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ORIGINAL ARTICLE

Comorbid psychiatric diagnosis and psychological correlates of eating disorders in dance students



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KEYWORDS

body dissatisfaction;
comorbidity;
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teasing

Background/Purpose: Although dancers are at risk for eating disorders (EDs), little is known about the features of EDs among the dance population. This study explores the prevalence of EDs, and their psychiatric comorbidities and correlates in dance students.

Methods: In total, 442 female high-school dance students participated in a two-phase survey. All participants completed screening questionnaires as well as measures assessing teasing, self-esteem, perfectionism, body dissatisfaction, and personality. Of the participating students, 311 underwent the Structured Clinical Interview for DSM-IV-TR Axis I Disorders.

Results: Sixty-eight individuals (15.4%) had an ED by DSM-IV diagnosis. The prevalence of any co-occurring mood (47.1%) and anxiety disorders (30.9%) was high. Although low self-esteem, high neuroticism, and high psychological distress were associated with EDs in univariate analysis, only teasing for overweight and body image dissatisfaction were significantly associated with EDs by multivariate analysis.

Conclusion: Prevention and intervention programs for dance students should include recognition and management of emotional disorders and strategies promoting positive body image and reducing the incidence of negative weight-related comments.

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Introduction

Eating disorders (EDs) most commonly develop during the period of mid-teens to early adulthood and often co-occur with medical and psychiatric disorders.¹ Researchers have posited that cultural influences, such as an aesthetic preference for thinness, are associated with the development of disordered eating behaviors in sports emphasizing a lean appearance (e.g., dancers).^{2,3} In previous studies, the prevalence was 0.7–31% for anorexia nervosa (AN), 1.6–19% for bulimia nervosa (BN), and 4.8–73% for ED not otherwise specified (NOS) among dancers, depending on the diagnostic criteria used, survey methods, level of competition, ethnicity, and type of dance (ballet dancers or dancers in general).^{2–7} The negative impact of ED in elite female athletes is demonstrated by a strong association with psychiatric comorbidity⁸ and consequences such as osteoporosis with increased fracture risk and menstrual irregularity.⁹ Compared to studies of the general population, studies investigating ED and its associated psychopathology in dance populations were generally preliminary and were limited by small sample size, lack of standardized diagnostic methods or use of multivariate analysis assessing the independence of potential risk factors.¹⁰

Eating pathology among adolescent ballet dancers has been attributed to the interaction between individual and environmental influences.³ Certain environmental factors, such as intense physical activity,⁶ a high level of competitiveness,^{2,3} criteria of student enrollment,¹¹ and critical appearance comments,^{6,9} may contribute to the high prevalence of EDs in dance groups. In addition to the cultural pressure to be thin, dancers who displayed a high level of perfectionism,¹² great concern, or dissatisfaction with their body image,¹¹ low self-esteem,¹² and perceived great pressure from coaches concerning their weight and body shape¹¹ are at a high risk for the development of disordered eating problems. Nevertheless, one study addressed that body mass index (BMI) itself did not have an influence on ED development for dance students.¹¹ Other factors identified as associated with EDs in nondance populations, such as high neuroticism score¹³ and teasing experiences,¹⁴ had never been examined in a dance population. Studies investigating the influence of weight status, negative affect, or body dissatisfaction on the relationship between teasing and EDs in dance population are also lacking.

Whether dancers with EDs have the same co-occurring psychiatric disorders as their nondance peers with EDs remains unclear. While co-occurring substance use and emotional distress are common in nondancers with EDs, they were not identified among dancers.⁸ To our knowledge, no other study has ever reported co-morbid psychiatric disorders among dance people with EDs using a diagnostic interview.

In one published study, we found that EDs were more prevalent in dance students than non-dance students (8% vs. 2%) and being overweight (BMI ≥ 23 kg/m²),¹⁵ high body image concern, high general psychopathology, weight reduction practices by close relatives, and low family support were correlates of EDs among dance students.⁷ In the current study, we aimed to investigate the co-occurring psychiatric disorders with EDs using a diagnostic interview and to examine the differential effects of perceived teasing

experience and self-rated personal characteristics on the development of EDs in dance student sample. We hypothesized that dancers' personal experiences or attitudes generated from the "pressure to be thin" environment may have more influences on the prevalent EDs than the objective measurement. The integration of objective and subjective assessments might provide us more clues indicating the management and prevention of EDs in this high-risk group.

