The Validity and Clinical Utility of Purging Disorder

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ABSTRACT

Objective: To review evidence of the validity and clinical utility of Purging Disorder and examine options for the Diagnostic and Statistical Manual of Mental Disorders fifth edition (DSM-V).

Method: Articles were identified by computerized and manual searches and reviewed to address five questions about Purging Disorder: Is there "ample" literature? Is the syndrome clearly defined? Can it be measured and diagnosed reliably? Can it be differentiated from other eating disorders? Is there evidence of syndrome validity?

Results: Although empirical classification and concurrent validity studies provide emerging support for the distinctiveness of Purging Disorder, questions remain about definition, diagnostic reliability in clinical settings, and clinical utility (i.e., prognostic validity).

Discussion: We discuss strengths and weaknesses associated with various options for the status of Purging Disorder in the DSM-V ranging from making no changes from DSM-IV to designating Purging Disorder a diagnosis on equal footing with Anorexia Nervosa and Bulimia Nervosa.

Keywords: purging disorder; classification; eating disorder not otherwise specified (EDNOS); Diagnostic and Statistical Manual of Mental Disorders (DSM)

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Introduction

At present, any clinically significant eating disturbance that is neither Anorexia Nervosa (AN) nor Bulimia Nervosa (BN) is diagnosed as Eating Disorder Not Otherwise Specified (EDNOS). Although "NOS" is intended as a residual category, in practice EDNOS captures a large proportion of patients presenting for treatment of a clinically significant eating disorder.[1,2] Similarly, community-based epidemiological studies have shown that most individuals with a clinical eating disturbance do not meet full criteria for AN or BN.[3–5] Because research largely has been directed at studying the eating disorders specifically recognized in DSM-IV, scientific knowledge about the prevalence, clinical correlates, risk factors for and treatment of EDNOS is limited. From a clinical perspective, the least is known about and the fewest treatment resources are available for the largest segment of patients seeking help for their eating problems.

The problem with the current nosology goes well beyond the fact that a large number of individuals cannot be given a specific diagnosis. A significant concern is that EDNOS includes a heterogeneous set of eating problems. The fourth edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV) provides six examples of clinical presentations that warrant a diagnosis of EDNOS; of these, Example 4 is the focus of our review: "the regular use of inappropriate compensatory behavior by an individual of normal body weight after eating small amounts of food"[6]; p. 594. Since the publication of the DSM-IV,[7] the term "Purging Disorder"[8] was introduced to give a name to and facilitate more systematic study of this particular EDNOS condition. We note that consistent with the term "compensatory" behavior, for the purposes of our review, purging is considered a symptom of Purging Disorder only when it is done for the purpose of weight or shape control. Therefore, our review does not consider studies of purging as a symptom associated with stress or anxiety, as a behavior expressing a religious practice (such as ritual cleansing using laxatives), or for other

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Supporting Information Table S1 may be found in the online version of this article.

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reasons unrelated to weight or shape (e.g., illness, extreme intoxication, withdrawal symptoms etc.).

Our review will focus on the overarching question of whether Purging Disorder should be introduced in the DSM-V (a) as a specific eating disorder (i.e., similar in "standing" to AN or BN), (b) within an expanded definition of AN or BN (which may or may not entail subtype status for Purging Disorder), (c) as a disorder in need of further study (i.e., placed in the appendix of DSM-V similar to how Binge Eating Disorder, BED, was introduced in the DSM-IV), or (d) whether no change should be made to how Purging Disorder is currently handled within the DSM-IV (i.e., it should remain an unnamed example within the list of possible EDNOS).

Whether to introduce a new disorder in the DSM-V depends in large part on the "clinical utility" of the diagnosis.[9,10] Can clinicians recognize and reliably diagnose Purging Disorder and does this diagnosis usefully inform course, outcome, and treatment decisions in ways that a diagnosis of EDNOS would not? Since DSM-III, concerns have been voiced about a proliferation of diagnoses and, as Blashfield et al.[11] have cautioned, once added, diagnostic categories are difficult to remove. Blashfield et al.[11] proposed five criteria to be considered when deciding whether to introduce a disorder in the DSM which include attention to clinical utility. One, there should be ample literature about the proposed syndrome. Two, the diagnostic criteria should be articulated clearly and assessment instruments should exist that may be used for determining whether an individual does or does not meet the criteria. Three, the proposed syndrome should be diagnosable with a high degree of reliability by independent assessors (clinicians). Four, evidence should be available that the proposed syndrome can be differentiated from other (similar) syndromes. And five, evidence should be provided regarding the coherence and validity of the syndrome, whereby validity is measured in part by clinically important variables such as differential treatment response, course, or outcome. Of note, these are not the only articulated set of criteria set forth for evaluating the validity or utility of including a diagnosis in nosological schemes. Thus, these criteria are not used to draw a final conclusion regarding what the fate of Purging Disorder should be in the DSM-V. Instead, they are used to provide a common framework for reviewing the different forms of evidence available for evaluating how Purging Disorder might be addressed in the DSM-V.

In this review, we explore the status of Purging Disorder according to Blashfield et al.'s[11] criteria. We also briefly describe gender, developmental, and cultural considerations concerning this syndrome. We conclude with options for consideration by the DSM-V Eating Disorders Work Group.

Method

Building upon a previous review article by Keel,[12] journal articles were identified by searching PubMed and PsycINFO for articles published (in print or electronically) as of Feb. 2009 (using the following search terms "Purging Disorder; Eating Disorder not Otherwise Specified; subthreshold or partial bulimia nervosa; purging), by searching ISI Web of Science for articles that had cited papers by Keel et al.,[8] Binford and le Grange,[13] or Wade et al.,[14] and by reviewing the reference lists of relevant journal articles for additional papers. Our search identified 30 articles available for an examination of definitions for Purging Disorder, and each article was coded for symptoms used for definition, name given to the syndrome, as well as diagnostic reliability, and mean purging frequency. Seven additional independent studies were found that described results of latent class or profile analysis for empirically classifying eating disorders. These articles were coded for resulting latent groups and the features associated with purging groups. Finally, studies comparing individuals with Purging Disorder to individuals with no eating disorder or with BN were coded in terms of the sample sizes and differences (or lack thereof) on a broad range of external validators.

Results

Criterion 1. Is There Ample Literature on Purging Disorder?

Blashfield et al.[11] recommended a minimum threshold of 50 journal articles, including at least 25 empirical articles, published about a proposed category in the 10 years leading up to its inclusion in the DSM. Although obtaining an accurate publication count is difficult because of the myriad of names used for Purging Disorder, the threshold number for empirical papers has been surpassed, as reflected in tables summarizing key findings of our review. We are aware of ~48 total journal articles that include the topic of Purging Disorder that have been published or are in press. We conclude that the "ample literature criterion" has been met for the number of empirical papers and may soon be met for the total number of published articles on this newly proposed syndrome. This literature provides a base for evaluating the merit of Purging Disorder as a diagnostic category in light of the remaining, more substantive, criteria.

Criterion 2. Is There a Common Set of Diagnostic Criteria for Purging Disorder and Are There Assessment Tools Available for Measuring the Syndrome?

A review published in 2007[12] found that no uniform set of criteria had been used across studies. However, there has been increasing consistency in terminology and definitions in more recent publications.[15–18] Table S1 has been updated from this previous review[12] and is available as Supporting Information Material. As described below, certain features have been used in a majority of studies, suggesting some uniformity in the conceptualization of the syndrome.

