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# An Overview of Binge Eating Disorder

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# An Overview of Binge Eating Disorder

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# Abstract

## An Overview of Binge Eating Disorder

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Abstract: Binge eating disorder (BED) is the most common eating disorder, affecting approximately 2% of men and 3.5% of women. BED has a complex etiology that includes both physical and psychological co-morbidities. Up to 50% of overweight and obese people seeking weight loss treatment have BED. Treatment includes pharmacological therapy and psychotherapy with the main goals of reducing binge frequency and weight reduction. Three categories of medications have been identified for the pharmacological treatment of BED: antidepressants, centrally acting appetite suppressants, and anticonvulsants Behavioral weight loss (BWL) includes modest weight reduction typically by reducing fat intake, eating regular meals and snacks and increasing weekly exercise. Interpersonal psychotherapy, Cognitive behavioral therapy and dialectical behavior therapy are the most successful forms for psychotherapy used to treat BED. In conclusion, BED etiology is multifaceted and successful treatment must address the complexities of the disorder.

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## Chapter 1: Background: *Definition of Binge Eating Disorder*

Binge-eating disorder (BED) was first described as non-purging bulimia nervosa. In 1992, it became recognized as a subset of eating disorder not otherwise specified (EDNOS). BED is the most common eating disorder, with a lifetime prevalence of approximately 2% in men and 3.5% in women (1). Among individuals seeking treatment for obesity, the prevalence estimates range between 15 and 50% (2).

BED is defined in the fourth edition (text revision) of the Diagnostic and Statistical Manual (DSM-IV-TR) as frequent binge eating episodes, characterized by the consumption of a large quantity of food in a discrete period of time, accompanied by a subjective sense of loss of control over eating. Individuals with BED must also experience distress about their binge eating, and binge episodes are associated with at least three of the following: eating more rapidly than normal, eating until uncomfortably full, eating large amounts when not hungry, eating alone because of embarrassment, and feeling disgusted, depressed, or guilty about overeating (2). BED is unique from bulimia nervosa (BN) because it does not include any regular, inappropriate compensatory behaviors to avoid weight gain such as self- included vomiting, rigorous exercise, or laxative abuse.

While the definition of BED does not include a body image related criterion similar to those defined for anorexia and bulimia nervosa, higher rates of weight and shape concerns are reported in individuals with BED compared to those without (3-4).

The term overvaluation describes an excessive influence of shape or weight on an individual's self-evaluation and subsequent feelings of self worth. The few studies that have looked at this in behavior in BED patients noted that the subjects were similar to those with BN and AN in their general shape and weight concerns (5-6) and more specifically with overvaluation (6).

When comparing overweight populations, those with BED have significantly greater preoccupation with their shape and weight compared to those without BED (7). It should be noted that concern with shape and weight does not depend on the weight status of individuals with BED (5). A recent study (8) looked at the shape and weight overvaluation in 399 patients with BED. The participants completed the Body Shape Questionnaire, the Beck Depression Inventory, and the Rosenberg Self Esteem Scale and were grouped as either clinical or subclinical overvaluation. The subclinical category included subjects who reported no influence or, at most, mild influence of shape or weight on their self-evaluation. Fifty-eight percent of participants reported clinical overvaluation, and forty two percent reported subclinical overvaluation. The groups did not differ in BMI. The clinical overvaluation group reported significantly greater levels of eating-related psychopathology, body image dissatisfaction, and depression and significantly lower self-esteem. These results suggest that overvaluation of shape and weight has clinical significance for both understanding and treating BED. Patients with BED should be assessed for overvaluation and interventions should include the goal of challenging and restructuring cognitions based on the exaggerated emphasis of shape and or weight in defining self-worth.

**THEORIES BEHIND THE BINGE**

The binge eating disorder behaviors of eating when not experiencing biological hunger and feeling disgusted with oneself afterwards, are included in the DSMIV criteria. Negative attitudes surrounding eating and body shape, psychiatric comorbidity, GI symptoms, and impaired social skills also contribute to the distress associated with the binge eating (2). The mechanisms that drive the binge are still unclear.

Many models of BED suggest that the dieting is the main trigger for binge eating. In the *restraint theory* of BED, an obsessive desire to be thin leads to unrealistic dietary restraint, resulting in binge eating to make up for the extreme calorie deprivation (9-11). A cognitively based variation of extreme dietary restraint is the *abstinence violation effect*. The binge results when the individual is unable to maintain the very low calorie intake. The diet triggers an all-or-nothing thought process that leads to a feeling of failure when unable to maintain perfect dietary restraint. Such rigid thinking is heightened by negative moods, which often lead to poor attempts to control eating and a subsequent binge (12). After the binge episode, the individual returns to the extreme diet restriction, and the cycle begins again.

