

## Chapter 23

# The Epidemiology of Bulimia

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**B**ulimia, as described in DSM-III [1], is characterized by an abnormal eating pattern of uncontrolled episodic binge eating usually accompanied by self-induced vomiting or laxative abuse to eliminate unwanted food. The bulimic episodes are followed by low mood and self-deprecatory thoughts. Food intake may be eliminated or greatly restricted between episodes. Patients who present for treatment are most often women in their mid-20s who developed the illness in their late teens [2-4]. The illness occurs primarily in white females of all socioeconomic classes [2-4].

While bulimia was included as a diagnostic category in DSM-III, research related to adequately describing and classifying the bulimia syndrome and the more narrowly defined sister syndrome, bulimia nervosa, is more recent [2-4]. Consequently, sophisticated epidemiologic studies have not yet been published. The purpose of this chapter is to examine our existing knowledge about the frequency of bulimic behaviors, the prevalence of the bulimia syndrome, and the factors that may be associated with the onset of that illness.

With increasing demand for more treatment resources for bulimia, the determination of the prevalence of bulimia in the general population is essential if we are to know what the potential needs for treatment might be. A related question of major importance is whether the incidence of bulimia is increasing.

Two problems that confound bulimia research in general are amplified in epidemiology research: the definition of binge eating and the selection of appropriate

inclusion criteria to define the bulimia syndrome. While there is agreement that binge eating consists of eating an unusually large quantity of food over a brief period of time, researchers differ on whether the latter subjective definition of binge eating should be quantified in terms of amount of food consumed and whether the factor of loss of control should be introduced into the definition. Second, the present DSM-III criteria for classification of the bulimia syndrome are being challenged. This controversy further contributes to the difficulty of developing inclusion criteria for self-report questionnaires on prevalence. Interpretation of prevalence study results is even further complicated by the use of inclusion criteria for bulimia nervosa and bulimarexia in some prevalence studies.

### DEFINITION AND FREQUENCY OF BULIMIC BEHAVIORS

Earlier studies [5-8] involving individuals who might now be diagnosed as having bulimia did not emphasize the high frequency of bulimic behaviors in the general population, as they were directed at differentiating between normal and compulsive eating [5], treating potential neurophysiological abnormalities [6,7], establishing inclusion criteria to define compulsive eating [7], or defining personality traits of compulsive eaters [8]. It wasn't until the studies of Hawkins and Clement in 1980 [9] and of Halmi et al in 1981 [10], that we became aware of the high frequency of bulimic behaviors in the popu-

Table 23.1

<b>Diagnostic Criteria for Bulimia (DSM-III)</b>	
*A.	Recurrent episodes of binge-eating (rapid consumption of a large amount of food in a discrete period of time, usually less than two hours).
B.	At least three of the following: <ol style="list-style-type: none"> <li>1. consumption of high-caloric, easily ingested food during a binge</li> <li>2. inconspicuous eating during a binge</li> <li>3. termination of such eating episodes by abdominal pain, sleep, social interruption, or self-induced vomiting</li> <li>4. repeated attempts to lose weight by severely restrictive diets, self-induced vomiting, or use of cathartics or diuretics</li> <li>5. frequent weight fluctuations greater than ten pounds due to alternating binges and fasts</li> </ol>
*C.	Awareness that eating pattern is abnormal and fear of not being able to stop eating voluntarily.
*D.	Depressed mood and self-deprecating thoughts following eating binges.
E.	The bulimic episodes are not due to Anorexia Nervosa or any known physical disorder.
*Essential features of Bulimia for the purposes of prevalence studies.	

<b>Diagnostic Criteria for Bulimia Nervosa</b>	
A.	Powerful and intractable urges to overeat.
B.	Attempts to avoid the fattening effects of food by inducing vomiting and/or abusing purgatives.
C.	Have a morbid fear of being fat.

lation. In this section, we will review the frequency of the behaviors that are associated with the inclusion criteria for bulimia based on the diagnostic criteria specified by DSM-III [1], and the inclusion criteria for bulimia nervosa as defined by Russell [4]. Specific questions from self-report questionnaires that were used to operationalize DSM-III diagnostic criteria and bulimia nervosa criteria will be discussed. Finally, problems related to the use of self-report questionnaires designed to assess the prevalence of bulimia or bulimia nervosa will be discussed.

