

# Binge eating disorder and the night-eating syndrome<sup>1</sup>

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**OBJECTIVE:** To determine in three samples of obese women the prevalence of two eating disorders – binge eating disorder and the night-eating syndrome.

**METHOD:** Interviews utilizing standard criteria. For binge eating disorder: the consumption of large amounts of food in a discrete period of time together with a subjective sense of loss of control and no vomiting or laxative abuse. For the night-eating syndrome: morning anorexia, evening hyperphagia and insomnia. Determining the rate of bingeing among patients receiving a placebo.

**SUBJECTS:** (1) 102 viewers of a television show describing binge eating disorder; (2) 50 participants in a trial of medication for this disorder and (3) 79 participants in a weight reduction program.

**RESULTS:** In the television sample 19.6% of respondents and in the weight reduction sample 7.6% met criteria for binge eating disorder; all subjects in the medication sample met criteria. During a 4-week placebo period average binge frequency fell from 6.0 to 1.7 binges per week. The night-eating syndrome was manifested by 13.7% of the television sample, 8.9% of the weight reduction sample and 15.0% in the medication trial sample. There was little overlap between the two disorders.

**CONCLUSIONS:** Binge eating disorder is far less frequent than has been believed on the basis of questionnaire studies and it is highly responsive to placebos. Frequency of the night-eating syndrome is comparable to that of binge eating disorder. Future studies should assess binge eating disorder by interview rather than by self-administered questionnaire.

**Keywords:** binge eating disorder; night-eating syndrome; placebo response, obesity

## Introduction

Binge eating disorder is a newly-proposed designation for an eating disorder first described in 1959.<sup>1</sup> It is characterized by the consumption of large amounts of food in a discrete period of time together with a subjective sense of loss of control but no compensatory behavior to limit weight gain.<sup>2</sup> Two large multi-site field trials found a prevalence of about 30% of persons enrolled in weight reduction programs,<sup>3,4</sup> a figure similar to that of early studies conducted in the decade before formal criteria were proposed.<sup>5-7</sup> The criteria for binge eating disorder established by Spitzer *et al.*<sup>3,4</sup> are listed in Table 1.

Another eating pattern described in the 1950s, the night-eating syndrome, has not aroused the same interest as binge eating. This pattern of morning anorexia, evening hyperphagia and insomnia was found in 64% of emotionally disturbed, severely obese patients in a special study clinic and in only 10% of obese persons in a nutrition clinic.<sup>8</sup>

The present study was stimulated by an unexpected finding during recruitment of subjects for a trial of

pharmacotherapy of binge eating disorder: to recruit 50 subjects it was necessary to screen 1450 obese women who had identified themselves as binge eaters! This surprisingly very low frequency led us to undertake a systematic, interview-based assessment of the frequency of binge eating.

In the course of evaluating large numbers of obese persons for this study, the senior author became convinced that the night-eating syndrome, which he had described 40 years before, was a real phenomenon worthy of further study. Accordingly, it, too, was assessed by interview in a systematic manner.

## Methods

### Diagnostic criteria

The criteria for binge eating disorder as proposed by Spitzer *et al.*,<sup>3</sup> and included in the Appendix to DSM IV, are listed in Table 1. In determining the frequency of binge eating alone, the criteria were those listed under Section A. For the complete diagnosis of binge eating disorder, four additional criteria were used:

B: behavioral indicators of loss of control;  
C: the presence of distress;

D: a frequency of at least two days a week for 6-month period;

E: failure to meet criteria for anorexia nervosa or bulimia nervosa, particularly the absence of purging following a binge.

Three criteria were established for the identification of the night-eating syndrome: (1) no appetite for break

<sup>1</sup> A preliminary report of this study was presented at the International Congress on Obesity in Toronto, Canada, on August 22, 1994.

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**Table 1** Diagnostic criteria for binge eating disorder\*

- A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:  
 (1) eating, in a discrete period of time (eg within any 2 h period), an amount of food that is definitely larger than most people would eat during a similar period of time in similar circumstances.  
 (2) a sense of lack of control over eating during the episode (eg a feeling that one cannot stop eating or control how much one is eating).
- B. During most binge episodes, at least three of the following behavioral indicators of loss of control are present:  
 (1) eating much more rapidly than usual.  
 (2) eating until feeling uncomfortably full.  
 (3) eating large amounts of food when not feeling physically hungry.  
 (4) eating alone because of feeling embarrassed by how much one is eating.  
 (5) feeling disgusted with oneself, depressed or feeling very guilty after overeating.
- C. The binge eating causes marked distress.
- D. The binge eating occurs, on average, at least 2 days a week for a 6-month period.
- E. Does not currently meet the criteria for anorexia nervosa or bulimia nervosa, purging or non-purging type.