Additional theories are founded on the role that affect may play in binge eating. *Trade off theory* (13) suggests that in the presence of negative mood, the binge eating is a coping mechanism that allows the individual to substitute the less painful feeling of post-

binge guilt for the more difficult emotional state of depression that may have preceded the binge. In the short term, the guilt becomes a distraction from the long term suffering of the depression (14). The *escape from self awareness model* proposes that the act of binge eating serves as a way to narrow the focus of the individual's attention to the immediate stimuli provided by the food in an effort to block out and avoid dealing with other negative emotions (15-16). *Masking theory* (17-18) suggests that instead of blocking out negative emotions, binge eating becomes the reason for the negative affect that then hides other emotional problems. The negative emotions get blamed on binge eating, which subsequently may be perceived as more controllable and/or tolerable than other aspects of one's life that may be the true cause for the distress.

In BED, the presence of negative mood is related to the degree to which overeating feels out of control and is experienced as a binge (19). Individuals with BED report greater distress resulting from negative moods, then non-binge eaters (13). Women with BED or a consistent binge eating pattern also binge eat when feeling only moderately negative (20), and report a more negative mood prior to binge eating than do women without BED (21-22). Individuals with BED eat in response to distress and are less aware of their internal hunger cues resulting in food consumption that is not in response to physical hunger (23).

A recent study looked at the relationship of dietary restriction and mood prior to a binge. In the prospective study (24), 33 females with BED used a handheld computer for 7 days to record binge behaviors. The subjects reported 1) emotion before and after a

binge, 2) perceived hunger and food intake before binge eating compared to control times, and 3) contribution of hunger, emotions, and abstinence violation. Using a paired t-test, mean huger was found to be significantly greater ($p < 0.05$) at binge precursor times ($M = 4.06$, $SD = 1.42$) than at non-binge times ($M=3.54$, $SD = 0.85$). Negative mood was significantly greater ($p < 0.001$) prior to binge episode ($M= 0.61$, SD 0.52) compared to non-binge times ($M= 0.37$, $SD = 0.21$), and even greater post-binge ($M= 0.91$, SD 0.51). Subjects reported the perceived cause of each binge as 47.7% due to how they felt, 17.4% the result of breaking a food rule, 14% to hunger, and the remaining 20.9% were attributed to unknown causes. The participants in this study did not report dietary restriction as the main trigger for binge episodes. The subjects did report negative mood and affect, as the main contributor to the binge and in the short term did not report an improvement in mood immediately following the binge.

**PHYSICAL SYMPTOMS**

Chronic gastrointestinal (GI) disorders are common in obese individuals and correlate with an increase in health-care support and a negative impact on quality of life (25). Individuals with a higher BMI are more likely to report reflux, symptoms of esophagitis, vomiting, abdominal pain, bloating, and diarrhea (26-27). A ten-pound increase in body weight over a ten-year span is associated with the onset of new GI symptoms (28). When compared to controls and non-BED subjects, individuals with BED have greater stomach capacity (29-31). This increased gastric size is associated with lower postprandial satiety (32). A population based survey of 4096 (33) measured GI symptoms, frequency of

binge eating episodes, and physical activity. BED was reported in 6.1% of participants. After adjusting for BMI, age, gender, race, diabetes mellitus, socioeconomic status and physical activity level, BED was independently associated with the following upper GI symptoms: acid regurgitation, heartburn, dysphasia, bloating, and upper abdominal pain ($p<0.001$). BED was also associated with the following lower GI symptoms: diarrhea, urgency, constipation, and feeling of anal blockage ($p<0.01$). It may be beneficial to screen obese patients for BED when individuals present with both lower and upper GI symptoms.

### ONSET OF OVERWEIGHT STATUS, DIETING, AND WEIGHT GAIN

The development of binge eating in overweight and obese individuals is not well understood. To best treat BED and help prevent additional weight gain the sequence of events and the onset of the binge eating must be better understood. Rigid eating behaviors, such as restrictive dieting, are the most common precursors and risk factors in the development of eating disorders (34). The literature suggests that binge eating may precede dieting for approximately one-third to one-half of BED patients (35-38). In overweight adults with BED, early onset of overweight is significantly associated with an early onset of both binge eating and dieting (37,39). In some of the current literature, researchers use sub-typing to help distinguish the onset of BED in subjects. The two groups include individuals whose dieting precedes their binge eating or diet first (DF) and those whose binge behaviors precede dieting or binge first (BF).

A university based outpatient eating disorder program collected data from 98 adults (80 females and 18 males) with BED (40). Thirty-five percent reported binge behaviors prior dieting while sixty five percent of the participants reported that dieting preceded binge eating. Compared with the diet-first (DF) group, the binge-first (BF) group was significantly younger at onset of overweight (DF M=15.8 SD 8.4, BF M=12.4 SD 6.8, p= 0.05), onset of binge eating (DF M=24.9 SD 10.6, BF M=11.6 SD 5.2, p=0.001), and the onset of BED diagnosis (DF M= 25.8 SD 11.3, BF M=17.8 SD 10.5, p= 0.02). The rates of binge-first in this study are higher than typically seen in eating disorder etiology and may have implications for new ways to treat BED, different from other ED.