Inclusion criteria for prevalence studies may be designed to elicit the prevalence of bulimia or bulimia nervosa. The DSM-III criteria for bulimia [1] and Russell's criteria for bulimia nervosa [4] are listed in table 1. Those studies, which state that the prevalence of bulimia is based on all the essential features of bulimia, indicate that criteria A, C, and D have been included [10,11]. Criterion B may not be considered to be an essential feature, since only three of five behaviors need to be endorsed.

Some researchers have reduced the number of subjects who meet the inclusion criteria by quantifying binge-eating behavior and adding other quantifying and qualifying statements such as weekly self-induced vomiting and/or laxative abuse [11,12]. This quantification may be important to more closely define the number of individuals who are potential treatment candidates. However, there is no assurance that the group of subjects identified by these more restrictive criteria desire treatment or view their behavior as problematic [13]. With this introduction, we will now consider the frequency of bulimic behaviors determined by responses to questions designed to operationalize DSM-III criteria for bulimia and criteria for bulimia nervosa.

Many researchers developing inclusion criteria for self-report questionnaires on bulimic behaviors introduce the element of loss of control into questions relevant to inclusion criteria for binge eating (DSM-III Criterion A). While the issue of quantifying the amount of food consumed during a binge remains, it has not been addressed by most researchers doing prevalence studies [13]. Hawkins and Clement, in their original study, used three statements, that of "uncontrolled excessive eating," "rapid eating," and "eating until painfully full" [9]. Two studies used "eating an enormous amount of food over a short period of time" and "uncontrollable urges to eat and then eating until physically ill" [10,11]. Our research group approached loss of control by adding to the binge-eating phrase, "in a way which would be embarrassing if others saw you" [12].

Table 2 summarizes binge-eating frequencies from several American studies [9-12]. These and other studies [14,15] support the premise that binge eating is a frequent behavior in both males and females with the frequency of binge eating reported by American women ranging between 57% and 79% [9-12] and by British women from 26% in a study of clinic patients [14] to 40% in a study of students [15]. Weekly binge eating has been reported by 7% to 14% of English women [14,15] and by 17% to 21% of American women [11,12]. Two American studies cite a lower frequency of binge eating for males [9,12], while one noted very little difference between males and females [10]. Weekly binge eating has been reported by 11% of males [12].

In studies based on DSM-III criteria, two questions have been asked to meet DSM-III Criterion C: "Do you consider yourself a binge-eater?" and "Are there times when you are afraid you cannot stop eating voluntarily?" [10,11]. In response to questions relevant to DSM-III Criterion C (table 2), women are much more apt than males (35% versus 8%) to consider themselves binge eaters [10]. Fifteen percent of female high school students endorsed this statement [11]. Fear of loss of

**Table 23.2 Reported Frequency of Behaviors Associated with Inclusion Criteria for “Essential Features” of Bulimia**

	Hawkins & Clement (9)		Halmi et al (10)		Pyle et al (12)		Johnson et al (11)
Population Sample	College Students <i>Female</i> n = 160		College Summer School <i>Female</i> n = 212		College Freshman <i>Female</i> n = 575		High School Students <i>Female</i> n = 1268
Response Rate	<i>Male</i> n = 54		<i>Male</i> n = 119		<i>Male</i> n = 780		
1. Criterion A (Binge-Eating)	88%	83%	66%		98%		98%
Binge-eating behavior	79%	45%	68%	60%	61%	42%	57%
Uncontrollable urge to binge- eat			54%	36%			19%
Weekly binge-eating					17%	11%	21%
2. Criterion C (problem eating/loss of control)			35%	8%			15%
See oneself as binge-eater			29%	15%			24%
Fear of loss of control over eating	11%	0%					
3. Criterion D (depressed/self-deprecatory)			62%	30%	45%	11%	42%
Depressed and self- deprecatory							
Depressed	29%	0%					
Self-deprecatory	21%	0%					

control over eating was reported by at least twice as many women as men [9,10]. One fourth of high school females reported a fear that they would lose control over their eating behavior [11].

