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A Comparison of Purging and Non-Purging Eating Disorder Patients in Comorbid Personality Disorders and Psychopathology

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Objective: We evaluated the significance of purging behavior in the diagnosis of eating disorders through an objective assessment of eating disorder psychopathology including personality disorders.
Methods: Subjects were 42 consecutive outpatients with eating disorders who visited the Outpatient Psychiatric Clinic at Tokai University Hospital (Kanagawa, Japan). Diagnosis of eating and personality disorders was established using the modified Structured Clinical Interviews for DSM-III-R and DSM-III-R-Axis II. Eating disorder symptoms and psychopathology were assessed with the Eating Disorder Examination, Eating Disorder Inventory 2, Beck Depression Inventory, and Leyton Obsessional Inventory Results were compared between purgers and non-purgers.
Results: Purgers had severe borderline or avoidant personality disorder, mixed personality disorder, eating attitude, depressive symptoms, and obsessive symptoms.
Conclusion: Purging behavior in eating disorder patients is associated with personality disorders, depression, and obsessive symptoms. Assessment of this behavior is critical in the diagnosis and treatment of eating disorders.

Key words : Purging, Eating Disorders, Personality Disorders, DSM-IV, DSM-IIIR

INTRODUCTION

Eating disorder patients present a wide variety of symptoms including restricting food intake, binge eating, and excessive exercise. In the subtyping of eating disorders, more attention has focused on dieting and binge eating than on purging behavior such as self-induced vomiting and the use of laxatives and/or diuretics. Purging behavior is common in both chronic anorectic and bulimic patients. This is supported by the finding that purging behavior may play an important role as one of the predictors for treatment outcomes in eating disorder patients [29, 44]. Purging behavior appears to be associated with greater psychopathology than binge behavior does because binge eating is frequently seen even in healthy individuals [33]. Conventional subtyping criteria for

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eating disorders based on dieting and binge eating do not reflect psychopathology of the disorders sufficiently. Subtypes of eating disorders are known to vary frequently within a patient, indicating unstable subtyping [27]. Few rationales thus support the use of such criteria. We evaluated the significance of assessment of purging behavior in eating disorder patients.

Interest has arisen recently in the psychopathology of purging behavior, although there is still little research in this area, first described by Beumont in 1976 [4]. Several studies have focused on purging behavior rather than binging behavior in order to evaluate the psychopathology of purging behavior. Garner *et al.* (1993) divided 380 patients with anorexia nervosa (AN) into three groups: restricting AN non-purgers (AN-R), restricting AN purgers (AN-RP), and bulimic AN (AN-B) [15]. They compared the psychopathology of purging behavior between these groups using the Eating Disorder Inventory (EDI), Beck Depression Inventory (BDI), and Hopkins Symptom Checklist. The comparison demonstrated that the psychopathology in the AN-RP group was greater than in the AN-R group and was equivalent to that in the AN-B group. This supports subtyping of eating disorders based on purging behavior rather than binging behavior. Willmuth *et al.* (1988) compared the psychopathology of purging behavior between purging and non-purging normal weight bulimics and showed that the psychology was more severe in the purging bulimics [46], O'Kearyney *et al.* (1998) compared the psychopathology between 77 purgers and 48 non-purgers using the EDI-2, BDI, Symptom Check List 90, and a self-report questionnaire based on the Eating Disorder Examination (EDE) [28]. The results indicated that the purgers had a more severe eating disorder with higher scores on sub-scales for eating disorder-specific psychopathology. The researchers concluded that purging behavior was a useful clinical index for differentiating the types of eating disorders. However, all these studies had two common limitations. One was the use of self-report questionnaires; the other was the assessment of eating disorder-specific psychopathology only.

Studies of purging behavior psychopathology require a comprehensive and objective assessment of psychopathology related to personality in addition to eating disorders. Numerous studies have been conducted on personality psychopathology, including early studies of perfectionism and suppressed emotion. Although subjective diagnostic criteria were used in the early studies, more objective assessment methods such as semi-structured and structured interviews have been used recently. Studies of personality disorders with a structured interview have demonstrated that 27% to 77% of eating disorder patients have concurrent personality disorders [17, 31]. Follow-up studies of eating disorders suggest that comorbid personality disorder is a predictor of poor outcome [16, 17, 20, 23]. Personality disorders have attracted attention in terms of possible prevention and appropriate treatment selection for eating disorders in clinical practice [38].