A retrospective study (41) of 155 women with BED examined the patterns of onset in binge behavior in diet-first and binge-first subtypes. The subjects completed the Oxford Risk Factor Interview to assess risk factors present before the onset of binge eating. Eighty one percent of the subjects reported that binging preceded dieting, while the remaining 19% reported dieting first. No significant differences were seen in risk factors between the groups. The BF group had a significantly earlier onset of BED compared to the DF group (M= 20.71 SD= 8.48 and M= 25.37 SD= 7.51 p=0.007, respectively). The DF group had significantly higher Eating disorder Examination-Questionnaire (EDE-Q) scores on a scale from 1 (no importance) to 4 (most important) compared to the BF for dietary restraint (BF= 1.93 SD 1.41, DF M=2.71 SD=1.28, p=0.006), weight concern (BF M=3.79 SD= 1.39, DF M=4.45 SD=0.92, p=0.003), and concern with shape (BF M=4.16 SD=1.39, DF M=4.73 SD=0.99, p=0.037).

A retrospective study (36) of 71 women with BED reported that 38.7 % had binged prior to dieting while 48.1% reported dieting preceded the binge behavior, it should be noted that 13.2% of the subjects reported binge and diet beginning at the same time and were put into the same group. The age of binge onset was significantly lower in the BF group (M=11.8 SD= 6.3) compared to the DF group (M= 25.7 SD= 10.9), p=0.0001. The authors suggested that the results indicate a pattern in the development of BED. Earlier onset is more commonly seen in the BF subset, while later onset is seen with the DF group. The BF pattern may be a tool used to better diagnose or prevent the development of BED later in life.

A retrospective study (37) of 87 individuals with BED (68 females and 19 males) was conducted to determine the order of onset of diet and binge behaviors, the age of their first binge, and the age when they met the DSM-IV criteria for BED. Psychological factors were also measured to see if there was a difference between the two groups. The subjects completed the Eating Disorders Examination and the SCID to assess past and current co-morbid psychiatric disturbance and the SCID-II to assess Axis II personality disturbance. Forty-five percent of the subjects reported that dieting preceded their first binge episode (DF) and 55% reported that binge eating receded their first diet (BF). There were significant differences between the two groups for both age of first binge (BF M=12.56 SD 7.38, DF M=24.9 SD 11.53, $p<0.0001$) and age the subjects first met the BED criteria (BF M=18.8 SD 10.74, DF M=33.2 SD 11.95, $p<0.0001$). The BF group also had a history of more psychiatric problems were more likely to have an Axis II personality disorder.

A retrospective study (42) collected self-reported onset and timing of overweight status, dieting, and binge eating was in 284 adults with BED (211 females and 73 males). The subjects were grouped as follows: 63% overweight-first (OF), 21% diet-first (DF) and 15.8% binge-first (BF). The BF group was significantly younger at the age of the BED diagnosis (OF M=27.3 SD 8.4, DF M=29.4 SD 12.4, and BF M=19.1 SD 11.9, $p<0.01$). The BF group reported significantly less dietary restraint than the OF and DF groups (OF M=2.27 SD 1.5, DF M=2.3 SD 1.5, BF M=1.7 SD 1.1, $p<0.05$).

**DIETING AND MENTAL HEALTH STATUS**

It is well established that dieting is a major risk factor for the development of disordered eating (43). A review by the National Task Force on the Prevention and Treatment of Obesity (44) looked at the impact of global weight loss treatment and specifically dietary restraint on the development or onset of eating disorders in overweight and obese adults. The review also included the impact of weight cycling on overall mental well-being.

In 1950, Keys (45) published work that demonstrated the strong relationship between dieting, weight loss and a downward spiral that included depression and the onset of disordered eating. In the "Minnesota Starvation Experiment", 32 healthy men reduced their food intake to approximately half of their usual calorie intake for 6 months. This severe restriction led to a weight loss of approximately 25% of their body weight. The subjects experienced and increase in depression and emotional distress. Some of the men engaged in self-mutilation and others started binge eating. A 3-month period of re-

feeding followed the initial 6 months. Some of the participants continued to binge eat, hoard food, and display a preoccupation with food after regaining access to food. The findings of this study in a healthy weight population are often generalized to the overweight and obese population. Current recommendations (46) for weight loss in overweight and obese adults suggest a modest weight loss of 10% body weight over 6 months with a calories deficit of 500-1000 kcal/day resulting 1 to 2 pounds per week.

