The prevalence of night eating syndrome and binge eating disorder among overweight and obese individuals with serious mental illness ☆

Jennifer D. Lundgren [a,*], Melisa V. Rempfer [a], Catana E. Brown [b,c], Jeannine Goetz [c], Edna Hamera [c]

[a] University of Missouri-Kansas City, Kansas City, MO, United States
[b] Touro University, United States
[c] University of Kansas Medical Center, Kansas City, MO, United States

ABSTRACT

The prevalence of night eating syndrome (NES) and binge eating disorder (BED) was assessed among overweight and obese, weight-loss-seeking individuals with serious mental illness (SMI). Sixty-eight consecutive overweight (BMI ≥ 25 kg/m²) and obese (BMI ≥ 30 kg/m²) individuals with SMI (mean age = 43.9 years; mean BMI = 37.2 kg/²; 67.6% Caucasian, 60.3% female) who were enrolled in a group behavioral weight loss treatment program were assessed at baseline for NES and BED with clinician-administered diagnostic interviews. Using conservative criteria, 25.0% met criteria for NES, 5.9% met criteria for BED, and only one participant met criteria for both NES and BED. This is the first study to find that obese individuals with SMI, compared with previously studied populations, are at significantly greater risk for NES, but are not at greater risk for BED. Stress, sleep, and medication use might account for the high prevalence of NES found in this population.

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1. Introduction

Persons with serious mental illness (SMI) are at increased risk of overweight and obesity compared with the general public (Dickerson et al., 2005). The mechanism of excess weight accumulation in this population is not fully understood; it is thought to be related both to physiological changes in hunger, satiety, and metabolism associated with medication use and to lifestyle factors such as increased sedentary behavior (Allison et al., 1999; Allison and Casey, 2001). Night eating and binge eating, two correlates of obesity, may be more common among persons with SMI than among those without psychiatric disorders (Bulik et al., 2002; Lundgren et al., 2006); these eating behaviors may consequently contribute to excess weight among persons with SMI.

Binge eating disorder (BED) is characterized by the consumption of an unusually large amount of food in a discrete period of time accompanied by perceived sense of loss of control over the eating episode; three of five qualifiers must be met: eating more rapidly than usual, eating until uncomfortably full, eating large amounts of food when not physically hungry, and eating alone because one is embarrassed, or feeling disgusted, depressed, or very guilty after a binge eating episode (DSM IV TR).

Individuals with BED often report lifetime histories of depression (Telch and Stice, 1998; Yanovski et al., 1993), but few studies have reported the prevalence of BED among individuals with serious mental illness, such as schizophrenia and bipolar disorders. Ramacciotti and colleagues (2004) assessed symptoms of BED among 31 adults diagnosed with schizophrenia. Among this primarily overweight and obese group (71% with a body mass index [BMI] of ≥ 25 kg/m²), five patients (16%) met criteria for BED, three of whom reported the onset of BED after treatment with atypical antipsychotics. Similar prevalence rates of BED among patients with bipolar disorder have been reported, ranging from 11.5% to 13.0% (Krüger et al., 1996; MacQueen et al., 2003) These prevalence rates are higher than that found among the general population (2%) (Spitzer et al., 1992), but are not uncharacteristic of an obese, non-psychiatric population (8.9% to 18.8%) (Brody et al., 1994; Stunkard et al., 1996).

NES is characterized as a delay in the circadian intake of food and manifested by evening hyperphagia and/or nocturnal awakening with ingestion of food three or more times/week (O'Reardon et al., 2004; Stunkard et al., 1955). Reviews by de Zwaan and colleagues (2003) and Striegel-Moore and colleagues (2008) highlight that varying NES diagnostic criteria have appeared in the literature over the past 50 years, and suggest that further information on the nature and prevalence of NES in diverse populations is needed. In a study of general psychiatric outpatients (of all body mass indices), Lundgren and colleagues (2006) found that 12.3% of patients met criteria for