There have been few studies of the relationship between purging behavior and personality disorders, although assessment of this relationship appears to be critical in the diagnosis of and appropriate treatment selection for eating disorders. Bram *et al.* (1983) studied six eating disorder patients using the Diagnostic Interview for Borderlines to show that patients with a history of binge eating and vomiting are likely to meet the diagnosis criteria for borderline personality disorder [6]. Although this was a pioneer study that demonstrated the association of eating disorders with borderline personality disorder, the authors evaluated the association only with borderline personality in various personality disorders and used a small population size. Pryor *et al.* (1996) focused on laxative abuse, which is one type of purging behaviors [30]. They found that eating disorder patients with laxative abuse were characterized by perfectionism and avoidant personality disorder, and that bulimia nervosa patients with laxative abuse had passive aggressive and borderline personality disorder. This was a unique study of the association of eating disorders with a wide variety of personality disorders focusing on laxative abuse as the purging behavior. In addition, this study suggested an association of purging behavior with perfectionism and avoidant personality disorder. The methodological limitation of this study was the use of self-report scales.

In the present study, we evaluated the significance of purging behavior in the diagnosis of eating disorders using a more objec-

tive assessment of the impact of the behavior on the severity of various eating disorder psychopathology including personality disorders.

METHODS

Subjects

The subjects of this study were 42 consecutive outpatients with eating disorders who visited the Outpatient Psychiatric Clinic of Tokai University Hospital (Kanagawa, Japan). All the patients met the diagnostic criteria for eating disorders from a modified version of Structured Clinical Interview for DSM-III-R (SCID) Patient Edition (With Psychotic Screen) (SCID-P W/PSY SCREEN) [1, 36, 39]. This modification was established by changing several questions in the original version so that the criteria were compatible with DSM-IV criteria [2]. At that time, the DSM-IV version of SCID was not yet available. According to the criteria, the subjects consisted of eight patients with anorexia nervosa restrictive type, eight with anorexia nervosa binge-purging type, 11 with bulimia nervosa purging type, two with bulimia nervosa non-purging type, six with binge eating disorder, and seven with eating disorder not otherwise specified excluding binge eating disorder (Table 1). Informed consent was obtained from each patient.

Assessment Methods

A structured interview was used for diagnosis of eating disorder, major depression, and personality disorder as well as for a more objective assessment of eating disorder symptoms. Three self-report scales were used for AN integrated assessment of eating disorder psychopathology, depression, and obsession.

To make a diagnosis of eating disorder and major depression, sections regarding these disorders in the above-mentioned modified version of SCID-P W/PSY SCREEN were used [36, 39]. For diagnosis on Axis II, we modified the SCID for Axis-II (SCID-II) by adding several questions so that this method could be used to make a diagnosis on Axis II in both DSM-III-R and DSM-IV [36, 39].

Eating disorder symptoms were assessed with the 10th edition of the EDE that is a structured interview designed to assess the specific psychopathological characteristics of eating disorder patients [10, 11]. This method have five behavioral sub-scales: restricted eating, bulimia, eating concern, weight concern, and shape concern. A total score was determined for each patient.

Three self-report scales used in this study were as follows:

(1) EDI-2: This scale consists of eight primary sub-scales, each of which measures a dimension of symptomatology or psychological features relevant to eating disorders, and includes three additional scales that assess personality and behavioral aspects of eating disorder psychopathology [13, 14]. Subjects answer questions for nine items using a 6-point scale. The reliability and validity of Japanese version have been confirmed [34, 40].

(2) BDI: This is a well-known 21-item self-report scale that is designed to measure psychological and physiological symptoms of depression [3, 32].

Table 1. Subcategories of DSM-IV eating disorder diagnosis of 42 subjects

	Number	Percent
AN-R	8	19.0%
AN-BP	8	19.0%
BN-P	11	26.2%
BN-NP	2	4.8%
BED	6	14.3%
EDNOS	7	16.7%

AN-R: anorexia nervosa restrict type; AN-BP: anorexia nervosa binge purge type; BN-P: bulimia nervosa purge type; BN-NP: bulimia non-purge type; BED: binge eating disorder; EDNOS: eating disorder not other specified exclude BED.

