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A Randomized Wait-List Controlled Trial of Dialectical Behaviour Therapy Guided Self-Help for Recurrent Binge Eating: A Pilot Study

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by

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Abstract

Empirically supported treatments (ESTs) exist but are not commonly used. Guided self-help (GSH) may be one tool to increase the dissemination of ESTs. This study examined the efficacy of a GSH treatment, for individuals with either full binge eating disorder (BED) or subthreshold BED, based on dialectical behaviour therapy (DBTgsh). Sixty individuals were randomized to either a DBTgsh condition or a wait-list condition (WL) for 13 weeks. Participants (mean age 42.8 years) were recruited from media advertisements. Individuals in the DBTgsh condition received a 40-minute orientation session, a copy of the manual, and six 20-minute support calls over 13 weeks. Participants were assessed at the beginning and end of the treatment period using diagnostic items from the Eating Disorder Examination and self-report measures. Participants in the DBTgsh condition were assessed at 6 months post-treatment. At the end of treatment, DBTgsh participants, compared to WL participants, reported significantly fewer binge eating episodes (2.1 versus 12.6) and significantly greater rates of abstinence from binge eating (50.0% versus 3.7%) in the last 28 days. In addition, after 13 weeks, participants in the DBTgsh condition reported greater increases in quality of life and emotional regulation ability and significant reductions in concerns about eating, shape, and weight, the tendency to be impulsive when in a negative mood, the tendency to eat when experiencing emotions, and the expectancy that food helps emotion regulation. Dietary restraint and the tendency to be impulsive when in a positive mood did not differ between the two groups. At 6 months post-treatment, most improvements in the DBTgsh group were maintained; rates of binge eating increased, but were still significantly lower than at baseline. DBTgsh may be an effective treatment for BED.

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List of Abbreviations

ACGT	Active comparison group therapy
BAI	Beck Anxiety Inventory
BDI-II	Beck Depression Inventory
BED	Binge eating disorder
BMI	Body mass index
CBT	Cognitive behavioural therapy
CI	Confidence interval
DBT	Dialectical behavioural therapy
DBTgsh	Dialectical behaviour therapy guided self-help
DERS	Difficulties in Emotion Regulation Scale
EBP	Evidence-based practice
EDE	Eating Disorder Examination
EDE-Q	Eating Disorder Examination Questionnaire
EDQLS	Eating Disorder Quality of Life Scale
EEI	Eating Expectancy Inventory
EES	Emotional Eating Scale
EM	Expectation-maximization algorithm
ES	Effect size
EST	Empirically supported treatments
GSH	Guided self-help
IPT	Interpersonal psychotherapy
M	Mean

N	Number of participants
ns	Not significant
p	Probability
SCID	Structured Clinical Interview for DSM-IV Axis I Disorders
SD	Standard deviation
sr^2	Squared part correlation
WL	Wait-list

A Randomized Wait-List Controlled Trial of Dialectical Behaviour Therapy Guided Self-Help for Recurrent Binge Eating: A Pilot Study

Over the last half-century, health care systems have increasingly come to emphasize evidence-based practice (EBP) and the cost-effective delivery of health care (Newnham & Page, 2009). EBP refers to clinical practice that is based on evidence about particular interventions, clinical expertise, and patient characteristics (Kazdin, 2008). EBP can be contrasted with empirically supported treatments (ESTs), a term that refers to interventions supported by research studies demonstrating their efficacy in controlled trials (Kazdin, 2008). Although ESTs are an important component of EBP, the term EBP emphasizes the ways in which ESTs are adopted in regular clinical practice. This study explored one possible tool that might help integrate an EST into practice.

Over the last several decades, a great deal of research has focussed on establishing ESTs for a variety of mental health conditions, including depression, obsessive compulsive disorder, and bulimia nervosa (Chambless et al., 1998). However, surveys of clinicians have found that these treatments are not being used as part of routine clinical care for mental illness – that is, as part of EBP. For example, a study of family physicians in the United Kingdom found that only 11% of their patients who were treated for PTSD received empirically supported treatment for PTSD that met minimum requirements for intensity and duration of treatment (Ehlers, Gene-Cos, & Perrin, 2009). Similarly, Kessler, Merikangas, and Wang (2007) examined the treatment received by individuals with depression in the community. Only 41.7% of individuals received treatment that met minimum standards based on published treatment guidelines. Unfortunately, not only do

individuals in the community generally not have access to ESTs, but ESTs are also not routinely used by mental health therapists.

