SOURCE: Freeman & Henderson, 1987)

Results

Sample

Thirty female students from food related courses agreed to take part. Their age ranged from 18 to 48 years, mean age was 25.0 (\pm 8.4). Mean BMI was 21.8 Kg/m² (\pm 3.8), range was 17-36 Kg/m² (Table 2). Students were enrolled on Community Nutrition, Food and Nutrition, or Home Economics courses, from all 3 levels. A small number (n =3) were postgraduate students, who had recently completed one of these courses.

(Table

2

here)

Table 2: Student's Age and BMI plus scores from Anamorphic Micro and BITE.

Student	Age	BMI kg/m²	BIP **	BID *	BITE score
1	20	10.5	102	101	0
2	48	20	96.5	91	1
3	19	25	103.5	97.5	1
4	20	24	116.5	80	2
5	20	19	119.5	75	4
6	22	19	102.5	100.5	4
7	42	23	89	91	5
8	21	18	94.5	91.5	5
9	24	19	108.5	99	5
10	18	20	98.5	99.5	5
11	22	24	110.5	83.5	6
12	20	26	115.5	86	7
13	39	23	108.5	90.5	7
14	24	18	99	98	8
15	24	24	109.5	92.5	8
16	41	24	93	85	9
17	20	17	106.5	100	9
18	24	21	91	100	10
19	21	18	100.5	95	11
20	21	24	98.5	96	11
21	27	19	98	94	11
22	22	24	112	87.5	12
23	45	36	96	88	15
24	21	22	103.5	84.5	15
25	20	20	95.5	96	16
26	23	22	105	90	16
27	20	19	91	100	19
28	22	26	123	70	29
29	21	20	122.5	92.5	29
30	19	23	113.5	81.5	36
mean	25.0	21.6	104.1	91.2	10.5
SD	8.5	4.3	9.5	7.9	8.6

BIP Scores

The scores of BIP ranged from 89 to 123 (mean = 103.8, \pm 9.5). No student scored 100 for BIP, indicating that all 30 students either underestimated or overestimated their body size. Twelve (40%) scored < 100 for BIP, underestimating their true body size; whereas, 18 (60%) scored > 100, overestimating their true body size.

BID scores

BID scores ranged from 70 to 101 (mean = 91.2, \pm 7.9). The majority of students (83%) scored < 100 indicating a desire to be thinner. There was no statistically significant association between BID and BIP scores and BMI, as those who desired to be thinner, and those who overestimated their size, fell in all BMI categories.

BITE scores

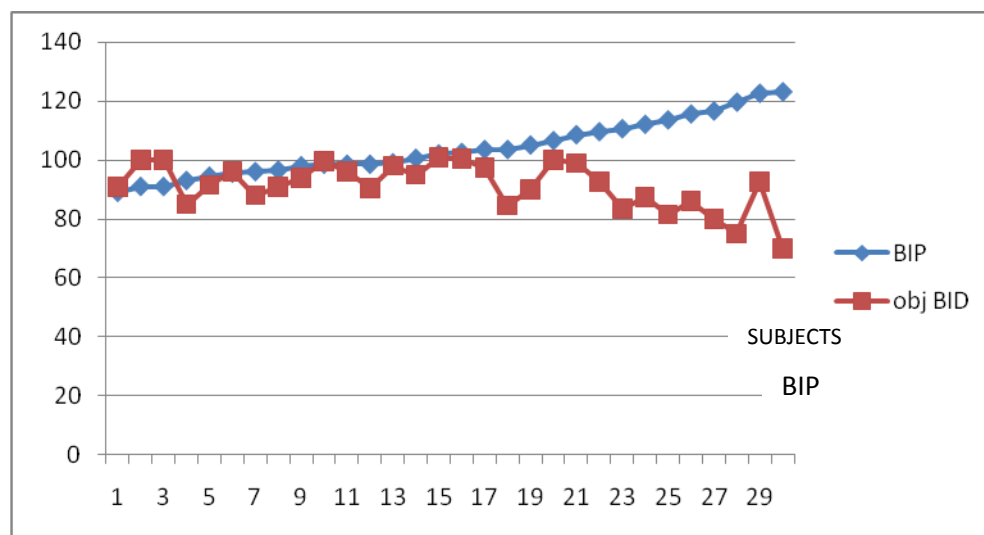
Scores from BITE ranged from 0 to 36 (mean = 10.5, \pm 8.6). Almost one third (30%) of students achieved scores indicating disordered eating (scoring >10) and 10% scored for clinically significant pathology of binge eating (scoring >25). No statistically significant association between BITE scores and BIP scores was found, using chi² test ($p > 0.5$). However, all those who scored for BN (score > 25) overestimated their body size. Moreover, the three students with the highest BITE score (29, 29, 36) have high BIP scores (123, 122.5, 113). Pearson Correlation test indicated a weak positive correlation between BITE scores and BIP scores ($R=0.33$); students with higher BIP scores were more likely to score high in BITE test.