NES, a rate that is significantly higher than the prevalence of NES in the general population (1.5%, Rand et al., 1997) and similar to the prevalence of NES among obese samples (6–16%) (Adami et al., 1999; Ceru'-Björk et al., 2001). With regard to co-morbid psychopathology, 30.6% of the patients with NES met criteria for a lifetime substance use disorder, compared with 8.3% of non-night eaters. Additionally, patients with NES were more likely to be prescribed more than one atypical antipsychotic than patients without NES (38.8% vs. 30.8%, respectively). Although this sample was, on average, overweight (mean BMI = 29.1 kg/m^2), obese psychiatric patients (BMI ≥ 30 kg/m^2) were 5 times more likely to meet criteria for NES than non-obese psychiatric patients (BMI 18.5–25.9 kg/m^2).

These studies suggest that persons with SMI are at increased risk for BED and NES compared with the general population. The current study replicated and expanded the previous studies of NES and BED among psychiatric samples. In particular, we assessed the prevalence of both NES and BED, as well as their co-morbidity, in a sample of obese, weight-loss-seeking individuals with SMI.

2. Methods

Sixty-eight consecutive overweight (BMI ≥ 25 kg/m^2) and obese (BMI ≥ 30 kg/m^2) individuals with SMI who were enrolled in a randomized, group behavioral weight loss treatment study were assessed at baseline for NES and BED. Participants were part of a larger study funded by the National Institute of Mental Health titled "A Psychiatric Rehabilitation Approach to Weight Loss" and included both those patients randomized to the treatment and control conditions. Participants were recruited for the larger treatment study through posters, announcements at group meetings, and referrals from case managers at two community mental health treatment facilities in the greater Kansas City area. Participants were eligible for the larger study if they were between the ages of 16 and 65 years, overweight or obese, were diagnosed with a serious mental illness by their psychiatrist, and if their psychiatrist deemed them competent to make medical decisions. Anyone needing a guardian for medical decision making was not enrolled. Subjects meeting eligibility requirements were enrolled in the study until the number of subjects needed was obtained.

SMI was operationalized according to National Institute of Mental Health (1991), which included a diagnosis of a schizophrenia spectrum disorder or mood disorder and evidence of impaired functioning for at least 2 years. Similar to the Lundgren et al. (2006) study of outpatient psychiatric patients, the chart diagnoses of experienced psychiatrists were used to establish the psychiatric diagnoses. In fact, the diagnostic category did not distinguish medication use We decided not to limit the participants to a single mental disorder diagnosis because individuals with schizophrenia and mood disorders share the same predisposing factors for obesity (poor health behaviors, lack of resources, low income and medications with side effects of weight gain).

After complete description of the study to the participants, written informed consent was obtained. The study protocol was approved by the institutional review boards of the University of Kansas Medical Center and the University of Missouri-Kansas City.

Participants were assessed at baseline on the following: age, gender, ethnicity, education, psychiatric diagnoses, psychiatric medication use, and shift work. Height and weight were measured, and BMI (kg/m^2) was computed.

Night eating behaviors were assessed with an expanded clinician-administered version of the *Night Eating Questionnaire* (NEQ) (Allison et al., 2008). The NEQ is a self-report measure of NES symptom severity, with scores ranging from 0 to 52 (Allison et al., 2008). Its reliability and validity have been established, and it has a positive predictive value of 62% using a cutoff score of 25 in a psychiatric population (Allison et al., 2008). For the current study, the NEQ was modified such that participants were read the questions while being shown cards with the response choices. Participants could either respond verbally or indicate their response by pointing to their choice on the corresponding visual cue card. This interview version of the NEQ included questions used in the Lundgren et al. (2006) study, and assessed the behavioral and psychological symptoms of NES during the past 28 days. Evening hyperphagia estimates were based on the participants' response to the question "How much of your daily food intake do you consume after suppertime?" Response choices were 0%, 1–25%, 26–50%, 51–75%, or 76–100%. Nocturnal awakening and ingestions of food were assessed with a two-part question: "When you get up in the middle of the night, how often do you snack?" If the participant reported sometimes or greater, the interviewer asked the participant to estimate the number of nocturnal ingestions during the previous 28 days. Distress and impairment in functioning related to night eating were also assessed.

