

Psychological and behavioural characteristics of females with anorexia nervosa in Singapore

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Abstract

Purpose This study aimed to compare a sample of females with anorexia nervosa in Singapore with international clinical and population samples from published data in terms of endorsement of risk factors related to anorexia nervosa, severity of eating pathology and levels of psychosocial impairment and to explore the nature of the relationships between the anorexia nervosa risk factors and adherence to Asian cultural values.

Method Data from the Eating Disorder Inventory-3 (EDI-3), the Eating Attitudes Test (EAT-26), the Perceived Sociocultural Pressure Scale (PSPS), the Ideal Body Stereotype Scale (IBSS), the Eating Disorder Examination Questionnaire (EDE-Q), the Clinical Impairment Assessment Questionnaire, and the Asian American Values Scale—Multidimensional (AAVS-M) were collected from 41 female patients (13–31 years old) who presented for treatment of anorexia nervosa at the Singapore General Hospital.

Results The profile and presentation of anorexia nervosa in Singapore was comparable to that observed in the Western clinical samples in terms of levels of endorsement of the risk factors for anorexia nervosa. No protective benefit of orientation to Asian culture was found.

Conclusion The observed pattern of general similarity of presentation between Western data and Singaporean data, together with the finding that no protective benefit of orientation to Asian culture was observed, suggests that it may be appropriate to directly apply evidence-based Western

models of intervention to the treatment of anorexia nervosa in Singapore.

Keywords Anorexia nervosa · Culture · Risk factors · Singapore

Introduction

Anorexia nervosa, as described in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) includes: a restriction of energy intake relative to requirements leading to a significantly low body weight; an intense fear of gaining weight or becoming fat even though at a significantly low weight; and disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight [1]. While a firm aetiological framework for anorexia has not yet been confirmed, risk factors include perceived pressure to be thin, thin-ideal internalisation, body dissatisfaction, dieting, perfectionism, and drive for thinness.

Pressure to be thin can be exerted by various sources both external and internal. Sociocultural pressures include the showcase of gracile models and advertisements of diet products and slimming programmes in magazines and on television, criticisms about weight or shape, encouragement to diet, and role-modelling of eating habits within families, as well as overt approbation of skinny models or celebrities and comparison of appearance among peers, and teasing. In some studies college women who were exposed to thin media images have been shown to have significantly more negative perceptions of their bodies afterwards than compared to those who viewed images of either average or

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plus size models. College women who were exposed to thin-ideal images from popular magazines demonstrated increased body dissatisfaction, negative mood states, and eating disorder symptoms, plus lowered self-esteem [2]. Cahill and Mussap [3] showed that women experienced increase in state anger, anxiety, depression, and body dissatisfaction following exposure to images of thin-ideal bodies in the media. More recent studies though, including a meta-analysis [4] and longitudinal studies [5, 6] have not replicated the relationship between thin media images and body dissatisfaction. Evidence regarding thin-ideal images in the media continues to be mixed. A longitudinal study by Helfert and Warschburger [7] found that parental encouragement to control weight and shape was a strong predictor of weight concerns in boys and girls over time. Rodgers and Chabrol [8] noted that verbal messages from both father and mother, for example, “You need to lose weight”, contribute considerably to body concerns and eating behaviours in offspring. Yanez et al. [9] showed that daughters whose mothers had abnormal eating attitudes were almost three times more likely to possess abnormal eating attitudes as well. Dixon et al. [10] discovered that fathers who strongly valued physical attractiveness in females were significantly more likely to have daughters who engaged in vomiting as a form of weight control.

Peers are the third avenue through which sociocultural pressures to be thin can be conveyed. A meta-analytic study by Menzel et al. [11] reported associations between weight-based teasing and body dissatisfaction, restrictive eating, and bulimic symptoms, as well as between general appearance teasing and body dissatisfaction. Hutchinson et al. [12] noted that perceived peer influence, perceived weight-based teasing, and eating behaviours of the peer group contributed to the prediction of individual eating pathology. Meyer and Gast [13] showed that the greater the belief that being thin would increase likeability with peers the more likely it was for disordered eating to occur and that being teased more frequently about body shape or eating habits by peers was predictive of disordered eating symptoms.