Recurrent purging to influence weight or shape has been included in most (26/30; 87%) articles in contrast to the use of compensatory behaviors—a broader feature that includes both purging (vomiting, laxatives, diuretics) and nonpurging (fasting, excessive exercise) behaviors. Among the 26 studies that included recurrent purging as a central feature, different methods of purging (i.e., self-induced vomiting or laxative abuse) have been included in at least 20 (77%). In five studies, purging was not explicitly defined, and one study reported on the presence of recurrent self-induced vomiting among women without binge eating.[19]

A recent article compared varying definitions of Purging Disorder in terms of resulting point prevalence estimates and evidence of syndrome validity using external validators.[20] Although a narrow definition which required purging through the use of self-induced vomiting, laxative or diuretic abuse to influence weight or shape resulted in the lowest point prevalence (and smallest sample size for analyses), this narrowly defined group demonstrated statistically significant differences from a non-eating disorder group on psychosocial adjustment. Moreover, large effect sizes were found for comparisons of this narrowly defined group and non-eating disorder controls across several external validators. In contrast, a broader definition of Purging Disorder that included those who engaged in any compensatory behaviors resulted in nonsignificant differences between the broad category and non-eating disordered individuals that were associated with small effect sizes. These results suggest that expanding the definition of Purging Disorder to include fasting or excessive exercise results in a more heterogeneous group that shows less distinct differences from normality.

Minimum frequency and duration of purging has varied considerably across studies. The highest frequency requirement has been a minimum of twice per week (in 15/30 articles; 50%), for a duration ranging from 4 weeks to 3 months. A handful of articles have used a minimum frequency of once per week, ranging in duration from 4 weeks to 6 months. The lowest frequency used has been a minimum of once per month with a duration ranging from one month to 3 months. Thus, wide discrepancies exist in the minimum frequency and duration used to define Purging Disorder in the extant literature.

In a study of EDNOS in 281 adolescent referrals from an eating disorders treatment program, Eddy et al.[21] found that 32 had purging episodes at least twice weekly for three months and 14 had purging at least once per month (but less than twice per week) for three months. Comparisons of these two purging groups revealed no significant differences. However, the number of subthreshold purgers was small, and it is unclear what proportion fell closer to the twice weekly requirement (i.e., purged once per week) vs. fell toward the lowest required threshold. Mirroring results of Eddy et al., Haedt and Keel[20] found that adjusting the frequency criterion for a diagnosis of Purging Disorder from twice per week to once per week increased the observed point prevalence of the syndrome in a college-based sample by ~50%, from 0.6% to 0.9% in women. In addition, both definitions of Purging Disorder resulted in groups that differed significantly from those without eating disorders on psychosocial adjustment, with nearly equivalent effect sizes.[20] Thus, reducing the minimum purging frequency to once per week did not reduce the homogeneity or clinical significance of the syndrome and allowed more individuals to move from the relatively heterogeneous and uninformative diagnosis of EDNOS to a homogeneous Purging Disorder group.

Spoor et al.[22] examined evidence of psychosocial impairment and health care utilization at different symptom frequency thresholds for a broader category of those with recurrent compensatory behaviors in the absence of binge eating. Results indicated that females who reported the use of compensatory behaviors one to seven times/month did not differ significantly from those who reported compensatory behaviors eight or more times/month but that both groups reported significantly greater psychosocial impairment and mental health care utilization compared with females with no eating disorder symptoms. In contrast, health care utilization differed significantly only between those using compensatory behaviors eight or more times/month and symptom-free individuals. This suggests that even rela-

tively low frequency levels of compensatory behaviors are "clinically significant".

In examining the reported mean frequency of purging episodes across study samples (see Supporting Information Table S1), it appears that higher mean frequencies are found in samples ascertained through clinical settings compared to those recruited from the community. Indeed, in looking at two clinic-based samples, 32 of 46 EDNOS-P patients (70%) in one study[21] and 106 of 145 EDNOS-P patients (73%) in another study[2] (personal communication with Rockert 4/3/08) reported purging at least twice per week.

Absence of binge-eating episodes as defined within the DSM has been included in most (25/30; 83%) articles. In three studies,[4,18,23] individuals with binge-eating episodes at subthreshold frequencies were included in the definition. However, the maximum frequency of objective binge episodes ranged from being less than twice per week to less than once per month across studies, and, in one of these studies,[18] none of the individuals with Purging Disorder reported objectively large binge episodes. In a fourth study,[24] it is unclear whether individuals with subthreshold frequencies of objective binge episodes were excluded although this seems likely because a separate group of individuals with subthreshold BN (i.e., all symptoms of BN present but at subthreshold frequency) was defined. Too little information is provided in a fifth study[3] to evaluate whether binge-eating episodes were present among their "purging type" EDNOS cases.

Beyond requiring the absence of objectively large binge episodes, two studies[25,26] have explicitly required the presence of subjective binge episodes (defined as consuming amounts of food that are not "objectively large" and experiencing loss of control over those episodes). To our knowledge, no study has compared individuals with Purging Disorder who have subjective binge episodes to those who do not. However, recent studies that have excluded individuals with any binge eating (subjective or objective) in their definitions of Purging Disorder[15,17,20] suggest that Purging Disorder without subjective binge episodes occurs in 0.6 to 0.8% of women. Thus, requiring subjective binge episodes for a diagnosis of Purging Disorder may leave many individuals who regularly purge for the purpose of weight or shape control in the EDNOS category.

A second problem with requiring subjective binge episodes is poor reliability for assessing these eating episodes.[27] Specifically, Peterson et al.[27] reported that agreement between originally reported and recalled subjective binge episodes was $r = 0.405$ for 3 month and $r = 0.272$ for 12 month recall. Level of agreement was significantly higher for recall of objective binge episodes, suggesting that episodes marked by intake of large amounts of food may be more distinctively recalled. Within the first author's experience assessing and treating Purging Disorder, there is considerable variability in the description of eating episodes that precede purging. Sometimes these episodes are described as involving a loss of control and called "binges"; however, at other times, the same episode is not described as involving any loss of control. Moreover, many individuals with Purging Disorder are aware that they are not eating excessive amounts of food and express ambivalence about whether or not they have lost control over their eating. These findings call into question the ability to reliably determine diagnoses of Purging Disorder if recurrent subjective binge episodes were a required feature. Notably, the two studies[25,26] that required subjective binge episodes for Purging Disorder did not provide estimates of interrater reliability to directly address this concern.

In the absence of objective binge episodes and problems with reliably identifying the presence of subjective binge episodes, one might question if there is any reliable way to characterize eating episodes that precede purging in Purging Disorder. Individuals with Purging Disorder report high levels of dietary restraint and often endorse specific dietary rules. Thus, purging may be precipitated by a perceived violation of dietary rules. To our knowledge, no study has employed this feature to define Purging Disorder. Instead, the purpose of purging to control weight or shape has been utilized to distinguishing purging that is related to an eating disorder from purging that may be related to other conditions.

Body image disturbance has been included in a minority of articles' (11/30; 37%) definitions of Purging Disorder. The primary form of body image disturbance used has been the undue influence of weight and shape on self-evaluation. In several instances, it seems likely that body image disturbance was included in diagnostic algorithms but not described in study methods because it did not uniquely identify those with Purging Disorder in relation to those given other eating disorder diagnoses. This impression is reinforced by the fact that the requirement of body image disturbance must be inferred in some studies (e.g.,[25]) from statements that participants would have met full criteria for BN except for the absence of binge-eating episodes.

Not currently meeting full criteria for AN or BN is implied in all articles because the diagnosis of EDNOS is made only when the full criteria for these syndromes are not met. In some, but not all studies, lifetime history of AN or BN is an exclusion criterion.