(3) Leyton Obsessional Inventory (LOI): This scale assesses obsessive symptoms, character traits, experienced distress, and interference of obsession with routine activities [9]. It consists of 46 questions regarding obsessive symptoms and 23 questions regarding obsessive personality. When a subject answers yes to a question, two types of questions are added for further self-rating. One type of question is concerned with the degree of experienced distress, which is rated on a 5-point scale. A total score for this type of questions is regard as a "resistance" score. The other is concerned with the degree of interference of obsession with routine activities, which is rated on a 4-point scale. A total score for this type of questions is regarded as an "interference" score. The Japanese version of LOI has been shown to have adequate test-retest reliability [12, 43].

Purgers and Non-purgers

Within 2 weeks after the initial visit, all the patients were interviewed individually and filled out the self-report questionnaires. Two patients with anorexia nervosa restricting type could not complete the interview because of severe starvation; they were re-interviewed after their general condition slightly improved over 2 weeks after the initial visit.

One (T. W.) of the authors was involved in the EDE structured interview and diagnosis of major depression on the modified version of SCID-P W/PSY SCREEN in all the patients. Another author (K. M.) was responsible for diagnosis on SCID-II and diagnosis of eating disorder on the modified version of SCID-P W/PSY SCREEN in all the patients. No studies of inter-rater reliability were thus needed in the diagnosis of each disorder.

On the basis of EDE results, all the patients were divided into two groups: purgers and non-purgers. Purgers were defined as eating disorder patients with at least two episodes of laxative use, diuretic use, and/or self-induced vomiting per week on average in last three months. Patients who did not fulfill this definition were classified as non-purgers. There were 21 purgers and 21 non-purgers. Three patients were excluded because the frequency of their purging behavior was below the threshold and did not meet the diagnostic criteria for purgers. The purgers consisted of 16 (76.2%) patients with episodes of self-induced vomiting; two (9.5%) with episodes of diuretic abuse; and eight (38.1%) with episodes of laxative abuse. Five purgers had at least two of these behaviors.

Statistic Analysis

Wilcoxon's U-test was used to compare EDE, EDI-2, LOI, BDI scores, or the number of personality disorder diagnosed between the purger and non-purger groups. Sub-categories of eating disorders and the comorbidity rate of major depression were compared between the groups with the chi-square test. Fisher exact test was performed to compare coexistent personality disorders and major depression between the groups.

RESULTS

Demographic Data and Clinical Features

Table 2 summarizes demographic data and clinical features of the subjects. The purgers were significantly older that the non-purgers. No significant differences were found in the mean onset age or the mean body mass index.

Major Depression

Table 2 also lists eating disorder subcategories and major depression diagnosed on the basis of the modified SCID.

Comorbidity of Axis II Disorders

Results for comorbid personality disorders are shown in Table 3. At least one personality disorder was found in 11 purgers (57.4%) and six non-purgers (28.6%); five (23.8%) of the purgers and none of the non-purgers had two personality disorders or more. The purgers were more likely to have personality disorder.

Three most common personality disorders in all the patients were avoidant (n = 8), obsessive-compulsive (n = 7), and borderline personality disorders (n = 5). Avoidant personality disorder was found in seven purgers (33%) and one non-purger (4.8%), with a statistically significant difference. All five patients with borderline personality disorder were purgers, with a statistically significant difference in the comorbidity of borderline personality disorder between the purgers and the non-purgers. Two purgers had both avoidant and borderline personality disorders simultaneously, which limited statistic analysis. No significant differences

Table 2. Demographic and clinical features of 42 patients with eating disorders

	Purger n = 21		Non-purger n = 21			
	Mean	S.D.	Mean	S.D.	t-value	p
Mean age	22.8	4.1	20.0	4.5	2.106	0.042
Mean onset age	17.5	3.0	18.2	4.2	0.598	0.553
Mean BMI	17.5	3.9	18.0	4.7	0.324	0.748
	Number	Percent	Number	Percent	chi-squqre	
Diagnosed DSM-IV eating disorder subcategories						0.000
AN-R	0	0.0%	8	38.1%		
AN-BP	7	33.3%	1	4.8%		
BN-P	11	52.4%	0	0.0%		
BN-NP	0	0.0%	2	9.5%		
BED	0	0.0%	6	28.6%		
EDNOS	3	14.3%	4	19.0%		
	Number	Percent	Number	Percent	Fisher exact test	
Diagnosed DSM-IV major depression						
	7	33.0%	3	14.0%		0.277

