Body Image Perception and the Risk of Unhealthy Behaviours among University Students

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ASTRACT

Background: *In this study, we sought to determine whether dissatisfaction with one's body was associated with unhealthy behaviours among University students.*

Subjects and Methods: *A cross-section of 383 male and female students recruited from the general University population completed a questionnaire consisting of socio-demographic items, Eating Attitudes Test (EATS-26), Body Shape Questionnaire (BSQ-16), Body Silhouette Chart, Rosenberg Self-Esteem Scale (RSE) and the Centre for Epidemiologic Studies depression scale (CES-D).*

Results: *Overall, 4.2% of participants reported to have been diagnosed with an eating problem. Females had significantly higher EATS-26, BSQ-16 and RSE scores than males. They were significantly more likely than males to choose silhouettes that were underweight to represent their current or desired body sizes and to engage in dieting behaviours. Additionally, persons who reported being diagnosed with an eating disorder were significantly more likely than those not diagnosed to report binging, bulimic and other eating-related behaviours (*$p < 0.01$*).*

For both males and females, perceived body image was significantly and positively associated with BSQ-16, EATS-26, and CES-D and inversely associated with RSE scores. Females of African-descent were significantly more likely than those of East Indian descent and other ethnic groups to report higher weights and to select larger silhouettes to represent their current body figure.

Conclusions: *Among participants, body dissatisfaction was associated with increased risk for depression, lower self-esteem, disordered eating and other weight related behaviours.*

La Percepción de la Imagen Corporal y el Riesgo de Conductas Malsanas entre los Estudiantes Universitarios

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RESUMEN

Antecedentes: *En este estudio, buscamos determinar si la insatisfacción con el propio cuerpo se hallaba asociada con conductas malsanas entre los estudiantes universitarios.*

Sujetos y Métodos: *Una sección transversal de 383 estudiantes – hembras y varones – reclutados de la población universitaria general, respondieron un cuestionario sobre información socio-demográfica, el Test de Actitudes hacia la Comida (EATS-26), el Cuestionario sobre la Forma Corporal (BSQ-16), la Gráfica de Silueta Corporal, la Escala de Autoestima de Rosenberg (RSE), y la Escala de Depresión del Centro de Estudios Epidemiológicos (CES-D).*

Resultados: *En general, 4.2% de los participantes reportó que se le habían diagnosticado algún problema de hábito de ingestión. Las mujeres tenían puntuaciones de EATS-26, BSQ-16 y RSE significativamente más altas que los hombres. Asimismo presentaban una tendencia significativamente mayor que los hombres, a escoger figuras corporales de bajo peso, a la hora de representar las dimensiones corporales que tenían o deseaban, o establecer comportamientos dietéticos. Además, las personas que reportaron haber sido diagnosticadas con algún trastorno alimentario, presentaron una tendencia significativamente mayor que las no diagnosticadas de ese modo, a reportar hiperfagia, bulimia y otros*

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comportamientos relacionados con la ingestión ($p < 0.01$). Tanto para los hombres como para las mujeres, la percepción de la imagen corporal estuvo significativamente y positivamente asociada con las puntuaciones de BSQ-16, EATS-26, y CES–D e inversamente asociada con las puntuaciones del RSE. Las mujeres de ascendencia africana presentaron una tendencia significativamente más alta que las de ascendencia indoriental y otras razas, a reportar pesos más altos y a elegir siluetas más grandes a la hora de presentar su figura corporal actual.

Conclusiones: *Entre los participantes, la insatisfacción corporal estuvo asociada con el aumento del riesgo de depresión, baja autoestima, trastornos alimentarios y otras conductas relaciones con el peso.*

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INTRODUCTION

Dissatisfaction with one's body image is increasingly being recognized as a risk factor for unhealthy behaviours (1, 2). In fact, a negative body image perception is associated with disordered eating behaviours, low self-esteem and suicide tendencies (3–7). Body image misperception can occur when an individual's perception of himself or herself deviates too greatly from the ideal (8). Regarded as a phenomenon confined to females in Westernized countries, altered body image perception is increasingly being recognized as an important public health issue in several developing countries (9–11). It is reinforced by culture, friends and family and the domination of global media concepts of the ideal body image. Other important risk factors for misperception of body image include gender, personality, race/ethnicity, socio-economic status and age (12–15). The close proximity of the Caribbean to the United States of America and Western Europe and the increased exchange of goods and services provide an opportunity for exchange and adoption of culture including issues related to perception of body image. Notwithstanding, very few studies have examined body image perception and antecedent behaviours within the Caribbean (16–20). The transition from high school to University life with its increased demand for independence provides a vulnerable environment for the development of altered body image perception, disordered eating behaviours and related unhealthy behaviours (21–23). We therefore sought to determine the behavioural correlates of body dissatisfaction among students at the University of the West Indies, St Augustine campus, Trinidad and Tobago.