BED was assessed by a clinical interview based on the Diagnostic and Statistical Manual 4th Ed Research Diagnostic Criteria questions for Binge Eating Disorder (DSM IV TR) that have been used in previous studies (Lichtenstein et al., 2006). The questions on the interview were modeled after the Eating Disorder Examination (Fairburn and Cooper, 1993) and the Questionnaire on Weight and Eating Patterns (Yanovski, 1993). Specifically, participants were asked if they "had ever had a binge eating episode when you ate what most people would regard as an unusually large amount of food in a short period of time." If a participant responded affirmatively, he/she was asked to describe in detail the amount and type of food consumed and when the binge eating episode occurred. Interviewers used

the EDE guidelines for determining when an amount of food consumed was unusually large. For participants who consumed an unusually large amount of food, a follow-up question "when you were binge eating, did you feel that your eating was out of control?" was asked. Again, for those responding affirmatively, participants were asked questions regarding the associated features of their binge eating (i.e., DSM IV TR, criteria B), distress and impairment resulting from binge eating, frequency and duration of binge eating, and compensatory behaviors. Participants were diagnosed with BED if they reported objective bulimic (binge) episodes, loss of control during the binge episode, met three of the five previously mentioned qualifiers (criteria B), reported distress and/or impairment in functioning, and their binge eating was not associated with the regular use of compensatory behaviors.

All interviews were conducted by bachelor's and master's level research assistants and were supervised by a clinical psychologist with experience in the assessment of NES and BED (JDL). All interview data, in particular the BED dietary recall data, were reviewed by the interviewers and the supervisor to ensure accuracy. When interviewers or the supervisor did not agree that the size of a binge eating episode was unusually large according to the EDE guidelines, it was coded "negative."

2.1. Statistical analyses

Prevalence rates are presented in percentages; *t*-tests were used to compare patient groups on demographic and psychiatric variables. For all *t*-tests, significance was set at $P < 0.05$.

3. Results

3.1. Participant characteristics

Table 1 shows the participants' demographic characteristics. Participants were on average 43.9 ± 10.4 years of age and had a measured mean BMI of 37.2 ± 8.1 kg/m^2. The age at which participants reported first becoming obese was 26.1 ± 14.5 years old. The majority of the sample was female (60.3%) and Caucasian (67.6%); 88.2% had a high school or college education. Three patients reported shift work during the 3 months preceding the assessment; because meal times for shift workers are non-normative, these participants were excluded from prevalence estimates for NES, but not for BED. Primary psychiatric diagnoses were as follows: 27.1% schizophrenia, 28.6% schizoaffective disorder, 17.1% bipolar disorder, 25.7% major depressive disorder. One participant, had a primary diagnosis of a personality disorder, and was included in the study because of functional impairment. The average number of currently prescribed psychotropic medications was 3.4 ± 1.6 (range 1–6 medications).

3.2. Prevalence of NES

The average Night Eating Questionnaire (NEQ) score for the sample (excluding shift workers) was 19.0 ± 7.3 points (out of 52 points). Because evening hyperphagia criteria have varied in the literature from ≥ 25% to ≥ 50% of total daily calories after the evening meal (de Zwaan et al., 2003), we examined the prevalence of evening hyperphagia using varying criteria. As expected, the prevalence of evening hyperphagia decreased as the criteria became more stringent (Table 2).

One participant reported a lack of awareness during nocturnal eating episodes, indicative of sleep-related eating disorder (Winkelman, 1998), and was excluded from nocturnal ingestion estimates. Of the remaining participants, 31 (45.5%) reported at least one nocturnal

Table 1
Participant demographic characteristics.

Variable	Mean ± S.D. or %
Age (years)	43.9 ± 10.4
Body mass index (kg/m^2)	37.2 ± 8.1
%Female	60.3%
%Caucasian	67.6%
Primary psychiatric diagnosis	
Schizophrenia	27.1%
Schizoaffective disorder	28.6%
Bipolar disorder	17.1%
Major depressive disorder	25.7%
Number of psychiatric medications	3.4 ± 1.6