Should night-eating syndrome be included in the DSM?

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Should Night Eating Syndrome Be Included in the DSM?

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ABSTRACT

Objective: This article examines the status of the literature on night-eating syndrome (NES) according to five criteria that have been proposed by Blashfield, Sprock, and Fuller1 (Compr Psychiatry 1990;31:15–19) to determine whether NES warrants inclusion in the psychiatric nosology as a distinct eating disorder.

Method: Relevant research papers were identified in Medline and PsychInfo using the search term “night-eating syndrome.”

Results: None of the five criteria was met. Specifically, at the time of review, there were not yet 25 empirical papers on NES; no commonly accepted definition of or assessment approach to NES has been adopted; the utility and validity of NES need to be established, and NES needs to be differentiated more clearly from other eating disorder syndromes.

Conclusion: This review suggests that the most pressing step toward clarifying the status of NES is to develop a uniform definition of NES. Once accomplished, research can progress to accumulating the necessary evidence to determine whether NES should be included in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. © 2006 by Wiley Periodicals, Inc.

Keywords: night eating; eating disorders; classification

Introduction

The Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV)2 recognizes two main eating disorders: anorexia nervosa (AN) and bulimia nervosa (BN). The diagnostic category of eating disorders not otherwise specified (EDNOS) is intended for individuals who experience clinically significant eating disturbances that do not meet the specific diagnostic criteria for AN or BN. The DSM-IV describes six specific examples of EDNOS; of these, binge eating disorder (BED) has received considerable empirical attention (for review, see Walsh3). Experts estimate that about 25% of individuals who seek treatment for an eating disorder meet criteria for EDNOS,4–6 yet, with the exception of BED, little research has been conducted on subgroups within this category. The prevalence of EDNOS in community samples is unknown because epidemiological studies typically have focused on AN and BN and their spectrum variants (for review, see Van Hoeken et al.7). Based on estimates of the prevalence of the spectrum variants of AN and BN and of BED, however, it is clear that EDNOS captures more individuals than AN and BN combined. Experts have called for more specific definitions of EDNOS and for research to clarify the nosology of eating disorders.

Night-eating syndrome (NES) is one of the six more specific disorders within the category of EDNOS. NES was introduced into medical literature by Stunkard et al.8 After its original identification in 1955, NES was largely ignored until studies that were carried out during the late 1990s (e.g., Birketvedt et al.9) stimulated a renewed interest. The present work addresses the question of whether NES should be included in future revisions of the DSM as a distinct diagnosis.

Experts have expressed concern over the proliferation of diagnostic categories, suggesting that the DSM includes diagnoses of questionable clinical utility and cautioning that, once added, diagnostic categories are difficult to remove. Blashfield et al.1 proposed five criteria to be considered when deciding whether to recognize a disorder as a legitimate category of pathology in the DSM: (1) there should be ample literature about the proposed syndrome; (2) the diagnostic criteria should be articulated clearly; (3) the proposed syndrome should be differentiated from other (similar) syndromes; (4) evidence...
should be available regarding the reliability of the diagnosis; and (5) evidence should be provided regarding the validity of the syndrome. The present work explores the status of NES according to these five criteria based on a comprehensive search of the literature.

**Criterion 1: Literature**

Blashfield et al.\(^1\) recommended that there be a minimum of 50 journal articles, including at least 25 empirical papers, published about a proposed category, in the 10 years preceding the proposal to include the diagnosis into the DSM. A literature search for “night-eating syndrome,” using PsychInfo and Medline, yielded just 32 articles total, 30 of which were published during the last 10 years. Twenty-one of these articles described empirical research; the remaining nine were reviews, case studies, or editorial pieces that we eliminated from further review. On the basis of these search results, Blashfield and colleagues’ first criterion for the recognition of NES as a distinct category in the DSM has not yet been met.

**Criterion 2: Diagnostic Criteria**

Blashfield et al.\(^1\) recommended that there be a common set of diagnostic criteria proposed across the literature. In addition, assessment instruments, such as structured interviews and self-report scales, should be available to permit adequate measurement of the diagnostic features of the syndrome. A 1994 review by DeZwaan et al.\(^10\) noted the wide variety in definitions of NES. As will be illustrated below, the literature continues to use varying definitions of the syndrome and assessment instruments vary widely from study to study. We will first describe each of the symptoms associated with NES and then discuss the matter of assessment.