Thin-ideal internalisation is conceptualised as the assimilation of societal standards of beauty and attractiveness into one’s belief system. High levels of internalisation of the thin ideal predicted, increased dieting [14] and heightened drive for thinness [15]. Drive for thinness is one of the core features of anorexia nervosa. Individuals who endorsed high levels of drive for thinness have displayed more severe psychopathology, including greater body dissatisfaction, dietary restraint, bulimia, and ineffectiveness, than those who did not endorse fat phobia [16]. Lee et al. [17] reported that the presence of a high drive for thinness predicted poorer outcome and greater chronicity of illness.

Culture and anorexia nervosa

Research has documented anorexia nervosa in Asian nations including China, Hong Kong, Japan and Singapore. Early findings in Asia documented patterns in eating disturbance that differed from Western-based symptom patterns. Lee et al. [18] recorded the subjective absence of an intense fear of fatness in the majority of a sample of Chinese patients studied in Hong Kong and Ong et al. [19] reported that in Singapore the presentation of anorexia nervosa was less severe as compared to Western populations. Subsequent studies indicated that anorexia nervosa in Asia is gradually becoming more similar to Western societies. Soh et al. [20] showed that general eating disorder psychopathology, dietary restraint, and concern about eating, were comparable between Singaporean Chinese and Australians of both Caucasian and East Asian descent. Addressing the earlier non-fat phobia finding, Lai [21] examined the clinical and psychosocial characteristics of Hong Kong Chinese adolescents diagnosed with anorexia nervosa and found that more than 80 % of the group reported fat phobia.

Mond et al. [22] examined eating disturbance of young women in Singapore and Australia and observed that although general levels of eating disorder psychopathology were comparable, Singaporean women reported a greater fear of losing control over their eating, and of gaining weight or becoming fat, as well as a greater anxiety toward regularly weighing themselves, relative to Australian women. Soh et al. [20] showed that within community samples, Singaporean Chinese women reported significantly greater levels of eating disorder psychopathology when compared to Australian women. A large population study found that the prevalence of young females at risk of developing eating disorders in Singapore was 7.4 %, and comparable to at risk prevalence rates in Western populations [23]. In that study risk was defined as having a score of 29 or higher on the 39 item Eating Attitude Test [24].

It has been argued that Eastern values, such as collectivism, are protective against eating disorders [25]. Soh et al. [20] found that greater Western acculturation was linked with greater overall eating disorder psychopathology. Yet other studies have shown the opposite trend. Tsai et al. [26] examined Taiwanese women who were living in either Taiwan or America. As expected, the Taiwanese-American participants scored lower on an ethnic identity scale. Contrary to expectations, the authors observed that the Taiwanese group had significantly greater body dissatisfaction and disordered eating attitudes and behaviours than the Taiwanese-American group. In line with this finding, Lake et al. [27] found that traditional Hong Kong-born women had greater dissatisfaction with body shape and more negative eating attitudes as compared to less

traditional Hong Kong-born women. It appears that the influences of culture on eating psychopathology are somewhat divergent and not well understood.

The present study

Singapore is a multicultural society strongly influenced by globalisation, where Western culture is widely embraced, especially by the younger generations. Only a small number of studies have examined anorexia nervosa in Singapore [19, 28, 29]. One purpose of the current study is to fill a gap in the literature by exploring the psychological and symptom profiles of a clinical population of female patients with anorexia nervosa in Singapore using empirically-established self-report instruments of eating psychopathology. A second intention is to explore the relationships between culture and risk factors for anorexia nervosa within a clinical population.

The specific objectives of this study were (1) to compare the current sample of females with anorexia nervosa in Singapore with various clinical and population samples with published data, in terms of endorsement of risk factors related to anorexia nervosa, severity of eating pathology, and levels of psychosocial impairment; (2) to investigate the relationships between risk factors identified in the research literature to be strongly related to anorexia nervosa, namely, drive for thinness, body dissatisfaction, perfectionism, dieting, perceived pressure to be thin, and thin-ideal internalisation, within a clinical population; (3) to investigate the associations between anorexia nervosa risk factors and eating disorder psychopathology, in general, and in particular, dietary restraint, eating concern, shape concern, and weight concern; (4) to observe associations between eating disorder psychopathology and psychosocial impairment; and (5) to explore relationships between the anorexia nervosa risk factors and adherence to Asian cultural values, including specifically collectivism, conformity to norms, emotional self-control, family recognition through achievement, and humility.