In summary, certain definitional features are common across studies that serve to distinguish Purging Disorder from not having an eating disorder and from the syndromes of AN, BN, and BED. Historically, the pathway to a uniform set of diagnostic criteria for eating disorder syndromes has come through inclusion of a syndrome in a set of research criteria (e.g., Feighner et al.[28] criteria for AN) or inclusion of a syndrome in the DSM-III or later editions (e.g., inclusion of bulimia in the DSM-III and inclusion of BED in the appendix of the DSM-IV). Toward the end of this article, we present suggested diagnostic criteria for Purging Disorder that reflect the commonalities among the clearly articulated sets of criteria used in previous studies.

Assessment Tools

As currently defined across articles, each symptom used for a diagnosis of Purging Disorder also may occur as part of other eating disorders. Therefore, the above symptoms and others listed in Supporting Information Table S1 can be measured with existing instruments of proven reliability and validity for the comprehensive assessment of eating disorders. Several studies examining Purging Disorder[4,8,13,17,26,29–32] have utilized the Eating Disorders Examination (EDE)[33] or the EDE-Questionnaire[34] because these measures do not employ skip rules. This makes it possible to evaluate the presence of purging when individuals do not have low weight or objectively large binge episodes. Both instruments explicitly require that purging behaviors are intended, at least in part, to control weight or shape. This ensures that purging behaviors fit within the larger category of eating disorders rather being related to other disorder categories (e.g., anxiety disorders, substance use disorders, or somatoform disorders). A particular advantage of the EDE is its distinction between objective and subjective binge episodes. Measures that do not examine the amount of food consumed during self-reported binge episodes are likely to include individuals who have Purging Disorder among those who have BN-purging type. A disadvantage is that the EDE is designed to capture diagnostic features over the past 12 weeks and requires modification to evaluate lifetime history of eating disorders. Although used less frequently, the Structured Interview for Anorexic and Bulimic Disorders (SIAB)[35] also discriminates between objective and subjective binge episodes and does not employ skip rules. Thus, like the EDE, the SIAB can be used without modification to diagnose individuals with Purging Disorder. Finally, Module H of the Structured Clinical Interview for DSM-IV Axis I Disorders can be modified to identify individuals with Purging Disorder. The main modification is to ignore skip rules and enquire about purging when individuals deny objectively large binge episodes. Previous studies have reported high interrater reliability for EDE assessments of BN and Purging Disorder for current diagnosis[8,29] or lifetime diagnosis[14] (see Criterion 3 section). Similar data have yet to be presented for the SIAB and SCID.

At this stage, we conclude that the criterion of a consistent definition has been partially met. It is possible to articulate a clear criteria set based on the existing consensus of certain key features used to define Purging Disorder in the literature. The related criterion of the availability of reliable assessment tools has been met. Regarding the definition, there is near unanimous agreement that purging to influence weight or shape encompasses vomiting and use of laxatives or diuretics but not excessive exercise or fasting. There also is agreement that purging occurs in the absence of objectively large binge episodes. Most definitions do not require the presence or absence of subjective binge episodes, and this may reflect difficulties in reliably assessing this feature. At this time, it is unclear whether or how eating episodes that precede purging should be defined. Less agreement is found for the additional criterion of body image disturbance, though this may reflect incomplete reporting of methods rather than true inconsistencies in how Purging Disorder has been defined across studies.

Criterion 3. Is There Diagnostic Reliability?

Most articles (21/30; 70%) have not reported on reliability of diagnostic assessments. In addition, with the exception of Fink et al.[16] who reported excellent interrater reliability (0.91) for Purging Disorder, studies that have reported diagnostic reliability provide estimates in aggregate for eating disorder diagnoses. Thus, it is possible that the reliability of Purging Disorder diagnoses is either higher or lower than depicted due to the impact of the reliability of other eating disorder diagnoses on overall estimates. Among the few studies providing estimates, interrater reliability appears to be excellent, with kappas ranging from 0.86 to 1.00. In addition, one study reported kappa = 0.96 for test-retest reliability for eating disorder diagnoses that

included Purging Disorder.[18] Of note, none of the studies reporting interrater reliability have required subjective binge episodes in their definitions of the syndrome. On the basis of data from Peterson et al.[27] discussed above, interrater reliability might be considerably lower if subjective binge episodes were among the disorder's diagnostic criteria.

For the key features that define Purging Disorder, data from Peterson et al.[27] regarding accuracy of symptom recall in eating disorders may be useful. Results from this study indicate high agreement between vomiting episodes reported at initial assessment and recall of vomiting episodes at 6 and 12-month follow-up, supporting the test-retest reliability of at least one form of purging. Similarly, results indicated high agreement between objective binge episodes at baseline and at 6 and 12-month follow-up as well as reasonably good agreement between objective binge days over a 3 month period and recall of these symptoms at 6 and 12-month follow-up. Evidence of test-retest reliability for the assessment of objective binge episodes would be important for requiring their absence in a diagnosis of Purging Disorder. Finally, adequate recall of importance of weight and shape (items assessing undue influence of weight and shape on self-evaluation) was found for 6 and 12-month follow-up, although recall was superior at 6-month follow-up. Overall, results from this study suggest that the key features that may be used to diagnose Purging Disorder should demonstrate good test-retest reliability.

It is important to note that studies have not evaluated whether clinicians can reliably recognize and diagnose Purging Disorder in patients presenting in their practice. In light of the aforementioned studies, we would conjecture that clinicians would be able to recognize and diagnose purging behaviors; however, this would have to be examined empirically. We conclude that Purging Disorder can be reliably diagnosed by two or more assessors but note that there is insufficient evidence that the reliability criterion has been met in clinical settings.

Criterion 4. Can Purging Disorder be Differentiated from Other Eating Disorders (and Normality)?

This question is particularly relevant for evaluating the validity of categorical distinctions between Purging Disorder and normality and between Purging Disorder and other eating disorders. If distinctiveness is not demonstrated, then Purging Disorder potentially resides on a continuum with other eating disorders and may be better captured by expanding criteria for existing syndromes. According to Kendell,[36] statistical approaches such as latent class analyses and discriminant function analyses are well-suited to address this issue. More recently, Wonderlich et al.[37] have articulated the value of taxometric approaches to this issue. Both discriminant function and taxometric analyses require the a priori identification of proposed syndromes. Although both analytic techniques have been used to examine eating disorders, their applications have been limited to comparisons of syndromes already included in the DSM-IV. As a consequence, our review is limited to studies that have used latent class or latent profile analyses.

Table 1 provides a summary of results from published studies using latent class and latent profile analyses. At least nine studies have examined the empirical typology of eating disorder syndromes using these approaches. Among these, seven have come from independent samples. Findings from these seven studies are mixed because of various methodological differences in samples and indica-

TABLE 1. Summary of latent class and latent profile analysis studies of eating disorders

Study	LC#	Healthy	BN	BED	ANr	PD	Other/Mixed
Sullivan et al.[38a]	4		BN	BED		PD	BED (SBEs)
Keel et al.[39]	4		BN		ANr		ABNmp, ANr low BID
Striegel-Moore et al.[40]	3		BN	BED		PD	
Wade et al.[31]	5	Healthy		Obese BED/PD/BN	No ED/ANr	Purging	Overweight
Duncan et al.[41]	5	Healthy					Low wt, Dieters, BID, ED
Pinheiro et al.[42]	4	Healthy	BN	BED		PD	
Eddy et al.[43b]	5		BN	BED			BNmp, High BID ANr low BID

Gray-shaded cells indicate that a study was not able to find a particular latent group due to restriction in participant inclusion criteria.
BN, bulimia nervosa; BED, binge eating disorder; ANr, anorexia nervosa restricting subtype; ED, eating disorder; PD, Purging Disorder; BID, body image disturbance; SBE, subjective binge episodes; ABNmp, anorexia bulimia nervosa multiple purging; mp, multiple purging.

