

Childhood Sexual Abuse and Its Association with Clinical and Psychological Features in Patients with Eating Disorders in China

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Background: To investigate the incidence of childhood sexual abuse (CSA) and its association on the clinical and psychological characteristics of patients with eating disorders (EDs).

Methods: In total, 970 patients, including 51 males and 919 females, were included in this study during 2008–2015. A cross-sectional survey was conducted using the Eating Disorder Questionnaire (CSA was assessed with two brief yes/no questions) and Eating Disorder Inventory. The patients were divided into two groups based on their CSA experience and into four groups based on the Diagnostic and Statistical Manual of Mental Disorders IV. Demographic, clinical, and psychological characteristics were compared between the two groups. A general linear model was used to explore interactions between ED subtypes and CSA and moderator effect models were used to assess how CSA influenced the relationship between psychological features and binge eating in bulimia nervosa (BN) and EDs not otherwise specified.

Results: The prevalence of CSA among patients with eating disorders was 8.4%, aligning with the general population in China. Those with a history of CSA exhibited significantly higher scores on psychological measures, with the exception of fear of maturity. Anorexia nervosa of the restricting type, had a lower rate of 4.9%, showing minimal association on this subtype. BN had the highest incidence of abuse of 12.6%. CSA history was significantly associated with higher ineffectiveness scores in both BN and EDNOS groups. CSA significantly moderated the associations between psychological traits (drive for thinness, bulimia, and interoceptive awareness) and binge eating frequency, with stronger associations observed in individuals without a history of CSA.

Conclusion: This study showed a nuanced interaction between CSA history and ED psychopathology. This emphasizes the need for clinicians to consider a history of CSA when assessing and treating individuals with EDs, especially BN and EDs not otherwise specified, as it may influence the severity and presentation of the disorder.

Keywords: eating disorders, childhood sexual abuse, China, diagnosis subtypes, psychological features

Introduction

Eating disorders (EDs) are serious mental disorders with the highest mortality rates among all mental disorders.^{1–3} They typically have a protracted course that lasts for years, resulting in many years lived with disability, significant caregiver burden, and heavy burden of healthcare costs.^{4–6} EDs are divided into four types based on the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV). An increasing number of studies have found that the prevalence of eating disorders is increasing in Asian countries, including China.^{7–11} The etiology and pathological mechanisms remain unclear.^{12,13}

Childhood sexual abuse (CSA) is a well-documented risk factor, which involves inducing or coercing a child to engage in sexual acts, including fondling, penetration, and exposure to other sexual activities.^{14–17} CSA is a complex

trauma associated with a wide range of mental health problems, sexual problems, and inter- and intrapersonal difficulties in adulthood.¹⁸ Although many studies have examined the link between CSA and EDs, findings remain inconsistent.^{16,19–22} Some report that CSA increases risk for bulimia nervosa (BN) and binge-eating disorder (BED) but not for anorexia nervosa (AN).²³ Others suggest that CSA is associated with all disorders characterized by binge-eating behaviors, including AN binge-purge type (AN-BP).²⁴ Overall, CSA mainly affects patients with binge eating behavior and related disorders.²¹

Importantly, research on this topic in Chinese populations is scarce, despite potential cultural differences that may influence both trauma disclosure and ED presentation. In China, CSA remains underreported due to stigma and family-related values emphasizing harmony and restraint, which may obscure its true prevalence and clinical association. Therefore, understanding these associations in a Chinese clinical context is essential for culturally informed assessment and intervention. This study aimed to investigate the prevalence of CSA among patients with EDs and to examine its association with clinical and psychological characteristics across diagnostic subtypes. We hypothesized that patients with a history of CSA would exhibit more severe psychological symptoms than those without such history, and that specific psychological traits (eg, drive for thinness, bulimia, interoceptive awareness) might moderate the relationship between CSA and binge-eating behaviors.

Methods and Materials

Participants

This study focused on patients diagnosed with ED recruited from the outpatient clinic of the Sixth Hospital of Peking University during 2008–2015 consecutively. All participants were enrolled in the Eating Disorders Registration Project (ED-RP), a structured data collection initiative designed to support clinical care and research on eating disorders. Detailed information regarding the registry procedures and assessment protocols has been reported previously.²⁵

Inclusion criteria were as follows: (1) a diagnosis of an ED according to DSM-IV criteria; (2) the ability to comprehend and complete self-report questionnaires; and (3) provision of written informed consent by the patient or their legal guardian. Exclusion criteria included: (1) severe psychiatric disorders such as intellectual disability, organic mental disorders, schizophrenia, or bipolar disorder; (2) self-harm, suicidal behavior, or major depressive disorder; and (3) severe physical illness or abnormal laboratory findings (eg, severe anemia, markedly elevated liver enzymes) deemed unsuitable for participation by physicians.

A total of 1056 patients were initially enrolled. Following data quality control and the exclusion of cases with missing essential information, the final analytic sample consisted of 970 patients with EDs, including 51 males and 919 females. The disposition of the participants is detailed in the flow diagram ([Supplementary Method](#) and [Figure S1](#)).

