

Eating Disorders and Obesity

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KEYWORDS

- Obesity
- Night eating syndrome
- Binge eating disorder
- Comorbidity

An understanding of the relationship between obesity and eating disorders has grown in recent years. Obesity is characterized by an excessive amount of fat in tissues of the body. Body fat typically is estimated by the body mass index, calculated as weight in kilograms divided by height in meters squared. Persons with a body mass index of 30 kg/m² or greater are considered obese.¹ In 2007 and 2008, the prevalence of obesity among US adult men was 32.2% and among adult women was 35.5%, although the rate of increase in prevalence of adult obesity has slowed over the past 10 years.² In the past, obesity had itself been considered to be an eating disorder. We have learned, however, that most overweight and obese persons do not overeat in any distinctive pattern. For a smaller number, however, 2 clear patterns of overeating have been identified: Binge eating disorder (BED) and night eating syndrome (NES). Both disorders are more prevalent among overweight and obese persons than among persons of normal weight, and they contribute to the overweight of such persons.

BINGE EATING DISORDER

Binge eating was first described by Hippocrates, who viewed it as a “sick form of hunger.”³ The first proposal of binge eating as a syndrome occurred in 1959 when it was proposed as “BED.”⁴ Since then, formal diagnostic criteria have been proposed and appear with a provisional diagnosis in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR, 2000). These criteria were based on 2 large studies (of 1984 and 1785 persons, respectively) conducted at 12 eating disorder programs.^{4,5} Two core features and several associated features have been identified.

Diagnostic Features

The first of 2 “core features” of the diagnosis of BED are “eating within a discreet period of time . . . an amount that is definitely larger than most individuals would eat under similar circumstances.”⁶ The second “core feature” of BED is experiencing a

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loss of control over eating during this period of time, as if one cannot stop eating or limit the quantity eaten. BED is to be distinguished from bulimia nervosa by the absence of compensatory behaviors such as vomiting, laxative abuse, or compulsive exercising. A sense of shame and disgust with oneself is associated with episodes of BED that cause significant distress. Compared with control (non-BED) obese persons, those with BED suffer from more severe obesity; earlier onset of overweight; earlier onset of, and more frequent, dieting; and greater psychopathology.^{4,5}

Prevalence

Estimates of the prevalence of BED vary widely, depending on the method of assessment (eg, survey vs interview) and the definition of a binge. In 2 community surveys, the prevalence was as low as 1.8%⁷ and 2.0%.³ Interview-based studies of treatment-seeking obese persons found higher rates (8.9%⁸ and 18.8%⁹). The prevalence of BED is greater the more severe the obesity; thus, rates of BED among severely obese persons undergoing bariatric surgery were 27%,¹⁰ 38%,¹¹ and 47%.¹² Equal numbers of white men and women are afflicted with BED, whereas black men report the disorder less often than black women.^{13–15}

Psychiatric Comorbidity

Two risk factors for BED have been documented: Psychiatric disorders and obesity. Psychopathology, especially depression, has been consistently reported among people with BED.^{16–25} Axis II disorders, particularly clusters B (dramatic–emotional) and C (anxious–fearful),^{17,19,21} also occur frequently in binge eaters (**Table 1**). In a community study, binge eaters showed several more vulnerabilities than the healthy control subjects, including frequent parental depression; greater susceptibility to obesity; more exposure to negative comments about shape, weight, and eating; morbid perfectionism; and negative self-evaluation.²⁶ Compared with subjects with other psychiatric disorders, binge eaters were distinctive only by more frequent reports of childhood obesity and awareness of negative comments about shape, weight, and eating.²⁷ Persons with BED reported less exposure to risk factors for general psychopathology than did those persons with bulimia nervosa.²⁶

Study	Major Depression	Any Substance Abuse or Dependence	Any Anxiety Disorder	Any Axis I Disorder	Personality Disorder
Yanovski et al, 1993	51	12		60	35
Specker et al, 1994	47	72	11.6	72.1	33
Mussel et al, 1996	47	23	18.8	70	
Telch & Stice, 1998	49	9		59	20

Data from Stunkard AJ, Allison KC. Binge eating disorder: disorder or marker? *Int J Eat Disord* 2003;34:5107–16.