Methods

Participants and procedures

This study comprised the cohort in a two-phase survey for EDs in dance students at 1-year follow-up. In the baseline survey (T1: year 2003),⁷ dance students enrolled in high schools with dance programs in Taiwan completed the first-phase survey filling out several self-administered questionnaires, including two screening questionnaires: the Eating Attitudes Test (EAT-26),¹⁶ and Bulimic Investigatory Test Edinburgh (BITE).¹⁷ Those screened positive by either the EAT-26 (EAT-26 ≥ 20 and BMI ≤ 18.5 kg/m²) or BITE (BITE Symptom score ≥ 15 or BITE Severity score ≥ 5) criterion and about 10% of those who screened negative by both criteria were selected for the second-phase interview using the Structured Clinical Interview for DSM-IV-TR Axis I Disorders Patient Edition (SCID-I/P).¹⁸ We recruited female students only because the number of male students was too small.

Dance students in Taiwan took basic classes with a focus on ballet, Chinese traditional dance, and modern dance while taking general high school curricula. The dance programs are designed to train students for future professional careers. Fig. 1 shows the enrollment flowchart of this current study. Dance students who were surveyed in 2003 and staying at the original high school at follow-up (excluding graduated students) were the potential participants of this study (T2: 2004). Written informed consent was obtained from students and their parents prior to the survey. Students who were willing to participate and were present at school on the day of the survey were asked to complete several self-report questionnaires in class, including two screening instruments (the EAT and BITE), as well as measuring their weight using an electronic scale. Height was recorded according to students' self-report. In all, 442 female students completed the survey questionnaires during March–May 2004 (response rate, 97.3%). The enrollment criteria for an interview were described as follows. In addition to those who screened positive by the EAT or BITE criterion at follow-up survey ($n = 200$), students who had participated in the Phase 2 interview at T1 ($n = 177$, response rate 98.3%) were also recruited. We did not interview those who were negative by both the EAT and BITE for 2 consecutive years ($n = 27$) for logistic reasons. In total, 311 students were interviewed using the SCID during April–November 2004 due to the overlap of participants in the two groups.

The study was approved by the Institutional Review Board of the National Taiwan University Hospital, Taipei, Taiwan.

Measures

Weight-related teasing history was assessed by one question, "Have you had ever been laughed at for body weight issues during the developmental stage?" The first possible response was "Yes, because I was overweight"; the second possible response was "Yes, because I was underweight"; and the third possible response was "No."

EAT-26

Each response to an item on the EAT was on a 6-point Likert scale. For scoring, each extreme response in the direction of "anorexic" scored 3 points, the adjacent alternatives as 2 points and 1 point, respectively, while the remaining three response alternatives in the nonanorexic direction scored 0 points. Internal consistency (Cronbach $\alpha = 0.83$)

and diagnostic validity of the Chinese version of the EAT-26 in dance students has been demonstrated to be good.¹⁹

BITE

This 36-item self-reported measure consists of two subscales: the symptom scale (30 items) and the severity scale (6 items). The former offers "yes" and "no" as response choices, while responses to the latter are scored with a number corresponding to the frequency of bingeing or purging. Internal consistency (Cronbach $\alpha = 0.81$ and 0.49) and diagnostic validity of the Chinese version of the BITE has been demonstrated in the dance students.¹⁹

Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale (RSES) contains 10 items with responses scored on a 4-point Likert scale ranging from