SUBJECTS AND METHODS

Study Population

The University of the West Indies is one of the two regional University systems globally (the other being the University of the South Pacific). With three campuses located in Jamaica (Mona campus), Trinidad and Tobago (St Augustine campus) and Barbados (Cave Hill campus), it caters primarily to the training needs of persons located in 13 island territories within the Caribbean. Currently, some 35 000 persons are enrolled in programmes offered at the University of the West Indies. At the time of the study, an estimated 7485 persons were enrolled for undergraduate degrees at the St Augustine campus with the following distribution by faculty – Social Sciences (31%), Science and Agriculture (19%), Humanities and Education (14%), Engineering (18%), Medical Sciences (10%) and Law (1%) (24). The target population for this study was students 18–35 years old which represented the group at increased risk for the effects of body dissatisfaction (25).

Sample size, Study Sampling procedure

We assumed that females would be twice as likely as their male counterparts to be dissatisfied with their current figure and report disordered behaviours linked to their body image. To realise this effect at a significance level of 5% with 90% power, a minimum of 182 participants was estimated in each group. This study was cross-sectional in nature and it was conducted over the period January 2005 to June 2005. Places where students congregate were identified. These areas were visited at random times each week and persons within the designated area were invited to participate in the investigation. This procedure was continued until the target for participation was recruited and enrolled.

Participants were informed of the purpose of the study upon recruitment. Written and verbal consent was obtained prior to enrolment in the study. Participation in the study was voluntary. Participants completed a self-administered questionnaire consisting of socio-demographic items and four standardized questionnaires namely the Eating Attitudes Test (EATS-26), the Body Shape Questionnaire (BSQ-16), the Rosenberg Self-Esteem Scale and The Center for Epidemiologic studies depression scale (CES-D). An investigator was on site to clarify issues relevant to the questionnaire. The EATS-26 consists of 26 items that measure a broad range of symptoms characteristic of abnormal attitudes towards food and eating. The test is scored using a Likert scale with a choice of six answers ranging from *`always'* to *`never'* for each of the 26 items. Possible scores on the EATS range from 0 to 78; scores ≥ 20 are generally considered indicative of increased risk for disordered eating behaviour (26, 27). This cut-off was used to categorize participants into two groups namely: low risk for eating disorder (EATS-26 score < 20) and increased risk for eating disorder (EATS-26 score ≥ 20). The BSQ-16 is a 16-item self-report measure designed to assess negative feelings about one's body size and shape by evaluating the fear of putting on weight, feelings of low self-esteem because of one's appearance, the desire to lose

weight and body dissatisfaction. This instrument utilizes a six-point Likert scale with possible scores ranging from 16 to 96. A score of ≥ 20 reflects body image concerns. The BSQ-16 has been shown to have good concurrent and discriminant validity (28, 29). Participants were divided into two groups based on their BSQ-16 scores as follows. Those with a BSQ-16 score < 20 were considered to have low levels of concern for their body image while those with BSQ-16 score ≥ 20 were considered to have higher levels of dissatisfaction with their bodies.

Body image perception was assessed using a discriminant body silhouette chart consisting of seven silhouettes ranging in morphology from severely underweight to severely obese. Participants were asked to select the silhouette that they believed was most similar to their current figure. Such scales are simple to use and have shown high degrees of reliability, as well as good correlation with objectively measured body mass (30–31). The results were categorized into three weight groups, namely underweight, normal weight and overweight. Similarly, participants were required to select the silhouette representing the figure they most desired. The discrepancy between the figures representing their current shapes and desired shapes represents the degree of altered body image perception. Persons desirous of a body shape that was different from their current perceived body image were classified as having a negative body image.