Von Ranson and Robinson (2006) attempted to survey all the clinicians within one city that provided regular treatment for eating disorders. They found that out of the 52 clinicians that participated, 32.7% used cognitive behavioural therapy (CBT) and 1.9% used interpersonal psychotherapy (IPT) as their primary approaches to treatment. Out of the treatment approaches identified, those two approaches were the only treatments recommended for the treatment of bulimia nervosa and binge eating disorder (BED; e.g., National Collaborating Centre for Mental Health, 2004). However, it should be noted that 86.5% and 53.8% of clinicians also stated that they used CBT and IPT, respectively, often or always, although it was unclear whether the treatment carried out by these clinicians was consistent with the manualized treatment approaches that have been studied. A more recent study surveyed individuals who belonged to one of two international eating disorder organizations for whom it might be expected that the use of ESTs would be higher. Out of the 402 participants surveyed, between 35% and 44% of clinicians exclusively used an EST for individuals with various eating disorders (Wallace & von Ranson, 2012). This research suggests that many clinicians who treat eating disorders are not routinely using ESTs. For individuals with other mental health conditions, there is also evidence that published treatment guidelines (American Psychiatric Association, 2006; National Collaborating Centre for Mental Health, 2004) are not being followed, even when therapists describe the treatment to clients as CBT, an EST for many conditions. This occurs both within the treatment of eating disorders and within the treatment of other mental health conditions.

For example, Stobie, Taylor, Quigley, Ewing, and Salkovskis (2007) found that only 40% of individuals with obsessive compulsive disorder who believed they had received CBT described treatments that met minimum criteria for CBT. In this study, minimal treatment criteria were defined as therapy that involved six or more sessions, included exposure and homework exercises, and focused on the obsessional problem. Further, Waller, Stringer, and Meyer (2012) found that fewer than 45% of eating disorder clinicians who stated that they consistently used CBT, used many of the main CBT techniques found in evidence based CBT for eating disorders (e.g., routine weighing, food diaries, exposure). These findings further suggest that many therapists do not carry out ESTs in a manner consistent with treatment manuals.

Overall, evidence suggests that despite the existence of ESTs, front line physicians are not appropriately referring patients to these treatments (Ehlers et al., 2009), therapists are not always using these treatments (von Ranson & Robinson, 2006; Wallace & von Ranson, 2012), and, when therapists attempt to use ESTs, the treatment is not consistently carried out as specified by treatment manuals (Stobie et al., 2007; von Ranson & Robinson, 2006; Waller et al., 2012). These findings suggest that many patients with mental health disorders do not receive ESTs. Without the use of ESTs, it is not possible to ensure clients are receiving the best available treatments. Treatments that have not been studied could be effective, ineffective, or harmful.

The reasons for the gap between research and practice are numerous and will not be explored in entirety here (see Shafran et al., 2009). However, one reason may be the belief that the findings from the research trials used to validate ESTs cannot be generalized to therapy practiced in the community (Kazdin, 2008). Specifically, research

trials establishing ESTs have been criticized for including only a subset of patients, using treatment manuals that are inflexible, and focusing on specific symptom amelioration rather than broader goals such as improving quality of life (Garfield, 1996; Kazdin, 2008). Unfortunately, many of these beliefs are not accurate, as treatment manuals do offer a degree of flexibility, and there is an increasing emphasis on including a diversity of patients in treatment trials (Kazdin, 2008). Another reason for the research-practice gap may be the belief that the effect of specific interventions on outcome is insignificant because common therapeutic factors, such as the therapeutic alliance, are largely responsible for therapeutic outcome (Garfield, 1996; Kazdin, 2008). Although common therapeutic factors are important, not all interventions are equally effective at reducing client's psychopathology (see Linehan et al., 2006; Wilson et al., 2010).

The use of empirically supported self-help manuals has been suggested as one of the tools that may assist in closing the research practice gap (Shafran et al., 2009). Self-help has been defined in a variety of ways and a range of terms has been used interchangeably with self-help, such as self-management, self-care, and self-change (Klingemann, Sobell, & Sobell, 2009; Lewis et al., 2003). For this paper, self-help is defined as requiring no or little clinician input and including instructions to improve skills to cope and manage with specific problems or difficulties (Lewis et al., 2003). Self-help manuals can be used both individually by patients as well as in conjunction with mental health workers who guide the patient through the self-help manual, a process known as guided self-help (GSH). Self-help and GSH can also act as first lines of treatment in a stepped care approach (Clark et al., 2009).

Self-help manuals allow for ESTs to be accessed by individuals within the community, regardless of whether or not those treatments are available from mental health professionals. Additionally, evidence suggests that for some conditions, such as BED (Grilo, 2007; Traviss, Heywood-Everett, & Hill, in press), expert training is not necessary for GSH therapists. Therefore, ESTs could be delivered by therapists delivering GSH without the requirements of extensive training. For these two reasons, the development of evidence-based self-help manuals appears to provide one avenue through which the dissemination of ESTs can occur in a cost-effective manner. Although self-help manuals alone will not replace the need for mental health professionals to conduct EBP, they are, nevertheless, an important tool to help close the research-practice gap.

