



## Comparing weight gain in the year prior to treatment for overweight and obese patients with and without binge eating disorder in primary care



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### ABSTRACT

**Objective:** To examine weight change trajectories among overweight and obese patients with binge eating disorder (BED) versus without (NBO) during the year prior to seeking treatment.

**Methods:** Participants were 97 (75 women, 22 men) overweight and obese patients recruited for the same weight-loss treatment in primary care; 26 (27%) met DSM-5 BED criteria. Participants were assessed with the Eating Disorder Examination and completed self-report questionnaires about their weight histories and the Beck Depression Inventory-II.

**Results:** Participants' self-reported current weight and measured current weight were significantly correlated and did not statistically differ. Reported weight changes during the year prior to seeking treatment differed significantly by group: BED patients gained an average of 18.3 lb (8.2 kg) whereas NBO patients gained an average of 1.5 lb (0.7 kg). Among BED patients, but not NBO, weight change during the prior year was positively correlated with greater eating-disorder psychopathology, binge-eating frequency, frequency of overeating at lunch and dinner, and depression scores. For the overall group, BED status and binge-eating frequency each made independent significant contributions to predicting weight change in the past year.

**Conclusion:** Findings suggest BED patients are gaining considerably more weight during the year prior to treatment than NBO patients. BED treatment may interrupt a steep weight gain trajectory and prevent further weight gain for BED patients suggesting need for early intervention. Primary care physicians should screen for BED when overweight and obese patients present with rapid weight gain.

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### Introduction

Binge eating disorder (BED), defined as recurrent binge-eating accompanied by marked distress but without extreme weight-compensatory behaviors, is a prevalent eating disorder associated strongly with obesity [1]. BED is linked with heightened medical and psychosocial problems [1, 2] and greater health-care utilization [3] relative to obese individuals without BED (NBO). Although certain psychological/behavioral [4] and pharmacological [5] treatments are effective for reducing binge-eating and associated psychopathology, most of these interventions generally result in minimal weight loss with obese BED patients [5,6]. It has been suggested, however, that treatments that reduce binge eating may interrupt *further weight gain* [7]. Indeed, in a community-based study of

non-treated young adults with BED, the rate of obesity increased from 22% to 39% during a five-year naturalistic follow-up [8].

Three recent studies with treatment-seeking BED patients [9–11] reported steep weight gain trajectories with self-reported weights averaging 9.5 lb (4.3 kg) [9] to 16.6 lb (7.5 kg) [11] during the year prior to seeking treatment in both primary care [9] and specialty treatment clinics [10,11]. These studies converged in suggesting that many patients with BED gain substantial amounts of weight prior to seeking treatment but differed somewhat in findings regarding the magnitudes of the weight fluctuations and their associations with binge-eating. Prior studies have also reported weight fluctuations during the weeks between patients' intake and first weight-loss treatment session among obese patients [12] and obese patients with BED [13].

Importantly, no studies have compared weight trajectories between overweight/obese patients with versus without BED prior to treatment. Thus, it remains unclear whether the reported weight gains [9–11] are specific to treatment-seeking BED patients. The present study compared weight changes during the past year by BED and NBO groups recruited to participate in the same weight-loss treatment study and examined

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the relationships between reported weight changes to eating behaviors and mood.

## Methods

Participants were a series of 97 (75 women, 22 men) overweight/obese (body mass index [BMI]  $\geq 25$ ) patients recruited through primary care provider referrals and flyers placed in waiting/patient rooms for a behavioral weight loss treatment study being performed in primary care in a large university-based medical health-care center in an urban setting. Participants were informed that the behavioral treatments were provided as part of a research study and would involve no cost. Twenty-six (27%) participants met DSM-5 BED criteria [14]. The majority of participants were White ( $n = 70$ , 72%) and had at least some college education ( $n = 87$ , 90%). Recruitment for the treatment study was intended to enhance generalizability by utilizing relatively few exclusionary criteria (BMI  $> 55$ , age over 65, select severe psychiatric problems (e.g., schizophrenia, bipolar disorder), severe medical problems (e.g., cardiac disease), current or planned pregnancy/breastfeeding, and uncontrolled liver disease, hypertension, thyroid disease, or diabetes). Regular access to the internet and telephone was required.