[a] Bulik et al.[44] conducted a latent class analysis on data from the Virginia Twin Registry used in Sullivan et al.[38] However, assessments in this study only queried purging if objectively large binge episodes were present. Thus, this article would not be able to detect Purging Disorder. To avoid inclusion of nonindependent findings, only the Sullivan et al.[38] article is included.

[b] Mitchell et al.[45] conducted a latent profile analysis on a subset of participants included in a latent profile analysis conducted by Eddy et al.[43] To avoid inclusion of nonindependent findings, only the larger Eddy et al.[43] paper is included.

tors included in analyses. For example, approximately half of the studies (3/7; 43%) have produced a latent group with no eating disorders; however, this is entirely a reflection of whether or not individuals without eating disorder features were included in analyses. Every study that has included individuals without eating disorder symptoms has produced a latent group that is relatively healthy, supporting a boundary or point of rarity between the presence and absence of eating disorders. Furthermore, no individuals with Purging Disorder have emerged within this healthy group, supporting a distinction between normality and Purging Disorder.

Among the seven independent latent structure studies, four (57%) have identified a class dominated by purging behavior, including three papers using latent class analyses (LCA)[38,40,42] and one article using latent profile analyses (LPA).[31] Results from LCA studies have provided more consistent support for a Purging Disorder class that is distinct from classes that resemble BN and BED. In contrast, results from LPA studies suggest greater overlap among syndromes characterized by purging, including Purging Disorder, AN-binge purge subtype, and BN purging subtype within a single latent group.

Table 2 summarizes the correspondence between features that may be used to diagnose Purging Disorder (i.e., recurrent purging to influence weight or shape, absence of objectively large binge episodes, body image disturbance, and absence of AN or BN) and the features of latent groups resulting from latent structure analyses. Overall, there is good correspondence between the requirement of recurrent purging to influence weight or shape and the presence of this feature in the majority of latent group members for at least four of the five studies. The exception to this is a study by Pinheiro et al.[42] in which excessive exercise appeared to be the dominant behavioral feature. We note, however, that not all studies in **Table 2** included excessive exercise in classification analysis, making it impossible to determine whether this symptom might have emerged with greater prominence in other studies. Inconsistent results have emerged with regard to minimum purging frequency and duration, with one study finding that most members can be characterized by purging episodes occurring at least twice a week over a 3-month period[31] and one study suggesting that this frequency would be rare.[38] Most studies support the absence of objectively large binge episodes in a majority of latent class members. When body image disturbance has been included in latent structure analyses, it has been found in a majority of purging class members. In other studies, validation analyses have supported elevated body image disturbance in purging class members compared with healthy comparison groups. Finally, all studies providing lifetime history estimates of AN and BN found that the recurrent purging behavior occurred in the absence of AN or BN for a majority of class members.

Latent structure studies have presented various sets of validation analyses for comparing their groups. Comparisons between a purging group and a healthy group have revealed several significant differences including lifetime Axis I disorders[38,40] various personality variables,[31,38] and suicidality.[31] Fewer differences have been reported between latent purging groups and groups that resemble BN or BED. In the Sullivan et al.[38] study, the purging group had significantly higher mastery compared with the BED group and significantly higher self-esteem and optimism compared with the BN and BED groups. In the Striegel-Moore et al.[40] study, the purging class differed in ethnicity from the BED class, with a higher proportion of white and lower proportion of black participants in the Purging Disorder group.

TABLE 2. Description of groups characterized by purging behaviors resulting from latent structure analyses

Proposed PD Features	Latent Structure Studies			
	Sullivan et al.[38] Latent Class 1 (n = 30)	Striegel-Moore et al.[40] Latent Class 1 (n = 116)	Pinheiro et al.[42] Latent Class 3 (n = 72)	Wade et al.[31] Latent Profile 4 (n = 87)
Recurrent Purging to influence weight or shape	100% vomit 10% lax or diuretics	100% vomit 16% laxatives 9% diuretics	38% vomit 17% laxatives 21% diuretics	67% vomit 54% laxatives 13% diuretics
Minimum frequency	7% $\geq$ twice/wk	Not included	Not included	67% vomit $\geq$ twice/wk for 3 months
Minimum duration	0% $\geq$ 4 months			
Absence of OBEs	80%	71%	86%	63%
Body Image Disturbance	58%	Elevated EDI Drive for Thinness and Body Dissatisfaction	Elevated EDE-Q Weight and Shape Concern	Elevated EDE Weight and Shape Concern
Not concurrent with AN	$\geq$90%	$\geq$97%	Not included	$\geq$83%
Not concurrent with BN	100%	$\geq$89%	Not included	$\geq$71%

Taken together, there is support for boundaries or points of rarity between purging syndrome(s) and normality. In addition, there is some support for boundaries or points of rarity between purging syndrome(s) and both BN and BED.[38,40,42] Features used to define Purging Disorder have received reasonably good support among a majority of studies that have identified a latent purging group. Two studies[31,43] have found that individuals with Purging Disorder fall into a latent class with individuals with AN-binge purge subtype and, to a lesser extent, BN-purge subtype. On balance, there are enough studies to recommend against lumping Purging Disorder in with related eating disorders but too few to confidently conclude that it represents a categorically distinct entity.

Criterion 5. Is There Syndrome Validity?

Syndrome validity is related to results from several different kinds of studies, including evidence of boundaries or points of rarity (see Criterion 4 section), specific etiology, and distinctive course or outcome, and distinctive treatment response. Evidence of distinct etiological processes can support the validity of a syndrome by demonstrating that a syndrome "breeds true" in family studies or has unique genetic contributions in twin studies or by demonstrating associations between a syndrome and "some more fundamental abnormality—histological, psychological, biochemical or molecular" ([36], p. 47). Notably, different indicators of syndrome validity do not always agree.[46] Given the intended use of the DSM-V as a tool to facilitate clinical care of patients, there is an emphasis for establishing the predictive validity of syndromes with regard to course, outcome, and treatment response[10]—validators that address clinical utility. However, methodologically rigorous studies that address these forms of validity take considerable time and resources to complete.

At this point, most studies have examined evidence of concurrent validity of Purging Disorder as a syndrome. **Table 3** provides a brief summary of reported distinctions between Purging Disorder and no eating disorder and between Purging Disorder and BN, focusing on variables that are not diagnostic features[46] (i.e., external validators). Studies indicate that individuals with Purging Disorder differ from non-ED individuals on a number of indicators (leptin concentrations, levels of depression, anxiety, lifetime mood, substance use, and anxiety disorders, suicidality, impairment, and health services utilization). Of note, even though self-induced vomiting has been associated with electrolyte imbalances[47] and increased risk of chronic esophageal inflammation,[48] we could not find a study examining this or other potential physical complications associated with Purging Disorder.

Fewer significant differences have been found in comparisons of Purging Disorder and BN. Purging Disorder and BN have been found to demonstrate significantly different CCK responses to a test meal and to have different serum amylase concentrations. In addition, some studies have reported differences on levels of depression, anxiety, current mood disorder diagnoses, and suicidality. Although these results appear to be offset by studies finding no significant differences on psychological indicators or psychosocial impairment, results suggest that when differences are found they reveal greater impairment among those with BN.

