

Why I Eat At Night: A Qualitative Exploration of the Development, Maintenance and Consequences of Night Eating Syndrome

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Abstract

Night Eating Syndrome (NES), as a diagnosis, presents as a combination of disordered eating, sleep and mood. Patients identified as having both NES and obesity demonstrate poorer outcomes in terms of weight loss compared to those with NES only. However, research focusing on psychological factors associated with NES remains relatively underdeveloped. This study aimed to explore the relationship between NES and the experience of emotion from the perspective of patients accessing a weight management service. Ten adults who met diagnostic criteria for moderate or full NES took part in a semi-structured interview. Data were analysed using a constructivist approach to grounded theory. A core concept to emerge from the analysis was termed 'emotional hunger'; reflecting an urge or need to satiate a set of underlying unmet emotional needs. It was underpinned by the following interrelated themes: (1) Cultivating a dependency on food; (2) Relying on food to regulate emotions; (3) Understanding the significance of night-time; (4) Acknowledging the consequences of night eating. This study provides an in-depth understanding of the relationship between NES and the experience of emotion from the perspective of patients attending a weight management service. Results have potential to inform future service development, particularly around the adoption of a more holistic approach to night eating behaviours.

Keywords

Night Eating Syndrome; Emotion; Obesity; Psychology; Interviews; Grounded Theory, Eating Disorders

Introduction

Night eating syndrome (NES) was first described by Stunkard, Grace and Wolff (1955) in obese outpatients and was characterised by morning anorexia, evening hyperphagia, and insomnia. Absence of a standardised definition of NES appears to have impeded recognition of the syndrome and, subsequently, it has been difficult to compare NES studies (Vander Wal, 2012). The first Night Eating Symposium, held in 2008, resulted in the development of a comprehensive set of research diagnostic criteria (Allison et al, 2010). NES has been included in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), described under Feeding or Eating Disorders Not Elsewhere Classified (American Psychiatric Association, 2013). Currently, it is defined as: the consumption of at least 25% of daily caloric intake after the evening meal and/or evening awakenings with ingestions at least twice per week. In addition, persons must be aware of their nocturnal ingestions and experience associated distress or impairment in functioning, with signs and symptoms lasting for at least three months (Allison et al, 2010).

Due to a history of differing criteria and researchers either looking at full syndrome NES, partial NES or broader night eating behaviour, prevalence estimates vary (Lundgren, Allison & Stunkard, 2012). It is suggested, however, that NES occurs in less than 1.5% of the general population (de Zwaan, Muller, Allison, Braheer & Hilbert, 2014; Striegel-Moore et al, 2005), 9% to 14% of people attending obesity clinics (Gluck, Geliebter & Satov, 2001), 9% to 42% of candidates for bariatric surgery (Allison et al, 2006) and 12% to 22% in outpatient psychiatric populations (Lundgren et al, 2006; Kucukgoncu, Tek, Bestepe, Musket & Guloksuz, 2014; Saraçlı et al, 2015).

Worldwide, rates of obesity are increasing, with more patients undergoing weight loss surgery (Colles, Dixon, & O'Brien, 2007). Individuals identified as obese with NES or night eating behaviour have demonstrated poorer weight losses during supervised diets and more complications during weight loss attempts compared to weight matched controls (Gallant, Lundgren & Drapeau, 2012). NES is associated with increased food intake, causing unwanted weight gain and obesity (Gluck, Venti, Salbe, Votruba, & Krakoff, 2011); hence, this condition may be a pathway to obesity (Marshall, Allison, O'Reardon, Birketvedt, & Stunkard, 2004)

NES has been described as a unique combination of an eating disorder, a sleep disorder and a mood disorder (Lundgren, et al, 2006; Lundgren, Allison, O'Reardon & Stunkard, 2008). Stunkard