## Procedures

Participants provided informed consent (study had IRB approval) and completed questionnaires. Participants were assessed by trained research-clinicians. During the screening phase of the study, the following two questions were added as part of the exclusion criteria: 1) How much has your weight changed in the last 6 months? This was only an exclusion if weight change was greater than 9 lb, due to a medical condition such as pregnancy or hormonal therapy. 2) Are you currently receiving any treatment for your eating or weight (weight loss programs)?

## Measures

Participants were asked to provide self-reported lowest and highest adult weights, ages for those weights, height, and weight currently, 3, 6, and 12 months ago. Actual weight was measured using a high-capacity digital scale and height was measured.

The Eating Disorder Examination (EDE [15]) is a well-established semi-structured interview that assesses eating disorders. The EDE has demonstrated good reliability in BED patients [16]. Analyses examined the EDE Global score (reflecting eating-disorder psychopathology), patients' perceptions of overeating at specific meals, and average number of days with *objective bulimic episodes* (OBEs; eating unusually large quantities of food with a subjective sense of loss of control, which corresponds to binge-eating) during the past six months. These OBEs were considered binge eating episodes.

The Beck Depression Inventory-II (BDI-II [17]) assesses current depression level. It is a well-established measure with excellent reliability and validity [18].

## Data analyses

Weight change during the past 12 months was calculated by subtracting self-reported weight 12 months ago from self-reported current weight. Three groups also were created: Maintained Weight (gained or lost  $< 5$  lb or 2.25 kg), Lost Weight (lost  $\geq 5$  lb or 2.25 kg), and Gained Weight (gained  $\geq 5$  lb or 2.25 kg) during the past 12 months [9]. Percent Weight Change also was calculated to help address different starting weights between the NBO and BED groups. Correlations were examined to test the relationships between Weight Change and the clinical measures for each of the BED and NBO groups. Additionally, *t*-tests were used to compare differences in clinical measures between the BED and NBO groups. A stepwise multiple regression analysis was

conducted to examine joint and independent contributions of variables predicting weight change during the past 12 months. Variables that differed between groups and variables that were associated significantly with Weight Change at the bivariate level were entered into the regression analyses.

## Results

The BED and NBO groups did not differ in sex, race, or education. BED patients (age  $M = 43.6$ ,  $SD = 9.4$ ) were significantly younger than NBO patients (age  $M = 48.9$ ,  $SD = 10.6$ ),  $t = 2.22$ ,  $p = .029$ . Age was not significantly correlated with Weight Change ( $p = .195$ ). BED patients were significantly heavier than NBO patients and therefore Percent Weight Change also was examined (Table 1).

### Accuracy of self-reported weight

Overall, participants' self-reported current weight ( $M = 217.9$ ,  $SD = 50.1$  lb or  $M = 98.1$ ,  $SD = 22.5$  kg) and measured current weight ( $M = 218.4$ ,  $SD = 50.2$  lb or  $M = 98.3$ ,  $SD = 22.6$  kg) were significantly correlated (Pearson's  $r = .999$ ,  $p < .0005$ ) and did not statistically differ ( $p = .069$ ); mean difference was less than one pound. Similar results emerged for the BED group; self-reported current weight and measured current weight were significantly correlated (Pearson's  $r = .999$ ,  $p < .0005$ ) and did not statistically differ ( $p = .243$ ). For the NBO group, self-reported weight and actual measured weight were significantly correlated (Pearson's  $r = .998$ ,  $p < .0005$ ), but were statistically different ( $p = .001$ ), albeit a difference of less than 1 lb.