Methods

Participants

The participants consisted of 41 female patients who presented for treatment of anorexia nervosa at the Singapore General Hospital with an age range of 13.8–31.1 years ($M = 18.9$ years). The majority (28 cases or 68.3 %) were classified by their treating doctor according to DSM-IV-TR diagnostic criteria as having anorexia nervosa—restricting type, while the other 13 participants (31.7 %) were diagnosed as having anorexia nervosa—Binge-eating/purging

type. Body Mass Index (BMI) scores ranged from 10.44 to 20.83 kg/m² ($M = 16.20$ kg/m²). Participants were generally ethnic Chinese (84 %), single (93 %) and secondary school or tertiary students (85 %).

Measures

Eating Disorder Inventory-3

The Eating Disorder Inventory-3 (EDI-3) comprises 91 items that evaluate psychological constructs known to be clinically relevant to eating disorders. The items are organised into 12 subscales, of which three risk scales (drive for thinness, bulimia, and body dissatisfaction) assess attitudes and behaviours concerning eating, weight, and body shape. The remaining nine psychological scales (low self-esteem, personal alienation, interpersonal insecurity, interpersonal alienation, interoceptive deficits, emotional dysregulation, perfectionism, asceticism, and maturity fears) assess psychological traits that are associated with the development and maintenance of eating pathology. The drive for thinness, body dissatisfaction, and perfectionism subscales of the EDI-3 were used in the current study to evaluate levels of drive for thinness (an extreme desire to be thinner, concern with dieting, preoccupation with weight, and an intense fear of weight gain), body dissatisfaction (discontentment with body shape and parts), and perfectionism. For the current study, Cronbach's alphas were 0.83 for the Drive for Thinness subscale, 0.89 for the body dissatisfaction subscale, and 0.75 for the perfectionism subscale.

Eating Attitudes Test

The Eating Attitudes Test (EAT-26) is a widely used self-administered screening tool designed to detect symptoms of anorexia nervosa. The EAT-26 contains 26 items that load onto three subscales—dieting, bulimia and food preoccupation, and oral control. The 13-item dieting subscale of the EAT-26 was utilised in the present study to assess dieting attitudes and practices. In the present study, the Cronbach's alpha for the dieting subscale was 0.91.

Perceived Sociocultural Pressure Scale

The Perceived Sociocultural Pressure Scale (PSPS) assesses the pressure to be thin respondents feel from their family, friends, dating partners, and the media. The 10-item PSPS was used to establish the level of perceived pressure to be thin in the present sample. Cronbach's alpha for the PSPS in the present study was 0.58. This measure only taps into individuals' tendency to perceive external pressure,

whether or not such pressure exists and thus is a measure of individual differences, not external influence.

Ideal Body Stereotype Scale

The Ideal Body Stereotype Scale (IBSS) is a measure of the extent of internalisation of the thin-ideal body image. It includes six statements regarding the attractiveness of women with various body shapes. The IBSS was utilised in the present study to explore the degree to which the current sample has internalised the thin-ideal. Internal consistency coefficient for the IBSS in the current study was 0.76.

Eating Disorder Examination Questionnaire

The Eating Disorder Examination Questionnaire Version 6.0 (EDE-Q) is a 28-item self-report measure of the severity of eating disorder psychopathology over the preceding 28 days. It contains four subscales, including dietary restraint, eating concern, shape concern, and weight concern. The EDE-Q was used to ascertain the severity of anorexia nervosa symptomatology in the present sample. Internal consistency coefficients in the present study were 0.86 for the dietary restraint subscale, 0.84 for the eating concern subscale, 0.91 for the shape concern subscale, 0.84 for the weight concern subscale, and 0.95 for the global scale.

Clinical Impairment Assessment Questionnaire

The Clinical Impairment Assessment Questionnaire Version 3.0 (CIA) was developed to quantify the secondary impact of eating pathology on psychosocial impairment in three domains, personal, encompassing mood and self-perception, Social, concerning interpersonal relationships and participation in activities, and cognitive, regarding memory, concentration, decision-making ability, and work performance. Similar to the EDE-Q, it focuses on the 28-day time frame prior to assessment. The CIA was utilised in the current study to determine the extent of psychosocial impairment related to eating psychopathology in the present sample. In the current study, internal consistency coefficients were 0.93 for the Personal subscale, 0.89 for the Social subscale, 0.91 for the cognitive subscale, and 0.94 for the global scale.