and colleagues (1955) reported a relationship between NES and low mood, but otherwise, associations between NES and psychological distress within the literature remain relatively underdeveloped (Allison et al, 2010; Vinai et al, 2015). Current research indicates that individuals with NES are significantly more likely than controls to meet diagnostic criteria for depression and anxiety disorder (Calugi, Dalle Grave, & Marchesini, 2009; Lundgren, Allison, O'Reardon & Stunkard, 2008). In contrast to diagnostic features of chronic depression, people engaging in night eating report more depression in the evenings compared to mornings (Birketvedt et al, 1999; Stunkard et al, 1955). Furthermore, patients have reported the onset of NES during periods of life event stress (Stunkard et al, 1955; Allison, Stunkard, & Thier, 2004), so NES may be an important indicator of psychological distress (Calugi et al, 2009). Vander Wal (2012) proposed, in line with the affect regulation model of binge eating (Polivy & Herman, 1993), that mood disturbances due to perceived stress or stressful life events potentially trigger overeating episodes in NES as a coping response. There is evidence that emotional eating moderates the relationship between NES, Binge Eating Disorder (BED) and BMI (Meule, Platte, & Allison, 2014), suggesting the existence of a potential pathway relating to the development and/or maintenance of night eating (de Zwaan, Marschollek, & Allison, 2015).

Progress continues to be made in understanding the role of emotional eating in response to stress. The co-ordinated neuro-endocrinological cascade of cortisol, insulin, ghrelin (hunger hormone) and leptin (satiety hormone), impacts on dietary intake in times of stress (Masih et al 2017). At the same time stress appears to alter the reward activation system such that a shift towards highly palatable, high fat 'comfort' foods is sought to obtain a reward effect from food (Born et al 2009). Ghrelin and leptin are thought to influence this hedonic process; ghrelin is associated with increased dopamine release and subsequent increased dietary intake and leptin has the opposite effect (Malik 2008). Thus, a complex neurological interplay between energy homeostasis and brain reward mechanisms appears to be at play in emotional eating (Dallman 2010). Yet individuals' attributions of their NES in light of these physiological and hedonistic influences, which may be partly genetically determined, remain poorly understood.

Few studies have explored the subjective experiences of patients with NES (Lundgren, Allison & Stunkard, 2012). One study recruited a severely obese population and identified several important factors related to their night eating behaviour; namely perceived control over night-time eating,

conflictual social relationships and low mood (Cleator et al, 2013). However, the study did not explore the underlying relationships between these factors. Given the high prevalence of NES in severely obese populations and the potential challenges this presents for weight control, further research dedicated to exploring the complex interplay between obesity, night eating and psychological difficulties is required (Cleator et al, 2013; Gallant, Lundgren, & Drapeau, 2012).

The current study sought to supplement and build upon the relatively limited research investigating the relationship between NES and emotions. This study aimed to explore the relationship between NES and the experience of emotion from the perspective of patients identified as obese attending a weight management service.

Methods

Ethics

Regional National Research Ethics Service approval (REF: 15/WM/0274) was obtained for the study and research governance was provided by the research and development committee of the NHS Trusts where participants were recruited.

Qualitative perspective

The current study employed grounded theory (Charmaz, 2014) to explore and understand, from the perspective of participants, the relationship between NES and the experience of emotion. In light of the paucity of research within this area, a grounded theory design was deemed appropriate to inform future research and clinical practice. An epistemological stance of constructivism was adopted (Charmaz, 2014), emphasising the subjective interrelationship between the researcher and participant and the co-construction of meaning (Hayes & Oppenheim, 1997; Pidgeon & Henwood, 1997).

Inclusion/exclusion criteria

Participants were recruited from a UK NHS outpatient specialist weight management service which had the following referral criteria: aged at least 18 years, Body Mass Index (BMI)>40 kg.m² with or without obesity related co-morbidities or a BMI>35 kg.m² with at least one obesity related co-

morbidity. Inclusion criteria for the study were: (i) identified as a moderate night eater or full syndrome night eater as defined by the Night Eating Diagnostic Questionnaire (NEDQ, Gluck, Geliebter, & Satov, 2001); (ii) aged 18 and over; (iii) English speaker. Participants were excluded from the study if they met the following criteria: (i) previous bariatric surgery; (ii) a diagnosis of Obstructive Sleep Apnea; (iii) employed in shift work.

Measures

- Night Eating Diagnostic Questionnaire (NEDQ)

The NEDQ (Gluck et al, 2001) was used to determine eligibility for the study. The NEDQ is a 21-item self-report measure of NES, which has been updated to reflect the most recent diagnostic criteria for NES (Allison et al., 2010). It has two scoring systems; a standard dichotomous score of either full syndrome or non-NES) and an experimental hierarchical score with 1 indicating no night eating, 2 mild night eating, 3 moderate and 4 full syndrome. NES Individuals scoring 3 and above on the experimental score system were considered eligible for this study.