## Chapter 2: Treatment: *Treatment Goals*

BED is a complex diagnosis that requires long-term treatment. The main goals of treatment include reduction or abstinence of binge eating behaviors and weight loss. A combination of long-term pharmacological and behavioral therapies are recommended.

### PHARMACOLOGICAL TREATMENT

Three categories of medications have been identified for the pharmacological treatment of BED: antidepressants, centrally acting appetite suppressants, and anticonvulsants (47). In general, individuals with BED often improve in the short term with most interventions and have levels of response have been observed with placebo in some studies. The data from randomized placebo controlled studies must be the focus in sorting out the best pharmacological treatment options.

Seven obese women (48) with BED, seeking weight loss treatment, completed an open-label trial of the sibutramine. The subjects took 15 mg/day for 12 weeks. Outcome assessments included the number of days with binge episodes per week (DBE), the number of binge episodes per week (NBE), the Binge Eating Scale (BES), the Beck Depression Inventory, and body weight evaluation. After 3 months, seven of the subjects reported that they were no longer binge eating. The final DBE (M=0.8 SD 1.9) was significantly lower than the initial DBE (M=5.2 SD 1.8), $p<0.001$. The final NBE (M=1.4 SD 3.5) was significantly lower than the initial value (M=8.2 SD 4.4), $p< 0.05$. The mean weight loss was 4 kg from baseline to the final visit. Subjects reported having dry mouth, constipation, and nausea during the study.

Seven adults (6 females and 1 male) with BED participated in a double-blind placebo-controlled crossover study (49). The ten-week study included two 4-week dosing periods with 15mg/d sibutramine or placebo in a random sequence crossover design. The two treatments were separated by a two -week non-treatment washout.

Sixty obese adults with BED participated in a randomized, double blind placebo controlled study for 12 weeks (50). Following a 2-week run-in period, subjects received either 15mg/day sibutramine (n=30) or placebo (n=30). Binge frequency, measured as the number of days with binge-eating episodes during the past week, and weight loss were the main outcome measures. There was no significant difference in binge frequency between the two groups. The researchers reported a significant weight change between the treatment (-7.4 kg) and placebo (1.4 kg) groups, $p<0.001$. Subjects in treatment group reported dry mouth and constipation.

Sixty subjects with BED participated in a randomized, placebo-controlled, double-blind, flexible-dose study of the efficacy and safety of fluoxetine (51). Participants received fluoxetine, 20 to 80 mg/day (n=30), or placebo (n=30) for six weeks. Subjects in the treatment group started with 20 mg/day for the 3 days. The dosage then increased, as tolerated, to 40 mg/day for 3 days, then to 60 mg/day. After 2 weeks at 60 mg/day, the dose was increased to 80mg/day as tolerated. The main outcome measure was number of binge episodes per week. Changes in body weight and BMI were also measured. Number of binges per week significantly lower in the treatment

group (M=1.8 SD 2.9) compared to the placebo group (M=2.7 SD 3.8) p=0.03. Changes in body weight were not significant between groups.

Twenty subjects (17 females and 3 males) with BED (52) participated in a double blind, placebo-controlled trial of fluvoxamine for 12 weeks. All participants received one week of singe-blind placebo, and were then randomized to flexible dose fluvoxamine (titrated up to 150 mg/day) or placebo. The outcome measures included binge frequency, eating concern, shape and weight concern. The number of days with binges decreased in both the placebo group (initial M=20 SD 6.21, final M=7.31 SD 9.31) and the treatment group (initial M=14.67 SD 55.68, final M=3.11 SD 4.20). These differences were not statistically significant and there was not a significant difference between the treatment and placebo groups. In fact, there were no significant differences between the treatment and placebo for any outcome variables.

Eighty-five subjects with BED participated in a multicenter placebo-controlled, double blind trial of fluvoxamine for 9 weeks (53). All participants started with a 1-week single blind lean-in period. The treatment group received 50mg/day fluvoxamine for a minimum of 3 days. On day for, the dose was adjusted on an individual basis up to 300 mg/day. The primary outcome measure was the frequency of binge eating measured by the number of binges per week. The authors reported that the frequency of binges, expressed as mean log ([binges/week])+1), decreased in both groups, but more so in the treatment group. This difference was not statistically significant.

Thirty-four outpatients with BED participated in a 6-week randomized, placebo-controlled, double blind, flexible-dose study to assess the efficacy of sertraline (54). The main outcome measure was number of binge episodes per week. Following a single-blind placebo lead-in period, subjects were assigned to double blind treatment with sertaline (n=18) or placebo (n=16). Subjects took 50mg/day for the first 3 days, then dose was adjusted up to as much as 200mg/day. The mean medication dose in the treatment group was 187mg/day. During the study, the frequency of binges decreased significantly in the treatment group (initial M=7.6 SD 4.8 and final M=1.13 SD 1.56) and placebo group (initial M=7.2 SD 5.8 and final M=3.85 SD 3.81), $p< 0.05$.