Asian American Values Scale: multidimensional

The Asian American Values Scale—multidimensional (AAVS-M) assesses the level of adherence to a number of cultural values that are salient to Asian people. The measure consists of 42 items that load onto five value dimensions, namely, collectivism, conformity to norms,

emotional self-control, family recognition through achievement, and humility. The AAVS-M was utilised in the present study to appraise the degree of alignment to Asian cultural values in the current sample. For the present study, Cronbach's alphas were 0.84 for the collectivism subscale, 0.83 for the conformity to norms subscale, 0.82 for the emotional self-control subscale, 0.95 for the family recognition through achievement subscale, 0.72 for the humility subscale, and 0.91 for the overall scale.

Procedure

Ethics approval was obtained from the Human Research Ethics Committee of James Cook University and the Singapore General Hospital. Suitable patients were identified by their treating physician or psychologist based on their diagnosis of anorexia nervosa. After written informed consent was obtained participants completed the questionnaires. Details of participant weight and height, as documented by their physician on the day of the administration of questionnaires, were subsequently obtained from the relevant hospital case notes.

Results

Comparisons with samples available from separately published studies

Table 1 lists the mean scores and standard deviations of the EDI-3 and EAT-26 Subscales for the current sample and for the EDI-3 United States adolescent comparison norm group [24] and the EAT-26 Canadian comparison norm group [30]. Single-sample *t*-tests showed no significant differences in mean scores between the present sample and the Western groups for all subscales across both subtypes ($p > 0.05$). Published clinical data were not found for the risk factors of perceived pressure to be thin and thin-ideal internalisation, and thus no comparisons were made for these risk factors in the present study.

Mean scores and standard deviations of the EDE-Q global scale and its subscales for the present sample, and mean scores for a clinical group of female adolescents with anorexia nervosa as well as for samples of female university students in Singapore and in the United States are presented in Table 2. Significantly higher levels of eating concern [$t(37) = 2.49, p = 0.02$] and weight concern [$t(39) = 2.05, p = 0.05$] were indicated by patients in the present study when compared to patients with anorexia nervosa in the United States.

Table 3 shows the mean scores and standard deviations of the CIA global scale and its subscales for the present sample in addition to the mean scores for a United

Table 1 Comparison of the EDI-3 drive for thinness, body dissatisfaction, perfectionism, and the EAT-26 dieting subscale means with means from western samples of patients with anorexia nervosa according to subtype

EDI-3/EAT-26 subscales	Anorexia nervosa subtype			
	Restricting type		Binge-eating/purging type	
	Present sample Mean (SD)	Western samples Mean	Present sample Mean (SD)	Western samples Mean
Drive for thinness ^a	17.0 (6.7)	17.7	16.9 (7.2)	18.0
Body dissatisfaction ^a	24.9 (9.8)	24.1	20.3 (8.6)	25.5
Perfectionism ^a	12.9 (4.8)	12.5	15.1 (6.2)	12.5
Dieting ^b	17.0 (10.3)	18.8	15.9 (10.6)	20.8

^a EDI-3 subscale means are compared with female adolescent patients with anorexia nervosa in the United States ($n = 124$) [24]

^b EAT-26 subscale means are compared with female patients with anorexia nervosa in Canada ($n = 160$) [30]

Table 2 Comparison of the EDE-Q means with means from a clinical sample of patients with anorexia nervosa and population samples of young adult women

EDE-Q scale/subscale	Present sample Mean (SD)	United States clinical sample ^a Mean	Singapore population sample ^b Mean	United States population sample ^c Mean
Global	3.17 (1.48)	–	1.57***	1.74***
Dietary restraint	2.83 (1.90)	3.08	0.96***	1.62***
Eating concern	2.84 (1.50)	2.23*	1.06***	1.11***
Shape concern	3.80 (1.56)	3.40	2.31***	2.27***
Weight concern	3.10 (1.57)	2.59*	1.96***	1.97***

* $p < 0.05$, *** $p < 0.001$

^a Female adolescent patients with anorexia nervosa in the United States ($n = 28$) [31]

^b Female University students in Singapore ($n = 164$) [22]

^c Female University students in the United States ($n = 723$) [38]

Table 3 Comparison of the CIA means with means from a clinical sample of patients with eating disorders and a population sample of young adult women