Ethics, Consent, and Permissions

This study was approved by the Independent Ethics Committee of the Peking University Institute of Mental Health (Approval No. 2018-8-28-1). Written informed consent was obtained from all participants after the study procedures were explained. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Questionnaire

Eating Disorder Questionnaire, EDQ

The Eating Disorder Questionnaire (EDQ) was developed as a self-assessment tool to gather information from patients undergoing treatment for EDs, as referenced in prior research.²⁶ In this study, the EDQ was utilized to collect comprehensive demographic data from patients, including sex, age, age at onset, duration of illness, educational background, occupation, and marital status. Additionally, the questionnaire captured a detailed weight history, along with behavioral symptoms, such as dieting, binge eating, and purging. In the EDQ questionnaire, 2 items constitute the CSA experiences, asking participants, “Before you were 18, did any of the following happen to you? (Respond with Yes or No).” The questions include: (1) Family Sexual Abuse: Someone from your family

forced you to engage in sexual activities (eg, unwanted touching, fondling, sexual kissing, or intercourse). (2) Non-Family Sexual Abuse: Someone outside your family forced you to engage in sexual activities (eg, unwanted touching, fondling, sexual kissing, or intercourse). Participants who responded “Yes” to either question were classified as having a history of CSA.

Eating Disorder Inventory-I, EDI-I

The EDI-I, a globally recognized self-rating scale, has been tested for reliability and validity within the Chinese context by local scholars.²⁷ Comprising eight distinct subscales, the EDI-I delves into areas, such as the pursuit of thinness, dissatisfaction with one’s body, bulimic tendencies, feelings of inefficacy, perfectionism, mistrust in interpersonal relationships, awareness of internal bodily states, and apprehension towards maturity. The scale specifically targets core eating disorder symptoms commonly associated with AN and BN, particularly through its first three subscales. Additionally, it evaluates attitudes and behaviors related to eating, weight, and body shape as well as a range of psychological traits relevant to eating disorders. This comprehensive assessment includes 64 items, each scored on a six-point scale ranging from one (never) to six (always). A higher cumulative EDI-I score indicates severe symptomatology.

Statistical Analysis

Demographic Analysis

Patient data, including diagnostic subtypes, history of CSA, age, sex, comorbidity status, psychological features, and BMI were comprehensively compiled and analyzed using SPSS. The eight psychological features included in the analysis were the drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, and maturity fears. Descriptive statistical analyses were performed according to CSA conditions to outline the basic data distribution. Chi-square tests were utilized to assess differences in categorical variables, such as sex and comorbidity status, between patients with and without a history of CSA. For continuous variables, such as age, BMI, ideal BMI, and psychological features, the analysis was conducted using independent sample *t*-tests (Table 1).

Table 1 Comparison of the Effects of Childhood Sexual Abuse on the Clinical and Psychological Characteristics of Eating Disorders

	CSA (81)	Non-CSA (889)	T/χ^2	Cohen's d/ Cramer's V	P	Power
Gender (M/F)	2/79	49/840	1.380	0.038	0.240	0.218
Age	21.67±5.14	20.49±4.90	2.065	0.240	0.039	0.565
Education	2.95±1.16	2.78±1.28	1.117	0.130	0.264	0.201
Course	5.14±4.21	3.97±3.46	2.261	0.335	0.027	0.635
Hospitalization (Yes/No)	99/722	18/52	10.545	0.019	<0.001	0.901
Employment (Yes/No)	57/23	631/233	0.118	0.011	0.732	0.063
Diagnosis	—	—	10.461	0.104	0.015	0.796
AN-R	14 (4.9%)	274 (95.1%)	—	—	—	—
AN-BP	13 (8.7%)	136 (91.3%)	—	—	—	—
BN	31 (12.6%)	215 (87.4%)	—	—	—	—
EDNOS	23 (8.0%)	264 (92.0%)	—	—	—	—
Comorbidity (Y/N)	23/58	212/677	0.836	0.029	0.360	0.149
BMI	18.45±3.06	17.58±3.67	2.408	0.279	0.018	0.690
DT	4.37±1.39	3.83±1.48	3.162	0.367	0.002	0.884
B	4.20±1.39	3.40±1.61	4.837	0.561	<0.001	0.996
BD	4.03±1.26	3.62±1.21	2.952	0.342	0.003	0.835

(Continued)

Table 1 (Continued).

