



Night eating among veterans with obesity



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ARTICLE INFO

Article history:

Received 8 March 2017

Received in revised form

10 July 2017

Accepted 11 July 2017

Available online 12 July 2017

Keywords:

Night eating

Obesity

Insomnia

Weight management

Veterans

ABSTRACT

The obesity rate is higher among veterans than the general population, yet few studies have examined their eating behaviors, and none have examined the presence of night eating and related comorbidities. This study examines night eating syndrome (NES) among veterans seeking weight management treatment, and relationships between NES and weight, insomnia, disordered eating, and psychological variables. The sample consisted of 110 veterans referred to a weight management program at VA Connecticut Healthcare System. More than one out of ten veterans screened positive for NES, and one-third screened positive for insomnia. Most individuals screening positive for NES also screened positive for insomnia. Night eating was associated with higher BMI, and with higher scores on measures of binge eating, emotional overeating, and eating disorder symptomatology. Veterans screening positive for NES were also significantly more likely to screen positive for depression and PTSD. When controlling for insomnia, only the relationships between night eating and binge and emotional eating remained significant. Those screening positive for PTSD were more likely to endorse needing to eat to return to sleep. Findings suggest that both NES and insomnia are common among veterans seeking weight management services, and that NES is a marker for additional disordered eating behavior, specifically binge eating and overeating in response to emotions. Additional studies are needed to further delineate the relationships among NES, insomnia, and psychological variables, as well as to examine whether specifically addressing NES within behavioral weight management interventions can improve weight outcomes and problematic eating behaviors.

Published by Elsevier Ltd.

1. Introduction

Night eating syndrome (NES), a condition in which individuals consume a large proportion of daily calories after the evening meal and eats upon waking in order to return to sleep, is estimated to affect 1–2% of the general population and 6–14% of individuals seeking weight management services (O'Reardon, Peshek, & Allison, 2005). The condition is typically accompanied by lack of appetite in the morning, strong drive to eat in the late evening hours, insomnia, low mood in the evening, and the belief that one needs to eat in order to fall asleep or return to sleep (Allison et al., 2010). NES affects men and women equally (Aronoff, Geliebter, & Zammit, 2001; Colles, Dixon, & O'Brien, 2007) as well as individuals of all age groups (Striegel-Moore, Franko, Thompson,

Affenito, & Kraemer, 2006). Night eating has been associated with higher waist circumference, poorer glycemic control, diabetes-related complications, and depressed mood (Gallant et al., 2014; Hood, Reutrakul, & Crowley, 2014; Morse, Ciechanowski, Katon, & Hirsch, 2006; de Zwaan, Müller, Allison, Brähler, & Hilbert, 2014); findings are mixed regarding the relationship between NES and BMI, but tend to suggest that night eating is associated with higher BMI (Gallant et al., 2014, 2015; Meule, Allison, Brähler, & de Zwaan, 2014). Studies examining night eating among college students and middle-aged adults have shown a significant relationship between night eating and emotional eating, food addiction, depression and poor sleep quality (Nolan & Geliebter, 2012, 2016).

The obesity rate is higher among veterans than the general population, yet few studies have examined eating behaviors in this population. The examination of night eating among Veterans makes logical sense, but has not yet been done. Veterans treated within the Veterans Health Administration (VHA) have high rates of NES-related comorbidities, including metabolic syndrome (Heppner et al., 2009; Keane, Meier, Noth, & Swislocki, 2009) and

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obesity (Breland et al., 2017). Further, the identification of NES may be particularly important to assess and address within the context of behavioral weight loss interventions for Veterans given that night eating may negatively impact weight outcomes. A recent study examining sleep disturbances among obese veterans engaged in weight loss treatment (Mayer, Levy, Farrell-Carnahan, Nichols, & Raman, 2016) found that most participants endorsed subjectively poor sleep quality and were at risk for sleep disorders such as obstructive sleep apnea and circadian sleep disorders. However, rates of insomnia were not reported and the potential relationship between insomnia and night eating among obese veterans is not known. In order to explore the potential scope of the issue and related comorbidities within the veteran population, this study examines the prevalence of NES among veterans seeking weight management treatment, as well as the relationships between NES, BMI, insomnia, disordered eating, depression, and post-traumatic stress disorder (PTSD). Based on past studies showing significant relationships between night eating and other aspects of disordered eating, depression, and BMI, it is hypothesized that night eating among Veterans would also be associated with measures of disordered eating, depression, PTSD, and BMI.

2. Materials and methods

2.1. Participants

The sample consisted of patients referred to the MOVE! weight management program at VA Connecticut Healthcare System. MOVE! is 16-week, group-based behavioral weight management intervention that focuses on education, motivation enhancement, problem solving, and goal setting related to dietary change and increasing physical activity. Patients who were referred to MOVE! attended an orientation session to learn about the program and different options for participation. Data were collected from fifteen of these monthly or bi-monthly orientation sessions between October 2014 and November 2015. The hour-long orientation sessions included a 20–30 min formal presentation with the remaining time allotted for completion of a standardized battery of questionnaires, consisting of the measures listed below as well as measures assessing weight history and food addiction, as part of clinical care. This study was approved by Institutional Review Board at VA Connecticut Healthcare System. Participants' written consent was waived with implied consent.