- Depression, Anxiety and Stress Scale (DASS-21)

Participants also completed The DASS-21 (Lovibond & Lovibond, 1996). This consists of three subscales measuring anxiety, depression and stress. Participants were asked to consider their mood over the last seven days and rate their response on a four-point scale. The DASS-21 was not used to determine eligibility for the study but was used to describe the sample in terms of anxiety and depression.

Procedures

A research assistant at the recruitment site used weight-management clinic lists to identify potential participants based on the medical history and clinical reports of night eating behaviour.. In total, 323 patient care records were screened and 82 potential participants were identified. These individuals were sent a participant information sheet two weeks prior to their routine clinic appointment. In total, 29 of the 82 potential participants consented to take part in the study. Others either declined to take part, did not attend clinic or were subject to rearranged appointments.

On attending their routine appointment, written consent was obtained by the first author for participants to complete the NEDQ and DASS-21 and for participants to be contacted at a later date by the researcher to discuss being interviewed. A face-to-face interview was then arranged with interested participants who met inclusion criteria based on their NEDQ score. Consent was obtained at this stage to collect other demographic and clinical data from hospital records including: age, gender, BMI and co-morbidity.

A purposive sampling approach was used to recruit individuals able to shed light on the research topic. Variation was aimed for in terms of gender and age of interviewees to provide some diversity within the sample. Dey's (1999) concept of theoretical sufficiency was utilised as a benchmark to determine the final sample size relating to the achievement of concept saturation, rather than content saturation. Analysis of initial interviews indicated an over presentation of female moderate night eaters, thus more males and individuals with full syndrome NES were purposefully recruited in order to ensure concept saturation.

Interviews

A topic guide to facilitate semi-structured interviews was developed. Based upon the aims of the study, a provisional search of the relevant literature and discussions between members of the research team, a number of open-ended questions and prompts were constructed to elicit participants' experiences and views. In line with grounded theory principles (Charmaz, 2014), the topic guide was regularly reviewed and updated as emerging concepts were being developed. All interviews were conducted in a dedicated research facility located on the same site as the weight management clinic. Each person was interviewed for approximately 60 minutes. Interviews were audio-recorded using a digital voice recorder. The principal researcher ensured participants were fully debriefed following their interview and adhered to a risk and distress protocol.

Data analysis

Interview data were analysed using a grounded theory framework described by Charmaz (2014). As recommended by Charmaz (2014), data collection and analysis were carried out in tandem over a six-month period (October 2015 – March 2016). Seven interview recordings were transcribed verbatim by the first author and three by a professional typist. The first author listened to all audio recordings several times whilst reading transcripts before proceeding with coding.

Transcripts were initially analysed using open coding, where each line of the transcripts was scrutinised to capture meanings and compare data instances for similarities and differences. Phrases that exemplified a phenomenon were recorded as in vivo codes. This first step enabled the researcher to separate data into codes and to identify further areas of exploration. Throughout, successive memos were written, enabling the researcher to understand the data in relation to emerging concepts and to consider links to existing theories (Glaser, 1978). Both line-by-line codes and initial memos were recorded within transcript margins.

Following the initial coding, a second stage of focused coding commenced. This entailed grouping together instances (events, processes, occurrences) that shared central features with one another. For example, the initial codes 'Doing, not thinking' and 'Separation of body and mind' were developed in response to participants talking about their experiences of eating. During the focused coding stage, these were grouped together and understood to represent a more focused notion related to a habitual process of eating, which formed part of the category – Relying on food to regulate emotions (see below). A process of constant comparison was conducted throughout. This was achieved by manually 'handling' the data; spreading out multiple pages of data, memos, codes and categories and moving back and forth between these looking for similarities and differences. Categories were then built into a conceptual model in order to identify and build relationships. The research team met regularly to discuss the ongoing coding and emergent analysis.

Credibility checks

Guidelines for qualitative research (Elliot, Fischer & Rennie, 1999) were followed to enhance the study's rigour. As a method of verifying the trustworthiness and completeness of the findings (Goldblatt, Karnieli-Miller & Neumann, 2011), member checking was performed. Each participant was sent a summary of prominent codes and categories and asked to complete and return a verification sheet by post. Three out of ten distributed verification sheets were returned. Feedback provided by participants gave some indication regarding the credibility of the data analysis. One participant stated: 'On all of the points we discussed, I feel you have understood most of what's been happening'. In a further attempt to increase the credibility of findings, a process of triangulation took place, whereby the research team discussed the categories with a practising Clinical Psychologist with expertise of eating disorders. This added further clarification and

modulation of categories. To increase transparency, direct quotations are presented to support the findings. Pseudonyms have been used to maintain anonymity.