DSM-III Criterion D, regarding depression and self-deprecatory thoughts, has been represented by one statement in three studies; being "miserable and annoyed after binge eating," [10,11] or being "depressed and down on yourself after binge eating" [12]. Hawkins and Clement [9] required endorsement of two statements to satisfy this criterion, "I hate myself after binge eating," and "I feel very depressed after binge eating." The feeling of being depressed and self-deprecatory after binge eating is much more common in women than men (table 2) [10,12]. Hawkins and Clement [9] found that while 29% of females endorsed being depressed after binge eating and 21% endorsed hating themselves after binge eating, neither statement was endorsed by any of the males (n=54) in the study.

Our group reported the frequency of nonessential features of bulimia (DSM-III Criterion B). It was found that 20% of female students reported binge eating on high-carbohydrate food; 8% preferred to eat in secret; 5% ate until interrupted by pain, self-induced vomiting, or other people; 51% used some form of weight control to lower their weight; and 20% had frequent weight fluctuations of 10 lb or more. These behaviors occurred at similar rates in males except for weight control measures and frequent weight fluctuations, which were approximately twice as frequent in women [12].

Studies of clinic patients with bulimia have shown that most patients use self-induced vomiting and/or laxative abuse as weight control measures [2,3]. For this reason, many prevalence studies include questions relative to one or more of the three criteria for bulimia nervosa. Cooper and Fairburn [14] have operationalized the criteria for bulimia nervosa by asking subjects if they have "uncontrollable episodes of binge eating," if they "vomit after binge eating," and if they are often "terrified by becoming fat." The latter criterion seems more specific than "I have a fear of becoming fat" [12]. Both American and English studies report the frequency of behaviors associated with bulimia nervosa. Six percent to 16% of the female population have reported self-induced vomiting [9-12,14,15], with 3% reporting that behavior on a current basis [14]. The 16% figure was somewhat alarming in that it occurred in high school females, which suggests that self-induced vomiting may be increasing relative to other bulimic behaviors [11]. The presence of self-inducing vomiting in males has been reported to be 6% [10,12]. Weekly self-induced vomiting has been reported in the range of 2% to 4% for females [11,12] and 1% for males [12] in

American studies. English studies indicate that a smaller percentage of weekly self-induced vomiting (from 0% to 1%) is reported by women [14,15]. We have far less data on the "morbid fear of being fat" [4], with our group noting that 63% of freshman college women and 32% of males reported a "fear of being fat." However, this was only slightly lower than that reported by "bulimic" female students (78%) [12]. In an English study, 21% of adult women endorsed a more restrictive statement, "often terrified of becoming fat" [14].

Ideally, prevalence studies involve the administration of a standardized, validated questionnaire to a sample, representative of the general population, through a structured interview. Unfortunately, such rigorous methodology has not been used thus far for bulimia research. Studies to date have been limited by the use of self-report questionnaires. Another limitation has been that most of the published questionnaire studies involve samples of high school or college students [9-12,15,16]. Only recently have other samples been surveyed [14,17]. A multitude of problems may confound results reported in questionnaire studies. Researchers must select wording that the surveyed population will understand, and at the same time correctly represent the diagnostic criteria on which the inclusion questions are based. Scope versus response rate must also be balanced in questionnaires. Questionnaires designed to operationalize DSM-III diagnostic criteria are often kept brief to maximize response rate [13,16]. However, this may preclude the detail necessary to measure lifetime prevalence for the disorder, and it may hinder the search for details about the psychopathological features of bulimia. The method of administration of a questionnaire can also greatly affect the response rate, with the lowest response rate usually obtained by direct mailings [16] and the highest by administration of the questionnaire by individuals who are in some way directly involved with the participants [11,12,14]. Many researchers prefer anonymous questionnaires, because the response rate is higher and the degree of honesty in response may also be greater [13]. With few exceptions [12,16], questionnaires used in reported studies were not validated by administration to eating disordered populations to determine their specificity for identifying that particular disorder. Also, controversy persists about whether bulimics overreport on questionnaires to please researchers [14,16] or underreport because they wish to keep their illness a secret [10,15,17,18].