In randomized controlled trials, self-help manuals have been found to be more effective at reducing symptomatology than wait-list control conditions and just as effective as short term individual psychotherapy for several disorders, including major depression, as well as several different types of anxiety and eating disorders (Cuijpers, Donker, van Straten, & Anderson, 2010; den Boer, Wiersma, & van den Bosch, 2004; Newman, Szkodny, Llera, & Przeworski, 2011; Peterson et al., 2001; Wilson, Wilfley, Agras, & Bryson, 2010). Although research on the use of self-help manuals in the community is limited, preliminary findings are encouraging.

Clark and colleagues (2009) described a pilot project preceding a major push in Britain to ensure EBP is carried out for mental health treatment in the country. This pilot project involved the use of self-help manuals as part of a stepped care approach to treatment. Self-help manuals were used by 1,442 clients out of the 1,654 who had had at least two contacts with staff at one of the clinics examined. In 95% of the cases,

depression was the major referral reason to this community mental health clinic. Only 44 individuals received in-session CBT from a specialist therapist. The overall rate of recovery, defined as being no longer classified as a case, was 56% at discharge and 50% at the time of a follow-up survey that occurred, on average, 42 weeks after treatment (Clark et al., 2009). These recovery rates surpass the natural recovery rate of depression for individuals who have been depressed for longer than 6 months by at least 30% (Clark et al., 2009). Further, these recovery rates are similar to another centre in Britain that saw similar types of cases but where therapists conducted exclusively individual and family therapy, as opposed to using self-help manuals (Kuhn, 2011). A recent follow-up study also found that individuals who attended one of the two pilot sites used fewer healthcare resources than a control group of individuals who did not attend the sites (de Lusignan, Chan, Parry, Dent-Brown, & Kendrick, 2011). These findings support the use of self-help manuals in the community as an important instrument in the delivery of effective mental health care.

Unfortunately, less research has been conducted in the area of self-help and GSH for eating disorders than for other disorders, such as depression or anxiety (Cuijpers et al., 2010; den Boer et al., 2004). However, the research that has been conducted supports self-help and GSH as viable treatment options. In particular, several studies have examined the efficacy of self-help and GSH approaches for the treatment of BED (Carter & Fairburn, 1998; Striegel-Moore et al., 2010; Wilson et al., 2010).

BED is characterized by recurrent episodes of binge eating without the regular use of compensatory behaviours, such as vomiting (American Psychological Association, 2000). BED has a lifetime prevalence of 2.8% for adults and is associated with elevated

comorbid psychopathology, past suicide attempts, and lower quality of life compared to obese and normal weight individuals (Grucza, Przybeck, & Cloninger, 2007; Hudson, Hiripi, Pope, & Kessler, 2006).

Carter and Fairburn (1998) found that for the treatment of BED, both self-help (*n* = 35) and CBT guided self-help (CBTgsh; *n* = 34) were superior to a wait-list control group (*n* = 24) at reducing binge eating. The treatment effect was maintained at 6 months follow-up. CBTgsh has also been found to be more effective than a behavioural weight loss program for reducing binge eating (Grilo & Masheb, 2005) and more effective than treatment as usual for individuals with BED (Striegel-Moore et al., 2010). Computer delivered self-help CBT has been found to be more effective than a wait-list group for individuals with BED (Carrard, Crépin, Rouget, Lam, Golay, & Van der Linden, 2011). These findings all support the use of self-help based CBT interventions for BED.

Particular attention should be paid to a recent study by Wilson and colleagues (2010). This study is noteworthy due to its large sample size, 205 individuals, relatively long follow-up time of 2 years, and the comparison of theoretically different treatment types. These authors found that individuals with BED who were treated with GSH based on CBT showed similar rates of binge eating abstinence as individuals with BED who had been treated with individually-delivered, manualized IPT for BED. Both treatments resulted in a higher percentage of participants who were abstinent from binge eating compared to a behavioural weight loss treatment program at two years' post-intervention, although all three groups showed similar abstinence rates initially at the end of treatment. Despite similar abstinence rates between CBTgsh and individually-delivered IPT, at two-year follow-up, scores on a measure of eating disorder psychopathology were found to

moderate abstinence rates for CBTgsh but not for IPT. That is, individuals with greater levels of eating disorder psychopathology did not benefit as much from CBTgsh as those with lower levels. The authors conclude from these findings that CBTgsh should be a first line treatment option for most patients with BED (Wilson et al., 2010).