	CSA (81)	Non-CSA (889)	T/χ^2	Cohen's d/ Cramer's V	P	Power
I	3.95±0.93	3.52±0.95	3.904	0.453	<0.001	0.973
P	4.19±1.04	3.91±1.03	2.305	0.267	0.021	0.648
ID	3.47±1.07	3.09±1.07	3.070	0.356	0.002	0.864
IA	3.94±1.07	3.46±1.19	3.488	0.405	0.001	0.936
MF	3.61±0.88	3.51±0.88	0.967	0.112	0.334	0.165

Notes: Categorical variables were compared using χ^2 -tests, and results are presented as n (absolute frequencies). For continuous variables, results are presented as Mean $\pm$ SD. Hospitalization status was coded as "Yes" for those who had been admitted to a psychiatric or medical ward due to eating disorder symptoms; data were missing for 79 participants. Education was coded as follows: 1 = middle school or below; 2 = high school or equivalent; 3 = university (not yet graduated); 4 = university graduate; 5 = master's degree (not yet graduated); 6 = master's graduate; and 7 = doctoral studies or above. Education was analyzed and presented as a continuous variable. Education data were missing for 3 participants. Illness duration data were missing for 159 patients. Employment status was coded as "working" if the participant was employed or currently enrolled in school; employment information was missing for 26 patients.

Abbreviations: AN, Anorexia nervosa; B, Bulimia; BD, Body dissatisfaction; BMI, Body mass index; BN, Bulimia nervosa; BP, Binge-eating/purging type; CSA, Childhood sexual abuse; DT, drive for thinness; EDNOS, eating disorder not otherwise specified; F, Female; I, Ineffectiveness; IA, interoceptive awareness; ID, Interpersonal distrust; M, Male; MF, fear of maturity; NA, Not Applicable; P, Perfectionism; R, Restricted.

Interaction Effects Between Diagnosis Subtypes and CSA History

The principal aim of this analysis was to examine the influence of two critical factors, CSA and diagnosis subtype, on a range of clinical features. This study aimed to ascertain whether different diagnostic subtypes are associated with distinct patterns of CSA. Multivariate Analysis of Variance was employed to investigate the potential interaction effects between the diagnostic subtype and history of CSA on these variables. Post hoc analyses were conducted to compare the psychological feature profiles across various diagnosis subtypes. Statistical significance was defined using a Bonferroni-adjusted threshold ($\alpha = 0.05/8 = 0.00625$). Unless otherwise specified, *p*-values reported in the text are uncorrected (raw); we explicitly indicate which results remain significant after Bonferroni correction.

Moderator Analysis: CSA as Moderators

To examine how CSA influences the relationship between psychological features and binge-eating frequency, moderation analyses were conducted using the PROCESS macro in SPSS. In these models, CSA (yes/no) was entered as the moderator, psychological traits as predictors, and binge-eating frequency as the dependent variable. The significance of these interactions was determined using bootstrap confidence intervals, offering insights into the potential moderating role of CSA in the interplay between psychological traits and binge eating behavior.

Exploratory Analyses of Functional Impairment and Temporal Trends

CSA-related functional impairments (work/study performance, family relationships, and drunk driving) were compared using Pearson's chi-square tests. Due to missing data exceeding 20%, no imputation was performed. Additionally, to evaluate potential temporal trends, an Analysis of Covariance (ANCOVA) was conducted to assess the effect of enrollment year on psychological features. Enrollment year was treated as a continuous covariate in a General Linear Model, adjusting for diagnostic subtype, CSA history, and their interaction.

Results

Demographic and Clinical Characteristics

In the current study, the prevalence of CSA among patients with eating disorders (EDs) was 8.4% ($n = 81$). The prevalence varied significantly across ED subtypes ($\chi^2 = 10.461$, $p = 0.015$), with Bulimia Nervosa (BN) patients demonstrating the highest prevalence (12.6%), followed by AN-BP (8.7%) and EDNOS (8.0%), while AN-R patients showed the lowest prevalence (4.9%). Regarding clinical characteristics, patients with a history of CSA were significantly older ($t = 2.065$, $p = 0.039$) and had a longer illness duration ($t = 2.261$, $p = 0.027$) than those without. Notably, the CSA

group exhibited a significantly higher rate of prior psychiatric hospitalization ($\chi^2 = 10.545$, $p < 0.001$). The CSA group also had a significantly higher mean BMI (18.45 ± 3.06 vs 17.58 ± 3.67 kg/m²; $t = 2.408$, $p = 0.018$). No significant differences were observed in gender distribution ($p = 0.240$), education level ($p = 0.264$), employment status ($p = 0.732$), or psychiatric comorbidity ($p = 0.360$).

As for psychological features, the CSA group scored significantly higher across nearly all EDI-1 subscales based on raw p-values. Significant differences were observed in drive for thinness ($t = 3.162$, $p = 0.002$), bulimia ($t = 4.837$, $p < 0.001$), body dissatisfaction ($t = 2.952$, $p = 0.003$), ineffectiveness ($t = 3.904$, $p < 0.001$), perfectionism ($t = 2.305$, $p = 0.021$), interpersonal distrust ($t = 3.070$, $p = 0.002$), and interoceptive awareness ($t = 3.488$, $p = 0.001$). After applying the Bonferroni correction for multiple comparisons across the eight psychological subscales ($\alpha = 0.05/8 = 0.00625$), all previously mentioned traits remained statistically significant except for perfectionism ($p = 0.021$). The results are presented in [Table 1](#).