To summarize, available studies clearly show that binge eating is a common problem. Self-induced vomiting to control weight is less common, with only a small percentage of people admitting to episodes of binge eating followed by self-induced vomiting. These behaviors

are much less likely to occur on a weekly basis and rarely occur on a daily basis. Many behaviors and attitudes related to bulimia are more common in females, especially the pattern of feeling depressed and having self-deprecatory thoughts after binge-eating. Other attitudes more common in women are fear of loss of control over eating, seeing oneself as a binge eater, and fear of being fat. The feelings and cognitions of the individuals who engage in bulimic behavior merit further study, particularly the role of anxiety, which for the most part has been neglected. Having reviewed the process for development of operationalized criteria for the diagnosis of bulimia and for bulimia nervosa, we may proceed to our discussion of the prevalence of the bulimia syndrome.

### THE PREVALENCE OF BULIMIA

Earlier work by Wermuth [7], which revealed that there was only one case of "compulsive eating" found in a retrospective chart review of 650 medical cases, illustrates the secretive nature of the bulimia syndrome and the ease with which cases may be overlooked. A study by Stangler and Printz in 1980 brought to our attention the high frequency of bulimia [18]. This retrospective chart review to check DSM-III diagnoses determined that 5.3% of 318 women and 1.4% of 282 men coming to a university student psychiatric clinic for treatment met the DSM-III diagnostic criteria for bulimia. The authors suggested that this figure was underreported, since a number of cases were revealed during treatment and were not diagnosed at evaluation. The same pattern was true of the development of interest in bulimia nervosa in England. Russell's original group of 30 cases was collected over a period of 6-1/2 years from 1972 to 1978 [4]. It wasn't until Fairburn and Cooper brought attention to the frequency of this problem and the small percentage of individuals who entered treatment that the high prevalence of this illness was suspected [19].

Table 3 summarizes much of the current work describing the prevalence of bulimia and bulimia nervosa using self-report questionnaires. The prevalence of bulimia, as defined in the questionnaires, ranges between 8% and 19% for students, with the higher percentage reported by studies involving eastern populations [10,16] and the lower percentage in two mid-western studies [11,12]. A recent survey of adult women demonstrated that 10% reported behaviors that met operationalized DSM-III criteria for bulimia [17]. The percentage of males with "bulimia" ranges from 0% to 6% [10,12,16], with less than 1 in 300 satisfying the more restrictive criteria of weekly binge eating and self-induced vomiting [12]. The prevalence of bulimia nervosa

in adult women in England was reported to be 2% using the criteria of uncontrollable binge eating, self-induced vomiting, and often terrified of being fat [14]. Fairburn [13] has observed that subjects meeting the diagnostic criteria for bulimia nervosa are also likely to meet the DSM-III diagnostic criteria for bulimia.

The use of more restrictive inclusion criteria, such as weekly binge eating and self-induced vomiting, has been advocated by our group as a method of identifying "bulimic" students who more closely resemble bulimic patients [12]. Our survey found that the sample defined as "bulimic" students without the restriction of weekly binge eating or self-induced vomiting differed from bulimic patients in that they tended to be overweight binge eaters who used fasting as a weight control measure. The clinic patients with bulimia who responded to the questionnaire, on the other hand, were more likely to be of normal weight, rather than overweight, and use self-induced vomiting as their primary method of weight control rather than fasting or restrictive dieting [12].