Table 3. Comorbidity of DSM-IV axis II disorders in 21 purgers and 21 non-purgers

	Purger n = 21		Non-purger n = 21			
	Number	Percent	Number	Percent	p	
Count of diagnosed personality disorders					0.052	U-test
0	10	47.6%	15	71.4%		
1	6	28.6%	6	28.6%		
2	4	19.0%	0	0.0%		
3	1	4.8%	0	0.0%		
					p	Fisher
Specific personality disorders						
OB-CO	3	14.3%	4	19.0%	NS	
Avoidant	7	33.3%	1	4.8%	0.045	
Borderline	5	23.8%	0	0.0%	0.048	
Dependent	0	0.0%	1	4.8%	NS	
Antisocial	1	4.8%	0	0.0%	NS	
Schizoid	1	4.8%	0	0.0%	NS	

OB-CO: obsessive compulsive, NS: not significant

Table 4. DSM-IV and DSM-IIIR valiability in comorbidity of personality disorders

	DSM-IV		DSM-IIIR	
	Number	Percent	Number	Percent
Count of diagnosed personality disorders				
0	25	59.5%	30	71.4%
1	12	28.6%	4	9.5%
2	4	9.5%	6	14.3%
3 or more	1	2.4%	2	4.8%
Specific personality disorders				
OB-CO	7	16.7%	3	7.1%
Avoidant	8	19.0%	8	19.0%
Borderline	5	11.9%	6	14.3%
Dependent	1	2.4%	3	7.1%
Antisocial	1	2.4%	1	2.4%
Schizoid	1	2.4%	1	2.4%
Hysterical	0	0.0%	1	2.4%

OB-CO: obsessive compulsive

were found in the comorbidity of obsessive-compulsive personality disorder between the purgers and the non-purgers.

Table 4 presents differences in the diagnostic rate for personality disorders in the patients between DSM-III-R and DSM-IV criteria. Since the same physician made a diagnosis for each patient, there was no independence.

Eating Disorder Symptoms

The purgers scored significantly higher on all EDE sub-scales, except for restricted eating, than the non-purgers did (table 5).

Eating Disorder Psychopathology

The purgers scored higher on all EDI-2 sub-scales than the non-purgers did. There were statistically significant differences in the mean sub-scale scores for drive for thinness, bulimia, ineffectiveness, interoceptive awareness, asceticism, and impulse regulation (Table 5).

Obsession

The purgers scored higher on all LOI subscales than non-purgers did. There were statistically significant differences in the mean sub-scale scores for symptoms, traits, and interference (Table 5).

Depression

Comorbid major depression diagnosed on the basis of the modified SCID was more common in the purgers than in the non-purgers, with no statistically significant differences ($p = 0.27$) (Table 2). The mean BDI score was significantly higher in the purgers ($p < 0.000$) (Table 5).

To eliminate any impact of depression on each sub-scale score of EDE, EDI-2, and LOI from statistic analyses, residual scores were obtained. Simple regression analysis was performed to assess the relationship between BDI scores and each sub-scale score of EDE, EDI-2, and LOI. Residual scores were then determined by subtracting the variable that was explained by BDI scores from each subscale score. Analysis of the resulting residual scores demonstrated no statistically significant differences in each sub-scale score, except for bulimia subscale score of both EDE and EDI-2 and eating concern sub-scale scores of EDE, between the purgers and the non-purgers.

Table 5. Comparison of mean EDI-2, EDE, LOI and BDI scores for purgers and non-purgers