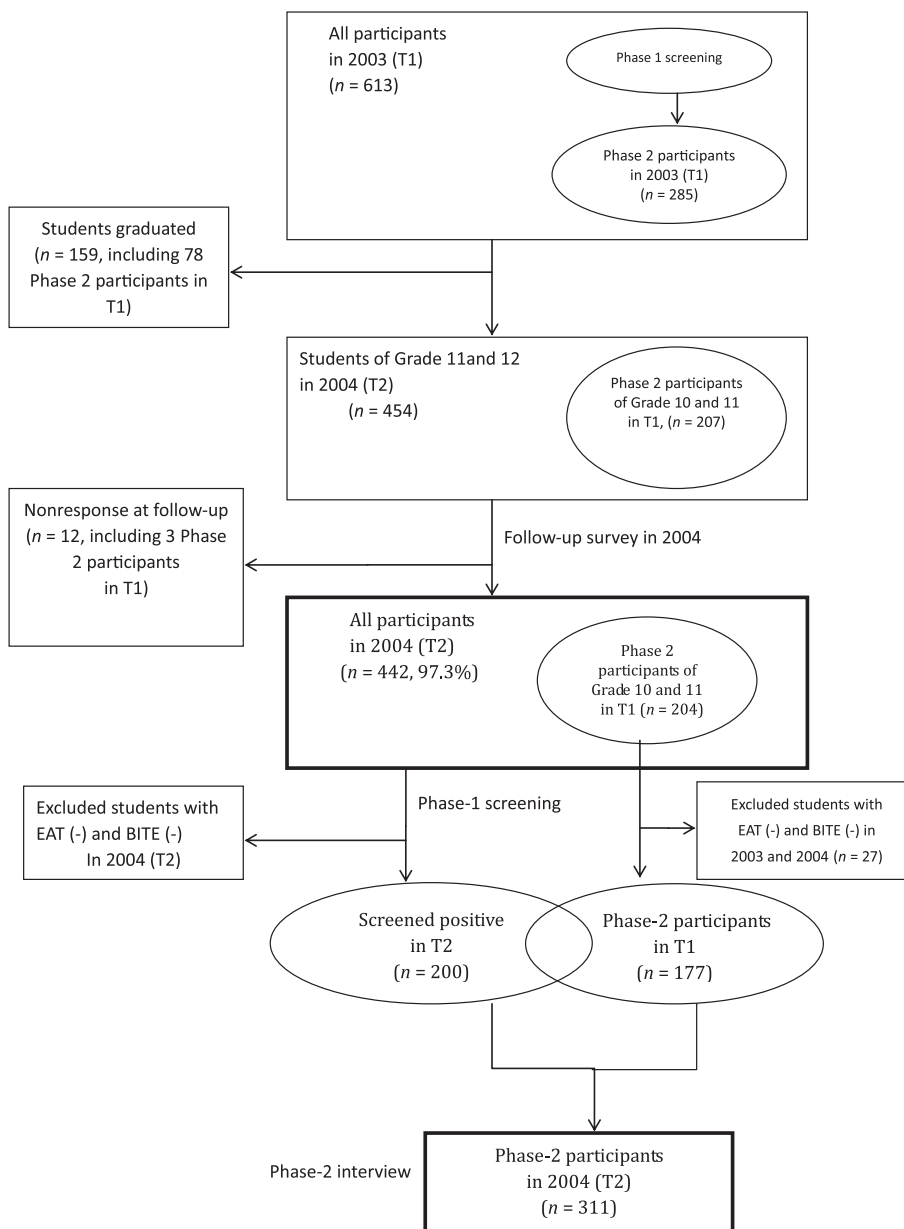


Figure 1 Flowchart of the two-phase case identification of eating disorders. BITE = Bulimic Investigatory Test Edinburgh; EAT = Eating Attitudes Test.

0 for “strongly disagree” to 3 for “strongly agree”.²⁰ Five items are negatively worded and reverse-scored. An overall score is determined by summing responses to all items. The scaling was modified to 1–4 and the responses were scored in the reverse direction to minimize possible modesty bias in culturally homogeneous Chinese people.²¹ Overall scores were 10–40 with high scores indicative of low self-esteem. Internal consistency reliability of the RSES was good in this study (Cronbach $\alpha = 0.82$).

Chinese Health Questionnaire

The Chinese Health Questionnaire (CHQ)-12 is a self-administered instrument used to identify nonpsychotic psychiatric disorders in community settings and to rate the severity of psychological distress.^{22,23} The questionnaire is derived from a Chinese translation of the General Health Questionnaire with the addition of culturally relevant items for psychiatric morbidity in Chinese society. It has demonstrated high internal consistencies for both community (Cronbach $\alpha = 0.84$) and hospital samples (Cronbach $\alpha = 0.83$), as well as good discriminant function. This study used the total CHQ-12 score to rate the severity of psychological distress.

Perfectionism subscale of the Eating Disorder Inventory

The Eating Disorder Inventory (EDI-1) comprises 64 items with responses scored on a 6-point Likert scale, ranging from 6 for “always” to 1 for “never”. Three subscales assess attitudes and behaviors concerning eating, weight, and body shape, including drive for thinness, bulimia, and body dissatisfaction. Five subscales assess psychological functioning, including perfectionism, ineffectiveness, interpersonal distrust, interoceptive awareness, and maturity fears. Internal consistency reliability and factorial validities of the Mandarin Chinese version of the EDI have been demonstrated for clinical and non-clinical populations in Taiwan.²⁴ This study used only the Perfectionism subscale.