Main Effects of Diagnosis Subtypes

The main effects of diagnostic subtypes were observed for several psychological features ([Table 2](#)). Specifically, significant differences remained after Bonferroni correction ($\alpha = 0.00625$) in drive for thinness ($F = 68.193$, $p < 0.001$), bulimia ($F = 242.312$, $p < 0.001$), body dissatisfaction ($F = 63.507$, $p < 0.001$), ineffectiveness ($F = 30.916$, $p < 0.001$), perfectionism ($F = 15.297$, $p = 0.002$), and interoceptive awareness ($F = 27.940$, $p < 0.001$). Interpersonal distrust ($F = 10.792$, $p = 0.021$) and maturity fears ($F = 3.772$, $p = 0.174$) did not reach statistical significance after correction. Post hoc comparisons for the diagnostic subtypes are presented in [Supplementary Table S1](#).

Main Effects of CSA

Within the model incorporating CSA, significant main effects were observed for several psychological features ([Table 2](#)). Specifically, CSA was associated with higher levels of bulimia ($F = 11.295$, $p = 0.005$) after Bonferroni correction ($\alpha = 0.00625$). Additional associations were observed for drive for thinness ($F = 8.472$, $p = 0.028$), body dissatisfaction ($F = 5.772$, $p = 0.049$), ineffectiveness ($F = 4.923$, $p = 0.013$), interpersonal distrust ($F = 6.604$, $p = 0.015$), and interoceptive awareness ($F = 7.889$, $p = 0.012$); however, these did not survive Bonferroni correction. These findings suggest that a history of CSA was particularly linked to bulimic symptomatology.

Interaction Effects Between Diagnosis Subtypes and CSA

Multivariate analysis of variance revealed significant interaction effects between diagnostic subtype and CSA history on several psychological dimensions ([Table 2](#)). Specifically, significant interactions were observed for both drive for thinness ($F = 2.974$, $p = 0.031$) and bulimia ($F = 4.600$, $p = 0.003$). After applying the Bonferroni correction ($\alpha =$

Table 2 Effects of Diagnosis Subtypes and Childhood Abuse on Psychological Features in Full Sample

	Diagnosis Effect			CSA Effect			Interaction Effect		
	F	P	η_p^2	F	P	η_p^2	F	P	η_p^2
DT	13.056	<0.001	0.039	4.866	0.028	0.005	2.974	0.031	0.009
B	56.686	<0.001	0.150	7.927	0.005	0.008	4.600	0.003	0.014
BD	17.161	<0.001	0.051	3.884	0.049	0.004	1.560	0.198	0.005
I	12.831	<0.001	0.038	6.130	0.013	0.006	1.004	0.390	0.003
P	4.963	0.002	0.015	1.158	0.282	0.001	1.624	0.182	0.005
ID	3.260	0.021	0.010	5.983	0.015	0.006	0.283	0.838	0.001
IA	7.500	<0.001	0.023	6.353	0.012	0.007	0.637	0.591	0.002
MF	1.659	0.174	0.005	0.056	0.813	0.000	1.135	0.334	0.004

Notes: p-values are uncorrected (raw). Bonferroni correction ($\alpha = 0.05/8 = 0.00625$) was applied for multiple comparisons across eight psychological variables.

Abbreviations: CSA, childhood sexual abuse; DT, drive for thinness; B, bulimia; BD, body dissatisfaction; I, ineffectiveness; P, perfectionism; ID, interpersonal distrust; IA, interoceptive awareness; MF, fear of maturity.

0.00625), the interaction effect for bulimia remained statistically significant, whereas the effect for drive for thinness did not survive the correction. Notably, these results remained significant when analyzed within the female subgroup alone ([Supplementary Table S2](#)).

While no significant differences based on CSA history were observed in AN-R, AN-BP, or BN subtypes, patients in the EDNOS group with a history of CSA exhibited significantly more severe psychopathological features. This pattern was particularly evident in drive for thinness (CSA: $M \pm SD = 4.74 \pm 1.12$ vs non-CSA: 3.92 ± 1.37 , $p = 0.006$), bulimia (CSA: 4.51 ± 1.05 vs 3.34 ± 1.43 , $p < 0.001$), and ineffectiveness (CSA: 4.13 ± 0.79 vs 3.57 ± 0.89 , $p = 0.004$), which remained significant after Bonferroni correction ([Table 3](#) and [Supplementary Tables S3–S6](#)).

Moderation Analysis: CSA as Moderators

The moderation analysis revealed significant moderating effects of CSA on the associations between the psychological traits drive for thinness (coefficient = -0.545 , $P = 0.027$), bulimia (coefficient = -0.508 , $P = 0.011$), and interoceptive awareness (coefficient = -0.734 , $P = 0.010$) and binge eating frequency ([Supplementary Table S7](#)). Stratified analyses demonstrated significant effects among females ([Supplementary Table S8](#)). CSA history moderated the relationship between these traits and binge eating frequency in the BN and EDNOS groups, with stronger associations observed in individuals without a history of CSA ([Figure 1](#)).