All females who scored for BN in BITE, desired to be thinner (BID < 100). The three students with the highest BITE scores (29, 29, 36) also achieved high scores for BID (70, 92.5 and 81.5), indicating a strong desire to be thinner. Person Correlation test showed a weak positive correlation ($R=0.3$); with students tending to score higher in BITE test when their desire to be thinner was high.

Correlation between BIP and BID.

Scores for BIP and BID were ranked and plotted on a graph. Although no statistically significant association was observed using chi² test ($p > 0.5$), the graph suggests a positive association between the two scores (figure 1). Person correlation test confirmed a positive correlation between BID and BIP ($R=0.59$).

Figure 1. Correlation between BIP and objective BID.



Discussion

This study appears to be one of the first to measure the BID among food related degree students. There are studies regarding ED among nutrition and dietetics students, but measurement of BIP or (dis)satisfaction among these students could not be found.

This study has shown a high prevalence of BID among students studying food related degree courses. Most (90%) were dissatisfied with their body size and 83% desired to be thinner than they actually were. These findings show a greater level of BID than findings of Cash and Pruzinsky (2004), where 40-70% of adolescent girls were dissatisfied. Not surprisingly, there was a positive correlation between overestimating body size and desiring to be thinner ($R=0.59$). This reflects the findings of

Vandereycken (1998), where a correlation between the degree of overestimation and degree of body dissatisfaction was found using a video distortion method. However, Vandereycken (1998) also found a correlation between BMI and BIP, where people with a higher BMI tended to overestimate their body size to a higher extent than those with lower BMI. In this study no link between body image and BMI was found.

The results were obtained despite a low mean BMI (21.8 kg/m^2) with 73% of students classified as 'healthy BMI' (WHO 2000). A further 15% were classified as underweight ($\text{BMI} < 18.5 \text{ kg/m}^2$) and these students were also dissatisfied with their body size, scoring < 100 for BID. The BID scores obtained show that some individuals desired to be slimmer by up to 25% (score = 75), meaning they wished to be 3/4 of their actual size. Only two students (7%) desired to be bigger and even then, it was only by tiny amounts (0.5 and 1.0%). A high prevalence of BID despite a low BMI would suggest that some students may suffer from an ED as dissatisfaction with BI, even when underweight or of normal weight, which is characteristic of an ED (Manley *et al.*, 1988; Franzen *et al.*, 1988; Benninghoven *et al.*, 2007; Salves *et al.*, 2009). Over half of the food students (60%) perceived themselves to be bigger than they actually were (by up to 23%). This contradicts the findings of some studies, such as Probst *et al.* (1992), who found that women preoccupied with food have a better awareness of their body size. However, this high prevalence of overestimation can in some way explain why despite a low BMI many students wished to be thinner.

The scores from BITE range from 0 to 36 with a mean score of 10.5. Disordered eating was found among 30% of students and a further 10% scored for BN (score > 25). This reflects the findings of other studies where people who are studying food are at higher risk of suffering from an ED (Reinstein *et al.*, 1992; Worobey and Schoenfeld, 1999). A positive correlation between BITE scores and BIP scores was observed, indicating that people most dissatisfied with their body size are more likely to suffer from ED. However, the Pearson's correlation was not very strong ($R=0.33$), possibly due to small sample size. Alternatively, the results may also suggest that the desire to be slimmer is not limited to patients with ED, and that BID is common among all women (Benninghoven *et*

al., 2006; Vandereycken, 1990). Although the majority of women are dissatisfied with their body size (Cash & Pruzinsky, 2004) only about 10% of the population develops ED symptoms, indicating that BID is not the only risk factor for ED pathology (Stein & Corte, 2003).