Personality assessments

Items from the Eysenck Personality Inventory (EPQ)²⁵ were used to assess personality using a binary response format. Ten items are related to neuroticism and ten items are related to extroversion. This scale has good internal consistency (Cronbach α) for the neuroticism (0.76) and extroversion (0.84) subscales. Convergent validity was evaluated by assessing correlations between the personality inventory and the CHQ, EAT, BITE, Perfectionism subscale, and RSES. The neuroticism dimension had mild-to-moderate correlations with all scales ($\gamma = 0.29$ – 0.53 , $p < 0.001$), and the extroversion dimension had weak correlations with the CHQ ($\gamma = -0.15$) and RSES ($\gamma = -0.37$), and was not correlated with other scales.

Body figure test

Figure drawings were adapted for use in this study.²⁶ Participants answered two questions using eight figure drawings that were presented randomly, ranging from 1 for “very thin” to 8 for “very heavy”. The two questions asked participants to choose a number that represented (1) their current appearance (self-perceived figure), and (2) how they would like to look (ideal figure). The numerical value calculated by subtracting the number corresponding to the

ideal figure from the number corresponding to the self-perceived figure was deemed body image dissatisfaction. A correlation between the number for the figure chosen as closest to the present body state and BMI was $\gamma = 0.61$ ($p < 0.001$).

Interview instrument and diagnosis

In addition to the SCID-I/P, interview content at baseline included a personal history of sexual/physical abuse and family history, including their parents’ marital status, mental illness, and obesity. We used the same interview content in this study, but excluded the history of sexual/physical abuse in the second-year survey.

To evaluate the presence of an ED and other comorbid psychiatric disorders in the preceding 12 months, this study applied the SCID-I/P.¹⁸ The interview was conducted by one experienced clinician (M.C.M.T.) blind to participants’ screening results and ED status. Those participants who had eating or mood symptoms that caused clinically significant distress but did not meet threshold criteria were diagnosed with EDNOS, anxiety disorders NOS, and depressive disorders NOS.

Statistical analysis

Missing data were imputed by the means of the same class, grade, and school subgroups. The means and standard deviations for continuous variables for the ED and non-ED groups were calculated, and differences were compared using the Student *t* test. For categorical variables, frequency differences were compared using the Chi-square test. Univariate logistic regression analyses were performed to assess the associations between variables of grade, overweight, parental education, weight-related teasing history, psychological distress, body dissatisfaction, self-esteem, perfectionism, and personality and the ED groups. Multivariate logistic regression was used to identify correlates of EDs by including significant variables in univariate logistic regression. All tests were two-tailed and $p < 0.05$ was considered significant. Statistical analysis used SAS 9.2 (SAS Institute, Inc., Cary, NC, USA).

Results

Characteristics of participants

Mean age of all participants was 16.3 ± 0.6 years. Mean weight and height were 50.5 ± 5.2 kg and 160.9 ± 5.2 cm, respectively. Sixty-eight (15.4%, 95% CI = 12.0–18.7%) out of all 442 T2 participants met DSM-IV diagnostic criteria for EDs at follow-up, including 1.6% ($n = 7$) with AN, 4.3% ($n = 19$) with BN, and 9.5% ($n = 42$) with ED NOS with subdivisions of binge eating disorder ($n = 2$, 0.4%), menstruating AN ($n = 2$, 0.4%), subthreshold BN ($n = 22$, 5.0%), and purging disorder ($n = 16$, 3.6%).

Table 1 presents characteristics of participants. Compared with the non-ED group, the ED group did not differ significantly in demographic features, weight, and age at menarche. However, compared with the non-ED group, the ED group had a significantly higher rate of being teased for overweight, and higher scores on the EAT,

Table 1 Demographic and clinical characteristics of participants.