Risk Factors

The influence of genetics on BED is unclear. A latent analysis of a large number of twins²⁸ revealed that one of the generated classes approximated the features of BED, and that monozygotic twin pairs more often fell into the same class than did dizygotic pairs. On the other hand, Lee and co-workers²⁹ did not find any familial tendency for BED.

A once-popular theory for the cause of BED has been put to rest in recent years; the theory is that dieting causes BED. Spitzer and colleagues^{4,5} reported that dieting occurred after the onset of binge eating, a finding that has been confirmed by 5 subsequent studies.^{30–35} The National Task Force on the Prevention and Treatment of Obesity concluded that empirical studies do not support the belief that dieting induces binge eating in obese adults.^{36,37}

NIGHT EATING SYNDROME

NES is an eating disorder characterized by a phase delay in the circadian pattern of food intake. It is manifested by (1) evening hyperphagia, or (2) awakenings accompanied by nocturnal ingestions, or (3) both.³⁸ NES was originally described in 1955, based on a single patient and on the subsequent treatment of 25 obese persons referred to a special study clinic because of difficulty in the management of their obesity.³⁹ The criteria noted in this original study were the consumption of 25% of caloric intake after the evening meal, initial insomnia at least half of the time, and morning anorexia. A revision of the required criteria was proposed in a study by Birketvedt and associates.⁴⁰ It reported nighttime awakenings, which were very often the occasion for the consumption of food. At present, provisional criteria for NES include morning anorexia, evening hyperphagia, and awakening accompanied by frequent nocturnal ingestion.⁴⁰

More recently, an item response theory analysis, using data from 1479 Night Eating Questionnaires, examined the symptoms of NES described.⁴¹ Item response theory revealed that evening hyperphagia, defined as eating 25% or more of the daily caloric intake after the evening meal, and/or the presence of nocturnal ingestions, more than half of the time upon awakening, were almost predictive of a diagnosis of NES. Morning anorexia and delayed ingestion of the first meal did not add enough information to be considered essential in diagnosing NES.

Prevalence

NES is uncommon in the general population (1.5%).⁴² As in the case of BED, prevalence of NES increases with increasing weight, from 8.9%⁴³ to 15%⁴⁴ in obesity clinics and from 10%⁴³ to 27%⁴² and 42%¹² among obese persons undergoing assessment for bariatric surgery.

A recent discovery has been the occurrence of NES in persons of normal weight. This fact came to light through responses to the NES Web site, which provided the Night Eating Questionnaire.⁴¹ The results showed one major difference between the responses of 40 obese night eaters and 40 nonobese night eaters: The normal weight night eaters were 7 years younger (33.1 ± 10.7 years vs 40.0 ± 14.3 years for the obese night eaters). The younger age of the nonobese subjects suggests that NES may contribute to the later development of obesity. This suggestion is supported by the fact that more than half of obese night eaters reported that their night eating began before their obesity.

Features

Four studies have confirmed aspects of the NES. Gluck and co-workers⁴³ reported that NES subjects consumed more of their food intake than did controls during the latter part of the day, and that a test meal at this time was larger in night eaters than in control subjects. This study also found elevated levels of depression in NES subjects. Aronoff and colleagues⁴⁴ reported that 70% of the 24-hour food intake of night eaters was consumed after 7 pm. Allison and associates⁴⁵ found that NES subjects awakened 1.7 times per night, and 73% of these awakenings were associated with snacking. Manni and co-workers⁴⁶ found NES (confirmed by polysomnography) in 10 patients who ate during half of these occasions.

Stress plays a strong role in the development and maintenance of NES. In the author's experience, approximately 75% of NES sufferers linked the onset of their disorder to a specific stress-related event. Those who reported a stress-related onset were nearly 15 years older at the age of onset than the 25% of respondents who did not experience such an event (34.2 vs 19.6 years; $P = .001$), suggesting a particular vulnerability to NES among persons with younger age of onset (Allison KC, Stunkard AJ, unpublished data, 2004).

Psychiatric Comorbidity

As in the case of BED, psychiatric comorbidity is common among people with NES.^{27,38} More than 75% of NES participants in one study had a lifetime history of an axis I disorder.³⁸ Specifically, night eaters met *DSM-IV* criteria significantly more often than control subjects for a history of major depressive disorder (47%), any anxiety disorder (37%), and any substance abuse and dependence (24%). Beck Depression Inventory scores were moderately elevated among people with NES.⁴⁷ Napolitano and colleagues⁴⁷ also reported even higher levels of state and trait anxiety and disinhibition of food intake among obesity clinic patients with NES than among those with BED or with no eating disorder.