CIA scale/subscale	Present sample Mean (SD)	United Kingdom clinical sample ^a Mean	Norwegian population sample ^b Mean
Global	29.3 (12.7)	20.1***	6.4***
Personal	12.6 (5.1)	10.2**	4.1***
Social	8.8 (4.5)	5.4***	1.1***
Cognitive	7.5 (4.6)	4.5***	1.2***

** $p < 0.01$, *** $p < 0.001$

^a Patients with eating disorders in the United Kingdom ($n = 123$) [37]

^b Female University students in Norway ($n = 438$) [40]

Kingdom clinical sample and a Norwegian population sample. Patients in the present study had significantly higher levels than the United Kingdom Clinical Sample on all measures (global psychosocial impairment, $t(40) = 4.64$, $p < 0.001$, personal $t(40) = 3.08$, $p = 0.004$, social $t(40) = 4.92$, $p < 0.001$, and cognitive $t(39) = 4.15$, $p < 0.001$).

Relationships within risk factors for anorexia nervosa

Relationships within the risk factors drive for thinness, body dissatisfaction, perfectionism (as measured on the EDI-3), dieting (as measured on the EAT-26), perceived pressure to be thin (as measured with the PSPS), and thin-

ideal internalisation (as measured by the IBSS), were investigated using Pearson product-moment correlations. Preliminary analyses were conducted to ascertain adherence to assumptions of normality, linearity, and homoscedasticity. Significant medium to large correlations between the constructs were observed and are presented in Table 4. Given the high obtained correlations, Bonferroni corrections have not been used for the reported correlational data.

Relationships between risk factors for anorexia nervosa and eating disorder psychopathology

Relationships between the risk factors for anorexia nervosa and eating disorder psychopathology (as measured by the EDE-Q) were examined using Pearson product-moment correlations. Preliminary analyses were performed to ensure that there were no violations of the assumptions of normality, linearity, and homoscedasticity. Significant medium to large correlations between the variables are presented in Table 5.

Relationships between eating disorder psychopathology and psychosocial impairment

Relationships between eating disorder psychopathology and psychosocial impairment (as measured by the CIA) were investigated using Pearson product-moment correlations, where assumptions of normality were met, and Spearman rank-order correlations, where assumptions of normality were not met. Significant medium to large correlations between the variables are shown in Table 6.

Relationships between risk factors for anorexia nervosa and Asian cultural values

Relationships between risk factors for anorexia nervosa and adherence to Asian cultural values (as measured by the AAVS-M) were explored using Pearson product-moment correlations (Table 7). Adherence to assumptions of normality, linearity, and homoscedasticity were determined in preliminary analyses.

Table 4 Pearson product-moment correlations between risk factors for anorexia nervosa

Risk Factors	1	2	3	4	5
1 Drive for Thinness					
2 Body Dissatisfaction	0.67***				
3 Perfectionism	0.46**	−0.08			
4 Dieting	0.73***	0.64***	0.30		
5 Perceived pressure to be thin	0.45**	0.14	0.45**	0.39*	
6 Thin-ideal internalisation	0.56***	0.40*	0.16	0.50**	0.40*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Discussion

The profile and presentation of anorexia nervosa in Singapore is similar to that observed in Western clinical samples. In terms of risk factors, patients with anorexia nervosa in the current sample endorsed similar levels of drive for thinness, body dissatisfaction, perfectionism, and dieting, as compared to female patients with anorexia nervosa in the United States [24] and Canada [30], for both subtypes of anorexia nervosa independently. This finding parallels the work of Lai [21] and Lee et al. [28] that documents similarities with Western patient groups.

When compared to female adolescent patients with anorexia nervosa in the United States [31], participants indicated similar levels of severity of eating pathology overall, as well as in particular, dietary restraint and shape concern, although higher levels of eating concern and weight concern were indicated in Singapore.

Greater orientation to Asian cultural values in general and within domains of collectivism, conformity to norms, emotional self-control, family recognition through achievement, and humility, were not significantly negatively correlated with risk factors for anorexia nervosa. This observation reflects the findings documented by Soh et al. [20], that orientation to Asian cultural values does not offer a safeguard against eating disorder psychopathology. Analyses yielded significant positive correlations between dieting and overall orientation to Asian cultural values, as well as between dieting and emotional self-control. Significant positive relationships were also noted between thin-ideal internalisation and overall orientation to Asian cultural values, emotional self-control, and family recognition through achievement, independently. These findings are in line with observations by Tsai et al. [26] and Lake et al. [27] that orientation to Asian culture was linked with greater body dissatisfaction and disordered eating attitudes.