Reflexivity

Consideration was given to how the researcher's role, experience and knowledge influenced data collection, analysis and interpretation. The lead author is a 30 year old, unmarried White British male with an interest in physical health. He has no personal experience of an eating disorder and has limited clinical experience of working with people experiencing eating disorders. He has a clinical interest in Cognitive Behavioural Therapy and Schema Focused Therapy, including clinical formulations. It is acknowledged that these experiences informed the research process and potentially impacted upon the collection and analysis of data. A study diary was utilised to encourage the maintenance of a reflexive stance as endorsed by Charmaz (2014). This raised the researcher's awareness of preconceived ideas around data collection and analysis. These were also challenged in regular meetings with other members of the research team, who were familiar with the data.

Results

Ten people (three male, seven female) took part. All were White British and ranged in age from 20 – 71 (Median: 52). Participants' BMI (m/kg²) ranged from 37 to 60 (Median: 51.5) and the majority had one or more obesity-related co-morbidities. Seven met criteria for moderate night eating and three met full criteria for NES as defined by the NEDQ. Responses on the DASS-21 indicated that all participants scored above the cut-off of 'normal' range (defined as scores above the 78th percentile) for depression and anxiety. Seven scored above the normal range for stress.

Core concept – 'Emotional hunger'

A core concept developed after prolonged engagement with the data was that of 'emotional hunger.' This related to participants' suggestion that they turned to food in response to a perceived need for emotional rather than physical nourishment. They made a clear distinction between sensations associated with physical as compared to emotional hunger; the trigger for the latter seemed to be located within the head, implying an experience of psychological discomfort or pain:

'Maybe it's in my head, I don't know, when you're hungry you know you're hungry. If I want something to eat, quite often my belly starts rumbling.... it's probably in here (pointed to head) rather than my belly.' (Robert)

For all participants, there was a sense of feeling overwhelmed at times, not by hunger, but by the uncontrollable nature and intensity of their emotions. Resisting the emotional urge to eat appeared to be a hopeless battle with an inevitable result:

'...eating always wins you know. I did try on occasions... but I was holding my stomach. It was hurtful. My stomach was screaming for food.' (Keith)

This idea of experiencing emotional distress as a kind of hunger permeated the following four categories that were produced through constant comparison between and within cases.

1. Cultivating a dependency on food

Generational family attitudes and early feeding styles were raised by interviewees as perceived significant influences upon their current relationship with food. There were consistent references to an early parental pressure to eat, which subsequently shaped dietary habits and attitudes towards food. Hence, participants often stated that their cue to finish eating was not based solely upon a feeling of physiological satiety:

'I was told that I always had to eat everything that was on the plate. I wasn't allowed to leave the table ...Now I have to finish everything that's on the plate.' (Amanda)

Melanie spoke about food playing an historical role in bringing the family together, providing a sense of intimacy and security:

'Food's always been there... when we were at home there were six of us kids. Three teenagers and three younger ones and the house was always full...I like a busy house.'
(Melanie)

Onset of night eating was precipitated by a number of significant stressful events. Interviewees' response to these difficulties reflected the use of food as a method to cope with emotional problems and their beliefs pertaining to the special qualities of food. Many described engaging in night eating due to actual or perceived loss; of someone close, a relationship, or physical health:

'...when it first started I was actually pregnant with my son and there was a possibility that there might be something wrong. I started off by not eating anything and then shortly afterwards...I was starting to eat after my evening meal.' (Amanda)

For Robert, night eating coincided with retirement, symbolising a loss of role and, in many respects, sense of identity:

'...with the best will in the world I couldn't do it, otherwise I'd still be at work...I'd rather be at work. ...I am depressed with this weight; I was depressed with finishing work.' (Robert)

2. Relying on food to regulate emotions

An awareness of emotional emptiness ran through participants' accounts; engaging in night eating offered, for them, a tried and tested method to quell such disquiet:

'I just feel like I want something...I'm looking for something to make me feel better... so I'll go and get the stuff that does.' (Margaret)