Risk Factors

There is a strong familial link in NES. Lundgren and co-workers⁴⁸ found that 36% of NES participants reported at least 1 first degree relative with night eating behaviors compared with significantly fewer (16%) matched controls ($P = .03$). This comparison is biased in favor of a higher prevalence among family members of night eaters, because they are far more aware of night eating than are persons without a relative with NES.

Eating Versus Sleep Disorder

The disturbed sleep with frequent ingestions has led to the view that NES is a combined sleeping and eating disorder. The 2004 study by O'Reardon and colleagues,⁴⁹ however, revealed no significant differences between night eaters and controls for sleep onset (23:31 \pm 1:40 vs 23:32 \pm 1:06) and sleep offset (07:24 \pm 1:07 vs 6:59 \pm 1:12). This finding suggests that, among night eaters, it is the eating pattern that is disturbed and that the sleeping pattern remains undisturbed. NES thus seems to be a disorder of biological rhythm, characterized by a delayed onset of eating (**Fig. 1**). This view encompasses the continuation of overeating into the night and the delay in onset of appetite in the morning.

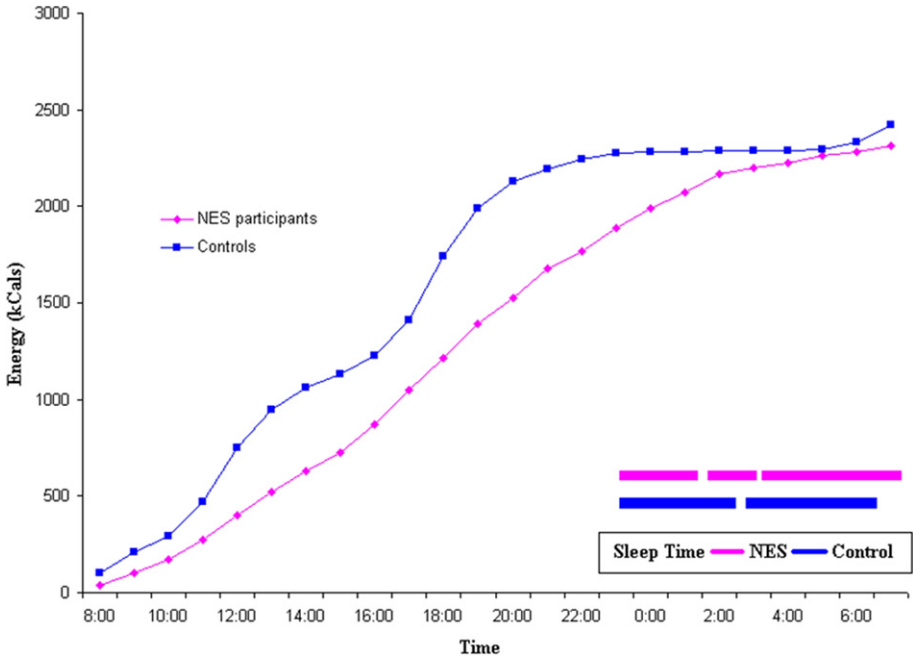


Fig. 1. Cumulative caloric intake for persons with NES. Note that persons with NES have more frequent awakenings than the control group. Note also a delayed circadian shift relative to matched control participants. (From O'Reardon JO, Ringel BL, Dinges DF, et al. Circadian eating and sleeping patterns in the night eating syndrome. *Obes Res* 2004;12:1789–96.)

SUMMARY

In conclusion, 2 types of disordered eating behaviors affect some overweight and obese persons. BED and NES present an excellent opportunity to recognize, treat, and prevent these disorders that, at the least, maintain, and at worst, promote, overweight and obesity. Articles in this volume by Wilson and co-workers and Allison and colleagues discuss current treatment options for BED and NES, respectively. Clinicians are encouraged to evaluate the presence of BED and NES in all patients who seek treatment for their obesity. Although the prevalence of these 2 eating disorders is relatively low, both are associated with significant distress and dysfunction that can be ameliorated with effective treatment.

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