The effects of gender and parental factors on the relationship of eating disorder symptoms and co-occurring psychiatric symptoms

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Abstract

Aims: This study aimed to investigate the co-occurring psychiatric symptoms with eating disorders (EDs) and the moderating effects of gender and parental factors on their relationships in a large sample of college students. **Methods**: Out of a total of 7531 new entrants, 5015 (participation rate, 66.6%; male: 51.6%) completed the Chinese version of the self-administered Adult Self-Report Inventory-4, Parental Bonding Instrument, and Family APGAR. Individuals with EDs (n = 541) were identified with either anorexia (n = 485) or bulimia (n = 20) alone, or both symptoms (n = 36). Linear regression models were used to test the prediction of EDs, parental educational level, perceived family support and parenting style to symptoms of other DSM-IV psychiatric disorders and the interactions between ED symptoms and gender or parental factors on the effects of these symptoms. **Results:** In addition to ED symptoms and lower perceived family support, gender-specific pattern was associated with significantly more severe symptoms of anxiety, obsessive-compulsive (OCD), depressive, and somatoform disorders. Paternal education levels as college and higher were associated with decreased symptom severity of anxiety and somatoform disorder, whereas maternal education levels as college and higher was associated with decreased symptom severity of OCD. Lower levels of care and higher levels of protection from both parents were generally associated with more severe psychiatric symptoms. Regarding the moderating roles of gender and parental factors, our results showed that male gender elevated, and higher paternal education and paternal care decreased the magnitude of relationships between ED symptoms and OCD; higher paternal educational level and paternal care decreased the magnitude of relationships between EDs and depressive symptoms; and higher maternal care level was associated with decreased magnitude of the relationship between ED symptoms and somatoform symptoms. There were no moderating effects from gender and parental factors on anxiety symptoms. **Conclusion:** This study demonstrated that in addition to their main effects on psychiatric symptoms, gender and parental factors may have moderating effects on the relationships between the EDs and co-occurring OCD, depressive disorder, and somatoform disorders symptoms. Our findings indicate an important role of parenting styles on the associations between EDs and these co-occurring psychiatric symptoms.

Background

Eating disorders (EDs) are often characterized with many concomitant emotional/behaviroal symptoms[1-2] and less attention was paid on its relationship with somatization symptoms[3]. Little is known about the moderating variables on the development of co-occurring emotional/somatization symptoms among EDs subjects. This study aimed to investigate the co-occurring psychiatric symptoms with EDs and the effect of gender and parental factors on their co-morbid relationships in a large sample of college students in Taiwan.

Methods

Participants

The participants consisted of 5015 first-year college students (male: 51.6%, mean age, 19.0 years; SD = 2.7) recruited from the National Taiwan University (NTU). Out of a total of 7531 new entrants in the two consecutive years (3756 in 2003 and 3775 in 2004), 5015 (participation rate, 66.6%) consented to the study and completed the questionnaires in the first weeks of the fall semesters.

Measures

Adult Self-Report Inventory-4 (ASRI-4)

A 136-item self report or interview scale, is derived from Youth Self-Report Inventory [4] for the purpose of making the DSM-IV referenced psychiatric diagnosis in adults. Two scoring procedures can be applied: the Symptom Count score (number of DSM-IV-specified symptoms) and the Symptom Severity score (a dimensional scoring). On rating, each item was assigned to one of four responses: 0 = never, 1 = sometimes, 2 = often, 3 = very often. Co-occurring psychiatric disorders were scored as symptoms severity by summing up the score of each item for a specific disorder. The psychometric properties of the Chinese ASRI-4 were demonstrated to be good.[5]

Parental Bonding Instrument (PBI)

The PBI is a 25-item instrument (items are rated on a 4-point Likert scale from "very likely" to "very unlikely") measuring the parents' behaviors and attitudes toward their child during that child's first 16 years.[6] The PBI consists of two principal dimensions: Care (12 items) and Protection (13 items). The Chinese PBI is a reliable and valid instrument and has been widely used in Taiwanese studies.[7]

Chinese version of the Family APGAR

Family APGAR, a 5-item measure, is designed to assess the five dimensions of perceived family support: adaptation, partnership, growth, affection, and resolve. A higher score indicates a more highly functional family.[8]

Statistical analysis

The comparison groups were the participants with and without EDs. Individuals with EDs (n = 541) consisted of either anorexia (n = 485) or bulimia (n = 20) alone, or both symptoms (n = 36).The categorical variables were compared with the chi-square test and continuous variables were with the analysis of variance (ANOVA) for significance. Linear regression model was used to test the prediction of EDs, parental educational level, perceived family support, and parenting style to symptoms of psychiatric disorders measured by the Chinese ASRI-4. In addition to the main effects, we also examined the interaction terms between EDs and gender, parental educational level, and parenting style on the prediction of co-occurring psychiatric symptoms by stepwise selection method.