Originally, Stunkard et al.\(^8\) defined NES as involving morning anorexia, evening hyperphagia, and insomnia or sleeplessness. Morning anorexia was defined as negligible (i.e., coffee or juice) or no intake at the traditional breakfast time. Evening hyperphagia was defined as consuming at least 25% of total daily calories after the evening meal. Insomnia or sleeplessness was required to occur three or more times a week. Since this first definition of NES was proposed, a variety of definitions have been introduced into the literature.

As shown in Table 1, there is considerable overlap across many definitions of NES: most share inclusion of three core symptoms: morning anorexia, evening hyperphagia, and sleep disturbance. However, the definitions of these symptoms are not consistent across the studies. Some studies describe additional clinical features, such as mood disturbance\(^11\) or sleep interrupted by eating.\(^12,13\) Next, each of the criterion symptoms shown in Table 1 is discussed in detail.

**Morning Anorexia.** Morning anorexia is included as a criterion of NES in all studies but two.\(^14,15\) Despite its widespread inclusion, the definition of “morning anorexia” varies greatly across studies and about one half of the studies do not further define it. Since its original operationalization as negligible (i.e., only coffee or juice) or no intake at the traditional breakfast time,\(^8\) morning anorexia has been defined as “no appetite for breakfast,”\(^11,16–19\) “negligible food intake,”\(^8,20\) “skipping breakfast altogether”\(^21,22\) or “not starting to eat until later in the day.”\(^19\) Inherently problematic in “no appetite for breakfast” is that it leaves open to interpretation whether any food was actually consumed. Just two studies used a definition that eliminated this ambiguity by adopting the criterion of “skipping breakfast.”\(^21,22\) And of these, only one also set a frequency threshold by requiring that breakfast be skipped at least four times a week.\(^23\) Clearly the literature does not adequately define morning anorexia.

**Night Eating.** A second and consistently required criterion for NES is night eating. Like morning anorexia, definitions of night eating vary widely. The term “evening hyperphagia” has been used extensively, though its operationalization differs considerably. Implied in the concept of evening hyperphagia is that food intake is shifted disproportionately into the latter part of the day. Efforts to operationalize evening hyperphagia typically involve two components: (1) the time of day or the timing relative to the last meal of the day when eating occurs, and (2) the amount consumed. For example, Stunkard et al.\(^8\) operationalized night eating as consuming 25% or more of daily caloric intake after the evening meal. This wording leaves unspecified what “evening” means. To address this, some investigators have selected a given hour of the day as the cutoff and specified a set percentage of daily calories to be consumed after this time. Napolitano et al.\(^17\) required 50% or more of daily calories to be consumed after 7 PM. This seemingly more specific approach remains problematic, however, as the hours selected in various studies ranged from 6 PM to 8 PM or, in some studies, the criterion required that the ingestion had to have occurred between the evening meal and going to bed.\(^24\) As experts from European countries have noted, the hour of the evening meal differs cross-culturally, thus demanding more careful consideration of the question
# Table 1. Definitions of night-eating symptoms