\* From Spitzer<sup>3</sup>

fast; (2) 50% or more of food intake after 7 p.m. and (3) trouble getting to sleep and/or staying asleep.

**Subjects**

Subjects of the present report were all women, and constituted three samples.

*The television sample* was designed to provide a systematic assessment of a sample of the large population that had been screened for admission to the pharmacotherapy trial and that had shown such a low rate of binge eating disorder. For this purpose, we focused on one of the major recruitment sources: persons who called the Weight and Eating Disorders Program in response to a five-minute segment on the local television news. In this segment, binge eating disorder was described by one of us (AS) and by a patient suffering from the disorder. These descriptions emphasized the key features of binge eating and distinguished it from the eating behavior of obese persons without these features. Viewers were then given a telephone number to call for further information about a program to test a new medication for the treatment of binge eating disorder.

A total of 645 inquiries were received, of whom a vast majority identified themselves as binge eaters. Since, as soon as we realized that a caller was not eligible for the trial (for reasons of male sex, concurrent illness, etc.), we did not complete the interview, we could not estimate the frequency of binge eating disorder among these subjects. Accordingly, to estimate this frequency, we selected 102 consecutive callers for a more thorough two-step procedure. First was a structured telephone interview, utilizing the Spitzer criteria noted above, conducted by two trained research assistants. It was followed, in persons with positive responses, by a face-to-face interview with either AS or RB.

The presence of the night-eating syndrome in this and the other two samples was determined by positive responses to the three criteria noted above.

*The weight reduction sample* was designed to assess the frequency of binge eating disorder in the type of clinical population from which the Spitzer criteria were derived. It consisted of 79 obese women who were assessed by entry into a weight reduction program that combined diet and exercise. Patients were either referred by physicians in the Section of General Medicine of

the Hospital of the University of Pennsylvania or responded to announcements in the local newspapers. A clinical psychologist (TW), in an interview that utilized the Spitzer criteria, classified patients as having: (1) binge eating disorder; (2) binge eating or (3) no eating disorder. Subjects in the first category met all five criteria for binge eating disorder while those in the second category reported binge eating but failed to meet the requirements for frequency and/or the associated features.

*The medication sample* consisted of 50 patients who participated in the pharmacotherapy trial. They were recruited for the trial by means of television and the print media, but did not include any of the 102 subjects in the television sample. Each had been diagnosed by interview as meeting the criteria for binge eating disorder. The rate of binge eating during the 4-week placebo period that preceded the drug trial was determined for all 50 subjects, based on diaries of binge episodes that were reviewed with the subject each week by AS or RB.

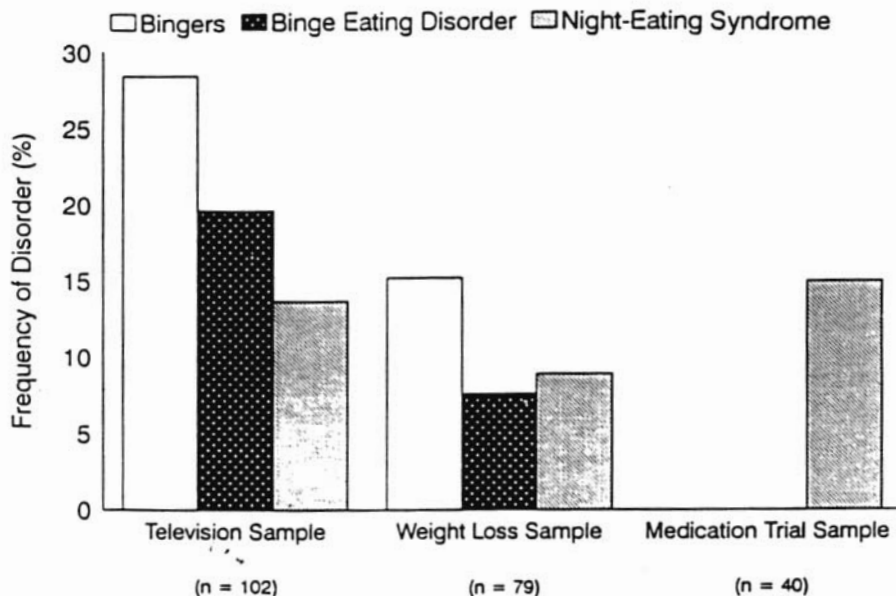
The frequency of the night-eating syndrome was based upon 40 of the 50 subjects, since this syndrome did not become an object of inquiry until after ten subjects had completed the study. For analyses of night eating the no. is thus 40.