To summarize, the bulimia syndrome is more common in women. "Bulimic" students are different than bulimic patients unless restrictive criteria that include weekly binge eating and self-induced vomiting are applied to quantify the bulimic behavior. When these restrictive criteria are used, the prevalence of bulimia corresponds more closely to that of bulimia nervosa. Data also suggest that very few individuals with bulimia or bulimia nervosa seek treatment.

### ETIOLOGY

A discussion of the factors contributing to the development of eating disorders is muddled by a lack of prospective studies regarding the development of bulimic behaviors. Information that we have available from bulimics and their families is retrospective and therefore colored by the effects of the eating disorder. The presence of specific personality traits in bulimic patients does not mean that they had these traits before their illness. Post-illness self-assessment of premorbid personality may be distorted. Depression, which is common in bulimics, will serve as an example. Severely depressed people may view themselves as having always been worthless, even though that is not the case. Similarly, we have seen bulimic patients who have stated that they always had low self-esteem and always needed to please others. These same patients may return for follow-up interviews a year after ending the behavior to tell us that they did not have either low self-esteem or the need to please others before their illness. A major need for future research is for a prospective longitudinal study that follows subjects from at least mid-high school

Table 23.3 The Reported Prevalence of Bulimia and Bulimia Nervosa

Source	Population	Response Rate	Inclusion Criteria <sup>a</sup>	Responding Sample	Prevalence for the Disorder	Bulimia with Weekly Binge-Eating	Bulimia & Weekly Binge-Eating Vomiting/Laxative Abuse
Halmi et al (10)	Eastern College Summer School	66%	DSM-III A, C & D	212 Female 119 Male	19% 6%	2%	
Pyle et al (12)	Midwestern College Freshman	98%	DSM-III A, B & D	575 Female 780 Male	8% 1%	4% 0.4%	1% 0.3%
Cooper and Fairburn (14)	Family Planning Clinic	96%	Bulimia Nervosa	369 Female	2%		
Johnson et al (11) <sup>b</sup>	Midwestern Public High School	98%	DSM- III A,C2,D	1268 Female	8%	5%	1%
Pope et al (19) <sup>c</sup>	Shopping Center Patrons	99%	DSM-III A,B,C1,D	300 Female	10%		
Pope et al (16) <sup>c</sup>	Urban Public College	50%	DSM-III A,B,C1,D	102 Female 47 Male	19% none		
	Private Women's College Seniors	64%	DSM-III A,B,C1,D	287 Female	13%		
	Suburban High School	84%	DSM-III A,B,C1,D	155 Female 107 Male	6% none		

<sup>a</sup>See Table 1<sup>b</sup>Omits "awareness that the eating problem is abnormal" (Criterion C)<sup>c</sup>Omits "fear of not being able to stop voluntarily" (Criterion C)

through mid-college and considers the psychopathologic parameters related to the development of bulimic behaviors as well as specific events that may be related to the onset. With this in mind, we will discuss the information available about the sociocultural, familial, characterological, and environmental factors that may contribute to the development of bulimia.

The current emphasis on thinness in our culture has been identified as a potential factor associated with the development of bulimia and bulimia nervosa [13,20]. There is mounting evidence of the increasing value placed on thinness in our society [20]. While the cultural dichotomy of exposure to unlimited amounts of food and an emphasis on thinness may contribute to eating disorders, there is at present little data to prove causality.

Information about families of bulimics is lacking. Herzog [21] has pointed out that 50% of the bulimics he studied came from homes broken by the death or severe physical illness of one parent. This is much higher than our own earlier findings of 9% of patients (3 of 34) who experienced death of parent, separation of parents, or were adopted [2]. We later found that 15% of 275 bulimics presenting at our eating disorder clinic had divorced parents (unpublished data).