Results

Demographic characteristics of the sample

Table 1 shows characteristics of individuals with and without ED symptoms. Individuals with EDs are younger and female predominance and have poorer family functioning measured by the APAGA compared to those without EDs. The parental styles show lower affectionate and care and higher protection in both parents of individuals with EDs than those of individuals without EDs.

Co-occurring psychiatric disorder symptoms among individuals with eating disorder symptoms

Individuals with EDs showed significantly more severe symptoms of psychiatric disorders including anxiety disorders, obsessive-compulsive disorder (OCD), tics, depressive disorders, bipolar disorder, somatoform disorders, post-traumatic stress disorder, dissociation, and adjustment disorder (Table 2).

Effects of gender and parental factors on the co-morbid patterns of psychiatric disorder symptoms and eating disorder

ED symptoms and lower perceived family support were associated with more severe symptoms of anxiety disorders, OCD, depressive disorders, and somatoform disorders (Table 3).
For anxiety disorder symptoms, female gender increased the severity of anxiety disorders and paternal education levels as college and higher was associated with decreased symptom severity of anxiety disorders. Lower levels of care and higher protection from both parents were associated with more severe anxiety disorder symptoms. There were no moderating effects from gender and parental factors on anxiety symptoms.
For OCD symptoms, male gender increased the severity of OCD disorders, but maternal education levels as college and higher showed a protective effect for symptom severity of OCD. Lower levels of care from father and higher levels of protection from both parents were associated with more severe symptoms of OCD. Regarding the moderating roles of gender and parental factors, male gender elevated, and paternal education of college and higher and paternal care decreased the magnitude of relationships between ED symptoms and OCD.
Similar to anxiety disorder, female gender and lower levels of care and higher protection from both parents were associated with more severe depressive disorder symptoms. Paternal education of college and higher and paternal care decreased the magnitude of relationships between ED symptoms and depressive disorders.
Main effects of gender, parenting style, and paternal educational level on somatoform disorders were the same as on anxiety disorders. Of note, higher maternal care level was associated with decreased magnitude of the relationship between ED symptoms and co-occurring somatoform symptoms.

Table 1. Demographic characteristics

	Eating symptoms		
	Yes n = 541	No n = 4474	Differences
	n (%) or Mean ± SD	n (%) or Mean ± SD	
Age (in years)	18.6 ± 1.1	19.1 ± 2.8	$F_{(1, 4997)} = 14.93$, $p < .001$
Gender			
Male	222 (41.1)	2354 (52.8)	$\chi_1^2 = 26.53$, $p < .0001$
Female	318 (58.9)	2101 (47.2)	
Family APGAR	6.6 ± 3.0	7.0 ± 2.8	$F_{(1, 5008)} = 7.51$, $p = 0.006$
Fathers			
Age(in years)	49.8 ± 4.3	50.3 ± 4.9	$F_{(1, 4641)} = 4.68$, $p = 0.031$
Educational level			
Senior high or lower	279 (52.6)	2119 (49.1)	$\chi_1^2 = 2.34$, $p = 0.126$
College or higher	251 (47.4)	2195 (50.9)	
Employment status			
Professional job	137 (26.3)	1143 (26.7)	$\chi_2^2 = 1.51$, $p = 0.470$
Technical job	296 (56.8)	2335 (54.4)	
Others	88 (16.9)	811 (18.9)	
Parenting style			
Affectionate and care	22.7 ± 7.3	23.8 ± 7.0	$F_{(1, 4921)} = 10.95$, $p < .001$
Protection	10.2 ± 7.0	9.4 ± 6.5	$F_{(1, 4920)} = 8.44$, $p = 0.004$
Mothers			
Age(in years)	46.9 ± 3.7	47.5 ± 4.3	$F_{(1, 4729)} = 9.55$, $p = 0.002$
Educational level			
Senior high or lower	336 (63.6)	2769 (63.4)	$\chi_1^2 = 0.01$, $p = 0.907$
College or higher	192 (36.4)	1600 (36.6)	
Employment status			
Professional job	46 (8.9)	380 (8.9)	$\chi_2^2 = 0.79$, $p = 0.674$
Technical job	238 (46.1)	1882 (44.2)	
Others	232 (45.0)	2001 (46.9)	
Parenting style			
Affectionate and care	26.2 ± 6.7	26.8 ± 6.1	$F_{(1, 4997)} = 5.16$, $p = 0.023$
Protection	12.7 ± 7.6	11.6 ± 6.7	$F_{(1, 4997)} = 11.60$, $p < .001$