Finally, only one study has examined Purging Disorder in relation to AN or BED,[16] but its small sample renders findings difficult to interpret. The relative lack of attention in the extant literature to comparisons of Purging Disorder and AN or BED likely reflects the extent to which AN has been demonstrated to differ from BN in course, outcome, treatment response, and mortality even when both are characterized by binge-purge symptoms and the lack of symptom overlap between Purging Disorder and BED. In light of findings based on LPA suggesting that Purging Disorder falls into the same class as AN, comparisons with AN would be especially important. Formal comparisons should be made to more fully address the validity of Purging Disorder when compared with all existing eating disorders.

An important caveat for interpreting results from studies reviewed above is that it is unclear whether psychological and biological correlates of Purging Disorder represent a "fundamental abnormality" because cross-sectional designs cannot speak to causation. However, these results form the necessary foundation for undertaking more time and resource-intensive longitudinal designs.

Does Purging Disorder Display a Distinctive Course or Outcome in Follow-Up Studies?

Methodologically rigorous studies that address this form of predictive validity and clinical utility take considerable time to complete. To our knowledge, only two studies have provided prospective follow-up data for PD.[8,18] In addition, three studies[4,49,50] have provided retrospective data on illness course and outcome.

TABLE 3. Studies examining differences between Purging Disorder and no eating disorder or Bulimia Nervosa

	Compared with No Eating Disorder				Compared with Bulimia Nervosa			
	Significant Difference		NS		Significant Difference		NS	
Variable	# Studies	Mean N	# Studies	Mean N	# Studies	Mean N	# Studies	Mean N
Biological Indicators								
CCK response			1	42	1 (−)	53		
Serum Amylase			1	53	1 (−)	57		
Serum Leptin	1	53					1	57
Psychological Indicators								
Suicidality	1	737			1 (−)	75		
Symptom Checklist (SCL)-90							1	215
Beck Depression Inventory	2	67	1	267	2 (−) ,1 (+)	79, 531	3	124
Rosenberg Self-Esteem Scale			2	502			3	237
Beck Anxiety Inventory			1	267	1 (−)	12		
State-Trait Anxiety Inventory-State	2	64			1 (−)	81	2	65
State-Trait Anxiety Inventory-Trait	2	67			2 (−)	79	1	54
Current Axis I Disorders								
Mood	1	72	1	62	2 (−)	79	1	56
Substance Use	1	72	1	62			3	71
Anxiety	2	67			1 (+)	81	2	66
Impulse	1	72					1	76
Michigan Alcoholism Screening Test							1	54
Drug Abuse Screening Test							1	54
Lifetime Axis I Disorders								
Mood	3	290			1 (−)	81	2	76
Substance Use	2	67					2	79
Anxiety	2	67					2	79
Impulse	1	72	1	62			2	79
Axis II Disorders/Personality								
Cluster A			2	67			2	79
Cluster B			2	67			2	79
Cluster C			2	67			2	79
Any Personality Disorder	1	72	1	62			2	79
Borderline Syndrome Index							1	215
MPS Concern Over Mistakes			1	737			1	75
EDI Perfectionism			1	267			1	12
Barratt Impulsiveness Scale-11	2	67	1	737	1 (−)	54	3	77
Impulsive Behavior Scale	1	267			1 (−)	12		
Psychosocial Impairment	4	1420					3	122
Treatment History								
Psychiatric Hospitalization					1 (+)	267	1	81
Psychological Treatment	2	730			1 (−)	54	2	133
Any Health Care Treatment	1	823	1	952			2	132
Totals for Each Type of Finding[a]	32		20		18, 15 (−), 3 (+)		50	

Because of overlap in two studies' samples[13,21] results on the BDI and RSE are reported only for the larger sample.[21] Thus, only unique comparisons are included in the table. (+) denotes a significant differences in which Purging Disorder was associated with greater impairment compared to BN; (−) denotes a significant difference in which Purging Disorder was associated with less impairment compared to BN. All significant differences between Purging Disorder and no eating disorder reflected greater impairment in Purging Disorder. [a]Totals include multiple results from individual studies.

Remission, Relapse, Recovery. On the basis of a short prospective follow-up period of ~8 months in a sample of 25 women with BN purging and 23 women with Purging Disorder at baseline,[8] no significant differences were found for rates of partial or full remission. There was inadequate duration of follow-up to assess relapse. In an 8-year longitudinal assessment of girls,[18] average episode duration for Purging Disorder was 4.7 months, compared with 3.6 months for BN and 3.9 months for threshold and subthreshold BED, and 2-year remission rates were 100% for all diagnostic groups, reflecting no significant differences in remission between Purging Disorder and BN or BED. Relapse rates for PD (5%) appeared to be lower than those observed for threshold/subthreshold BN (41%) and threshold/subthreshold BED (33%). However, this may reflect the later age of onset for PD compared to BN and BED coinciding with the end of the longitudinal study.[18]

In one retrospective report of Purging Disorder outcome, rates of remission 6 months into pregnancy were significantly higher for those with retrospective diagnoses of Purging Disorder compared with those with retrospective diagnoses of BN and BED.[50] Further, continuation of Purging Disorder

was significantly lower than continuation of BED.[50] In contrast, other retrospective reports of Purging Disorder[4,14,49] have indicated no significant differences in duration of illness or remission in comparison to AN, BN, or partial/subthreshold BN or BED.

Diagnostic Crossover. On the basis of a short prospective follow-up period of 8 months in a sample of 25 women with BNp and 23 women with Purging Disorder at baseline,[8] cross-over rates were low. No women met criteria for AN at follow-up in either group. Two women with BN at baseline (8%) met criteria for Purging Disorder at follow-up, and this was significantly less likely than continuing to have BN ($p < 0.001$). Similarly, one woman with Purging Disorder at baseline (4%) met criteria for BN at follow-up, and this was a significantly less likely outcome than continuing to have Purging Disorder ($p = 0.001$). In an 8-year longitudinal study of girls,[18] no cases (0%) of Purging Disorder ($n = 22$) crossed-over to AN, one case (5%) crossed over to BN, and two cases (9%) crossed over to BED. Further, no cases (0%) of BN and one case of BED (1%) crossed-over to Purging Disorder. These rates of diagnostic cross-over were substantially lower than observed between BN and BED which ranged from 19% to 42%.

On the basis of retrospective reports, 0–30% of women with Purging Disorder have reported histories of AN.[4,8,30,49] Viewed as a proportion of those with lifetime diagnoses of AN, 0–12% of women with AN also had Purging Disorder at another time in their lives. Favaro et al.[49] reported that three individuals with lifetime diagnoses of BN (7%) later developed Purging Disorder.

In summary, there are very limited data on course and outcome for Purging Disorder. Overall, course may not differ dramatically between Purging Disorder and BN, with the exception that Purging Disorder appears to have a later age of onset.[18] However, preliminary findings support reasonable longitudinal stability of Purging Disorder as a diagnosis with several studies demonstrating that a majority of individuals with lifetime diagnoses of Purging Disorder do not have histories of any other full-threshold eating disorder.

Does Purging Disorder display a distinctive treatment response? We were unable to locate any treatment studies for individuals with Purging Disorder. As noted in the introduction, this likely reflects the extent to which controlled treatment studies have focused on formally defined syndromes. In light of the emphasis in the DSM on clinical utility, the lack of such data clearly impedes evidence based recommendations.

Who Most likely presents with Purging Disorder?