Thirty-eight subjects with BED participated in a 6-week, single-center, parallel group, randomized, placebo-controlled, double blind, forced titration, flexible-dose study to assess the efficacy of citalopram (55). The primary measure of efficacy was frequency of binge-eating episodes. Secondary measures included frequency of binge days, BMI, and weight. After a week of single-blind placebo, subjects were assigned to treatment with citalopram (n=19) or placebo (n=19). Subjects began treatment with 20 mg/day for the first 7 days. The dosage was then increased, as tolerated, to 40 mg/day for 7 days, and then 60 mg/day for the remainder of the study. The medication could be reduced to a minimum of 20 mg/day at any time in response to a subject experiencing intolerable side effects. The average dose was 57.9 mg/day for the citalopram group. . During the study, the frequency of binges episodes decreased significantly in the treatment group (initial M=5.2 SD 3.6 and final M=1.7 SD 3.1) and placebo group (initial M=5.7 SD 2.6 and final M=3.4 SD 3.0), $p< 0.05$. Frequency of binges days decreased significantly in the

treatment group (initial M=4.0 SD 1.7 and final M=1.2 SD 2.0) and placebo group (initial M=4.0 SD 1.5 and final M=2.8 SD 2.2), $p< 0.05$. Changes in BMI and weight were not significantly different between the groups.

Sixty-one subjects with BED (53 females and 8 males) participated in a 14-week randomized, placebo-controlled, double blind, flexible dose study to assess the efficacy of topiramate (56). The primary outcome measure was binge frequency, secondary measures included number of binge days per week, BMI and weight. The initial dose was 25 mg/day for the first 3 days. On day 4, the dose increased to 50 mg/day and then to 75 or 100 mg on day 7. The dose was steadily increased to reach a maximum of 600mg/day at 10 weeks. The dose was reduced in subjects that did not tolerate the increases. The efficacy of treatment was determined with a repeated-measures random regression analysis comparing the rate of change of binge frequency during the treatment period between groups as well as the other outcome measures. Log transformations were used to normalize the data and stabilize the variance. Subjects in the treatment group had a significantly greater rate of reduction in binge frequency compared with the placebo group (-0.276 SE 0.077, $p< 0.001$). A similar reduction was seen for binge day frequency (-0.279 SE 0.070, $p<0.002$), BMI (-0.540 SE 0.182, $p=0.003$), and body weight change (-3.20 SE 1.15, $p=0.005$). This study was followed by an open-label, 42-week extension study (57) with 31 of subjects to assess the long-term effectiveness and tolerability of topiramate. Subjects were evaluated every 4 weeks. Baseline for treatment group was defined as the week 1 of the controlled study, while the baseline for the placebo group was defined as the beginning of the open trial or week 16. Topiramate

was titrated upward from an initial dose of 25 mg/day to a maximum dose of 600 mg/day based on subject response and tolerability. The outcome measures included binge frequency, binge day frequency, BMI, weight, and percent and total body fat. Treatment was associated with statistically significant changes from baseline in mean binge frequency for all subjects who completed at least 4 weeks (-3.2, $p < 0.001$) and the subjects who completed treatment (n=10, -5.0, p= 0.002). Binge frequency was also significantly decreased in from baseline in the subjects that received treatment during both the studies (n=15, -4.0, p<.001) and for subjects that received in only during the extension study (n=15, -2.5, p=0.044).

**BEHAVIORAL TREATMENT**

Behavioral treatments for BED include psychotherapy and weight loss. Behavioral weight loss (BWL) includes modest weight reduction typically by reducing fat intake, eating regular meals and snacks and increasing weekly exercise. Interpersonal psychotherapy, Cognitive behavioral therapy and dialectical behavior therapy are the most successful forms for psychotherapy used to treat BED.

**INTERPERSONAL PSYCHOTHERAPY**

Interpersonal psychotherapy (IPT) for BED, was created by Wilfley (58-59). It was based on treatment for depression and later adapted to treat bulimia nervosa (60). IPT is a three phase manualized treatment. The first phase is composed of four sessions focused on a detailed analysis of the interpersonal context within which the eating disorder developed and was maintained. This leads to a formulation of the current

interpersonal problem areas, which then form the focus of the second phase of therapy aimed at helping the patient make interpersonal changes in the specific area or areas identified. The final phase includes three sessions that review the patient's progress and explore ways to handle future interpersonal difficulties. During treatment connections are made between interpersonal events and binge eating, but the therapy does not include any of the specific behavioral or cognitive outcomes that are part of CBT.