<table>
<thead>
<tr>
<th>Study</th>
<th>Morning Anorexia</th>
<th>Evening Hyperphagia</th>
<th>Sleep Disturbance</th>
<th>Sleep Disturbance and Eating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stunkard et al.(^8,a)</td>
<td>Morning anorexia with negligible food intake at breakfast (not more than a cup of coffee or juice)</td>
<td>Consumption of ≥ 25% of the total daily caloric intake after the evening meal</td>
<td>Sleeplessness at least until midnight more than half the time</td>
<td></td>
</tr>
<tr>
<td>Kuldau and Rand(^19)</td>
<td>Morning anorexia</td>
<td>Evening hyperphagia</td>
<td>Insomnia</td>
<td></td>
</tr>
<tr>
<td>Stunkard et al.(^18)</td>
<td>Morning anorexia, no appetite for breakfast</td>
<td>Consumption of ≥ 50% of the total daily caloric intake after 7PM</td>
<td>Insomnia, trouble getting to sleep or staying asleep</td>
<td></td>
</tr>
<tr>
<td>Hsu et al.(^15,b)</td>
<td>Morning anorexia (delay of eating for several hours after awakening)</td>
<td>Excessive evening eating</td>
<td>Insomnia</td>
<td></td>
</tr>
<tr>
<td>Rand et al.(^23,c)</td>
<td></td>
<td></td>
<td>Present</td>
<td>Usual consumption of some food just before going to sleep or waking up during sleep to eat</td>
</tr>
<tr>
<td>Adami(^26)</td>
<td>No food or only a little food before breakfast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powers et al.(^14)</td>
<td></td>
<td>Consumption of 25% of one's total daily calories after the evening meal</td>
<td>Difficulty sleeping</td>
<td></td>
</tr>
<tr>
<td>Birketvedt et al.(^9)</td>
<td>Morning anorexia</td>
<td>Evening overeating; consumption of at least 50% of daily food intake after 6 PM–8 PM (Norway)</td>
<td>Insomnia</td>
<td></td>
</tr>
<tr>
<td>Allen(^24)</td>
<td>Morning anorexia</td>
<td>Consumption of 50% of one's total daily calories after the evening meal but before sleep period</td>
<td>Insomnia as defined by nocturnal awakenings</td>
<td></td>
</tr>
<tr>
<td>Stunkard(^30)</td>
<td>Morning anorexia</td>
<td>Evening overeating; consuming at least 50% of daily food intake after 6 PM</td>
<td>Insomnia</td>
<td></td>
</tr>
<tr>
<td>Aronoff et al.(^20)</td>
<td>Morning anorexia or negligible intake in the morning</td>
<td>Consumption of 50% of one's total daily calories after 7 PM</td>
<td>Insomnia or sleeplessness more than 3 times per week</td>
<td></td>
</tr>
<tr>
<td>Ceru-Bjork et al.(^16)</td>
<td>Morning anorexia (no appetite in the morning)</td>
<td>Largest food intake during a time period after 7 PM</td>
<td>Insomnia, trouble getting to or staying asleep</td>
<td></td>
</tr>
<tr>
<td>Gluck et al.(^21)</td>
<td>Morning anorexia, skipping breakfast 4 or more days a week</td>
<td>Consuming more than 50% of total daily calories after 7 PM</td>
<td>Difficulty falling or staying asleep 4 or more days a week</td>
<td></td>
</tr>
<tr>
<td>Napolitano et al.(^17)</td>
<td>Morning anorexia; lack appetite in the morning.</td>
<td>Eating ≥ 50% of daily calories after 7 PM</td>
<td>Sleep difficulties</td>
<td></td>
</tr>
<tr>
<td>Geliebter(^22)</td>
<td>Morning anorexia, skipping breakfast</td>
<td>Consuming most food in the late evening and at night</td>
<td>Insomnia associated with either falling asleep or staying asleep</td>
<td></td>
</tr>
<tr>
<td>Marshall et al.(^12)</td>
<td>Morning anorexia</td>
<td>Evening hyperphagia</td>
<td>Nighttime awakenings</td>
<td>Ingestion of snacks during nighttime awakenings</td>
</tr>
<tr>
<td>Mullington et al.(^32)</td>
<td>Morning anorexia</td>
<td>Evening hyperphagia</td>
<td>Insomnia</td>
<td></td>
</tr>
<tr>
<td>Pawlow et al.(^31)</td>
<td>Lack of appetite in the morning</td>
<td>Consumption of 50% of one's total daily calories after 6 PM</td>
<td>Difficulty falling asleep or staying asleep; insomnia</td>
<td></td>
</tr>
<tr>
<td>Qin et al.(^33)</td>
<td>Morning anorexia</td>
<td>“Consuming most food in the later evening and at night”</td>
<td>Going to sleep very late</td>
<td></td>
</tr>
<tr>
<td>O'Reardon et al.(^31)</td>
<td>Morning anorexia (even if subject eats breakfast)</td>
<td>Consumption of 50% of one's total daily calories after the evening meal</td>
<td>Awakenings at least once per night followed by consumption of snacks</td>
<td></td>
</tr>
<tr>
<td>Vander Wal et al.(^34)</td>
<td>Morning anorexia</td>
<td>50% or more of daily food intake after 7 PM</td>
<td>Insomnia</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Additional criteria: emotional distress  
\(^b\) Only defined as “night-eating syndrome.”  
\(^c\) Additional criteria: evening tension and/or feeling upset for 2 months.
of meal timing.\textsuperscript{25,26} Five studies\textsuperscript{9,11,13,16,31} explicitly excluded night shift workers with the understanding that their night eating reflected their work schedules.

