Psychiatry Research 215 (2014) 185–191

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Relationship between daily affect and overeating-only, loss of control eating-only, and binge eating episodes in obese adults

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ARTICLE INFO

Article history:
Received 9 January 2013
Received in revised form
8 August 2013
Accepted 9 August 2013
Available online 5 November 2013

Keywords:
Latent growth mixture modeling
Mood
Obesity

ABSTRACT

The two objectives of the current study were: (1) to identify daily patterns of negative affect (NA) in obese individuals; and (2) to determine whether daily affect patterns were related to overeating without loss of control (OE-only), loss of control eating without overeating (LOC-only), and binge eating (BE) episodes. Fifty obese (BMI=40.3±08.5) adults (84.0% female) completed a two-week ecological momentary assessment protocol during which they completed assessments of NA and indicated whether their eating episodes were characterized by OE and/or LOC. Latent growth mixture modeling (LGMM) was used to identify daily trajectories of NA. GEE analysis was used to determine whether daily affect trajectories were differentially related to the frequency of OE-only, LOC-only, and BE episodes. The LGMM analyses identified nine unique trajectories of NA. Significantly higher frequencies of OE-only and BE episodes occurred on days characterized by high or increasing levels of NA. There were no significant differences between classes for the frequency of LOC-only episodes. These data suggest that NA may act as an antecedent to OE-only and BE episodes and that targeting "problematic affect days" may reduce the occurrence of OE-only and BE episodes among obese individuals.

1. Introduction

Binge eating is defined by the Diagnostic and Statistical Manual for Mental Disorders, 4th edition, text revision (DSM-IV-TR) as having two key characteristics, namely, the consumption of an objectively large amount of food and the subjective feeling that one has lost control during the eating episode (American Psychiatric Association, 2000). Binge eating is relatively common and is associated with significant medical and psychiatric comorbidities, including increased risk of overweight and obesity (Hudson et al., 2007). Although not all individuals who binge eat are overweight or obese, those individuals with concurrent binge eating and obesity are typically older, have a longer duration of illness, eat more meals and snacks throughout the day, and exercise less than non-obese binge eaters (Goldschmidt et al., 2011). Similarly, compared to obese individuals who do not binge eat, individuals with concurrent obesity and binge eating report greater body dissatisfaction (Striegel-Moore et al., 1998; Hsu et al., 2002), higher disinhibition (Wadden et al., 1993; de Zwaan et al., 1994; Hsu et al., 2002) more psychopathology (Wadden et al., 1993; Striegel-Moore et al., 1998), more frequent weight fluctuations (de Zwaan et al., 1994), and consume more calories during both meals and binges in laboratory settings (Yanovski et al., 1992; Goldfein et al., 1993; Hsu et al., 2002). These findings suggest that although binge eating and obesity are each associated with physiological and psychological consequences, the combination of binge eating and obesity may be particularly problematic with regard to comorbidity and risk.

During the past two decades, there has been growing interest in the relationship between affect, particularly negative affect (NA), and binge eating among individuals who are obese. Early descriptive research among obese individuals found that mood alteration was often cited as a motivation for binge eating (Arnow et al., 1992; Arnow et al., 1995), that binge eating was often precipitated by NA (Arnow et al., 1992), and that there was a significant positive correlation between emotional eating and the severity of binge eating (Arnow et al., 1995). Experimental designs corroborated these findings by demonstrating that exposure to NA through mood induction increased the likelihood that individuals with co-occurring binge eating and obesity experienced their eating as out of control, defined their eating as a "binge", and engaged in investigator-defined binge eating (Agras and Telch, 1998). More recently, research using ecological momentary assessment (EMA) has demonstrated that loss of control eating episodes among

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http://dx.doi.org/10.1016/j.psychres.2013.08.023

obese individuals are associated with both increased stress and increased NA, regardless of whether the episodes were characterized by overeating (Goldschmidt et al., 2012). Taken together, these findings appear to provide robust support for the hypothesis that binge eating in the context of obesity is associated with fluctuations in momentary affect, and more specifically, increases in NA.

However, the extent to which conclusions can be drawn regarding the relationship between binge eating and affect is limited by methods used to define and identify episodes of binge eating. As stated above, binge eating is characterized by both the consumption of an objectively large amount of food and the subjective feeling that one has lost control during the eating episode (American Psychiatric Association, 2000). Although the DSM-IV-TR requires that both features be present, individuals with concurrent binge eating and obesity self-define binge eating primarily in terms of whether loss of control is present (Telch et al., 1993). This finding suggests that self-defined binge eating episodes may differ qualitatively from investigator-defined binge eating episodes such that they may be more likely to reflect loss of control eating than binge eating (i.e., the combination of loss of control and overeating).