**COGNITIVE BEHAVIORAL THERAPY**

Weight loss programs for obese individuals with BED that do not focus on psychological problems may result in lowered self-esteem and increased negative affect (61). When compared with obese non-binge eaters, obese binge eaters lose significantly less weight or rapidly regain it, and have higher rates of treatment drop-out (62). Cognitive behavior therapy (CBT) (62) is a broader form of therapy that is made up of two major components: behavioral techniques and cognitive restructuring. In the behavioral part, normalizing of the eating pattern is established and individuals are encouraged to moderate overall intake. In the cognitive part, maladaptive thoughts about dieting, shape, weight, and overall self-worth are challenged.

Seventy-four obese women (62), 37 with BED and 37 non-binge eaters participated in a study that compared the efficacy of CBT with behavioral weight loss treatment. Subjects were randomly assigned to one of the four groups that met for 15 weekly sessions of 150 minutes each. The outcome measures included concerns about shape, weight and eating, restraint, weight, binge-eating, self-esteem, and depression.

The experimental design included a pre- and post-measurement with a 6 month follow-up. In the CBT groups, the first stage (6 sessions) focused on identifying and changing dysfunctional thoughts about shape, weight, and eating. The second stage (6 sessions) was about teaching cognitive techniques to recognize and challenge negative self-talk and thought patterns. The final stage (3 sessions) focused on maintaining new thought patterns and avoid future relapses. The behavior weight loss group focused on healthy eating that included three meals and three snacks daily, reducing fat intake, eating 1500-1800 kcal/day, regular exercise and becoming more aware of high risk situations that may precede a binge. CBT was more effective in reducing concerns about shape, weight, and eating, as well as restraint and in improving self-esteem. These results were maintained at 6-month follow-up. The behavior weight loss treatment was more effective in reducing weight. Binge eating was reduced with both treatments equally at post-treatment, but at 6 months, the CBT group had significantly fewer subjects that reported binge eating.

CBT has been shown to be an effective treatment for BED (63-64) and is recommended as the psychological treatment of choice (65). Yet CBT is underutilized in BED treatment and few patients receive any mental health treatment that specifically targets the eating disorder (66-69) typically receive treatment for general mental health or weight loss (69). Barriers of widespread use of CBT include few clinicians trained and the intensity and cost of the treatment that requires twenty 50-min sessions over 5 months (70-71). To help provide cost-effective delivery of treatment resources, experts have called for a "stepped care" approach to the treatment of eating disorders, with less

intensive treatments as the first step and more intensive treatments saved for those who fail to respond (72). Short, guided self-help (GSH) approaches based on cognitive behavioral principles (CBT-GSH) have been shown to be more effective in treating BED (71,73) than behavioral weight loss (BWL).

Ninety subjects with BED (73) participated in a randomized clinical trail to assess the efficacy of CBT-GSH and BWL compared with a control group. The three 12-week treatment conditions were administered individually following guided self-help protocols. Intent-to-treat analyses showed that CBT-GSH had significantly higher remission rates compared to BWL and controls. Weight loss was minimal and was not significantly different between treatment groups.

Two hundred five subjects with BED (71) participated in a randomized clinical trail to assess whether patients with BED require therapy in addition to BWL and whether IPT is more effective than either BWL or CBT-GSH. The three treatments were conducted during a 24-week interval. Participants were followed up at 6-month intervals for 2 years after the end of treatment. The IPT sessions were all individual and subjects had a total of 19 sessions during 24 weeks. The total therapy time was the same for the BWL group. The BWL treatment initially focused on dietary change with a weight loss goal of 7% of starting weight. Participants were asked to reduce fat intake to 25% of calories from fat. Self-monitoring of exercise, fat intake, and calorie intake was the main goal of the program. Subjects were encouraged to exercise 2.5 hours per week. The CBT-GSH group had 10 treatment sessions. Participants were assessed for general

psychopathology (SCID-I), personality disorders (SCID-II), and eating disorder psychopathology (EDE). At 2-year follow-up, both IPT and CBT-GSH resulted in greater remission from binge eating than BWL ($p<0.05$, odds ratios: BWL vs CBT-GSH, 2.3; BWL vs IPT, 2.6; and CBT-GSH vs IPT, 1.2). Self-esteem ($p<0.05$) and global Eating Disorder Examination ($p<0.05$) scores were moderators of the treatment outcome. IPT and CBT-GSH were significantly more effective than BWL in eliminating binge eating after 2 years. Guided self-help based on CBT is a first-line treatment option for patients with BED, with IPT or full CBT used for patients with low self-esteem and high eating disorder psychopathology.

One hundred twenty three subjects (74), 59 with BED participated in randomized, clinical trail to evaluate whether a CBT-GSH delivered in 8 sessions in a health maintenance organization (HMO) setting over a 12-week period was more effective than treatment at usual (TAU). TAU includes treatment of general mental health conditions and weight loss, not specifically the eating disorder pathology. Baseline, post-treatment, and 6- and 12-month follow-up data were used in intent-to-treat analyses. At 12-month follow-up, CBT-GSH resulted in greater abstinence from binge eating (64.2%) than TAU (44.6%), measured by the EDE scores. Secondary outcomes reflected greater improvements in the CBT-GSH group in dietary restraint ($d=0.30$), eating, shape, and weight concern (ds= 0.54, 1.10, 0.49, respectively). There was no difference in weight change between the groups.