	Eating disorder group (<i>n</i> = 68)	No eating disorder group (<i>n</i> = 374)	Total (<i>n</i> = 442)
Grade			
11	33 (48.5)	187 (50)	220 (49.8)
12	35 (51.5)	187 (50)	222 (50.2)
Highest parental educational level (y) ^a			
<9	5 (7.4)	12 (3.3)	17 (3.9)
9–12	14 (20.6)	56 (15.3)	70 (16.1)
12–16	40 (58.8)	232 (63.4)	272 (62.7)
≥16	9 (13.2)	66 (18)	75 (17.3)
BMI (kg/m ²)	19.7 (1.8)	19.5 (1.6)	19.5 (1.6)
Overweight (BMI ≥ 23 kg/m ²)	2 (2.9)	8 (2.1)	10 (2.3)
Menarche (y) ^b	13 (1.1)	13 (1.2)	13 (1.1)
Eating Attitudes Test***	20.5 (10.8)	13.8 (8.4)	14.8 (9.2)
Bulimic Investigatory Test, Edinburgh***	22.6 (7.9)	13.5 (6.7)	14.9 (7.6)
Symptom***	16.5 (5.5)	10.7 (4.8)	11.6 (5.3)
Severity***	6.1 (4.1)	2.7 (2.9)	3.2 (3.3)
Chinese Health Questionnaire*	3.9 (2.6)	3.1 (2.4)	3.2 (2.5)
Body image dissatisfaction***	2.7 (1.5)	2 (1.3)	2.1 (1.4)
Rosenberg Self-esteem Scale*	25.0 (4.2)	23.8 (4.1)	24.0 (4.1)
Perfectionism subscale of the EDI	5.6 (4.5)	5 (4.2)	5.1 (4.3)
Personality Inventory			
Neuroticism*	6.4 (2.2)	5.6 (2.3)	5.7 (2.3)
Extroversion	6.1 (2.4)	6.2 (2.4)	6.2 (2.4)
Teasing history			
For underweight	0 (0)	16 (4.3)	16 (3.7)
For overweight***	32 (47.8)	87 (23.5)	119 (27.2)

Data are presented as *n* (%) or mean (standard deviation).

p* < 0.05; *p* < 0.01; ****p* < 0.001.

BMI = body mass index; EDI = Eating Disorder Inventory.

^a Data missing for nine students in the no eating disorder group.

^b Data missing for 27 students.

the Symptom and Severity scales of the BITE, the CHQ, body image dissatisfaction, self-esteem scale, and neuroticism. No significant difference existed for perfectionism score between the ED and non-ED groups.

Comorbid psychiatric disorders

More than half of the students with EDs were diagnosed with at least one comorbid psychiatric disorder (63.2%, *n* = 43). Students with EDs had risk of co-occurrence with any anxiety or mood disorder that was roughly two-fold higher than that for those without EDs. Post-traumatic stress disorder (OR = 7.53; 95% CI = 1.35–42.04) ranked the highest risk of co-occurring with an ED. No student in the ED group had alcohol or substance use disorders (Table 2).

Correlates for EDs

Univariate logistic regression analyses showed that a history of being teased for being overweight, higher CHQ score, greater body image dissatisfaction, low self-esteem, and higher neuroticism significantly increased the likelihood of having an ED. When all variables significantly associated with EDs by univariate analyses were subjected to

multivariate logistic regression analysis, only teasing for being overweight and body image dissatisfaction remained significantly associated with EDs (Table 3). In addition to identify the main effects, we also conducted moderation analyses to examine the significant two-way interactions between teasing and other biological (weight status) and psychological variables (self-esteem, neuroticism, and psychological distress). None of these variables influenced the association between perceived teasing for overweight and EDs.

Discussion

This study found that the prevalence of EDs (15.4%) in this cohort of dance students was comparable to the prevalence rate for dance population published previously and ED NOS was the most common diagnosis among all ED subtypes. The EDs were commonly associated with mood and anxiety disorders. The ED group had a more prevalent history of teasing for overweight and had higher levels of body image concern, psychological distress, neuroticism, and a lower level of self-esteem than the non-ED group. Multivariate analysis revealed that history of teasing and body image concern remained significantly associated with EDs in this dance student sample.

Table 2 Comorbid psychiatric diagnosis of cases with eating disorders and no eating disorders ($n = 311$).