Predisposing personality characteristics are even more difficult to evaluate. We are not aware of published studies that evaluate adult bulimics relative to predisposing personality traits. Consequently, the only studies available that provide clues to personality traits in bulimic individuals come from retrospective reports of subjects with bulimarexia [22] and bulimic anorectic adolescents [23] and adults [24]. Boskind-Lodahl pointed out that the bulimarectics that she saw had a high need for validation before the illness and felt that developing a better body would solve their problems [22]. Strober reported impulsiveness and weight control problems in bulimic anorectic adolescents before the onset of the illness [23]. Casper and associates [24] in comparing bulimic anorectics with restrictive anorectics noted that before the onset of the illness both groups were reported to have been industrious, achievement-oriented, and dichotomous thinkers. Bulimic anorectics, unlike restrictive anorectics, were outgoing, articulate, socially confident, sexually experienced, and had more dysphoria and less optimism about the future.

Neurological problems have been suggested as a possible factor in the onset of bulimic behaviors. Rau et al [6] and later Weumuth [7] reported on a series of "compulsive eaters" who demonstrated a high frequency of abnormal EEGs. While treatment with phenytoin was effective in some cases, improvement was not correlated with EEG findings. Our group has reported that the rate of abnormalities in EEG tracings

for bulimics probably is not different from the rate in the general population [25].

Russell's earlier findings [4] suggested to some that anorexia nervosa might be a cause for bulimia [26]. This suggestion has not been supported by Halmi's findings of only one case of anorexia nervosa in 355 students with a high prevalence of bulimia [10] and the recent survey findings of Pope et al [16] suggesting a relatively low prevalence of anorexia nervosa in student groups that have a higher prevalence of bulimia.

Considerable attention has been paid to precipitating events for bulimia, that is, those events that may be associated with the onset of the disorder. Voluntary dieting has been often associated with the onset of the disorder. Voluntary dieting before the onset of bulimia was reported by 88% of a small series of patients coming to our clinic [2]. Johnson et al [27] reported voluntary dieting in association with onset in 34% of a large series of bulimic subjects. On the other hand, concern over diet and weight also seems prominent in the typical student population. Johnson et al [11] reported that 52% of high school females reported dieting by the time they were 14, 37% were on a diet at the time of the survey, and 14% of the population reported being chronic dieters.

The high frequency of dieting behavior before the onset of bulimia has added to speculation that being overweight may contribute to the development of the bulimia syndrome [10]. Halmi et al [10] reported that the "bulimic" students had a history of being overweight and had more of a tendency to be overweight currently than nonbulimic students. Fairburn and Cooper [19] reported a high number of weight fluctuations, both above and below the norm, in those individuals who later developed symptoms of bulimia nervosa, but found no indication that a majority of patients had a history of being overweight. We are aware of no data to support the argument that a majority of bulimic patients are overweight before the onset of the illness, although they may view themselves as being overweight.

The presence of stressful events at the time of the onset of bulimia has been reported [2,27]. While studies at our center found that 88% of a series of bulimic patients reported some type of loss or stressful event [2], Johnson et al [27] reported that only 7% of their subjects reported conflict before the onset, with the same percentage reporting a significant loss. They found that a much higher percent of subjects (40%) reported the onset of bulimia at a time when there were a high number of unpleasant emotions present [27]. Reports of stress-induced onset would suggest that individuals who are prone to develop bulimia may have problems with coping skills or with cognitive style.

## SUMMARY

While there have been several useful studies reported on the prevalence of bulimia in the general population, their research design has not been sufficiently rigorous to encourage definitive statements regarding the prevalence of bulimia in the general population. Taking these limitations into consideration, the bulimia syndrome as we see it in patients probably occurs in 1% to 2% of females in the target age of 18 to 30. This corresponds to the reported prevalence of bulimia nervosa. The higher prevalence figures reported may represent an earlier stage of the illness, may be identifying individuals who have a predisposition to develop the illness, or recording isolated symptoms that occur over time but never together in the person's life span. Prevalence studies may also be identifying a significant number of overeaters. Before the bulimic illness, individuals may be concerned about weight, with the bulimia syndrome developing after a combination of dieting and external or internal stress of undetermined severity. We must add to this limited knowledge regarding the causes and prevalence of bulimia and bulimia nervosa to successfully develop programs for prevention and treatment of this debilitating syndrome.

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