The primary goals of CBT-GSH are to develop a regular pattern of moderate eating using self-monitoring, self-control strategies, and problem-solving. Relapse prevention is emphasized to promote maintenance of behavioral change. The primary role of the therapist is to explain the rational for the use of the self-help manual, generate a reasonable expectancy for a successful outcome, and to motivate the patient to focus on using the manual. Individuals with BED frequently suffer from multiple problems in addition to binge eating including, high levels of eating disorder psychopathology (unhealthy restraint and eating patterns, eating concerns, and overvalued ideas regarding weight and shape) and psychological distress (depression and low self-esteem) (75-76).

Etiological models highlight a variety of cognitive, behavioral, interpersonal, and affective risk factors implicated in binge-eating episodes (15,77). Cognitive risk factors include the internalization of the "thin ideal", divided thought patterns pertaining to food and eating, body dissatisfaction, and unrealistic standards and expectations of oneself. Behavioral risks involve food restrictions and restraints. Interpersonal factors include isolation, interpersonal skill deficits, and dissatisfaction with interpersonal relations. Affective risk factors include low self-esteem, anxiety, and dysphoria. The roles of restrained eating and negative affect are central in the conceptual models of treatment.

CBT (78) focuses on these behavioral and cognitive factors by prescribing regular meals and snacks in an effort to establish normal eating patterns and decrease urges to binge, encouraging exposure to "feared" foods, and changing distorted thinking about

weight, body image, and food. In contrast, interpersonal theories (such as IPT) describe the binge behavior in the context of being symptomatic of disturbances in interpersonal functioning. The treatment focuses on recognizing and problem-solving interpersonal difficulties involved in grief, disputes, role transitions, or interpersonal deficits.

Individuals who binge may have trouble with emotion regulation. Binge eating can be used as a fast way to numb emotions that are painful, rather than adapt to the emotion (79). During a binge episode, attention is focused, and thoughts are directed away from the true meaning behind an emotional response and instead directed on immediate food-related issues. The binge functions as a way to cope with unpleasant emotions and escape emotional distress when the individual is unable to regulate their emotions in a healthy way (78).

**DIALECTICAL BEHAVIOR THERAPY**

Dialectical behavior therapy (DBT) can best be described as a combination of CBT and the Eastern Zen practices (80) of observation, mindfulness, and avoidance of judgment. It is the balance between finding a strategy for change while simultaneously accepting that change must happen. The behavioral portion of DBT includes a structured contract or set of agreements threat both the client and therapist agree to. DBT is the empirically validated treatment of choice for people with borderline personality disorder. It is a long-term treatment aimed at decreasing behaviors that are life threatening and quality-of-life impairing. DBT primarily treats adaptive affect regulation and may be helpful in treating binge eating (78).

CBT and IPT have shown to be unable to help as many as 50% of individuals with eating disorders (81). One theory is that individuals that don't respond to CBT or IPT are not early rapid responders to treatment (82-83), have more severe eating disorder symptoms, are more impulsive (84), report increased negative mood,(85) or have other mental health co-morbidities. DBT may be the treatment approach that helps this sub-set of individuals with BED. Standard DBT involves group skills training, individual psychotherapy, a therapist consultation team, and access to 24-hr telephone coaching.

Forty-four women with BED (86) were randomly assigned to group DBT or a wait list control condition to evaluate the use of DBT adapted for BED. Baseline and post-treatment measures included the EDE, weight, mood, and affect regulation. Subjects in the treatment group had significantly lower number of binge days and binge episodes ($p<0.01$) and significantly lower scores for weight, shape, and eating concerns ($p<0.05$). There were no significant differences between groups on dietary restraint. Eighteen women in the treatment group were assessed at the 3- and 6-month follow-ups. At 3-month 67% and at 6-month 56% reported abstaining from binge behaviors. At 6-month follow-up, the 89% continued to practice skills taught during treatment, practicing an average of 3.6 different skills per week on an average of 4 days per week.

In a randomized, controlled trail, 101 subjects with BED (87) were assigned to 20 sessions of group therapy: DBT for binge eating disorder (DBT-BED) or active comparison group therapy (ACGT). Assessments of eating behaviors and emotion regulation were administered at baseline, post-treatment, and 3-, 6-, and 12-months

following treatment. The DBT-BED group had a significantly lower dropout rate (4%) than the ACGT group (33.3%). Linear Mixed Models showed post-treatment binge abstinence and reductions in binge frequency were achieved more quickly for DBT-BED (64%) than ACGT (36%). There were no significant differences reported at the follow-up assessments. At 12-month follow-up binge abstinence rate = 64% for DBT-BED and 56% for ACGT. There were no significant changes on emotion regulation.