Discussion

This is one of the few studies to investigate the co-morbid psychiatric disorder symptoms of EDs and the moderating effects of gender and parents on the relationship of EDs and co-morbid psychiatric disorder symptoms among a school-based sample of young adults. This study corroborates the previous findings that EDs were associated with many co-occurring psychiatric symptoms, and individuals with EDs were at risk for the co-existence of mood disorders, anxiety disorders, OCD, and somatoform disorders.
In addition to their main effects on psychiatric symptoms, gender and parental factors may have moderating effects on the relationships between the EDs and these co-occurring psychiatric symptoms. While paternal care was demonstrated to be significantly reduced the risk of OCD and depressive disorder symptoms, maternal care was found to be significantly reduced the risk of somatoform disorders for individuals with EDs.

Table 2. Co-morbid Psychiatric Symptoms with Eating Disorder Symptoms

Psychiatric disorder symptoms	Eating Symptoms		Differences	
	Yes n = 541	No n = 4474		
	Mean ± SD	Mean ± SD	*F*	*p*
Anxiety Disorders	15.02 ± 6.05	11.56 ± 5.46	189.55	<.0001
Generalized Anxiety Disorder	9.82 ± 3.86	7.81 ± 3.56	150.69	<.0001
Social Phobia	3.07 ± 1.90	2.18 ± 1.69	130.91	<.0001
Specific Phobia	0.85 ± 0.91	0.61 ± 0.75	46.08	<.0001
Agoraphobia	0.54 ± 0.77	0.41 ± 0.64	19.10	<.0001
Panic Disorder	0.73 ± 0.68	0.54 ± 0.61	45.33	<.0001
Obsession-Compulsions	1.55 ± 1.38	1.06 ± 1.15	80.95	<.0001
Tics	1.57 ± 1.39	1.13 ± 1.19	63.49	<.0001
Depressive Disorders	17.75 ± 7.85	13.33 ± 7.06	184.17	<.0001
Major Depression	8.89 ± 4.21	6.66 ± 3.72	168.34	<.0001
Dysthymia	8.86 ± 3.81	6.68 ± 3.45	189.26	<.0001
Bipolar Disorder	6.20 ± 4.57	4.50 ± 3.72	95.93	<.0001
Somatoform Disorders	4.81 ± 2.56	3.47 ± 2.21	171.26	<.0001
Somatization	2.71 ± 1.76	2.16 ± 1.50	63.54	<.0001
Hypochondriasis	0.65 ± 0.78	0.47 ± 0.65	37.24	<.0001
Body dysmorphic	1.44 ± 0.91	0.84 ± 0.75	292.06	<.0001
Post-traumatic Stress	7.94 ± 3.88	6.00 ± 3.43	149.43	<.0001
Dissociation	0.99 ± 1.35	0.62 ± 0.98	62.67	<.0001

Table 3. Associations between eating disorder symptoms, parenting, family support, and symptoms of anxiety, obsession-compulsion, depression, and somatoform disorders

	Anxiety symptom		Obsessive-compulsive symptoms		Depressive symptoms		Somatoform symptoms	
	β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p
Eating symptoms	3.20(0.25)	<.001	0.65(0.15)	<.001	6.08(0.79)	<.001	1.90(0.24)	<.001
Gender (male vs. female)	-0.47(0.16)	.003	0.30(0.04)	<.001	-0.47(0.20)	.018	-0.16(0.06)	.011
APGAR	-0.99(0.18)	<.001	-0.21(0.04)	<.001	-2.09(0.23)	<.001	-0.33(0.07)	<.001
Paternal education of college and higher	-0.73(0.16)	<.001	-	-	-	-	-0.13(0.06)	.049
Maternal education of college and higher	-	-	-0.11(0.05)	.017	-	-	-	-
Paternal care	-1.33(0.23)	<.001	-0.23(0.05)	<.001	-1.95(0.31)	<.001	-0.62(0.09)	<.001
Paternal protection	1.29(0.24)	<.001	0.24(0.05)	<.001	0.99(0.31)	.001	0.38(0.10)	<.001
Maternal care	-0.98(0.24)	<.001	-	-	-1.35(0.31)	<.001	-0.24(0.10)	.021
Maternal protection	1.12(0.23)	<.001	0.13(0.05)	.007	1.74(0.30)	<.001	0.20(0.09)	.033
Eating symptoms x Gender	-	-	0.22(0.11)	.047	-	-	-	-
Eating symptoms x Paternal education	-	-	-0.29(0.14)	.039	-1.28(0.60)	.032	-	-
Eating symptoms x Paternal care	-	-	-0.32(0.14)	.026	-1.72(0.83)	.037	-	-
Eating symptoms x Maternal care	-	-	-	-	-	-	-0.79(0.26)	.003

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