The public health significance of a disorder derives from its prevalence (i.e., higher prevalence disorders create greater burden) and its clinical significance (the more pervasive the impairment the greater the burden). At present, few data exist on what proportion of individuals seeking treatment has Purging Disorder and, as such, it is unclear how often clinicians in routine practice would encounter this syndrome. Prevalence estimates based on consecutive case series of patients presenting at tertiary treatment centers range from a low of 3% at an inpatient facility[1] to a high of 18%[26] or 24% in outpatient clinics.[13] The few epidemiological studies that have reported prevalence estimates for Purging Disorder suggest comparable percentages to those reported for DSM IV AN or BN. Current ("point") prevalence estimates in adult female samples have been quite similar across studies conducted in Australia (0.5%),[3] Canada (0.6%)[17] and in US college samples (0.6% and 0.8%).[15,20] Life-time prevalence estimates have been more variable, ranging from 1.1% in an Italian sample[49] to 5.3% in an Australian sample.[4]

Developmental Considerations. With few exceptions, studies on Purging Disorder have comprised older adolescents and young adults and have reported average ages of onset of around 20 years.[2,4,49] In a sample of 1,336 school children, aged 9–13 years at baseline, Sancho et al.[51] found one case of Purging Disorder, representing a point prevalence estimate of 0.14% in girls and 0% in boys. At two-year follow-up, when the children were between the ages of 13–15 years, no cases of Purging Disorder were found.[51] In a recent 8-year longitudinal study of adolescent girls, Stice et al.[18] reported that peak age of onset was 17 years for BN versus 20 years for Purging Disorder, providing support for results from retrospective studies' estimates.

Gender Considerations. The point prevalence of Purging Disorder was higher in women (0.6%–0.9%) than in men (0.1%) in one college-based sample[20] and appeared to be higher in girls (0.14%) compared to boys (0%) ages 9–13 years.[51] However, these estimates are based on relatively small samples and lack the stability associated with estimates from larger population-based samples.

Ethnic and Racial Minorities. Studies to date lack adequate power to detect significant differences in ethnic composition. Bearing in mind the caveat that symptom prevalence cannot be used to extrapolate full syndrome estimates, we note that in epi-

demiological studies of adolescent samples, ethnic differences for purging behavior were found to be either nonsignificant[52] or significant only when comparing black girls with Hispanic girls (the latter reporting higher rates).[53] Overall, studies indicate that Purging Disorder is not restricted to any particular racial or ethnic subgroup. However, larger epidemiological studies are required to examine whether some groups are over or underrepresented among those with Purging Disorder.

Cultural Considerations. Becker[54] provided a very useful examination of attempts to understand whether eating disorders identified within one cultural context exist in other cultural contexts. Studies reviewed above indicate that Purging Disorder has been identified in the United States, Canada, England, Australia, Portugal, Italy, and Tanzania. Thus, with the exception of the study of East African women and girls by Eddy et al.,[19] reports of Purging Disorder have emerged from Western cultures. Of note, the cases of Purging Disorder identified among Tanzanian women and girls occurred predominantly in students, reflecting a high level of education compared with the full sample,[19] which may increase exposure to Western ideals. Becker et al.[55] found an increase in the use of self-induced vomiting to control weight among adolescent Fijian girls following the widespread introduction of television and Western programs to girls' households. In addition to these recognizable features as potential consequences of globalization, Becker et al. recently found that 35% of Fijian school girls ages 15 to 20 years endorsed traditional herbal purgative use.[56] Follow-up analyses indicated that traditional herbal purgative use was associated with significantly elevated impairment and distress in these girls,[57] supporting the value of culture-specific assessments to enhance detection of eating disorder symptoms in non-Western contexts.[56] However, Becker[54] cautioned that syndromes identified within a Western context may not be represented in a comparable indigenous illness category. In particular, although Fijian girls endorse using herbal purgatives to compensate for feasts that do not involve consumption of more food than most people eat in that context, this behavior is not always associated with distress and has not been identified as an "emic" (from within the local group) disorder.[54] Thus, care is required to ensure that definitions created in a Western context do not inadvertently pathologize local practices that may be normative and culturally sanctioned within non-Western settings.[56]

Discussion

We conclude by reviewing possible options regarding the status of Purging Disorder in the DSM-V. Our examination of strengths and weaknesses associated with each option reflects, in part, limitations of the extant literature on Purging Disorder. However, some of these limitations may be addressed in the near future given that research on Purging Disorder has increased rapidly over recent years. Indeed, in revising Supporting Information Table S1 from a previous review published in a 2007, we found that the number of empirical papers on Purging Disorder has more than doubled. Thus, rather than concluding with what option is superior based on current evidence, we acknowledge that new articles may be published with findings that impact which option is best supported for the DSM-V.

Option A: Introduce Purging Disorder as a Distinct Eating Disorder

There are several reasons why Purging Disorder might be recognized as a specific Eating Disorder in the DSM-V. The literature on Purging Disorder is significant and growing, a reasonably consistent set of diagnostic criteria has been developed, the disorder can be recognized reliably, is distinct from normality, and is associated with distress and impairment. A major gap in the existing literature, however, is the relative absence of information on whether Purging Disorder demonstrates a distinctive course, outcome, or treatment response compared with existing eating disorders. Given the importance of ensuring that diagnoses in the DSM have clinical utility, it may therefore be premature to include Purging Disorder as a specific eating disorder in the DSM-V.

Option B: Redefine Diagnostic Criteria for Major Eating Disorders (AN or BN) to Accommodate Purging Disorder

A second possibility would be to group Purging Disorder either with AN or BN. Individuals with Purging Disorder do not meet Criterion A of the DSM-IV criteria for AN. However, individuals with Purging Disorder might be included within a broadened category of AN binge-purging subtype if this criterion were relaxed. There is some support for this option from two studies finding that Purging Disorder was grouped with AN-binge purge subtype in LPA.[31,43] The proportion of Purging Disorder cases absorbed into an expanded AN definition would depend on how far the low weight criterion was adjusted as individuals with Purging Dis-

order can be normal weight or overweight. Given the clinical utility of distinguishing between individuals with binge-purge behaviors on the basis of low weight (e.g., differential treatment response to selective serotonin reuptake inhibitors, differential course, and outcome with notably high rates of premature death in low weight individuals but not in normal weight individuals with binge-purge behaviors), it is likely that only a modest relaxation of the low weight criterion would be appropriate before an unacceptable loss of information would occur. If only a modest extension of the low weight criterion occurs, then a relatively small proportion of individuals with Purging Disorder could be accommodated within a revised definition of AN.

Another option would be to alter the criteria for what constitutes a binge in the diagnostic criteria for BN. If a binge eating episode were defined solely by a sense of loss of control over eating irrespective of the size of the eating episode (see[58] for a detailed discussion of studies examining the definitions of binge eating), some individuals with Purging Disorder would meet criteria for BN. However, as noted earlier, this may have deleterious effects on the extent to which BN can be reliably diagnosed given problems with assessing subjective binge episodes.[27] In addition, it remains to be explored how many individuals with Purging Disorder would be reclassified as suffering from BN with this revision. Approximately 0.6% of college women report purging at least twice per week to control weight or shape, endorse distress and psychosocial impairment but do not endorse loss of control over their eating and would be excluded in this approach.[20] In addition, our review suggests that Purging Disorder appears to be distinct from BN on several biological and psychological features, which may contribute to differences in course and treatment response. These findings speak against absorbing Purging Disorder into a broader category with BN until studies have been completed to examine whether or not Purging Disorder and BN demonstrate distinct course and treatment response.

Another related option would be to articulate a broader diagnostic category for bulimic syndromes which would include a subtype of individuals who meet current, DSM-IV criteria for BN and a subtype for individuals who meet criteria for Purging Disorder. One problem with this option is that, at present, it is unclear whether Purging Disorder would be best situated as a subtype of a broad category related to BN or a broad category related to AN or neither.