Risk factors for anorexia nervosa

Perceived pressure to be thin was significantly correlated with thin-ideal internalisation, thin-ideal internalisation was significantly correlated with body dissatisfaction, and

Table 5 Pearson product-moment correlations between risk factors for anorexia nervosa and eating disorder psychopathology (EDE-Q)

Risk factors	EDE-Q				
	Global	Dietary restraint	Eating concern	Shape concern	Weight concern
Drive for thinness	0.84***	0.59***	0.77***	0.84***	0.83***
Body dissatisfaction	0.68***	0.46**	0.44**	0.82***	0.67***
Perfectionism	0.23	0.08	0.39*	0.17	0.19
Dieting	0.84***	0.73***	0.68***	0.77***	0.74***
Perceived pressure to be thin	0.28	0.16	0.44**	0.29	0.26
Thin-ideal internalisation	0.39*	0.23	0.38*	0.47**	0.40*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6 Pearson product-moment correlations and spearman rank-order correlations between eating disorder psychopathology (EDE-Q) and psychosocial impairment (CIA)

EDE-Q Scale/Subscale	CIA			
	Global ^a	Personal ^a	Social ^b	Cognitive ^b
Global	0.75***	0.75***	0.65***	0.62***
Dietary restraint	0.68***	0.62***	0.58***	0.59***
Eating concern	0.72***	0.67***	0.73***	0.61***
Shape concern	0.59***	0.66***	0.47**	0.46**
Weight concern	0.71***	0.70***	0.55***	0.60***

** $p < 0.01$, *** $p < 0.001$

^a Analysed with Spearman rank-order correlations

^b Analysed with Pearson product-moment correlations

body dissatisfaction was significantly correlated with dieting, lending support for the sociocultural theory of eating pathology. Drive for thinness was significantly positively correlated independently with body dissatisfaction, perfectionism, dieting, perceived pressure to be thin, and thin-ideal internalisation, likely because drive for thinness is one of the central features of anorexia nervosa [1].

Contrary to previous research findings [2, 3, 11], perceived pressure to be thin was not significantly correlated with body dissatisfaction, nonetheless, in line with earlier studies, perceived pressure to be thin and thin-ideal internalisation were each significantly correlated with dieting [32]. In addition, perfectionism and perceived pressure to be thin were also significantly correlated possibly indicating that individuals who strive for perfection tend to be more aware of the expectations of others regarding shape and weight and feel obligated to conform to them. Further work is needed to better understand the relative importance of internal self-evaluation versus external factors.

In examining the relationships between risk factors for anorexia nervosa and eating disorder psychopathology, it was observed that drive for thinness, body dissatisfaction, and dieting were moderately to strongly positively correlated with eating psychopathology overall and across all four domains, including dietary restraint, eating concern, shape concern, and weight concern. These findings mirror earlier studies which have documented that higher levels of drive for thinness [16, 33], body dissatisfaction [34, 35], and dieting [36], were related to more severe eating psychopathology. These observations indicate the salience of these risk factors for anorexia nervosa.

Table 7 Pearson product-moment correlations between risk factors for anorexia nervosa and asian cultural values (AAVS-M)

Risk factors	AAVS-M					
	Overall	COL	CON	EMO	FAM	HUM
Drive for thinness	0.17	0.09	0.02	0.27	0.17	-0.13
Body dissatisfaction	0.13	-0.06	0.05	0.19	0.15	-0.00
Perfectionism	0.12	0.25	0.01	0.15	0.10	-0.20
Dieting	0.33*	0.08	0.18	0.39*	0.31	-0.09
Perceived pressure to be thin	-0.02	-0.13	-0.16	0.04	0.13	-0.02
Thin-ideal internalisation	0.39*	0.07	0.17	0.34*	0.42**	-0.19

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

COL Collectivism, CON Conformity to Norms, EMO Emotional Self-Control, FAM Family Recognition through Achievement, HUM Humility

To a lesser extent, thin-ideal internalisation was significantly correlated with global eating psychopathology, eating concern, shape concern, and weight concern, indicative of it being a moderate contributory factor for anorexia nervosa. Finally, perfectionism and perceived pressure to be thin were significantly correlated only with eating concern, suggestive of them being generally weaker predictors for anorexia nervosa.