For all participants, the process of night eating was depicted as habitual or automatic, producing an almost involuntary, conditioned response of 'zoning out' or 'switching off', expressed by Joe as 'doing, not thinking'. The notion of habitual eating appeared to be characterised by a separation of the body and mind:

'Your body can do something totally different to what your thoughts are doing ...my mind is still wherever it is and you could have eaten whatever you've eaten.' (Katherine)

Others described a lack of awareness during the actual act of eating:

'...it's not something that I'm sort of consciously aware of. Quite often I'd be eating and not realise that I'm actually doing it.' (Amanda)

For the majority of participants, eating was characterised by consuming 'quick' and 'easily available' carbohydrate based foods, which were associated with certain emotional changes:

'I like cake, sweets and chocolate... I feel calm when I'm eating them.' (Melanie)

In understanding the functional effects of night eating, a number of interviewees likened the process to alcohol and smoking, as it represented an automatic action serving an emotional regulatory function:

'Colleagues that I work with, a lot of them would go home and open a bottle of whiskey... I've never smoked but I've obviously turned to food.' (Amanda)

The physiological reaction of eating and fullness provided a calming, almost anaesthetic return, removing feelings of distress:

'If I'm hungry (.) if I eat, I just start to calm down and the pain calms down. Because you're tense aren't you, you go really tense when you're angry.' (Katherine)

Participants felt that others did not understand the drive to quell 'emotional hunger' that triggered night eating. There was a sense that their inner world was dismissed, as a focus centred on the external manifestation of their night eating (i.e. weight gain). For example, clinical interactions were defined by questions and conversations pertaining to diet and exercise, whereas interviewees

wanted to address questions such as 'Why can I not eat less?' and 'Why do I choose food?' Most believed that their identity was defined by their weight, which in turn defined their care:

'They're only still looking at this one little box...I can't understand why they haven't got me as a whole. But you try to tell them and it's no, they're just fat busting.' (Katherine)

3. Understanding the significance of night-time

All participants reported that their mood was lowest at the end of the day. This time represented a period of heightened emotional vulnerability, when they felt disconnected from others, alone with a sense of emotional emptiness. For Keith, the positioning and proximity of his evening snacks seemed to represent a sense of companionship:

'I always bring a packet of biscuits in with me and put them on a table next to me'. (Keith)

Interviewees reported being more highly attuned and attentive to feelings and negative thoughts at night and ruminated upon their emotional experiences or situation:

'Sometimes something may cross my mind... Maybe something on the television will trigger something off.' (Keith)

'I eat at night when I've got nothing to do and that's when I start to think and worry about things...my dad's not well (.) very unwell and he's not going to get better.' (Sally)

Conversely, daytime was described as a distraction or place of safety. Participants found comfort or strength to cope with their emotional difficulties during the day by engaging in activities or by connecting with others and drawing on social support:

'Yeah I don't tend to snack during the daytime at all...I am so busy there isn't a time to think about anything other than what you are doing.' (Amanda)

'During the day I can handle it... my daughter comes in to see me each day... And then after that of course, the snacking starts.' (Keith)

The night also appeared significant in relation to providing the right social conditions for eating to occur, produced by a feeling of privacy and a sense of eating away from any witnesses:

'I get up, avoiding the creaky floorboards... and go downstairs, well the kitchen's the first place you go isn't it?' (Margaret)

There were differences in when within the night participants ate. There were those who engaged in what could be described as 'evening eating', who consumed a significant amount of their daily calories after their evening meal, before going to bed, and those who engaged in what we have labelled as 'night-wake eating', who got up after going to bed to eat; this could occur more than once in a single night:

'...if I'm in bed at 10 'clock, I can be up two, three times a night eating.' (Katherine)

Those engaging in evening eating recalled seeking food in response to a dull, prolonged emotional aching that increased in intensity over time. In contrast, in night-wake eating, the urge to eat appeared more immediate, to cope with an overwhelming emotional hunger that was intolerable to bear. Katherine described the nature of her eating in response to waking and the resultant experience of 'dark thoughts':

'I'm hungry, I'm awake ...I'll go and find cake or biscuits. I wouldn't think twice about eating it. It's anything instant really...