	AN ($n = 7$)	BN ($n = 19$)	ED NOS ($n = 42$)	Eating disorders ($n = 68$)	No eating disorder ($n = 243$)	OR (95% CI)
	n (%)	n (%)	n (%)	n (%)	n (%)	
Anxiety disorders (any)**	1 (14.3)	9 (47.4)	11 (26.2)	21 (30.9)	34 (14.0)	2.75 (1.46–5.15)
Panic disorder	0	3 (15.8)	2 (4.8)	5 (7.4)	8 (3.3)	2.33 (0.74–7.37)
Agoraphobia	0	2 (10.5)	1 (2.4)	3 (4.4)	2 (0.8)	5.56 (0.91–33.97)
Social phobia	0	0	1 (2.4)	1 (1.5)	10 (4.1)	0.35 (0.04–2.77)
Obsessive-compulsive disorder	0	1 (5.3)	1 (2.4)	2 (2.9)	3 (1.2)	2.42 (0.4–14.81)
Post-traumatic stress disorder*	0	1 (5.3)	3 (7.1)	4 (5.9)	2 (0.8)	7.53 (1.35–42.04)
Generalized anxiety disorder	0	2 (10.5)	1 (2.4)	3 (4.4)	3 (1.2)	3.69 (0.73–18.73)
Anxiety disorders, NOS**	1 (14.3)	3 (15.8)	4 (9.5)	8 (11.8)	11 (4.5)	2.81 (1.08–7.3)
Mood disorders (any)**	4 (57.1)	10 (52.6)	18 (42.9)	32 (47.1)	71 (29.2)	2.15 (1.24–3.74)
Major depressive disorder	4 (57.1)	7 (36.8)	11 (26.2)	22 (32.4)	39 (16.1)	2.50 (1.36–4.62)
Dysthymia	1 (14.3)	1 (5.3)	5 (11.9)	7 (10.3)	26 (10.7)	0.96 (0.4–2.31)
Depressive disorders, NOS*	1 (14.3)	6 (31.6)	4 (9.5)	11 (16.2)	17 (7.0)	2.57 (1.14–5.78)
Bipolar I-II disorders	0	0	0	0	6 (2.5)	—
Substance use disorders (any)	0	0	0	0	1 (0.4)	—
Alcohol abuse or dependence	0	0	0	0	0	—
Illicit drug abuse or dependence	0	0	0	0	1 (0.4)	—
Any mental disorder***	5 (71.4)	14 (73.7)	24 (57.1)	43 (63.2)	92 (37.9)	2.82 (1.62–4.93)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; OR in bold type indicates statistically significant.

AN = anorexia nervosa; BN = bulimia nervosa; CI = confidence interval; ED = eating disorder; NOS = not otherwise specified; OR = odds ratio.

Most of the prevalence studies using diagnostic interviews were conducted in ballet dancers and a meta-analysis study reported that the overall prevalence of EDs in all dancers (12%) was slightly lower than the prevalence found in ballet dancers (16.4%).⁴ The finding that the prevalence of EDs at 1-year follow-up (15%) was higher than that in the 1st year (8%) corroborated the previous observation that ED was a chronic and relapsing illness.²⁷ The increased prevalence in all EDs might also be explained by the fact that certain disordered eating attitudes and behaviors increase throughout adolescence.²⁸

The majority of ED patients in this study had at least one associated psychiatric disorder. This finding was consistent with that obtained by previous research investigating individuals with EDs from general community samples.¹ In

terms of individual disease category, the relative risk of having post-traumatic stress disorder in students with EDs compared with students without EDs was distinguishingly higher than that of the other co-occurring psychiatric disorders. Links between trauma and EDs have been found not only in adults, but also in children and adolescents.²⁹ Prior research on the spectrum of trauma has primarily focused on physical/sexual assaults, but emotional abuse in other forms, such as teasing and bullying, have also been shown to be associated with mental health problems.³⁰ Since the percentage of individuals having the history of physical/sexual abuse was low (3.9%) in the first-year sample⁷ and our follow-up study failed to demonstrate the association of history of physical/sexual abuse and EDs,³¹ we did not examine their association in this present study. However,

Table 3 Univariate and multivariate logistic regression analysis of correlates for eating disorders.

	Univariate analysis	Multivariate analysis	p
Grade (11 th grade as the reference)			
12	1.06 (0.63–1.78)	—	
Overweight (BMI ≥ 23 kg/m ²)	1.39 (0.29–6.68)	—	
Parental education (<12 years)	1.70 (0.94–3.07)	—	
Teasing for being overweight	2.99 (1.75–5.10)***	1.92 (1.04–3.54)*	0.0374
Chinese Health Questionnaire	1.12 (1.02–1.24)*	1.00 (0.87–1.14)	0.9727
Body image dissatisfaction	1.45 (1.20–1.77)***	1.37 (1.11–1.70)**	0.0033
Rosenberg Self-Esteem Scale	1.07 (1.00–1.14)*	1.01 (0.94–1.10)	0.7363
Perfectionism subscale of the EDI	1.03 (0.97–1.10)	—	
Personality Inventory			
Neuroticism	1.17 (1.04–1.32)**	1.11 (0.94–1.30)	0.2084
Extroversion	0.97 (0.87–1.08)	—	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