The Rosenberg Self-Esteem Scale (RSE) was used to assess self-esteem. This scale consists of ten items each answerable on a four point Likert scale ranging from *'strongly agree' to 'strongly disagree'* with higher total scores representing greater self-esteem (32–33). Finally, the risk of depression was assessed with the Centre for Epidemiologic Studies depression scale (CES-D). This is a 20-item self-report scale designed to assess symptoms of depression in the general population. Items refer to the frequency of symptoms during the week prior to participating in the study. These were scored on a four-point scale from *'rarely' to 'always'*. Total scores for the CES-D can range from 0 – 60. Scores of ≥ 16 are commonly viewed to be indicative of increased risk of depression (34–35). Subjects reported both height and weight in inches and pounds respectively. Body mass index (BMI) was calculated by dividing reported weight in kilograms by reported height squared in meters. In addition, participants were asked whether they had ever been diagnosed with an eating disorder, as well as, issues related to bulimic behaviours (*ie* binge eating and self-induced vomiting after eating). Finally, participants were requested to state their ethnic background. To determine the reliability of the instrument, ninety students were administered the questionnaire on two occasions eight weeks apart. Following the completion of the questionnaire, participants had weight and height measured to the nearest 0.1 kg and 0.1 cm respectively using standard procedures (36).

Statistical analysis

All analyses were performed by SPSS 11.0 for Windows prior to analyses. Body mass index, weight, height, age and all summary scores (*ie* EATS-26, BSQ-16, CES-D and RSE) were checked for deviations from normality. These checks revealed that scores for EATS-26 and BSQ-16 were skewed to the right. Where variables were normally distributed, parametric tests (e.g. t-test, analysis of variance (ANOVA) were used to analyse the data depending on the number of categories for each variable. Non-normal data were analysed by non-parametric tests (*eg* Whitney U test, Kruskal-Wallis one-way analysis of variance and Median tests). Chi-square tests were used to assess independent associations where data were categorized. Pearson product moment correlation was used to determine associations among EATS-26, BSQ-16, and RSE and CES-D with body image perception. To determine test-retest reliabilities, correlation analyses were conducted for each psychometric test score and anthropometry using the overall scores from each occasion of testing.

RESULTS

Reliability of instrument

Table 1 shows test-retest reliability correlation coefficients for standard psychometric test by gender. Overall, test-retest reliabilities correlation coefficients ranged from 0.76–0.96 in females and 0.53–0.97 in males. Test-retest correlation coefficients were significantly higher for CES-D and RSE among females as compared to males. Among participants, BMI based on actual weights and heights were significantly correlated with the BMI of silhouettes chosen to represent current figure ($r = 0.98$; $p < 0.001$). Notwithstanding, results of the paired *t*-test analyses showed that actual BMI was significantly higher than perceived BMI among females (24.6 ± 4.8 v. 20.6 ± 4.1; $p < 0.001$) but not among males (24.6 ± 4.6 v. 24.2 ± 4.2; $p = 0.7$)

Table 1: Comparison of test-retest reliability correlation coefficients for standard psychometric test by gender

Variable	Females n = 46	Males n = 44	*p*-value
Eating attitude test (EATS-26)	0.76	0.72	ns
Center for Epidemiologic Studies depression scale (CES-D)	0.81	0.53	< 0.05
Rosenberg Self-Esteem Scale	0.94	0.71	< 0.05
Body Shape Questionnaire (BSQ16)	0.96	0.97	ns
Body Mass Index	0.98	0.98	ns

ns = not significant

Characteristics of participants

Three hundred and eighty-three persons (184 females and 199 males) 18 to 35 years old participated in the study.

Overall, 42.5% of participants reported being of East Indian descent, 34.3% of African descent, 13.3% of mixed African-East Indian descents and 10% from other ethnic groups. Table 2 shows the socio-demographic characteristics of participants. There were no significant differences in age, marital status, faculty of origin and attendance status between males and females. However, the majority of male participants (54.3%) perceived themselves to be of East Indian descent while the majority of females perceived themselves to be of African descent.