Functional Impairment and Temporal Trends

Additional analyses revealed that CSA was associated with greater functional impairments in work or study performance ($\chi^2 = 15.219$, $p < 0.001$, Cramer's $V = 0.149$, Power = 0.947) and family conflict ($\chi^2 = 15.696$, $p < 0.001$, Cramer's $V = 0.159$, Power = 0.977), as shown in [Supplementary Table S9](#). These findings suggest that the psychological consequences of CSA extend beyond core eating pathology to broader domains of daily functioning.

Furthermore, the ANCOVA results indicated that enrollment year had no significant impact on any of the eight psychological features (all $p > 0.05$; see [Supplementary Table S10](#) for details). These findings suggest that the psychological consequences of CSA are robust and extend to broader domains of functioning, regardless of temporal trends during the study period.

Discussion

This was the first large-sample survey on CSA conducted among individuals with EDs in Mainland China. In this large-sample survey, we observed a relationship between different ED subtypes and CSA. The prevalence of CSA among patients with EDs (8.4%) was comparable to that reported in community samples in China. However, this finding should be interpreted cautiously, as CSA may be substantially underreported due to stigma, cultural taboos, and brief assessment methods.²⁸ The observed prevalence in our sample is notably lower than that reported in studies conducted in Western countries, such as the United States and those in Europe.^{29–33}

Furthermore, our analysis revealed that individuals with EDs who had a history of CSA tended to exhibit more pronounced manifestations of core ED symptoms and other associated psychological traits. Within the spectrum of different diagnosis subtypes, the prevalence of CSA is highest among individuals diagnosed with BN. Moreover, among individuals with BN, CSA was associated with a heightened sense of ineffectiveness. These findings underscore the intricate interplay between CSA and EDs and shed light on the unique characteristics and challenges faced by affected individuals in Mainland China.

Anorexia Nervosa and CSA

In the current study, the prevalence of CSA among individuals within the AN subgroup was not higher than that among other ED subtypes or an epidemiological survey targeting the general population.³⁴ Importantly, our findings resonate with international research that similarly failed to establish a robust association between CSA and restricting AN.^{22,35} To understand these findings, it is crucial to consider the complex etiology and pathological mechanisms underlying EDs. These conditions are influenced by several factors, including genetics, prenatal and perinatal risks, and adverse childhood experiences.³⁶ Current evidence suggests that biological factors play a larger role in the development of AN,^{13,37–39} whereas

Table 3 Multivariate Analysis of Variance on the Association of “Diagnostic Subtypes and Childhood Maltreatment” with “Clinical and Psychological Characteristics” of Patients with Eating Disorders

	Anorexia Nervosa – Restricted (288)			Anorexia Nervosa – BP (149)			Bulimia Nervosa (246)			ED Not Otherwise Specified (287)		
	CSA	Non-CSA	p	CSA	Non-CSA	p	CSA	Non-CSA	p	CSA	Non-CSA	p
Gender (M/F) ^a	1/13	13/261	0.684	0/13	7/129	0.402	0/31	11/204	0.198	1/22	18/246	0.648
Comorbidity (Y/N) ^a	1/13	46/228	0.341	5/8	37/99	0.389	11/20	59/156	0.354	6/17	70/194	0.964
Age	19.36±5.90	18.09±4.03	0.441	21.38±3.43	21.05±4.94	0.813	22.84±5.80	22.75±5.20	0.933	21.65±4.23	20.84±4.39	0.392
BMI	14.58±1.68	14.52±1.89	0.913	16.31±1.01	15.00±1.90	0.001	19.96±1.90	20.75±2.77	0.127	19.98±3.00	19.50±2.95	0.450
DT	3.65±1.87	2.96±1.50	0.097	4.10±1.53	3.94±1.31	0.687	4.54±1.17	4.77±0.95	0.305	4.74±1.12	3.92±1.37	0.006
B	2.42±1.23	2.03±1.07	0.181	4.18±1.45	3.98±1.38	0.628	4.77±1.04	4.87±0.90	0.582	4.51±1.05	3.34±1.43	<0.001
BD	3.18±1.15	3.01±0.98	0.521	3.67±1.24	3.33±0.86	0.198	4.27±1.21	4.32±1.14	0.790	4.44±1.18	3.82±1.29	0.025
I	3.16±1.10	3.07±0.94	0.708	3.88±0.73	3.77±0.95	0.692	4.20±0.87	3.87±0.81	0.037	4.13±0.79	3.57±0.89	0.004
P	3.57±0.79	3.67±1.05	0.735	3.91±1.01	4.08±1.11	0.585	4.40±1.12	4.09±0.96	0.096	4.42±0.96	3.93±0.97	0.020
ID	3.19±1.05	2.77±1.09	0.154	3.56±1.17	3.21±1.05	0.251	3.69±1.13	3.33±0.95	0.059	3.30±0.93	3.17±1.08	0.573
IA	3.36±1.12	2.90±1.19	0.162	4.01±1.03	3.82±1.13	0.572	4.07±0.98	3.90±1.00	0.366	4.06±1.11	3.49±1.14	0.021
MF	3.59±0.89	3.42±0.89	0.486	3.42±0.80	3.74±0.92	0.233	3.82±0.97	3.60±0.85	0.184	3.45±0.77	3.42±0.84	0.880

Notes: ^aThese variables were compared by using χ^2 tests. P-values are shown uncorrected (raw). Bonferroni correction ($\alpha = 0.05/8 = 0.00625$) was applied for multiple comparisons across eight psychological variables. P-values indicating statistical significance are highlighted in bold in the main text. Detailed statistical values, including t-statistics, χ^2 values, and effect sizes (Cohen's d and Cramer's V), are provided in [Supplementary Tables S3–S6](#) for each respective diagnostic subgroup.