BMI = body mass index; EDI = Eating Disorder Inventory.

we should not underestimate the effect of perceived weight-related teasing (which is prevalent in our sample) as traumatic to individuals with ED in this “weight conscious” dance group. Of note, women with EDs tend to perceive higher levels of stress or report more negative mood than women without EDs.³² Lowered threshold in appraisal of stressful situations might also render dancers with EDs more susceptible to co-occurring post-traumatic stress disorder. Future study may explore whether history of physical/sexual abuse, perceived teasing experience, or susceptibility of perceived stress has influences on the co-occurrence of post-traumatic stress disorder in dance students with EDs. The commonly reported substance use comorbidity among adolescents with EDs¹ was not seen in one dance group.⁸ Previous surveys have also shown that prevalence rates of alcohol and illicit drug use in a Taiwanese adolescent sample and clinical ED and non-ED psychiatric patients were lower than that in Western society.^{33,34} Similar findings that drug use disorder in Japanese ED patients was less prevalent than in Western countries has also been reported.³⁵ Whether the lower co-occurrence rate in our study was due to different ethnic groups or (dance) group characteristics awaits further study.

Body dissatisfaction was prevalent in adolescents and was an important factor associated with the development of ED symptoms in general adolescent populations.³⁶ Unlike body image dissatisfaction, the association between weight teasing and disordered eating/EDs was less consistently demonstrated.^{37–39} Some studies observed that weight teasing was associated with increased eating disorder behaviors; however, this association became marginally significant or insignificant after the weight variable was controlled.^{37,39} Of note, current weight status and other traits (neuroticism or self-esteem) did not moderate the relationship between perceived teasing and EDs in this study. It highlighted that dance students with EDs were susceptible to the experiences of being teased for overweight regardless of their current weight status and other individual vulnerability factors, and it was partially parallel with the finding that dancers with EDs have reportedly been pressured from coaches and classmates concerning their weight and body shape regardless of their body weight.¹¹ This finding also argued for the independent effect of perfectionism or self-esteem on higher eating psychopathology of dancers.¹²

One previous experimental study found that social pressure to be thin resulted in increased body dissatisfaction instead of a negative affect and the authors suggested that a negative affect was a more distal consequence of pressure to be thin than body dissatisfaction.⁴⁰ Furthermore, individuals with EDs reportedly have impaired emotional recognition and emotional regulation difficulties.⁴¹ Prior research findings may partially explain why psychological distress was not as strong as body dissatisfaction in its association with EDs in the final multivariate model. Aside from individual factors, we recommend keeping dance students away from negative weight-related comments by teachers or peers at school during the developmental stage.⁴²

This study has the following limitations. First, only participants who were screened positive in the 2nd year were interviewed. A false negative ED case may exist when

individuals were screened negative by both scales. However, the likelihood is very low because the diagnostic validities of the EAT and BITE have been demonstrated to be good to excellent and no ED case existed among those screened negative by the EAT and BITE at T1.^{7,31} Second, teasing for overweight was measured by one item. However, a single-item measure for teasing consistently underestimated the strength of the relationship between teasing and bulimic behaviors.³⁸ Differential misclassification caused by underestimation may not diminish the validity of study results. Third, this study was unable to determine whether the associated teasing experiences reflected teasing events from the recent past or events that have carried over from childhood. Future studies should specify the timeframe and specific sources of reported teasing (peers, teachers, or parents) and examine the effects of teasing (either current or retrospective) on the development of EDs as well as the co-occurring psychiatric comorbidities. Fourth, male students were not included and all findings in this study were not analyzed in relation with ED subtypes due to a modest sample size. Finally, lack of a comparison group in this study limited the ability to assert that findings for dance students were distinct from those of general students.

In conclusion, EDs were prevalent among dance students and were commonly associated with anxiety and depressive disorders. History of teasing for overweight and body image dissatisfaction were the two factors associated with EDs in this dance student group. Our findings suggest that fostering an environment where attitudes about weight are nonjudgmental and developing programs that facilitate positive body images are important to prevent EDs among the dance student population. The co-occurring anxiety and depressive disorders need to be adequately recognized and managed as well.

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