Table 2: Socio-demographic characteristics of participants

	Female n = 184	Male n = 199	*p*
Age (years)	21.3 (2.4)	21.1 (2.8)	0.69
Marital status (%)			
Single	94.6	95.5	
Married	5.4	3.5	
Divorced	0	1.0	0.27
Ethnic group (%)			
Indo-West Indian	28.3	54.3	
Afro-West Indian	42.9	21.6	
Mixed	28.8	19.1	< 0.01
Faculty (%)			
Medical sciences	10.9	10.6	
Engineering	15.2	19.6	
Science and Agriculture	25.5	17.1	
Humanities and Education	13.0	18.6	
Social sciences	35.3	34.2	0.19
Attendance status (%)			
Part-time	3.8	6.5	
Fulltime	96.2	93.5	0.27

Ethnicity body image perception and related behaviours

The results of univariate ANOVA showed that there were no significant differences in EATS-26 and BSQ-16 scores among the various ethnic groups. Among females, BMI calculated from reported weights and heights was significantly higher in persons of African descent compared to participants of East Indian descent and mixed African-East Indian descent ($p = 0.002$). Female participants of African descent had significantly higher RSE scores that those of East-Indian descent ($p = 0.006$). Females of mixed African-East Indian descent had significantly lower CES-D scores than those of East Indian descent ($p = 0.046$). Additionally, persons of mixed African-East Indian descent were significantly more likely than those of East Indian descent to select smaller silhouettes to represent their current figures ($p = 0.04$). On the other hand, females of East Indian descent were significantly more likely than those of mixed African-East Indian descent to choose as their desired figures, silhouettes that were different from those selected to represent their current figures ($p = 0.014$).

Gender body image perception and related behaviours

Table 3 shows body image perception and psychometric test results by gender. Females were significantly more likely than males to select a silhouette that was underweight to represent their current (Odds ratio (OR) = 2.8, 95% Confidence Intervals (CI): 1.7, 4.4; $p < 0.001$) and desired (OR = 7.9, 95% CI: 4.9, 12.7; $p < 0.001$) figures. Notwithstanding, there was no significant difference in the proportion of persons of either gender who desired figures that were different from their current figure ($p = 0.26$). Females had significantly higher mean BSQ-16 ($p < 0.001$), EATS-26 ($p < 0.001$) and RSE ($p = 0.04$) scores than males. They were also significantly more likely than males to engage in dieting (OR = 1.9, 95% CI: 1.2, 2.8; $p = 0.002$), consume low calorie food (OR = 7.9, 95% CI: 4.7, 13.3; $p < 0.001$), use laxatives (OR = 4.0, 95% CI: 1.5, 10.1; $p = 0.003$), be aware of the caloric content of foods (OR = 2.4, 95% CI: 1.3, 4.3; $p = 0.002$), be preoccupied with the desire to be thinner (OR = 3.7, 95% CI: 1.2, 11.6; $p = 0.014$), be terrified of being overweight (OR = 3.7, 95% CI: 1.9, 7.0; $p < 0.001$), and report weight cycling (OR = 2.3, 95% CI: 1.3, 3.9; $p = 0.003$). Females were significantly more likely than males to have EATS-26 scores ≥ 20 after controlling for previous diagnosis of disordered eating behaviours (OR = 2.6, 95% CI: 1.9, 1.1, 6.2; $p = 0.04$). Finally, males were significantly more likely than females to increase physical activity as a means of losing weight (OR = 10.2, 95% CI: 5.7, 18.2; $p < 0.001$).

Table 3: Body image perception by gender

Variable	Female n = 184 Mean (SD)	Male n = 199 Mean (SD)	*p*
Weight (kg)	64.8 (3.3)	69.8 (3.5)	< 0.01
Height (cm)	132.7 (30.5)	162.3 (34.0)	< 0.01
Rosenberg self-esteem scale	21.6 (3.6)	20.7 (3.4)	0.014
Body Satisfaction Questionnaire (BSQ-16)	38.7 (17.8)	27.8 (12.8)	< 0.01
CES-Depression score	16.4 (10.1)	15.9 (9.9)	0.63
Eating Attitude test (EATS-26)	8.3 (8.7)	5.6 (8.6)	< 0.01
Perceived current weight (%)			
Underweight	48.4	27.8	
Normal weight	32.6	51.5	
Overweight	19.6	20.7	< 0.01
Desired weight (%)			
Underweight	66.9	19.6	
Normal weight	29.8	68.8	
Overweight	3.3	11.6	< 0.01
Body image perception (%)			
Lower weight	45.3	27.6	
No change	43.1	48.2	
Higher weight	11.6	24.1	< 0.01