Cos if you turn over, you're wide awake by that time because you haven't got up and got something to eat.' (Katherine)

4. Acknowledging the consequences of night eating

As noted above, interviewees referred to food being more than a source of physiological nourishment; it had special qualities that brought a sense of calmness. However, the feeling of comfort and relief provided by food soon dissipated and it was acknowledged by all participants that night eating served only as a short-lived solution, soon relapsed by feelings of guilt, shame, anger and self-condemnation:

'It's just a temporary feeling...I don't know if satisfied is the right word. That kind of (.) a bit of satisfaction and a bit of enjoyment.' (Joe)

'It goes as soon as I've finished what I'm eating and then that feeling changes.' (Sally)

'...it's 'you stupid cow you're supposed to be losing weight'. And it comes back at me like that... I get angry that I'm doing it.' (Katherine)

Hence, the impact of night eating in response to emotional hunger was understood as a set of inter-related consequences, reflecting what participants described as a 'vicious cycle'. It could lead to a difficult trade-off between short-term comfort and relief, and the inevitability of having to deal with the emotional, social and physical after-effects of night eating. These included difficulties in relationships, particularly with family members. Consequently, some participants felt a burden to others:

'Afterwards, you know, I'd remember that I'd made a promise to my mum and then when she found out, that's when the arguments would start.... It was mostly because she was helping me, trying to help me lose weight.' (Joe)

A concern was expressed during interviews that despite many promises, a continuation with night eating, and the consequence of further weight gain and health deterioration, would be perceived as a sign of not caring. For some, this was linked to failure:

'I feel as though I have let them down... I think they're concerned that I'm the healthy one at home and if anything happens to me...I have made promises to both of them.' (Amanda)

In an attempt to minimise post night eating emotions, some participants tried to downplay the significance of their eating episode:

'I'd always try and tell myself like it's alright you know, it's just one sort of blip.. But I always knew in the back of my mind that it wasn't. I was sort of lying to myself.' (Joe)

Others discussed hiding evidence as a strategy to prevent further negative emotional and social consequences should family members find out:

'If I had chocolate, I will hide the wrappers... I am ashamed; I don't want her to know that I have let her down again.' (Amanda)

As a result, for many there was a sense of feeling forced to be underhand or overly vigilant to avoid being 'caught' or exposed.

Discussion

The current study aimed to address a gap in the literature by exploring the relationship between NES and the experience of emotion, from the perspective of patients identified as obese. It adds to the literature in novel ways. Specifically, we identified a core concept of 'emotional hunger', which reflects a set of unmet emotional needs, characterised by psychological discomfort, dissatisfaction, loneliness and emptiness. Underpinning this core concept and illustrating the development, onset and maintenance of night eating were the four categories outlined above. The model we present illustrates the inter-related nature of these categories and their relationship to the core concept of 'emotional hunger' (see Figure 1).

Participants offered insights into their relationship with food, demonstrating a learned belief pertaining to its unique, intimate, calming, functional qualities. Food was much more than a source of physiological nourishment; for participants, it provided an automatic method of emotional regulation, echoing previous proposals and findings (de Zwaan et al, 2015; Meule et al, 2014; Vander Wal, 2012). For participants, food was an attempt to satiate emotional distress. This is concordant with the affect regulation model of binge eating (Polivy & Herman, 1993), which asserts that maladaptive binge eating behaviour functions to decrease negative emotions. With further reference to binge eating behaviour, the affect regulation model proposes that increases in negative emotions trigger binge eating episodes, with the eating behaviour functioning to alleviate emotional distress through distraction or comfort (Telch & Agras, 1996; Gluck, 2006). Findings presented in our study suggest that the automatic nature of night eating fulfils a similar emotional regulatory function; the reduction in emotional distress establishes a conditioned habitual pattern of night eating behaviour.

Our findings are consistent with previous research on NES (Allison, Stunkard & Their, 2004, Stunkard, Grace & Wolff 1955) because participants related onset to stressful life events, often based around some form of loss. For many interviewees, commencement of night eating seemed to reflect an interaction between their perceived inability to deal with emotional difficulties and their food beliefs mentioned above. In line with previous research (Calugi et al, 2009; de Zwaan, Roerig, Crosby, Karaz & Mitchell, 2006; Gluck et al, 2001; Lundgren, Allison, O'Reardon & Stunkard, 2008), all participants scored above the normal range for depression and anxiety. The finding that participants' mood tended to become lower in the evening, in contrast to classic depression, again reflects previous research (Birketvedt et al, 1999; Stunkard et al, 1955) and was identified in this study as a key factor precipitating night eating. Our analysis is novel in highlighting the significance of night-time; the end of the day represented a time of increased emotional vulnerability and loneliness for participants and heightened attentiveness to emotional triggers. As a result, findings suggest a direct link between night-time, emotion and eating behaviour. The significance of night-time appeared to manifest itself as two distinct categories of behaviour, namely 'evening eating' and 'night-wake eating'; they were distinguished by a more intense experience of emotions and immediate need to respond by eating associated with the latter.