Abbreviations: M, male; F, female; Y, yes; N, no; CSA, childhood sexual abuse; BP, binge-eating/purging type; ED, eating disorder; DT, drive for thinness; B, bulimia; BD, body dissatisfaction; I, ineffectiveness; P, perfectionism; ID, interpersonal distrust; IA, interoceptive awareness; MF, fear of maturity.

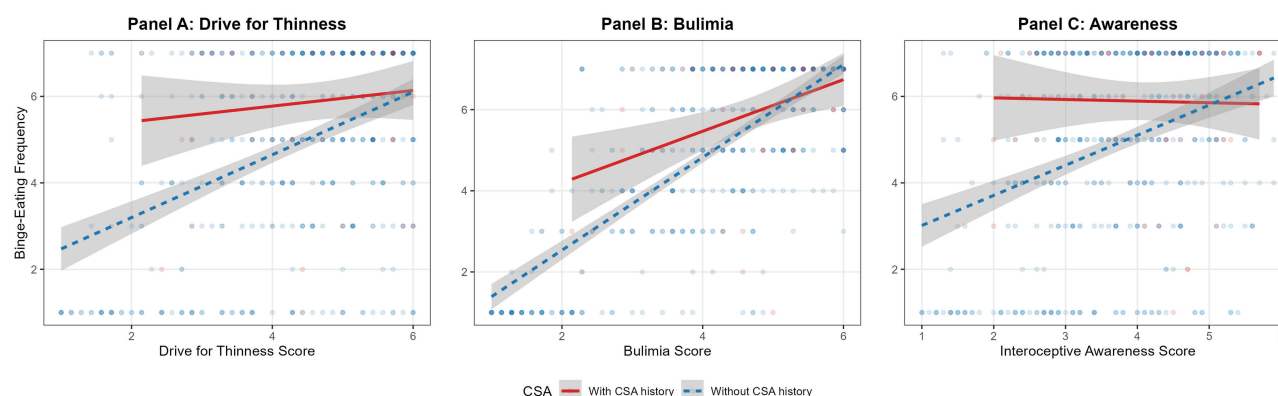


Figure 1 Moderation Effects of Psychological Traits on the Relationship Between Childhood Sexual Abuse and Binge Eating Frequency in BN and EDNOS Groups. (A–C) illustrate the moderating effects of Drive for Thinness (A), Bulimia (B), and Awareness (C) on the relationship between childhood sexual abuse (CSA) and binge-eating frequency in the combined BN and EDNOS sample. The x-axis represents psychological trait scores, and the y-axis represents binge-eating frequency, with higher values indicating more frequent binge-eating episodes. Lines depict model-predicted binge-eating frequency for individuals with and without a history of CSA, estimated from moderation models in which psychological traits were mean-centered prior to analysis.

people with binge spectrum disorders have slightly lower levels of heritability.⁴⁰ A notable aspect of our study is its pioneering nature in the Chinese population. To the best of our knowledge, this is the first study to report these findings in a Chinese population. By shedding light on the distinct characteristics of CSA prevalence in individuals with restricting AN in China, our study provides valuable insights into the global body of knowledge regarding EDs and their etiologies.

Bulimia Nervosa and CSA

This study suggests that CSA is significantly associated with the clinical presentation and psychological characteristics of BN and EDNOS. This finding underscores the profound link between CSA and the etiology of BN, highlighting its importance in understanding the complexities of this condition. In addition, individuals with BN who have experienced CSA display distinct personality traits and behavioral patterns. BN was the most significant characteristic, with CSA survivors exhibiting a higher propensity for bulimic behavior. Appropriate dietary behaviors are essential for the health of the nervous system.⁴¹ This observation emphasizes the centrality of binge eating and purging episodes in the clinical manifestations of BN in patients with a history of CSA. Furthermore, our study identified significant differences in body dissatisfaction and interpersonal distrust among CSA survivors with BN. Our results closely mirror those reported in studies conducted in other countries, demonstrating the robustness and consistency of the relationship between CSA and BN across diverse cultural contexts.^{23,24} These findings enhance our understanding of the complex interplay of factors contributing to BN and emphasize the need for comprehensive assessments and therapeutic interventions that address the unique challenges faced by individuals with a history of CSA in the context of this ED.