Overall, 4.2% of participants (3.3% of females and 5%, of males) reported being diagnosed with disordered eating behaviours. Females who reported being diagnosed with disordered eating behaviours were more likely to have EATS-26 scores ≥ 20 (OR = 11.7, 95% CI: 2.2, 63.5; $p = 0.004$), be preoccupied with the desire to be thinner (OR = 16.8, 95% CI: 3.0, 94.1, 18.2 ; $p = 0.001$), use diet pills (OR = 8.5, 95% 1.5, 46.2; $p = 0.014$) , engage in binge eating (OR = 8.2, 95% 1.4, 46.4; $p = 0.02$ and report weight cycling (OR = 7.3, 95% CI: 1.3, 41.8; $p = 0.02$) than those not diagnosed with disordered eating behaviours. Similarly, males who reported being diagnosed with disordered eating behaviours were more likely to have EATS-26 scores ≥ 20 (OR = 13.1, 95% CI: 2.7, 63.3; $p = 0.0014$), use laxatives (OR = 9.2, 95% 1.5, 54.9; $p = 0.02$) , engage in binge eating (OR = 15.5, 95% 2.3, 106.1; $p = 0.002$ and engage in bulimic (OR = 23.4, 95% 2.9, 187.8; $p = 0.003$ and dieting behaviours (OR = 5.8, 95% 1.2, 28.2; $p = 0.003$) than those not diagnosed with disordered eating behaviours. In addition, they were also more likely to report being stressed out by deadlines (OR = 4.3, 95% 1.1, 15.8; $p = 0.046$) and finances (OR = 7.0, 95% 1.4, 33.7; $p = 0.02$) than those not diagnosed with disordered eating behaviours.

Body image perception and psychometric scores

Table 4 shows psychometric test scores and eating behaviours by body image perception and gender groups. Females who desired figures that were smaller than their current perceived figure (thinner figure) had significantly higher mean BSQ-16 and EATS-26 scores than those who desired figures that were identical (same figure) or larger (larger figure) than their current figures ($p < 0.01$). There were no significant differences in mean BSQ-16 and EATS-26 scores between persons in the same and larger figure groups. In addition, females in the thinner body image group had significantly higher mean CES-D scores than those in the same body image group. Among males, there was linear reduction in mean BSQ-16 from the lower to the uppermost body image group ($p < 0.01$). However, there were no significant differences in RSE, EATS-26 and CES-D scores among these body figure groups. Females in the thinner figure group were significantly more likely than those in the same figure group to be engaged in binge eating.

Table 5 shows Pearson Correlation Coefficient for body image perception and psychometric test score by gender. The BSQ-16 was significantly positively associated with EATS-26 and CES-D current body image. The RSE was significantly inversely associated BSQ-16, EATS-26, and CES-D. These findings remained significant after controlling for the effects of age and ethnicity. In addition, RSE was significantly inversely associated with current perceived body image in females and positively associated with current perceived body image in males. In addition, desired body image was inversely associated with RSE scores in males only.

DISCUSSION

We found several gender differences in dissatisfaction with body size and unhealthy behaviours. Females were more likely than males to be dissatisfied with their current figures. They were also at increased risk for disordered eating

Table 4: Psychometric test scores and weight-related behaviours by body image perception and gender (mean (SD).