In the general population about 2-5% of people meet the criteria for ED (Saules *et al.*, 2008). These findings suggest that nutrition students have a far greater prevalence of ED than the general population. However, the sample size may be considered too small to be extended to the population of nutrition students as a whole. Despite this, support systems should be developed at university facilities (Reinstein *et al.*, 1992). Furthermore, Houston *et al.* (2008) have warned about the high incidence of ED among dietitians and nutritionists and raise the question of how this personal experience with ED may influence relationships with clients.

Limitations of the study

The sample size was small, although more than one hundred students on food related degree courses were invited to take part, only 30 agreed and are therefore not representative of the whole population. Results may also be influenced by 'healthy volunteer effect' (HVE), where those who volunteer tend to be healthier than the general population and have less problems than non-volunteers, thereby introducing bias to the study (Froom *et al.*, 1999). It could be assumed that those with no concerns about weight and body size would be those who easily agreed to participate in the study. Alternatively, it could also be argued that students with more of an interest in the subject area, that is disordered eating or body image dissatisfaction, may be more willing to take part.

There is a limitation regarding the software 'Anamorphic Micro. The distortion of the whole body does not allow for manipulation of separate body parts. This could cause difficulties in assessing BID and BIP among those females who were unhappy with just one particular body part. However, patients with ED tend to be generally dissatisfied with the whole shape of their bodies (Grogan, 2008).

Some studies show that body size estimation may be affected by factors such as: repeated testing, state of hunger, lighting in the room, the type of clothing worn by the subject (Cash, Pruzinsky, 2004), certain points in menstrual cycle (Farrell *et al.*, 2005) and mood (Taylor & Cooper, 1992). None of these factors were controlled in this present study.

The BITE questionnaire, despite being a validated test, has some limitations. BITE was designed to identify binge eating (Freeman & Henderson, 1987), which is characteristic of those with BN. Although the tendency to overestimate body size tends to be more common among BN (Fernandez-Aranda *et al.*, 1999; Tovee *et al.*, 2003), BID is also common in those with AN, so a test measuring both ED would be more appropriate. If a test measuring for both BN and AN was used, those students with high BID scores but lower BITE scores, may score higher for AN.

Conclusion

Students studying food related degree courses, such as nutrition and home economics, despite their increased knowledge about the importance of a balanced diet, have high prevalence of BID and may be at increased risk of developing ED.

REFERENCES:

Ackard DM, Croll J. & Kearney-Cooke AM. (2002). "Dieting frequency among college women: Associations with disordered eating, body image, and related psychological variables while controlling for body mass index". *Journal for Psychosomatic Research*, 52, 129-136.

Akdevelioglu Y. and Gumus H. (2010). "Eating Disorders and Body Image Perception among University Students". *Pakistan Journal of Nutrition* 9 (12), 1187-1191.

Benninghoven D., Raykowski L., Solzbacher, Kunzendorf S., Jantschek G. (2007). "Body images of patients with anorexia nervosa, bulimia nervosa and female control

subjects: A comparison with male ideals of female attractiveness". *Body Image* 4, 51-59.

Cash T., Pruzinsky T. (2004). *Body Image. A handbook of theory, research and clinical practice*. The Guilford Press, London & New York.

Farrell C. M. L., Shafran R. (2005). "Assessment of body size estimation: A review". *European Eating Disorders Review*, 13, 75-88.

Fernandez-Aranda F., Dahme B., Meermann R. (1999). "Body image in eating disorders and analysis of its relevance: A preliminary study". *Journal of Psychosomatic Research*, Volume 47, Issue 5.

Franzen U., Florin I., Schneider S., Meier M. (1988). "Distorted Body image in Bulimic Women". *Journal of Psychosomatic research*, Volume 32, pp. 445-450.

Fredenberg J.P., Berglund P.T., Dieken H.A. (1996). "Incidence of eating disorders among selected female university students". *Journal of the American Dietetic Association*; 96:64-65.

Froom P., Melamed S., Kristal-Boneh E., Benbassat J., Ribak J. (1999). "Healthy Volunteering Effect in Industrial Workers". *Journal of Clinical Epidemiology*, Vol. 52, No. 8, pp. 731–735.

Gilbert S. (1989). *The Psychology of Dieting*. Routledge, London & New York.