	Purger n = 21		Non-purger n = 21		U-test	Control BDI U-test
	Mean	S.D.	Mean	S.D.	p	p
EDI-DT	13.3	5.0	7.8	6.6	0.0081 **	0.1824
-B	12.6	7.0	5.6	6.0	0.0022 ***	0.0483 *
-BD	16.1	6.5	14.2	6.4	0.4196	0.2907
-I	18.1	6.6	10.4	6.9	0.0007 ***	0.3391
-P	5.4	4.6	4.5	4.1	0.5179	0.9799
-ID	7.3	5.3	5.5	3.9	0.2927	0.6506
-IA	14.7	7.0	5.7	5.6	0.0001 ***	0.0682
-MF	10.3	5.7	7.4	5.9	0.0695	0.7724
-A	9.1	4.5	5.4	3.8	0.0066 **	0.3082
-IR	9.0	7.4	4.2	4.9	0.0110 *	0.8602
-SI	10.2	5.6	7.6	4.7	0.1984	0.7724
EDE						
Restrait	2.2	1.7	1.3	1.4	0.0678	0.6507
Bulimia	4.0	2.2	1.3	1.6	0.0003 ***	0.0152 *
Eating concern	3.1	1.3	1.3	1.2	0.0001 ***	0.0403 *
Weight concern	3.0	2.1	1.5	1.4	0.0291 *	0.7820
Shape concern	3.3	1.7	1.9	1.1	0.0071 **	0.9099
LOI						
Symptom	18.5	9.2	12.0	6.3	0.0125 *	0.7037
Trait	10.6	3.8	7.2	3.9	0.0101 *	0.1631
Residence	17.7	11.0	11.9	8.3	0.0667	0.7353
Interference	13.3	12.2	6.1	5.8	0.0435 *	0.8217
BDI	30.1	7.2	17.3	9.2	0.0001 ***	

DT: Drive for Thinness, B: Bulimia, BD: Body Dissatisfaction, I: Ineffectiveness, P: Perfectionism, ID: Interpersonal Distrust, IA: Interoceptive Awareness, MF: Maturity Fears, A: Asceticism, IR: Impulse Regulation, SI: Social Insecurity.

DISCUSSION

1. Relationship Between Purging Behavior and Psychopathology

Eating disorder patients are known to have a variety of concurrent personality disorders. Our study demonstrated that the comorbidity rate of personality disorders was highest for avoidant personality disorder, followed by obsessive-compulsive and borderline personality disorders. Concurrent borderline and avoidant personality disorders were more common in purgers than in non-purgers. The personality disorder overlap rate was significantly higher in purgers. These results indicate the association of purging behavior with various personality psychopathologies such as impulsivity, marked mood shifts, unstable interpersonal relationship, and avoidance, suggesting more

serious personality disorders in purgers. Pryor *et al*. focused on laxative abuse as a purging behavior and found the association of personality disorders with this abuse on the basis of self-report scale scores [30]. We included diuretic abuse and self-induced vomiting as well as laxative abuse into purging behavior and used a more objective assessment method, *i.e*., a structured interview, to demonstrate the association of purging behavior with borderline and avoidant personality disorders. Our results support the usefulness of assessment of purging behavior including diuretic and laxative abuse and self-induced vomiting to predict borderline or avoidant personality disorder psychopathology. In contrast, the comorbidity rate of obsessive-compulsive personality disorder varied with the self-report scale used. On the basis of the DSM diagnosis made with the modified SCID-II, no differences were found in the rate between purgers and non-purgers. LOI scores showed the significantly higher comorbidity rate in purgers. This discrepancy seems to result from differences in the power and definition of obsessive-compulsive personality disorder between the scales used.

Our study also demonstrated that purgers had more severe non-personality disorder psychopathology such as eating disorders assessed by the EDE and EDI-2, depression assessed by the BDI, and obsessionality assessed by the LOI, compared with non-purgers. These results indicate that purging behavior can be used as an important index for assessment of overall eating disorder psychopathology including personality disorder psychopathology. Our results thus support a previous finding that the presence or absence of purging behavior is useful for subcategorizing eating disorders according to psychopathology, and suggest that purging behavior assessment can also be applied to personality disorder psychopathology [5, 15, 28, 37].

2. Racial Considerations

There have been two prior studies of the coexistence of eating disorders and personality disorders in Japanese patients using a structured interview. Ikuta (1990) assessed the influence of borderline personality disorder on clinical courses in Japanese patients with eating disorder [20]. They reported poor improvement in eating behavior and persistent impulsive behavior as well as major depression in patients with borderline personality disorder. These results are similar to those from Western studies. Matsunaga *et al*. (1998) studied all subtypes of personality disorders in Japanese patients with eating disorder using DSM-III-R criteria to show no significant differences in the comorbidity rate of overall personality disorders between Japanese and Western patients, although the comorbidity rate of histrionic personality was lower in Japanese patients [26].

In our study, approximately 40% and 30% of eating disorder patients met diagnostic criteria for at least one personality disorder from DSM-IV and DSM-III-R, respectively. The comorbidity rate of personality disorders was highest for avoidant personality disorder, followed by obsessive-compulsive and borderline personality disorders. For the subtypes of personality disorders, these results agree with those from previous studies using DSM-III-R criteria. On the basis of these discussion, the results of our study are unlikely to be specific to Japanese patients.