Psychosocial impairment of anorexia nervosa

Levels of psychosocial impairment in general, as well as in personal, social, and cognitive areas, were significantly greater in the present study cohort as compared to patients with eating disorders in the United Kingdom [37]. The United Kingdom sample consisted of a combination of patients with various eating disorder diagnoses, including anorexia nervosa (6.5 %), bulimia nervosa (39.0 %), as well as eating disorder not otherwise specified (EDNOS—54.5 %—a catch-all diagnostic category from the DSM-IV-TR which has been modified in the DSM V). In contrast, the current sample comprised solely of patients with anorexia nervosa. Bohn et al. [37] had observed that higher levels of eating disorder psychopathology as measured on the EDE-Q and as rated by expert clinicians were associated with greater levels of secondary psychosocial impairment as assessed on the CIA. Therefore, perhaps because anorexia nervosa is characterised by extreme weight loss, intense fear of weight gain, and wide-ranging detrimental health effects, eating disorder psychopathology would be expected to be more severe, and hence related to greater psychosocial impairment, relative to bulimia nervosa and EDNOS. It could be that the current sample, which consisted entirely of patients with anorexia nervosa, had a higher level of eating disorder psychopathology as compared to the United Kingdom sample that included patients with a mix of diagnoses, which can possibly account for the disparity in levels of psychosocial impairment between the two groups. This hypothesis cannot be verified as EDE-Q scores of the United Kingdom sample were not published. When the relationships between eating disorder psychopathology as measured on the EDE-Q and psychosocial impairment as assessed on the CIA were explored in the present sample, it was observed that eating disorder psychopathology was significantly positively correlated with psychosocial impairment, similar to that noted by Bohn et al. [37]. Moderate to strong positive correlations were observed between both global as well as all domain-specific constructs for both scales indicating that a close relationship exists between severity of eating disorder psychopathology and degree of secondary psychosocial impairment.

Limitations

The study's sample size limits the potential for generalisation and the sample was limited by consisting of only treatment seeking women recruited from one particular hospital with a broad age range. The data are reliant on self-report measures and risk factors were measured concurrently with psychopathology rather than prospectively. It is not possible to fully evaluate protective benefits in a clinical sample, where possible protective benefits did not have an effect. This aspect limits the interpretability of the observed results as one cannot state whether or not existing correlations mean that protective benefits really do not exist or that they do not exist in an affected sample. A deep analysis of protective benefits in non-clinical samples could be the objective of a new study.

Comparisons between previously published samples and the Singaporean sample may have been affected by demographic data other than the obvious differences in country, though this is difficult to assess due to only limited demographic information being provided in the cited comparison samples. The Canadian study consisted of anorexia nervosa patients with a mean age of 21.5 (SD = 5.4) and a University student comparison group [30], an American study used anorexia nervosa patients with a mean age of 15.08 (SD = 1.5) [31], the Singaporean–Australian study used University students aged between 18 and 20 years [22], a second American study used undergraduate women with a mean age of 18.7 (SD = 1.2) [38], the United Kingdom study used patients with an eating disorder aged between 18 and 65 years [37] and a study from Norway used University students with a mean age of 24.8 (SD = 6.8). In the present study the mean age was 18.9 years.

Implications

Given the debate surrounding the notion that anorexia is a Western problem that becomes problematic for non-Western cultures only as a result of “Westernisation” or “modernisation” [39] the finding that Eastern cultural values are not protective for anorexia is salient. The findings of this study have established that the profile and presentation of anorexia nervosa in Singapore is similar to that observed in Western clinical samples in terms of the risk factors of drive for thinness, body dissatisfaction, perfectionism, and dieting. In terms of eating disorder psychopathology the Singapore sample was similar to a United States sample for some measures (dietary restraint and shape concern) but recorded significantly higher scores for other measures (eating concern and weight concern).

The observed pattern of general similarity of presentation, together with the finding that no protective benefit of orientation to Asian culture was observed, suggests that it may be appropriate to directly apply Western models of intervention to the treatment of anorexia nervosa in Singapore. Since greater eating disorder psychopathology corresponded to higher levels of secondary psychosocial impairment, interventions to improve psychosocial functioning such as interpersonal relationships, cognitive performance, mood and self-concept may also be warranted.

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical approval Ethics approval was obtained from the Human Research Ethics Committee of James Cook University and the Singapore General Hospital.

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

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