**Results**

Characteristics of patients are shown in Table 2. Note the similarity in age, height and weight of the members of the three samples. The average body mass index (BMI = weight in kilograms/height in meters squared) of more than 35 indicates that patients were significantly obese.

**Table 2** Characteristics of subjects

	Television sample	Weight loss sample	Medication trial sample
Age (years)	39.2 ± 10.8	39.2 ± 8.6	44.0 ± 10.0
(Range)	(18-65)	(21-60)	(22-61)
Height (cm)	164.8 ± 6.9	164.8 ± 6.6	164.5 ± 7.3
Weight (kg)	101.7 ± 25.5	96.0 ± 11.8	95.8 ± 19.0
BMI (kg/m <sup>2</sup> )	37.8 ± 9.1	35.3 ± 4.0	35.5 ± 6.6
(Range)	(23.9-68.6)	(28.1-48.3)	(26.5-55.7)



**Figure 1** Prevalence of binge eating disorder and night-eating syndrome in the three samples. The first two sets of bar graphs show the percentage of persons manifesting binge eating, binge eating disorder and the night-eating syndrome. The last bar graph shows the percentage of persons in the medication trial who manifested the night-eating syndrome. All subjects in the medication trial manifested both binge eating and binge eating disorder.

### Binge eating disorder

The first finding of this study is the relatively low frequency of binge eating disorder, as shown in Figure 1. Among the 102 persons in the television sample who had identified themselves as suffering from binge eating disorder and who underwent the two-stage interview schedule, only 28.4% met even the criteria for binge eating and no more than 19.6% met the full criteria for binge eating disorder. Among patients enrolled in the weight reduction program the comparable values were 15.2% and 7.6%. By design, all patients in the medication trial met criteria for binge eating disorder.

### Responsiveness to placebos

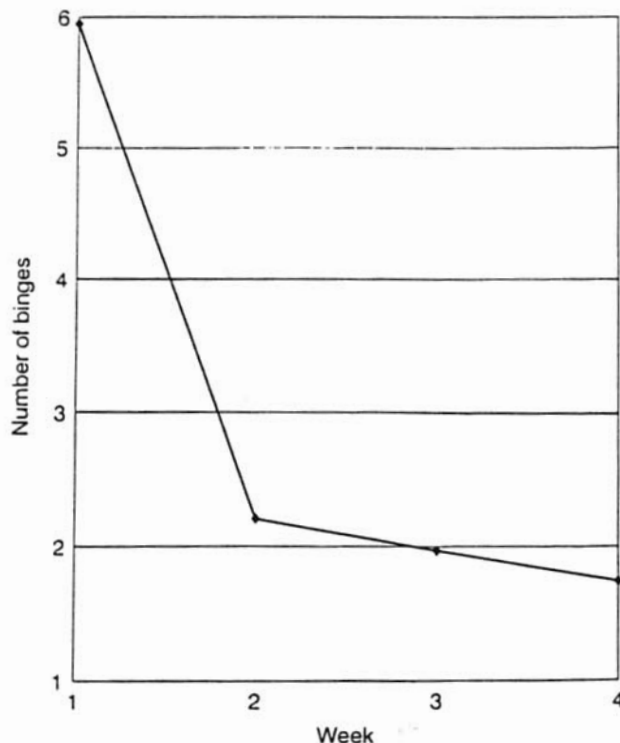
The second finding is the remarkable responsiveness of patients with binge eating disorder to placebo as assessed by weekly interviews in which binge eating diaries of patients in the medication sample were carefully reviewed. Figure 2 shows that, during the 4-week placebo period prior to the initiation of active treatment, the average frequency of bingeing by subjects who had met all binge eating criteria fell by 72% (from 6.0 to 1.7 binge episodes per week). In 22 of the 50 subjects the frequency fell so low as to make them ineligible for the trial, leaving 28 who participated.