Beyond psychological correlates, recent international research has highlighted loneliness as a key psychosocial mechanism linking childhood trauma to eating pathology. For instance, loneliness might partially mediate the relationship between childhood trauma and eating disorder severity, suggesting that trauma-related social withdrawal and unmet attachment needs may exacerbate disordered eating behaviors.⁴² A systematic review further confirmed loneliness as a transdiagnostic factor across anorexia nervosa, bulimia nervosa, and binge eating disorder, reinforcing its role in both the development and maintenance of ED symptoms across cultural contexts.⁴³ These findings suggest that interventions fostering social connectedness and emotional regulation may help mitigate the enduring impact of early trauma on ED psychopathology.

Interaction Effects Between Diagnosis Subtypes and CSA

Examination of the interaction effects between diagnosis subtypes and the history of CSA has unveiled intriguing insights into the psychological profiles of individuals with different EDs. Specifically, our findings highlight the nuanced influence of the history of CSA on various aspects of EDs. Significant interaction effects were identified in the drive for

thinness and bulimia domains, underscoring the distinctive association of a CSA history across ED subtypes. This suggests that individuals with certain EDs and a history of CSA may exhibit heightened concerns regarding thinness and exacerbation of bulimic symptoms compared to their counterparts without such traumatic history. While causal relationships cannot be inferred, our findings underscore the importance of routinely screening for CSA in patients with eating disorders and providing trauma-informed, individualized interventions. Regarding the null finding in maturity fears, cultural influences - such as conservative attitudes toward sexuality and adult roles in Chinese society - may moderate the relationship between sexual trauma and maturity fears, leading to a culturally distinct manifestation of trauma-related psychopathology.⁴⁴

Clinical Significance and Statistical Robustness

In the full sample, the associations between CSA and core psychopathology - most notably bulimic symptoms and ineffectiveness - demonstrated moderate-to-large effect sizes and high statistical power. This confirms that the observed psychological impairments in CSA survivors are clinically substantial and not merely artifacts of the large sample size. Furthermore, our subgroup analyses highlight diagnostic heterogeneity. In the EDNOS subgroup, the impact of CSA was particularly robust, showing large effect sizes and near-maximal power. This identifies the EDNOS population as highly vulnerable to the psychological sequelae of trauma. Conversely, in the AN-R subgroup, the lack of statistical significance for certain traits (eg, drive for thinness) likely reflects limited power due to the smaller number of CSA cases rather than a true absence of effect. By reporting these metrics, we provide a more balanced view of how the clinical relevance of CSA varies across the eating disorder spectrum, supporting the need for subtype-specific, trauma-informed care.

Ineffectiveness as a Core Feature Linking CSA and BN & EDNOS

Ineffectiveness reflects pervasive feelings of powerlessness and loss of control over one's eating behaviors, body image, and emotions. This feeling often manifests as a belief that one's efforts to change eating habits, weight, or shape are futile, leading to a sense of hopelessness and frustration. This sense of helplessness has been closely associated with low self-esteem and impulsivity—key psychological features of BN and BED.^{45–47} CSA may intensify these traits by disrupting emotional regulation and self-concept.^{48,49} In our study, both BN and EDNOS patients with a history of CSA exhibited significantly higher levels of ineffectiveness. Given that EDNOS in our sample primarily comprised BED, these findings support ineffectiveness as a core psychological feature connecting CSA, BN, and BED.

Building upon these findings, clinical implications are evident. A trauma-informed assessment framework should be routinely implemented in eating disorder care to identify patients with a “maltreated ecophenotype,” characterized by heightened emotional dysregulation and treatment resistance.⁴⁹ Given the central role of ineffectiveness in CSA-positive BN and EDNOS, Dialectical Behavior Therapy (DBT) may be particularly useful, as its modules on emotion regulation and distress tolerance directly address the maladaptive coping patterns underlying binge-purge behaviors.⁵⁰ Moreover, integrated cognitive-behavioral approaches that treat trauma and eating pathology concurrently - such as combining CBT for EDs with Cognitive Processing Therapy (CPT) - have shown superior and sustained outcomes in reducing both PTSD symptoms and disordered eating.⁵¹ Such trauma-informed, integrative models may enhance recovery by simultaneously targeting emotion dysregulation and trauma-related cognitive distortions.

Building on this perspective, growing international evidence has further clarified how early trauma influences disordered eating through both psychosocial and neurobiological pathways. Studies across multiple cultural contexts have indicated that experiences of childhood maltreatment can heighten emotional distress and social isolation, with loneliness emerging as a key mediator between early trauma and eating pathology.⁵² Other research has demonstrated that childhood maltreatment is associated with alterations in stress-regulation systems—such as dysregulated hypothalamic–pituitary–adrenal (HPA) axis activity and structural brain changes in emotion-related regions—potentially increasing vulnerability to impulsive and affect-driven eating behaviors.^{53–55} Furthermore, cross-cultural investigations have consistently shown that early adverse experiences significantly elevate the risk of developing eating disorders, suggesting that the link between trauma and disordered eating transcends sociocultural boundaries.^{56,57}