TABLE 4. Proposed criteria for Purging Disorder

A	Recurrent purging in order to influence weight or shape, such as self-induced vomiting, misuse of laxatives, diuretics, or enemas.
B	Purging occurs, on average, at least once a week for 3 months.
C	Self-evaluation is unduly influenced by body shape or weight or there is an intense fear of gaining weight or becoming fat.
D	The purging is not associated with objectively large binge episodes.
E	The purging does not occur exclusively during the course of anorexia nervosa or bulimia nervosa.

Option C: Introduce Purging Disorder as a Provisional Diagnosis in Need of Further Study

A third option is to continue to include Purging Disorder in EDNOS but provide explicit criteria for Purging Disorder as a provisional diagnosis in need of further study. This option, which was employed for BED in the DSM-IV, has the advantage of naming and defining a syndrome in order to promote needed research without the disadvantages incurred by the other options discussed above.

In Table 4, we present possible criteria for defining this provisional syndrome. The suggested criteria reflect commonalities among definitions presented in Supporting Information Table S1 such that results from most studies would remain relevant for understanding Purging Disorder if the proposed definition were included in the DSM-V. However, future research is needed to examine whether this working definition provides the best fit for the presentation of Purging Disorder. Specific areas of inquiry include (1) the minimum frequency and duration of purging that distinguishes a clinically significant disorder of eating from a brief bout of disordered eating behavior, (2) the necessity of defining the nature of eating episodes that precede purging, and (3) the nature of body image disturbance that best characterizes individuals with Purging Disorder (e.g., undue influence of weight or shape on self-evaluation, intense fear of gaining weight or becoming fat, extreme need to control weight or shape). A poor definition of a valid syndrome will undermine efforts to evaluate syndrome validity. Thus, although it is useful for the field to adopt a working definition of Purging Disorder that definition should not become sacrosanct, and there should be mechanisms in place to allow improvements to how we define Purging Disorder as more data are collected. Thus, the suggested criteria in Table 4 represent a potential starting place to begin addressing several questions necessary to evaluate syndrome validity and essential to help individuals with this clinical presentation.

Option D: Make no Revision

Given the limited empirical literature on clinical utility of Purging Disorder as a diagnostic entity,

another option is to make no change to the current DSM-IV approach, and for Purging Disorder to remain a briefly characterized example of EDNOS with no name. This option would eliminate the risk of prematurely introducing a disorder that may lack extensive documentation of clinical utility and would not require the uncertainties entailed in significantly expanding existing category definitions. However, this approach carries the highest opportunity cost because it constrains collection of the kinds of information required to understand whether Purging Disorder has clinical utility. Data from Haedt and Keel[20] suggest that Purging Disorder has existed for at least 28 years, and yet a main reason for uncertainty surrounding its possible inclusion as a "new" disorder is the absence of studies that might establish evidence-based treatments, course, or outcome for Purging Disorder. This lack of knowledge is a direct reflection of the adage that "we study what we define."[59]

Future Directions

The extant literature suggests that Purging Disorder is associated with several indicators of clinical significance and distinctiveness and, as such, may warrant an increased level of recognition within DSM-V. Future studies are needed to address the definition, diagnostic reliability in clinical settings, and clinical utility (i.e., prognostic validity) of Purging Disorder. Greater understanding of the course, outcome, and treatment of Purging Disorder would facilitate decisions on the status of Purging Disorder within the DSM and would help individuals who suffer from this condition.

References

1. Dalle Grave R, Calugi S. Eating disorder not otherwise specified in an inpatient unit: The impact of altering the DSM-IV criteria for anorexia and bulimia nervosa. Eur Eat Disord Rev 2007;15: 340–349.
2. Rockert W, Kaplan AS, Olmsted M. Eating disorder not otherwise specified: The view from a tertiary care treatment center. Int J Eat Disord 2007;40:S99–S103.
3. Hay PJ, Mond J, Buttner P, Darby A. Eating disorder behaviors are increasing: Findings from two sequential community surveys in South Australia. PLoS ONE 2008;3:e1541.
4. Wade TD, Bergin JL, Tiggemann M, Bulik CM, Fairburn CG. Prevalence and long-term course of lifetime eating disorders in an adult Australian twin cohort. Aust NZ J Psychiatry 2006;40: 121–128.
5. Hudson JI, Hiripi E, Pope HG Jr, Kessler RC. The prevalence and correlates of eating disorders in the national comorbidity survey replication. Biol Psychiatry 2007;61:348–358.
6. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 4th ed. Text Revision (DSM-IV-TR). Washington, D.C.: American Psychiatric Association, 2000.
7. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), 4th ed. Washington D.C.: American Psychiatric Association; 1994.
8. Keel PK, Haedt A, Edler C. Purging disorder: An ominous variant of bulimia nervosa? Int J Eat Disord 2005;38:191–199.
9. Regier DA. Classifying eating disorders in the DSM-V: New nosological perspectives. Int J Eat Disord 2007;40:S8–S9.
10. Walsh BT. DSM-V from the perspective of the DSM-IV experience. Int J Eat Disord 2007;40 (Suppl):S3–S7.
11. Blashfield RK, Sprock J, Fuller AK. Suggested guidelines for including or excluding categories in the DSM-IV. Compr Psychiatry 1990;31:15–19.
12. Keel PK. Purging disorder: Subthreshold variant or full-threshold eating disorder? Int J Eat Disord 2007;40:S89–S94.
13. Binford RB, le Grange D. Adolescents with bulimia nervosa and eating disorder not otherwise specified-purging only. Int J Eat Disord 2005;38:157–161.
14. Wade TD. A retrospective comparison of purging type disorders: Eating disorder not otherwise specified and bulimia nervosa. Int J Eat Disord 2007;40:1–6.
15. Crowther JH, Armey M, Luce KH, Dalton GR, Leahey T. The point prevalence of bulimic disorders from 1990 to 2004. Int J Eat Disord 2008;41:491–497.
16. Fink EL, Smith AR, Gordon KH, Holm-Denoma JM, Joiner TE Jr. Psychological correlates of purging disorder as compared with other eating disorders: An exploratory investigation. Int J Eat Disord 2009;42:31–39.
17. Gauvin L, Steiger H, Brodeur JM. Eating-disorder symptoms and syndromes in a sample of urban-dwelling Canadian women: Contributions toward a population health perspective. Int J Eat Disord 2009;42:158–165.
18. Stice E, Marti CN, Shaw HA, Jaconis M. An 8-year longitudinal study of the natural history of threshold, subthreshold, and partial eating disorders from a community sample of adolescents. J Abnormal Psychol (in press).
19. Eddy KT, Hennessey M, Thompson-Brenner H. Eating pathology in East African women: The role of media exposure and globalization. J Nerv Ment Dis 2007;195:196–202.
20. Haedt AA, Keel PK. Comparing definitions of purging disorder on point prevalence and associations with external validators. Int J Eat Disord 2009 Jun 17; [Epub ahead of print (DOI: 10.1002/eat.20712)].
21. Eddy KT, Celio Doyle A, Hoste RR, Herzog DB, le Grange D. Eating disorder not otherwise specified in adolescents. J Am Acad Child Adolesc Psychiatry 2008;47:156–164.
22. Spoor ST, Stice E, Burton E, Bohon C. Relations of bulimic symptom frequency and intensity to psychosocial impairment and health care utilization: Results from a community-recruited sample. Int J Eat Disord 2007;40:505–514.
23. Mond J, Hay P, Rodgers B, Owen C, Crosby R, Mitchell J. Use of extreme weight control behaviors with and without binge eating in a community sample: Implications for the classification of bulimic-type eating disorders. Int J Eat Disord 2006;39: 294–302.
24. Machado PP, Machado BC, Goncalves S, Hoek HW. The prevalence of eating disorders not otherwise specified. Int J Eat Disord 2007;40:212–217.
25. Keel PK, Mayer SA, Harnden-Fischer JH. Importance of size in defining binge eating episodes in bulimia nervosa. Int J Eat Disord 2001;29:294–301.
26. Fairburn CG, Cooper Z, Bohn K, O'Connor ME, Doll HA, Palmer RL. The severity and status of eating disorder NOS: Implications for DSM-V. Behav Res Ther 2007;45:1705–1715.
27. Peterson CB, Miller KB, Johnson-Lind J, Crow SJ, Thuras P. The accuracy of symptom recall in eating disorders. Compr Psychiatry 2007;48:51–56.