### Night-eating syndrome

The third finding is the frequency of the night-eating syndrome in the three samples (Figure 1). In the first two it was similar to that of binge eating disorder: 13.7% among patients in the television sample and 8.9% among patients in the weight reduction program. It was 15.0% among the patients in the medication trial (all of whom manifested binge eating disorder).

Insomnia has been characterized by the time it occurs as 'sleep onset' insomnia (i.e. difficulty in getting to

sleep) and 'medial' insomnia (i.e. difficulty in staying asleep). Table 3 shows for the three samples the percentage of persons manifesting these types of insomnia among persons also manifesting morning anorexia and evening hyperphagia - here termed 'night eaters'. In the



**Figure 2** Mean number of binges per week reported by 50 subjects during the 4-week placebo run-in to the medication trial. Frequency fell from 6 to 1.7 binges per week.

**Table 3** Insomnia among subjects with and without evening hyperphagia and morning anorexia

Sample	'Night eaters' <sup>*</sup>					'Non-night eaters'				
	n	Initial only	Medial only	Both	Neither	n	initial only	Medial only	Both	Neither
Television	24	20.8%	8.3%	29.2%	41.7%	78	21.8%	5.1%	33.3%	39.7%
Weight loss	13	30.8%	7.7%	15.4%	38.5%	66	9.1%	15.2%	24.2%	51.5%
Medication trial	6	16.7%	33.3%	50.0%	0%	34	2.9%	20.6%	20.6%	55.9%

\* Subjects who report evening hyperphagia and morning anorexia

television and weight loss samples there appeared little difference between these 'night eaters' and the 'non night eaters' in either the percentage with some form of insomnia or in the pattern of insomnia. There were too few (six) 'night eaters' in the medication trial to permit meaningful comparisons with the other samples. Either or both forms of insomnia satisfied the insomnia criterion for the night eating syndrome.

Table 4 shows the BMI of subjects in the three samples according to the presence or absence of binge eating disorder and the night-eating syndrome. Subjects who reported both patterns had a significantly greater BMI than did subjects with neither pattern ( $P < 0.05$ ). Otherwise the BMI in the different samples was relatively similar.

**Overlap of the two eating patterns**

The fourth finding is that there was only marginal overlap between binge eating disorder and the night-eating syndrome. Table 5 shows the values for the three

**Table 4** Body mass index and eating patterns

Sample	Binge eating disorder only	Night eating syndrome only	Both†	Neither
Television	35.3	34.6	44.2	38.2
Weight loss	36.7	34.4	-	35.3
Medication trial	34.9	-	39.7	-

Subjects with both binge eating disorder and night-eating syndrome (†) were heavier than those in three other categories ( $P < 0.05$ ).

**Table 5** Concordance of binge eating disorder and night-eating syndrome

Television sample (n = 102)		Night eating syndrome	
		+	-
Binge eating disorder	+	6	14
	-	8	74
Weight loss sample (n = 79)		Night eating syndrome	
		+	-
Binge eating disorder	+	0	6
	-	7	66
Medication trial (n = 40)		Night eating syndrome	
		+	-
Binge eating disorder	+	6	34
	-	0	0

samples. Of subjects with binge eating disorder, 30% in the television sample, none in the weight loss sample and 15% in the medication sample manifested the night-eating syndrome. Of subjects with the night-eating syndrome, 43% in the television sample and none in the weight loss sample manifested binge eating disorder.

**Discussion**

The first finding of this study is the surprisingly low rate of binge eating disorder, as compared with previous reports. In our trial of treatment of binge eating disorder, only 50 of 1450 obese women who identified themselves as binge eaters had been eligible. We therefore assessed 102 such women in the television sample who had also identified themselves as binge eaters after having watched a show that carefully described binge eating disorder. Even in this self-selected sample no more than 19.6% met criteria for binge eating disorder.