**COMBINATION TREATMENT**

Eighty obese subjects with BED (88), were randomly assigned to either CBT or BWL groups that participated in 16 weekly treatments and 6 monthly follow-up sessions. Binge eating, general psychopathology, and BMI were assessed at baseline, post-treatment, and 12-month follow-up. At the end of treatment, both groups had significant reductions in binge episodes and frequency. The CBT treatment group had a faster improvement on binge behaviors, while the BWL group had faster reduction in BMI. At 12-month follow-up, there were no significant differences between the treatment groups.

One hundred sixteen subjects with BED (89) participated in a 20-week behavioral weight control treatment study designed to evaluate the added benefit of two adjunctive interventions, individual CBT and fluoxetine, in 16 group sessions. Subjects were randomly assigned to receive CBT + fluxetine, CBT + placebo, fluoxetine, or placebo in a two-by-two factorial design. Outcome measures assessed at the end of treatment included binge frequency, weight, and measures of eating-related and general psychopathology. All subjects reduced binge eating and had improvements in both

general and eating-related psychopathology. Subjects that received CBT had significantly lower binge frequency ($p<0.001$) and increased binge abstinence ($p<0.001$) compared with subjects that did not receive CBT. Fluoxetine treatment was associated with significantly greater reduction in depressive symptoms compared with placebo ($p<0.05$).

One hundred sixty-two subjects with BED (58), were randomly assigned to 20 weekly sessions of either group CBT or group IPT. Assessments of binge eating and related eating disorder psychopathology, general psychological functioning, and weight were obtained at baseline, post-treatment, and at 4-month intervals up to 12-months following treatment. There were no significant differences in binge-eating recovery rates for both groups post-treatment (CBT= 79%, IPT = 73%) and at 1-year follow-up (CBT = 59%, IPT = 62%). Binge eating increased from post-treatment to follow-up, but remained significantly lower than baseline measures. Across treatments, patients had similar significant reductions in associated eating disorder symptoms. Dietary restraint decreased faster with CBT, but IPT had similar values at follow-up measures.

# Chapter 3: Recommendations: *Meta-analysis*

A 2010 meta-analysis by Vocks et. al (90) compared the effectiveness of the available psychological, pharmacological, and weight-loss treatments of BED with regard to the major outcomes of symptomatology concerning BE behavior, body weight, restrained eating, concerns about eating, weight and shape, depression, and dropout rates. The meta-analysis included 38 studies with 1973 participants. Effect sizes, odds ratios, and simple rates were integrated in fixed and random (mixed) effects categorical models. The results of the meta-analysis indicated that from randomized controlled trials, psychotherapy and structured self-help, both based on cognitive behavioral interventions, were found to have large effects on the reduction of binge eating. The randomized controlled pharmacotherapy trials, mainly comprised on anti-depressants, revealed medium effects for the reduction of binge eating. Uncontrolled studies on weight-loss treatments showed moderate reductions of binge eating. Combination treatments did not result in higher effects compared with single-treatment regiments. Except for weight-loss treatment, none of the interventions resulted in considerable weight reduction. In conclusion, psychotherapy and structured self-help, both based on cognitive-behavioral therapy are recommended as the first-line treatments.

**FUTURE DIRECTIONS**

The public health sector has responded well to the obesity problem in America, sending out a clear message that a change in daily habits will promote weight loss and

maintain a healthy weight. For most people, eating less and moving more are attainable goals. For the overweight and obese individuals with BED, this message is not enough. The subset of the population that also suffers from the mental health co-morbidities common in BED, may require psychotherapy and pharmacological intervention. This gap in the treatment protocol for weight reduction in the overweight and obese, may be reinforcing the restricting eating patterns and binge behaviors that lead to weight gain. To best help the BED population, it would be beneficial to screen for both the physiological and psychological symptoms in the physicians office to help identify the disordered eating behavior. The message of wellness should focus on small changes over time that lead to long-term weight reduction and relapse prevention.

## CONCLUSION

The high prevalence of BED in the overweight and obese population seeking weight loss treatment illuminates the need for a change in weight loss treatment. BED is a complex diagnosis that does not have a one size fits all treatment protocol. This disordered eating behavior cannot be treated with diet and exercise alone. The high rate of placebo response to drug-therapy is an important part of the puzzle. The mental health status of the individual should be assessed. A treatment team that includes a physician, therapist, and dietitian will help to increase successful weight loss and prevent relapse. The underlying goals of abstinence from binge behaviors and sustained weight loss will ultimately result in an increased quality of life for individuals with BED. Taken together,

BED etiology is multifaceted and successful treatment must address the complexities of the disorder.

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