28. Feighner JP, Robins E, Guze SB, Woodruff RA Jr, Winokur G, Munoz R. Diagnostic criteria for use in psychiatric research. Arch Gen Psychiatry 1972;26:57–63.
29. Keel PK, Wolfe BE, Liddle RA, DeYoung KP, Jimerson DC. Clinical features and physiological response to a test meal in purging disorder and bulimia nervosa. Arch Gen Psychiatry 2007;64: 1058–1066.
30. Keel PK, Wolfe BE, Gravener JA, Jimerson DC. Comorbidity and disorder-related distress and impairment in purging disorder. Psychol Med 2008;38:1435–1442.
31. Wade TD, Crosby R, Martin NG. Use of latent profile analysis to identify eating disorder phenotypes in an adult Australian twin cohort. Arch Gen Psychiatry 2006;63:1377–1384.
32. le Grange D, Binford RB, Peterson CB, Crow SJ, Crosby RD, Klein MH, et al. DSM-IV threshold versus subthreshold bulimia nervosa. Int J Eat Disord 2006;39:462–467.
33. Fairburn C, Cooper Z. The Eating Disorder Examination. In: Fairburn C, Wilson GT, editors. Binge Eating: Nature, Assessment and Treatment, 12th ed. New York: Guilford Press, 1993, pp. 317–331.
34. Fairburn CG, Beglin SJ. Assessment of eating disorders: Interview or self-report questionnaire? Int J Eat Disord 1994;16: 363–370.
35. Fichter MM, Herpertz S, Quadflieg N, Herpertz-Dahlmann B. Structured Interview for Anorexic and Bulimic disorders for DSM-IV and ICD-10: Updated (third) revision. Int J Eat Disord 1998;24:227–249.
36. Kendell RE. Clinical validity. Psychol Med 1989;19:45–55.
37. Wonderlich SA, Joiner TE Jr, Keel PK, Williamson DA, Crosby RD. Eating disorder diagnoses: Empirical approaches to classification. Am Psychol 2007;62:167–180.
38. Sullivan PF, Bulik CM, Kendler KS. The epidemiology and classification of bulimia nervosa. Psychol Med 1998;28: 599–610.
39. Keel PK, Fichter M, Quadflieg N, Bulik CM, Baxter MG, Thornton L, et al. Application of a latent class analysis to empirically define eating disorder phenotypes. Arch Gen Psychiatry 2004; 61:192–200.
40. Striegel-Moore RH, Franko DL, Thompson D, Barton B, Schreiber GB, Daniels SR. An empirical study of the typology of bulimia nervosa and its spectrum variants. Psychol Med 2005; 35:1563–1572.
41. Duncan AE, Bucholz KK, Neuman RJ, Agrawal A, Madden PA, Heath AC. Clustering of eating disorder symptoms in a general population female twin sample: A latent class analysis. Psychol Med 2007;37:1097–1107.
42. Pinheiro AP, Bulik CM, Sullivan PF, Machado PP. An empirical study of the typology of bulimic symptoms in young Portuguese women. Int J Eat Disord 2008;41:251–258.
43. Eddy KT, Crosby RD, Keel PK, Wonderlich SA, Ie Grange D, Hill L, et al. Application of latent profile analysis to empirically identify eating disorder phenotypes in a clinical sample. J Nerv Ment Dis 2009;197:41–49.
44. Bulik CM, Sullivan PF, Kendler KS. An empirical study of the classification of eating disorders. Am J Psychiatry 2000;157: 886–895.
45. Mitchell JE, Crosby RD, Wonderlich SA, Hill L, Ie Grange D, Powers P, et al. Latent profile analysis of a cohort of patients with eating disorders not otherwise specified. Int J Eat Disord 2007;40:S95–S98.
46. Wonderlich SA, Crosby RD, Mitchell JE, Engel SG. Testing the validity of eating disorder diagnoses. Int J Eat Disord 2007;40 (Suppl):S40–S45.
47. Greenfeld D, Mickley D, Quinlan DM, Roloff P. Hypokalemia in outpatients with eating disorders. Am J Psychiatry 1995;152: 60–63.
48. Matsha T, Stepien A, Blanco-Blanco E, Brink LT, Lombard CJ, Van Rensburg S, et al. Self-induced vomiting—Risk for oesophageal cancer? S Afr Med J 2006;96:209–212.
49. Favaro A, Ferrara S, Santonastaso P. The spectrum of eating disorders in young women: A prevalence study in a general population sample. Psychosom Med 2003;65:701–708.
50. Bulik CM, Von Holle A, Hamer R, Knoph Berg C, Torgersen L, Magnus P, et al. Patterns of remission, continuation and incidence of broadly defined eating disorders during early pregnancy in the Norwegian Mother and Child Cohort Study (MoBa). Psychol Med 2007;37:1109–1118.
51. Sancho C, Arija MV, Asorey O, Canals J. Epidemiology of eating disorders: A two year follow up in an early adolescent school population. Eur Child Adolesc Psychiatry 2007;16:495–504.
52. Austin SB, Ziyadeh NJ, Forman S, Prokop LA, Keliher A, Jacobs D. Screening high school students for eating disorders: Results of a national initiative. Prev Chronic Dis 2008;5:A114.
53. Chao YM, Pisetsky EM, Dierker LC, Dohm FA, Rosselli F, May AM, et al. Ethnic differences in weight control practices among U.S. adolescents from 1995 to 2005. Int J Eat Disord 2008;41: 124–133.
54. Becker AE. Culture and eating disorders classification. Int J Eat Disord 2007;40 (Suppl):S111–116.
55. Becker AE, Burwell RA, Gilman SE, Herzog DB, Hamburg P. Eating behaviours and attitudes following prolonged exposure to television among ethnic Fijian adolescent girls. Br J Psychiatry 2002;180:509–514.
56. Becker AE, Thomas JJ, Bainivualiku A, Richards L, Navara K, Roberts AL, et al. Validity and reliability of a Fijian translation and adaptation of the Eating Disorder Examination Questionnaire. Int J Eat Disord 2009 Mar 23; [Epub ahead of print (DOI: 10.1002/eat.20675)].
57. Becker AE, Thomas JJ, Bainivualiku A, Richards L, Navara K, Roberts AL, et al. Adaptation and evaluation of the Clinical Impairment Assessment to assess disordered eating related distress in an adolescent female ethnic Fijian population. Int J Eat Disord 2009 Mar 23; [Epub ahead of print (DOI: 10.1002/eat.20665)].
58. Wolfe BE, Wood Baker C, Smith AT, Kelley-Weeder S. Validity and utility of current definition of binge eating. Int J Eat Disord (in press).
59. Walsh BT, Kahn CB. Diagnostic criteria for eating disorders: Current concerns and future directions. Psychopharmacol Bull 1997;33:369–372.