Grabe S., Ward M., Shibley Hyde J. (2007). "The Role of the Media in Body Image Concerns Among Women: A Meta-Analysis of Experimental and Correlation Studies". [*Psychological Bulletin*, Volume 134, Issue 3](#), pp. 460-476.

Grogan S. (2008). *Body Image. Understanding Body dissatisfaction in Men, Women, and Children*. 2nd edition, Routledge, London & New York.

Henderson M., Freeman C.P.L. (1987). "A Self-rating Scale for Bulimia. The 'BITE'". *British Journal of Psychiatry*, Volume 150, pp. 18-24.

Houston Ch., Bassler E., Anderson J. (2008). "Eating disorders among Dietetics Students: An Educator's Dilemma". *Journal of the American Dietetic Association*. Volume 108, Number 4.

Hughes ., Desbrow B. (2005). "Aspiring dietitians study: A pre-enrolment study of students motivations, awareness and expectations relating to careers in nutrition and dietetics". *Nutrition & Dietetics*, [Volume 62, Issue 2-3](#), pages 106–109.

Korinth A., Schiess S., Westenhoefer J. (2009). "Eating behavior and eating disorders in students of nutrition sciences". *Public Health Nutrition*, Nutrition Society. Pp. 1-6.

Latzer Y. and Tzischinsky O. (2005). "Eating attitudes in a diverse sample of Israeli adolescent females: a comparison study". *Journal of Adolescence* 28, 317–323.

Manley R., Tonkin R., Hammond C. (1988). "A Method for the Assessment of Body Image Disturbance in Patients with Eating Disorders". *Journal of adolescent Health Care*, Volume 9, Number 5, pp. 384-388.

Probst M. Van Coppenolle H. Vandereycken W. Gorist M. (1995). "Body size estimation in eating disorder patients. Testing the video distortion method on a life-size screen". *Behaviour Research and Therapy*. Volume 33, No.8, pp. 985-990.

Probst M., Van Coppenolle H., Vandereycken W., Gorist M. (1992). "Body image assessment in Anorexia Nervosa Patients and university students by means of video distortion: A reliability study". *Journal of Psychosomatic Research*, Volume 36, No.1. pp. 89-97.

Saules K., Collings A., Hoodin F., Angelella N., Alschuler K., Ivezaj V., Saunders-Scott D., Wiedemann A.A (2009). "The contribution of weight problem perception, BMI, gender, mood, and smoking status to binge eating among college students". *Eating Behaviors*. 10 (1),1-9.

Simplex Information Solutions (www.symlexsoftware.com) (accessed 22/11/2009)

Skrzypek S., Wehmeier P., Remschmidt H. (2001). "Body image assessment using body size estimation in recent studies on anorexia nervosa". A brief review. *European Child & Adolescent Psychiatry* 10:215-221.

Stein K.F, Corte C, (2003). "Reconceptualizing causative factors and intervention strategies in the eating disorders: a shift from body image to self-concept impairments". *Archives of Psychiatric Nursing*, Vol. XVII, pp. 57-66.

Taylor M., Cooper P. (1992). "An experimental study of the effect of mood on body size perception". *Behaviour Research Theory*, Volume 30, No.1, pp 53-48.

Thorsteinsdottir G. and Ulfarsdottir L. (2008). "Eating Disorders in College Students in Iceland". *The European Journal of Psychiatry*, Volume.22, No.2.

Tovee M.J., Benson P.J., Emery J.L., Mason S.M. and Cohen-Tovee E.M. (2003). "Measurement of body size and shape perception in eating-disordered and control observers using body-shape software". *British Journal of Psychology*, 94, 501–516.

Vandereycken, W. (1990). "The relevance of body-image disturbances for the treatment of bulimia". In M. M. Fichter (Ed.), *Bulimia nervosa. Basic research, diagnosis and treatment*,. Chichester & New York: Wiley.

Vandereycken,W., Probst,M., Coppenolle,H.V.,& Peters,G.(1998). "Body size estimation in anorexia nervosa patients: The significance of overestimation". *Journal of Psychosomatic Research*, 44, pp.451–456.

WHO (www.who.org) (accessed 12/02/2010)

Worobey J. and Schoenfeld D. (1999). "Eating disordered behavior in dietetics students and students in other majors". *Journal of the American Dietetic Association*, Volume 99, Number 9.