Another dimension that is implied in several studies is overeating; yet, none of the studies specifically describe the minimum amount of food that must be consumed to meet the diagnostic criteria. Investigators have used the terms “excessive evening eating,”\textsuperscript{23} “eating throughout the evening,”\textsuperscript{19} or “overeating in the evening,”\textsuperscript{17} all of which fail to specify an objective amount of food. The measurement of night-eating episodes might be improved by adopting a two-part definition similar to the definition of binge eating developed by Fairburn and Cooper.\textsuperscript{27} In binge eating, the key elements are eating an objectively large amount of food and experiencing loss of control over the eating episode. We propose to require presence of at least two elements when defining night eating: eating at an unusually late time of the day and eating a disproportionate amount relative to the overall daily intake. There is some indication in the literature that a third element might be useful: one study noted a compulsive quality to the food consumption.\textsuperscript{28}

Whether requiring loss of control would improve the definition of night eating requires further study. The potential for diagnostic overlap with BED or bulimia nervosa arising from such a definition will need to be considered.

Judging from the literature on the difficulties encountered in the measurement of binge eating, it can be expected that questionnaire based measurement of night eating will result in higher rates of night eating than interview or food diary based assessment. However, to our knowledge, so far no study has explored the reliability or validity of measurements of this key NES symptom.

**Sleep Disturbance.** Sleep disturbances such as insomnia or difficulty falling asleep are used as diagnostic criteria for NES in most studies but differ in their definitions. Two studies required the sleep disturbance to be accompanied by food intake,\textsuperscript{12,13} whereas Adami\textsuperscript{26} suggested “usual consumption of some food just before going to sleep or waking up during sleep time to eat.” The other studies\textsuperscript{9,11,14–24,29–34} did not link food consumption specifically to the sleep disturbance. The latter studies described sleep disturbances as “trouble getting to or staying asleep,”\textsuperscript{11,16,18,21,22} “nocturnal awakenings,”\textsuperscript{24} “insomnia,”\textsuperscript{9,20,23,29,30,32,34} or “sleeplessness.”\textsuperscript{8} Without a standardized definition of these sleep-related symptoms, results cannot be compared across studies.

Some authors specified a minimum frequency for sleep disturbance such as experiencing sleep problems more than three times a week,\textsuperscript{20} four times a week,\textsuperscript{21} or more than half the time,\textsuperscript{8} or nightly awakening.\textsuperscript{12} Hence, even when studies included a frequency criterion, they chose differing criteria and applied them to a variety of sleep disturbances (difficulty falling asleep; night time awakening).

**Mood Disturbance.** Two studies proposed mood disturbance as a diagnostic feature of the disorder,\textsuperscript{6,23} however, each applied a different definition: “evening tension/feeling upset”\textsuperscript{23} and “emotional distress.”\textsuperscript{6} In some studies, mood disturbance was noted as a comorbid feature of NES\textsuperscript{11,12,21} and described as being highest in the morning and then continually deteriorating throughout the day.\textsuperscript{9,18,30}

**Duration of Symptoms.** Few definitions specify the duration of NES symptoms.\textsuperscript{13,22} Recently, Tanofsky-Kraff and Yanovski\textsuperscript{35} proposed that, similar to the definitions of anorexia nervosa and bulimia nervosa, NES criteria should include the requirement of a minimum duration of three months. Adoption of this proposal would be an important improvement: without a duration criterion, even individuals who report quite transient disturbances may be diagnosed as suffering from a disorder, raising questions about the clinical utility of the diagnosis.