### Weight trajectories during the year prior to treatment

Overall, patients gained an average of 6.0 lb or 2.7 kg ( $SD = 20.5$  lb or  $SD = 9.2$  kg), which corresponds to 2.36% ( $SD = 8.8$ ) of their body weight in the 12 months before weight loss treatment. Weight Change differed significantly; BED patients gained  $M = 18.3$  lb or 8.2 kg ( $SD = 24.8$  lb or 11.2 kg; range =  $-4.0$  lb to  $+99.3$  lb or  $-1.8$  kg to 44.7 kg) and NBO patients gained  $M = 1.5$  lb or 0.7 kg ( $SD = 16.6$  lb or 7.5 kg; range =  $-77.6$  lb to  $+50.0$  lb or  $-34.9$  kg to  $+22.5$  kg) (Table 1, Fig. 1a). Lowest adult weight and age at lowest adult weight did not differ by group (Table 1).

Among BED patients, 34.6% ( $n = 9$ ) maintained weight (gained or lost  $< 5$  lb or 2.25 kg), 0% ( $n = 0$ ) lost weight (lost  $\geq 5$  lb or 2.25 kg), and 65.4% ( $n = 17$ ) gained weight (gained  $\geq 5$  lb or 2.25 kg). Among NBO patients, 36.8% ( $n = 25$ ) maintained weight, 19.1% ( $n = 13$ ) lost weight, and 44.1% ( $n = 30$ ) gained weight during the year before treatment. Fisher's Exact Test indicated that there were more NBO patients in the Lost Weight category than BED patients,  $\chi^2(N = 94) = 5.77$ ,  $p = .017$ , but not the Gained Weight,  $p = .065$ , or Maintained Weight,  $p = .846$ , categories (see Fig. 1b for Weight Change categories).

### Eating behaviors and depression

Table 1 summarizes the correlates of 12-month Weight Change with eating-disorder psychopathology, eating behaviors, and depression. Among BED patients, Weight Change was positively correlated with EDE Global, binge-eating frequency, frequency of overeating at lunch and dinner, and BDI-II scores. Among NBO patients, Weight Change was not significantly associated with any of the clinical measures. A stepwise multiple regression analysis was conducted to examine the joint and independent contributions of the variables (EDE Global, binge-eating frequency, frequency of overeating at lunch and dinner, and BDI-II scores), when controlling for age, current BMI, highest adult weight, and BED status, to predict Weight Change. Analyses revealed that BED status and binge-eating frequency accounted for 41.1% of the variance of Weight Change,  $F(2, 90) = 31.43$ ,  $p < .0005$ , and both made significant independent contributions: BED status (beta = 0.384,  $t = -2.73$ ,  $p = .008$ ) and binge-eating frequency (beta = 0.916,  $t = 6.52$ ,  $p < .0005$ ).

## Discussion

This is the first study, to our knowledge, to compare weight change for overweight/obese individuals with and without BED in primary care during the year prior to seeking weight-loss treatment. Several notable findings emerged. First, there was a striking difference in weight change trajectories; BED patients gained, on average, 18.3 lb (8.2 kg), while NBO patients gained, on average, only 1.5 lb (0.7 kg), during the year prior to seeking treatment. Second, the magnitude of weight fluctuations varied for both groups; weight change of BED patients ranged from 4 lb lost to 99.3 lb gained (1.8 kg lost to 44.7 kg gained), while weight change of NBO patients ranged from 77.6 lb lost to 50.0 lb gained (34.9 kg lost to 22.5 kg gained). When categorizing patients as Maintained Weight (gained or lost  $< 5$  lb or 2.25 kg), Lost Weight (lost  $\geq 5$  lb or 2.25 kg), or Gained Weight (gained  $\geq 5$  lb or 2.25 kg), nearly two-thirds of BED patients gained weight and none lost, while less

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