3. Influence of Differences in Diagnostic Criteria between DSM-III-R and DSM-IV

A comparison of the coexistence of eating disorders and personality disorders in our study with that in previous studies requires methodological discussion. Most studies of eating disorders and comorbid personality disorders have used diagnostic criteria from DSM-III-R, whereas we used those from DSM-IV. Slight fluctuations in diagnostic criteria for personality disorders between these systems may result in different subjects whose condition is diagnosed as personality disorder. In our study, there were more eating disorder patients with at least one personality disorder and fewer patients with two personality disorders or more when DSM-IV was used. The comorbidity rate was also different for several subtypes of personality disorders when DSM-IV was used. The number of eating disorder patients with obsessive-compulsive personality disorder was three for DSM-III-R and seven for DSM-IV. Similarly, patients with dependent, histrionic, and borderline personal disorder were decreased from three to one, from one to none, and from six to five, respectively. Differences in prevalence of personality dis-

orders should be considered in comparisons of studies of the disorders using DSM-III-R with those using DSM-IV.

4. Comorbidity of Depression

Our results show that concurrent depression was more common in purgers than in non-purgers. Eating disorder patients often present with depressive symptoms and often also have a family history of depression [7]. Eating disorders were once regarded as a subtype of depression, and many researchers studied the differences and/or similarities between the disorders and depression. Recent follow-up studies have demonstrated that in eating disorder patients, depressive symptoms are likely to occur after the onset of eating disorder and to subside with the improvement of the disorder [21, 42]. In contrast, there have been reports of eating disorder patients with prolonged depressive symptoms even after relief of eating disorder or with bipolar disorder with a certain frequency [35, 42]. A study has suggested genetic factors that are involved in both eating disorder and depression [45]. On the basis of these findings, the association of depression with eating disorder is now considered as a multifactorial relationship rather than a simple causal relationship [19]. Our results show that purging is one of the factors that contribute to concurrent depression in eating disorder patients.

In our study, a comparison of the comorbid depression rate between the sub-categories of eating disorder demonstrated that the rate was higher in the purgers than in the non-purgers. This is probably because a series of abnormal eating behaviors from binge eating to purging is associated with depression. Here a question arises. Which eating behavior is more likely to worsen depression, binge eating or purging behavior? There have been no accepted answers because these abnormal eating behaviors correlate [22, 2, 41]. A vicious circle of binge eating and purging behavior appears to worsen depression [24, 25].

5. Impact of Comorbid Depression on Assessment Methods

Depressive state has been shown to affect the assessment, particularly self-report assessment, of psychopathology and comorbid personality disorders in eating disorder patients [18]. In our study, few statistically significant differences were found in each sub-scale score of LOI, EDI-2, and EDE between purgers and non-purgers when impacts of depression on the scores were eliminated from statistic analysis. This is because of internal correlation between depression and each sub-scale score. The presence of this correlation merely indicates that there was some relationship between them. We cannot jump to the conclusion that depression rather than purging behavior was responsible for the differences in each sub-scale scores. Carroll *et al.* (1996) showed that high comorbidity rates of personality disorders with eating disorders do not result only from depression-related factors in personality disorder assessment [8].

It is noteworthy that a statistically significant difference remained in the bulimia and eating concern sub-scale scores of EDE between purgers and non-purgers after impacts of depression on each sub-scale scores of LOI, EDI-2, and EDE were eliminated from statistic analyses. Since binge purging was more common in purgers than in non-purgers, the bulimia sub-scale score was significantly higher in purgers, showing obviously that the score has no relationship with depression. The finding that a significant difference remained in the eating concern sub-scale score after elimination of impacts of depression on the score indicates higher eating concern in purgers with or without depression. This overthrows the assumption that purgers have lower eating concern because they can purge even after binge eating.

Further analysis of the eating concern sub-scale scores revealed that two scores for fear of losing control over eating and preoccupation with food, eating, or calories were higher in purgers. Purgers seem to have a fear of losing control over eating and try to maintain the control by purging behavior. This suggests that the fear is the central psychopathology of purging behavior that is not affected by depression. Further studies are expected to verify the causal relationship between the fear and purging behavior.

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