The value among patients in the weight reduction program was even lower: 7.6%. Basdevant *et al.* recently reported a similar low prevalence of binge-eating disorder (8.9%) among 292 patients in a weight reduction program in Paris.<sup>9</sup> These values are far lower than the 30% which has been the accepted value for persons entering weight reduction programs.<sup>2-4</sup>

What are the reasons for the discrepancy between these and earlier reports? One possibility is that the values in the present study were based on interview rather than on self-administered questionnaires, as in earlier reports.<sup>3,4</sup> Responses to questionnaires would have identified most of the television sample as binge eaters. Interviews reduced this value to 19.6%. O'Neil has noted that interviews reduced by 75% a questionnaire-based prevalence of binge eating disorder (P O'Neil, personal communication, 23 August 1994).

The second finding of this study is the surprisingly strong placebo responsiveness of patients with binge eating disorder. The 72% placebo response of persons in the medication trial is almost identical to that of the report by Alger *et al.*,<sup>10</sup> in which binge frequency decreased by 69% in patients receiving placebo.

The third finding of the study was the presence of the night-eating syndrome in from 8.9% to 15% of obese women in the three samples. These values are similar to the 10% of obese persons identified as night-eaters in a nutrition clinic in the original study.<sup>8</sup> Since that time, Rand and associates have reported the night-eating syn-

drome among 0.4% of persons of normal weight;<sup>11</sup> 15% of severely obese persons;<sup>12</sup> half of the members of an Alcoholics Anonymous group;<sup>13</sup> and 25% of 'morbidly' obese surgical patients.<sup>14</sup>

The first report of this syndrome suggested that it reflected an altered circadian rhythm of food intake, sleep and mood, apparently in response to stress.<sup>8</sup> It was viewed as a possible variant of depression.<sup>15</sup> Thus, both disorders are characterized by a depressive mood, but its evolution during the day differs. In major depression, mood is lowest when a person awakes and improves during the day. In the night-eating syndrome, by contrast, mood is highest when a person awakes and over the course of the day deteriorates into evenings filled with distress and overeating.

The view that the night-eating syndrome reflects an altered circadian rhythm suggests that it might better be understood as a dimension of behavior rather than as a syndrome. The clinical and epidemiological utility of viewing this behavior as a syndrome, however, led us to attempt to define criteria for it. These criteria have varied, however, even for the same author (AS). Thus, in the original report of very carefully studied subjects, whose reports of food intake justified considerable confidence, the criterion for the key behavior of night-eating was the consumption of at least 25% of total caloric intake after the evening meal. In the present report, of patients who had been less intensively studied, the threshold was raised to 50% in an effort to avoid false positives. Other authors such as Rand and her colleagues have utilized other criteria, including evening anxiety.<sup>11-14</sup>

Do the night-eating syndrome and binge eating disorder represent different entities? The data in Table 5 suggest that they do. The vast majority of subjects reported only one of the disorders; the percentage of persons reporting both disorders was only 21% in the television sample, 0% in the weight loss sample and 15% in the medication sample. Similarly, Kuldau and Rand reported that only one of 25 'morbidly obese' patients with the night-eating syndrome also met DMS III criteria for bulimia and concluded that 'the case for status of NES as syndrome in its own right is strengthened by the almost entirely different set of eating behaviors and attitudes associated with it and bulimia'. Given the relative imprecision of the diagnostic criteria and the bias of obese subjects to affirm questions regarding overeating, these findings support the independence of the two disorders.

Newly delineated 'nocturnal sleep-related eating disorders' are characterized by eating upon arousal from sleep, often in association with sleep walking and related sleep disturbances. The relationship between the night-eating syndrome and those disorders is unclear, in part, because of uncertainty regarding their nature. Thus, they have been reported largely in infants<sup>16</sup> and largely in adults,<sup>17-20</sup> primarily during sleep<sup>17,18</sup> or primarily during wakefulness,<sup>19</sup> and with<sup>17-20</sup> or without<sup>19</sup> polysomnographic evidence of parasomnias.

Clarification of the nature of these disorders should

make it easier to determine their relationship to the night-eating syndrome. A working hypothesis suggests that they represent the tail of a distribution of disordered circadian rhythms manifesting as the night-eating syndrome.

The relatively low frequency of binge eating disorder found in the three selected samples of obese persons in the present report suggests the need for further study of more representative populations. Such studies should rely on interviews rather than self-administered questionnaires and should incorporate measures of the reliability of the diagnosis over time.

The finding of a night-eating syndrome suggests that future assessment of obese persons include inquiry into this disorder; a multicenter study is now under way.

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