Participants appeared all too ready to blame themselves for their maladaptive night eating and accepted the societal notion that this behaviour is somehow their own fault. Negative self-evaluation and repeatedly letting loved ones down contributed to a chronic feedback behavioural loop. Yet at the same time participants showed deep frustration that professionals had yet to offer a comprehensive hypothesis for night eating behaviour and appeared to focus more on the outcome of their eating difficulties (i.e. weight gain). Participants alluded to different types of hunger, experienced at both physiological and psychological levels, and described how the urge to 'zone out' by eating high calorie, palatable foods was involuntary; it resulted in calmness, but was short-lived and addictive. It is possible that at a basic physiological level, the neuro-biological interplay of energy homeostasis and brain reward mechanisms that result from stress induced eating is different in night eaters than in non-night eaters and is yet to be determined (Jauch-Chara & Oltmans, (2014)). Helping professionals involved in managing individuals with NES to understand the complexity of these physiological processes may be an important step forward in reducing patients' frustration over their behaviour.

The majority of participants in this study talked about an experience of inner conflict and having to make a difficult trade-off between emotional relief and the inevitability of dealing with a vicious cycle of emotional, social and physical consequences experienced after night eating. These consequences often resulted in feelings of guilt, shame, anger and self-condemnation, further reinforcing emotional hunger. The acknowledgement of impaired interpersonal relationships, particularly with family members, mirrors the work of Cleator et al (2013). In an often unsuccessful attempt to minimise negative post night eating emotions, some participants appeared to engage in a process of cognitive reframing (depicting it as a 'blip'), whilst many others, to avoid difficult social relations, talked about hiding physical evidence.

Limitations

Individuals were recruited from one site based within a regional service. We believe, however, that our findings and model have broad theoretical significance in understanding the relationship between NES and the experience of emotion within individuals identified as obese.

In this study, procedures associated with grounded theory outlined by Charmaz (2014) were followed. However, theoretical sampling was not strictly adhered to for pragmatic reasons of time

constraints associated with completing the research. Nevertheless, Dey's (1999) concept of theoretical sufficiency was utilised, focusing on establishing categories sufficient to generate a testable grounded theory. Steps were taken to include a varied sample in terms of age, gender and night eating behaviour, although it is acknowledged that a homogenous sample took part in terms of ethnicity; all participants identified as White British.

Implications for practice

Findings from this study, in particular the concept of 'emotional hunger', illuminate the potential importance of adopting a holistic approach, which includes developing a psychological understanding, when working with individuals who are obese and exhibiting night eating behaviour. It is evident in this sample that addressing emotions through food leads to long-term psychological, social and physical consequences. Hence, they need to be supported to understand and develop healthier strategies that deal with what were depicted as sometimes intensely powerful negative emotions.

Recommendations for future research

With regards to future research, an exploration of the two distinct night eating categories (evening eating and night-wake eating) is recommended to further understand their significance and relationship within NES. Further work is also needed to understand more fully the neuro-biological interplay of energy homeostasis and brain reward mechanisms in individuals with NES. In addition, conducting a similar study within a different centre, or preferably in a variety of services and including minority ethnic groups would be beneficial.

Conclusion

This study has contributed to the development of a greater insight into the relationship between NES and the experience of emotion in individuals identified as obese. Using a grounded theory design has allowed for an in-depth understanding of how the core concept of 'emotional hunger' relates to the four categories identified from the data, and how these interact and contribute to the development, onset and maintenance of NES. The study has suggested that dealing with emotions by eating can lead to long-term emotional, social and physical consequences. This highlights the need for a holistic intervention for people who are obese with NES, which involves developing a

psychological understanding when working with individuals who are obese and exhibiting night eating behaviour.

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FIGURE 1: A model to show the categories identified from the study and how they are underpinned by the core concept of 'emotional hunger'