Given that the accuracy of binge eating assessments depends on the definition of binge eating used (e.g., self-defined vs. investigator-defined), it is important to evaluate research findings in this context. For example, one of the studies described above defined binge eating only in terms of whether loss of control was present (Arnow et al., 1992), and a second study only utilized self-defined binge eating episodes in analyses (Arnow et al., 1995). Although the two other studies described above (Agras and Telch, 1998; Goldschmidt et al., 2012) did assess both features of binge eating (i.e., overeating and loss of control), these studies found significant effects for affect and loss of control eating, but not affect and overeating (defined in terms of caloric intake). Only one study found a significant relationship between affect and investigator-defined binge eating (i.e., both loss of control and overeating were present) (Agras and Telch, 1998). To summarize, three studies have found a relationship between affect and loss of control eating (Arnow et al., 1992; Agras and Telch, 1998; Goldschmidt et al., 2012), two studies have found a relationship between affect and self-defined binge eating (Arnow et al., 1995; Agras and Telch, 1998), and only one study has found a relationship between affect and investigator-defined binge eating (Agras and Telch, 1998). Because self-defined binge eating may be more characteristic of loss of control eating than binge eating (which is characterized by both loss of control and the consumption of an objectively large amount of food), these previous investigations appear to suggest that among obese individuals, momentary fluctuations in affect may be more closely associated with the experience of loss of control eating rather than binge eating.

The identification of binge eating episodes may also be impacted by the timing of the assessment relative to the binge eating episode (s) themselves. Specifically, research has demonstrated that some individuals who explicitly deny binge eating when assessed retrospectively will endorse binge eating when assessed in the moment (Greeno et al., 2000; Le Grange et al., 2001). Although it is possible that participants in these studies deliberately minimized their binge eating symptoms during the assessments utilizing retrospective recall, it seems unlikely given that they did endorse binge eating symptoms when assessed in the moment. It may be more likely that these differences result from retrospective recall biases such as current mood (Teasdale and Fogarty, 1979), retroactive reconstruction, and effort after meaning (Stone and Shiffman, 1994). Given this information, it is notable that two of the studies described above assessed binge eating retrospectively (Arnow et al., 1992; Arnow et al., 1995) whereas the other two utilized momentary assessment. Of the two studies that utilized momentary assessment of binge eating, one assessed binge eating in a laboratory setting (Agras and Telch, 1998), and one assessed binge eating using EMA (Goldschmidt et al., 2012). Although both laboratory settings and EMA procedures allow for momentary data collection, EMA procedures may be more ecologically valid given that they occur in the natural environment rather than in a laboratory setting (Shiffman et al., 2008).

In addition to being more ecologically valid, EMA procedures are also advantageous because they can be used to obtain information at regular intervals over relatively longer periods of time (e.g., days, weeks). As such, EMA data provide a unique opportunity to examine possible antecedents to behavior, such as whether fluctuations in affect precipitate episodes of binge eating. As stated above, one study has utilized EMA procedures to examine the relationship between affect and binge eating in the context of obesity (Goldschmidt et al., 2012). Although these studies suggest that increased NA may be associated with loss of control eating, these data do not establish how often increased NA is associated with loss of control eating. In addition, these previous investigations do not indicate whether NA fluctuates and if such fluctuations differ from day to day. Because the magnitude (i.e., high, low) and trajectory (e.g., increasing, decreasing) of NA may vary from day to day, some daily patterns of NA may be more likely to precipitate problematic eating behaviors such as overeating, loss of control eating, or binge eating. Understanding how daily NA patterns vary as well as how such variations are related to overeating, loss of control eating, and binge eating could provide critically important information for the treatment of binge eating and obesity (Crosby et al., 2009).

The first objective of the current study was to identify prototypical daily patterns of affect among obese individuals using latent growth mixture modeling (LGMM). The second objective was to determine whether there were differences between the daily affect patterns with regard to the frequency of overeating without loss of control (OE-only), loss of control eating without overeating (LOC-only), and binge eating (BE). Based on previous research on co-occurring obesity and binge eating, as well as previous LGMM findings in bulimia nervosa, it was hypothesized that days characterized by high or increasing levels of NA would be associated with more frequent LOC-only and BE episodes.

2. Methods

2.1. Participants

Obese (BMI > 30) adults between the ages of 18 and 65 were recruited through community advertisements and flyers. Potential participants were excluded if they (a) met current or lifetime criteria for DSM-IV anorexia nervosa (AN) or bulimia nervosa (BN), (b) had received gastric bypass surgery, (c) were pregnant or breastfeeding, (d) were currently enrolled in treatment for obesity, or (e) were unable to read and understand English. Given that research has demonstrated that individuals may deny binge eating during retrospective recall, but endorse binge eating during EMA procedures, we elected to include obese individuals who denied binge eating at baseline to enhance the generalizability of the findings. We also elected to include obese individuals who denied binge eating at baseline because we were interested in examining the relationship between daily affect patterns and episodes of OE-only and LOC-only, both of which may be present in individuals who do not binge eat. A total of 105 individuals were screened for eligibility and 50 participants were enrolled in the EMA protocol. Of the 55 individuals who were screened but were not enrolled, five were eligible but decided against participating prior to scheduling the informational meeting, 13 were eligible but did not attend their informational meeting and could not be rescheduled, and 37 were ineligible. The most common reasons for ineligibility were regular use of inappropriate compensatory behaviors ($n=19$) or current or lifetime history of AN or BN ($n=9$).

2.2. Measures

2.2.1. Structured Clinical Interview for DSM-IV axis I disorders, patient edition – eating disorder module (SCID-I/P)

The SCID-I/P (First et al., 1995) is a semi-structured interview that assesses current and lifetime history of Axis I psychopathology. The eating disorder module of the SCID-I/P was administered by a trained doctoral-level psychologist at