**Assessment of NES.** Given the lack of consistent definitions of NES symptoms, it is perhaps not surprising that there also are no consistently used, well-designed instruments to determine presence and severity of NES. Most studies measured NES with self-report questionnaires that were developed specifically for the study by its author(s). Of the 23 studies only eight\textsuperscript{11–13,15,17,19,21,26} reported any information on how their questionnaires were derived. Three of these studies used the Night Eating Questionnaire, a 14-item instrument that assesses eating times, appetites, craving, nighttime awakenings, and mood, using a 0–4 Likert scale.\textsuperscript{11–13} The others that were described ranged from a 30-item form with a true/false format\textsuperscript{26} to self-report questions about weight status, weight loss methods, binge eating, night eating, compensatory behavior, fluid consumption, and psychological status\textsuperscript{15} to authored questionnaires based on Stunkard’s night eating syndrome criteria.\textsuperscript{17,19,21} Seven studies also examine food diaries to evaluate intake\textsuperscript{6,9,11,13,20,24,31} and 11 studies\textsuperscript{8,13–15,17–20,23,31,34} used structured clinical interviews to assess eating disorders and/or mood.

Only one study examined the reliability and the utility of a night eating symptom questionnaire.\textsuperscript{34} It found that the test–retest reliability of the Night
Eating Syndrome Questionnaire, a subscale of the Weight and Lifestyle Inventory, was modest \( r = .53, p < .001 \) and that the questionnaire lacked cut points that would produce high specificity and sensitivity. A single screening question for NES, “to what extent does snacking after dinner contribute to your weight problem?” was also analyzed. The question’s positive predictive value varied considerably \( (.16–.98) \) depending on the definition of NES used. The wide variety of assessment instruments makes it difficult to compare the aspects of the syndrome among studies.

In conclusion, the literature does not yet reflect a core set of required diagnostic criteria. Although a number of common features are assessed across the studies, (i.e., morning anorexia, evening hyperphagia, sleep disturbance, and, to a lesser extent, mood disturbance), there is considerable variation regarding their operationalization, including the frequency and duration thresholds that might lead to a diagnosis. The discrepancies seen in the assessment instruments reflect the definitional variability.

**Criterion 3: Differentiation From Other Clinical Syndromes**

Blashfield et al. recommended that there should be at least two independent, empirical studies establishing differential diagnosis. This criterion requires that in order for NES to be recognized as a syndrome, it must be shown that its symptomatology is distinct from other syndromes, including other eating disorders, mood disorders, and sleep disorders.

Three studies required that the night eating occur in the absence of another eating disorder. By definition, in these studies, it was not possible to examine the potential overlap of NES and other eating disorders. Several studies have examined the presence of eating disorders, most frequently binge eating disorder (BED), among patients with NES, with mixed results. Hsu et al. reported that in a sample of 10 individuals with NES, eight also met criteria for BED or BN, suggesting considerable overlap between NES and BED.

In conclusion, there is not yet clear, substantial evidence that NES and its proposed diagnostic criteria are distinct from other established eating disorders and no studies have examined the differential diagnosis between NES and mood disorders.

**Criteria IV and V: Diagnostic Reliability and Syndrome Validity**

The diagnostic reliability criterion requires that there be at least two empirical studies by independent research groups where inter-clinician agreement levels have \( \kappa \) values of \( \geq .70 \). The syndrome validity criterion requires at least two independent empirical studies that indicate that if a patient exhibits one diagnostic symptom (e.g., night eating) the same patient will have at least a .50 probability that she or he will exhibit another symptom of the same disorder (e.g., morning anorexia). We were unable to locate any study that provided information regarding the inter-rater reliability or the validity of NES.

**Conclusion**

Our review suggests that there is not yet adequate empirical support for the inclusion of NES into the DSM. Despite the growing number of articles on NES, the diagnostic criteria remain vague and variable across studies. A critical first step toward resolving the question of whether NES should be recognized as a distinct eating disorder involves developing a uniform definition of the syndrome. At present, unresolved questions include which symptoms belong to the core symptom cluster, what frequency thresholds best indicate clinical levels of such symptoms, and what duration demarcates the syndrome from transient disturbance. Consistent with DSM principles, it will further be necessary to provide evidence that NES is associated with distress or dysfunction. Moreover, progress will require the development of assessment measures with documented reliability and validity. The field will benefit from the recent advances in the development of diagnostic interviews and self-report questionnaires for AN and BN and of measures of functional impairment due to disordered eating. Psychometrically sound measurement tools will be critical for examining whether NES describes a clinically significant syndrome that can be differentiated from other, already defined eating disorders or mental disorders. We conclude that NES does not currently meet the criteria proposed by Blashfield et al. for including a diagnosis in the DSM. Our review indicates the need for further study to determine the utility of NES as a diagnostic category.

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