The sample consisted of 126 veterans. One hundred and ten participants returned completed questionnaires. Participants had a mean age of 61.6 years ($SD = 8.5$) and average BMI of 38.0 ($SD = 7.4$; range 26.63–55.83). Most participants were male (90.0%). Roughly three-quarters of participants identified as white or Caucasian, 18.3% identified as black or African American, and 4.6% identified as "other."

2.2. Measures

Demographics. Age and sex were self-reported by participants on the questionnaire. Information about race, ethnicity, and BMI was extracted from electronic medical records.

Insomnia Severity Index (ISI). The ISI is a 7-item measure that assesses for the presence and severity of insomnia. The ISI has demonstrated adequate internal consistency, concurrent validity, and sensitivity to change (Bastien, Vallières, & Morin, 2001). A score of ≥ 15 is associated with the presence of moderate to severe insomnia. Cronbach's alpha for the current study is 0.95.

Night Eating Questionnaire (NEQ). The NEQ assesses factors associated with NES, including timing of food intake, sleep disturbance, and food consumption during nighttime hours. The measure

has demonstrated adequate internal consistency and concurrent validity and an acceptable positive predictive value for identifying the presence of NES (Allison et al., 2008a). We utilized a cutoff score of ≥ 25 to indicate screening positive for NES, as is commonly used in the literature. Participants completed the 13 items of the measure that contribute to the total score of the measure. Standardized Cronbach's alpha for the current study is 0.68. One item on the measure assessing "Do you need to eat in order to get back to sleep when you are awake at night?" has been shown to discriminate between individuals with and without nocturnal eating when using a cutoff of 2 ("somewhat") on a scale of 0–4 (Vinai et al., 2014), and was also examined in analyses.

Patient Health Questionnaire (PHQ-2). The PHQ-2 is a commonly used screening measure for depression in the primary care setting. The two-item measure assesses the frequency of depressed mood and anhedonia during the previous two weeks, and has demonstrated good sensitivity for detecting major depression in patients seen in primary care (Arroll et al., 2010). Cronbach's alpha for the current study is 0.86.

Primary Care PTSD Screen (PC-PTSD). The PC-PTSD is a 4-item measure that is routinely used in VA to screen for PTSD, and has demonstrated good sensitivity and specificity for detecting PTSD (Prins et al., 2003). Cronbach's alpha for the current study is 0.74.

Eating Disorder Examination Questionnaire (EDEQ). The EDEQ (Fairburn & Beglin, 1994) is a 28-item questionnaire based on the Eating Disorder Examination interview (Fairburn et al., 1993), with which it has demonstrated good concordance (Grilo, Masheb, & Wilson, 2001). It assesses both behavioral and cognitive symptoms of eating disorder diagnoses. We used an abbreviated version of the EDEQ which has demonstrated good internal consistency and concurrent validity (Grilo, Henderson, Bell, & Crosby, 2013). Cronbach's alpha for the current study is 0.85.

Yale Emotional Overeating Questionnaire (EOQ). The EOQ is a 9-item questionnaire assessing the frequency with which individuals eat in response to various emotions (Masheb & Grilo, 2006). The EOQ has good concurrent validity with measures of eating disorder symptomatology. Cronbach's alpha for the current study is 0.94.

Binge Eating. The MOVE!23 questionnaire is a clinical tool developed to assess the individual needs of patients participating in VHA's national MOVE! weight management program. The questionnaire assesses various factors that can impact weight management, including medical and mental health comorbidities, eating behaviors, physical activity, and social support. Only the item assessing binge eating was used in this study. The item asks, "On average, how often have you eaten extremely large amounts of food at one time and felt that your eating was out of control at that time?" Response options are: "Never," "Less than 1 time/week," "1 time/week," "2–4 times/week," "5 + times/week."

Questionnaire for Eating and Weight Patterns. The QEWP-R is a 28-item self-report measure that assesses symptoms of eating and weight disorders (Spitzer, Yanovski, & Marcus, 1993). Studies have supported its psychometric properties and its ability to identify individuals who binge eat (Barnes, Masheb, White, & Grilo, 2011; Elder et al., 2006). The QEWP-R was used to assess for the presence or absence of binge eating disorder.

2.3. Analyses

Demographic information was analyzed using basic frequencies and descriptive analyses. Mean item scores for the four factors of the NEQ (Allison et al., 2008a) were calculated. Comparisons of prevalence of insomnia and NES by demographic factors were analyzed using independent samples t-tests and chi-square analyses, and relationships among continuous variables were

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