Variable	Body image perception			
	Thinner figure	Same figure	Larger figure	*p*
Females				
n	**82**	**78**	**21**	
Rosenberg self esteem scale	21.0 (3.6)	22.2 (3.4)	20.0 (4.2)	0.06
Body Satisfaction Questionnaire (BSQ-16)	50.3 (18.0)	27.0 (8.8)	24.3 (5.0)	< 0.01
CES-Depression score	19.4 (10.1)	13.9 (9.3)	14.2 (10.7)	< 0.01
Eating Attitude test (EATS-26)	11.4 (11.1)	5.5 (5.2)	6.3 (4.2)	< 0.01
Pre-occupied with the desire to be thinner (%)	14.6	1.2	0	< 0.01
Engaged in dieting behaviours (%)	11.1	1.2	0	0.014
Engaged in binge eating (%)	32.9	6.4	23.8	< 0.01
Tried to lose weight (%)	86.6	44.9	4.7	< 0.01
Males				
n	**55**	**96**	**48**	
Rosenberg self esteem scale (RSE)	20.1 (3.3)	21.1 (3.5)	20.8 (3.5)	0.31
Body Satisfaction Questionnaire (BSQ-16)	35.4 (15.7)	26.7 (11.2)	21.3 (5.6)	< 0.01
CES-Depression score (CES-D)	16.7 (9.8)	15.5 (9.7)	15.5 (9.7)	0.62
Eating Attitude test (EATS-26)	6.8 (11.3)	5.4 (8.6)	4.7 (4.3)	0.55
Pre-occupied with the desire to be thinner (%)	1.8	0	0	0.27
Engaged in dieting behaviours (%)				
Engaged in binge eating (%)	7.3	5.2	0	0.19
Tried to lose weight (%)	74.6	40.6	10.6	< 0.01
	74.6	40.6	10.4	< 0.01

Table 5: Partial correlation coefficients of body image perception and psychometric scores

		RSE	BSQ-16	EATS-26	CES-D	Current Body Image	Desired Body Image
RSE	**F**		-0.35**	-0.27**	-0.58**	-0.15*	-0.03
	M		-0.41**	-0.25**	-0.44**	-0.19**	0.18**
BSQ-16	**F**	-0.35**		0.63**	0.46**	0.56**	0.04
	M	-0.41**		0.55**	0.42**	0.52**	0.09
EATS-26	**F**	-0.27**	0.63**		0.45**	0.34**	0.004
	M	-0.25**	0.55**		0.31**	0.07	0.013
CES-D	**F**	-0.59**	0.46**	0.45**		0.24**	-0.05
	M	-0.44**	0.42**	0.31**		0.19**	0.17*
Current Body Image	**F**	-0.15*	0.56**	0.34**	0.23**		0.46**
	M	0.19**	0.42**	0.07	0.19**		0.52**
Desired Body Image	**F**	-0.03	0.04	0.004	-0.05	0.46**	
	M	-0.18**	0.09	0.013	0.17*	0.52**	

* $p < 0.05$
** $p < 0.01$

behaviours such as dieting, using laxatives, preoccupation with the desire to be thinner and weight cycling. These findings have been demonstrated in a number of studies and suggest that the gender differences in these behaviours may be cross-cultural (8, 37). Furthermore, the fact that body dissatisfaction was associated with lower self-esteem and increased risk of depression suggests that dissatisfaction with current figure might be a useful proxy for a wide range of unhealthy behaviours in this group (38–40). Approximately half of the participants had scores that are associated with an increased risk of depression during the study. This suggests the need for more student support services to address many of the stresses associated with university life.

The overall prevalence of 4.2% of participants being diagnosed with disordered eating behaviours is similar to the prevalence of anorexia and bulimia seen in more developed countries. While we were not able to identify the particular type of eating disorder diagnosed, core features of disordered eating behaviours such as body dissatisfaction, dieting and a desire to be thinner was quite common in this population. For example over a third of the participants have tried dieting and ten per cent of them have used diet pills. Thus, there might exist in this population many non-specified eating disorders. This might also be evident in the fact that there were no gender differences in the prevalence of diagnosed eating problems.

Although there was no significant differences in BSQ-16, CES-D and EATS scores among the various ethnic groups, participants of East Indian descent were more likely than those of African descent to desire a smaller figure. On the other hand, participants of African descent tended to report heavier weight than the other ethnic groups. These findings are consistent with those found in adolescents of various ethnic groups in the Caribbean (19, 20). They might suggest attitudes to body image that are rooted in the cultural experiences of the various ethnic groups.

This study has several limitations. The cross-sectional design of the study does not allow a temporal sequence between body dissatisfaction and unhealthy behaviours to be established. Also, although we were able to show good stability of the various components of the questionnaire, we did not validate the instrument using other measures of depression, self-esteem and body dissatisfaction. The findings therefore must be interpreted with caution and at best can only represent associations.

CONCLUSION

Among participants, body dissatisfaction was associated with increased risk for depression, lower self-esteem and other disordered eating and weight-related behaviours.

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