Moderation Analysis: CSA as Moderators

The moderation analysis elucidates the complex interplay between CSA, psychological traits, and binge-eating frequency, particularly within the Bulimia Nervosa (BN) and EDNOS subgroups. Specifically, CSA significantly moderated the impact of “drive for thinness,” “bulimia,” and “interoceptive awareness” on binge-eating behavior. Two potential mechanisms may explain these patterns. First, individuals in the CSA group exhibited higher binge-eating frequencies and elevated psychological scores. This clinical profile may introduce a “ceiling effect,” where the association between psychological traits and binge-eating behavior reaches a plateau due to symptom saturation. This is supported by our post-hoc power analysis and observed moderate-to-large effect sizes, suggesting that the clinical impact of CSA is substantial. Second, in the CSA group, the increased severity of the disorder may diminish the relative predictive value of individual psychological regulation. These findings highlight the need for a nuanced, trauma-informed understanding of EDs. While the cross-sectional design precludes causal inferences, the results suggest that CSA serves as a pivotal moderator that alters how psychological characteristics relate to eating pathology.

Our moderation analysis reveals a critical divergence in the psychopathological structures of ED patients with and without CSA history. In the non-CSA group, binge-eating frequency remains closely coupled with core cognitive traits, such as “drive for thinness.” However, this association is significantly attenuated—or “decoupled”—in the CSA group, despite their more severe functional impairments. This phenomenon suggests a fundamental reshaping of regulatory mechanisms in trauma-exposed individuals. For CSA survivors, disordered eating may evolve into an entrenched, autonomous coping mechanism to alleviate trauma-related distress, rendering it less sensitive to traditional, ED-specific psychological fluctuations. Alternatively, the observed decoupling may indicate that survivors employ more destructive externalizing behaviors as a maladaptive substitution for disordered eating symptoms when facing acute emotional dysregulation. This necessitates a trauma-informed therapeutic shift beyond standard interventions like Enhanced Cognitive Behavior Therapy (CBT-E), prioritizing emotional stabilization and addressing interpersonal disruptions.¹⁵

Limitations

This study has some limitations. First, the cross-sectional design of the study limits the ability to infer causality between CSA and EDs. Longitudinal studies are required to establish a causal relationship and to understand the temporal dynamics between CSA and the onset or progression of EDs. Second, the study’s focus on a Beijing-based facility may not fully capture the regional and sociocultural diversity of China. Although our hospital serves as a national referral center for patients from various provinces, significant urban-rural differences in healthcare access and cultural attitudes toward mental health still exist. These factors may influence trauma disclosure patterns and the clinical presentation of eating disorders, meaning our findings should be generalized to other Chinese regions or international contexts with caution. Third, the study sample was drawn from a single outpatient clinic may limit the generalizability of the findings. Since these individuals were seeking tertiary psychiatric care, they may represent more severe or complex cases than those in the general population. Fourth, the reliance on self-reported data for CSA assessment may have introduced bias. Given the sensitive nature of sexual trauma and Chinese cultural values - such as “face-saving (*mianzi*)” and family harmony - participants may have under-reported their experiences. This potential under-reporting could lead to an underestimation of CSA prevalence and should be considered when interpreting our findings. Fifth, the assessment of CSA using only two yes/no items may have limited sensitivity and depth, which should be considered when interpreting the findings. Sixth, the absence of a non-clinical control group limits our ability to determine whether the observed CSA-related features are specific to eating disorders. Future research incorporating non-clinical controls is needed to validate the specificity of these associations. Seventh, the use of DSM-IV criteria reflects the period of data collection (2008–2015). Although the EDNOS group in this study primarily presented with binge-eating symptoms, the lack of formal DSM-5 BED categorization is a limitation, and the findings should be interpreted within this historical context. Eighth, the female predominance (94.7%) limits the generalizability of our results to males, who may exhibit distinct clinical and trauma profiles. While female-only sensitivity analysis confirmed our findings’ robustness, future studies with larger male samples are needed to explore these gender-specific relationships. Additionally, the study’s focus on CSA as

a singular factor in the etiology of EDs may have overlooked other significant contributing factors, such as genetic predispositions, other forms of abuse or trauma, and sociocultural influences. Finally, while this study provides crucial insights into the psychological features of patients with BN and EDNOS with a history of CSA, it does not fully explore the potential therapeutic implications of these findings. Despite these limitations, this study makes a significant contribution to the understanding of the relationship between CSA and EDs in a relatively under-studied population, offering a foundation for future research and clinical practice improvements in this field.

Conclusion

This study represents a pioneering effort to explore the prevalence of CSA and its association with various subtypes of EDs within an outpatient population in Mainland China, particularly highlighting its association with BN and atypical EDs. Moreover, the results indicated variability in the association of CSA across different ED subtypes, suggesting a nuanced interaction between CSA history and ED psychopathology. This emphasizes the need for clinicians to consider CSA history when assessing and treating individuals with EDs, as it plays a pivotal role in the disorder.

Data Sharing Statement

Data supporting the findings of this study are available from the corresponding author upon request.

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Disclosure

All authors declare that they have no conflicts of interest.

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