Despite the overall equivalency of CBTgsh with IPT and the superiority of both pure self-help and GSH over wait-list interventions, many individuals do not fully benefit from self-help CBT and CBTgsh. Approximately 40% of participants in Wilson et al.'s (2010) treatment study who had received CBTgsh had not stopped binge eating at the end of treatment, and 38% had not stopped binge eating by the time of the 2 year follow-up. Similar rates of binge eating abstinence have been found in other studies of CBT based GSH (Carter & Fairburn, 1998; Peterson et al., 2001; Striegel-Moore et al., 2010). Substantial portions of individuals who receive CBTgsh continue to report binge eating. It is possible that certain people may respond better to other types of treatment delivered through GSH. Therefore, self-help manuals based on other approaches should be developed and validated.

Over the last decade, treatment for BED and bulimia nervosa based on dialectical behaviour therapy (DBT) has been under development. DBT was developed by Marsha Linehan in the 1970s as a treatment for individuals with borderline personality disorder who had a history of self-harm and suicide attempts. DBT integrates both Western psychological, mainly CBT, techniques and Zen practices, particularly its emphasis on mindfulness. The treatment's central tenet is an emphasis on acceptance balanced with an emphasis on change (Linehan, 1993). Emphasis is also placed on enhancing clients' emotional regulation skills (Linehan, 1993). Research findings suggest that DBT is

effective in reducing suicidality and increasing general functioning for persons with borderline personality disorder compared to both treatment as usual, as well as treatment delivered by peer-nominated "expert clinicians" (Linehan et al., 1991; Linehan et al., 2006; Turner, 2000).

DBT has been adapted for the treatment of BED. The purpose of the treatment is to reduce binge eating by teaching individuals with BED how to regulate affect (Telch, Agras, & Linehan, 2000). There is a growing research base that suggests negative affect may be important in the development and maintenance of BED. Difficulty regulating emotions has been found to account for 16% of variance in binge eating in undergraduate students (Whiteside et al., 2007). Individuals with BED have demonstrated elevated levels of impulsivity when in a negative mood compared to non-eating disordered controls, which suggests that individuals with BED may be more likely to binge eat and engage in other impulsive behaviours when in a negative mood (Masson, unpublished). Experimental research has found that individuals with BED who underwent a negative mood induction task ate more calories (Chua, Touyz, & Hill, 2004) and were more likely to have a binge eating episode (Agras & Telch, 1998) than individuals who did not undergo the negative mood induction task. A recent meta-analysis of studies using ecological momentary assessment found that an increase in negative affect often occurs directly before a binge in individuals with BED (Haedt-Matt & Keel, 2011; Stein et al, 2006). Despite the accumulating evidence that supports binge eating as a maladaptive affect regulation behaviour, few treatments specifically address affective regulation difficulties in individuals with BED. Several studies have been conducted since 2000 examining the efficacy of DBT (for BED) in reducing binge eating.

For example, Telch, Agras, and Linehan (2000) conducted an uncontrolled trial of DBT adapted for the treatment of individuals with BED. Treatment outcome was hypothesized to be mediated by three specific factors: a) gaining and strengthening the ability to regulate emotions, b) increasing the ability to tolerate negative emotions, and c) increasing awareness of the problems associated with BED and the benefits of using alternative methods of emotion regulation. A total of 11 women took part in the treatment trial. A 20-session treatment manual was developed to teach emotional regulation skills. Each of the 20 sessions lasted 2 hours. Mindfulness skills, emotion regulation skills, and distress tolerance skills were taught. Participants were also taught how to conduct behavioural analysis of their behaviour. Only a subset of the treatment tools used in DBT was utilized when DBT was adapted for BED. A total of 82% of women experienced no binge eating four weeks prior to the end of treatment. The average reduction in binge eating frequency was 95%. Measures of negative affect and emotion regulation showed decreases at discharge compared to admission. Measures of concern about shape and weight also showed large decreases whereas a measure of eating Restraint did not show a large difference. At 6 month follow-up 70% of the women remained abstinent (Telch et al., 2000).

Telch, Agras, and Linehan (2001) conducted a randomized controlled trial with 44 individuals with BED that compared DBT to a wait-list control group. Treatment consisted of 20 two-hour group therapy sessions where emotion regulation skills were taught. Other aspects of the methodology were also the same as Telch and colleagues' 2000 study. A total of 89% of women experienced no binge eating 4 weeks prior to the end of treatment compared to a rate of 12.5% for the control group. Abstinence rates

were 56% at the 6 month follow-up for the DBT control condition. Although this 6 month abstinence rate is similar to abstinence rates found for the treatment of BED with CBT, it is possible that DBT may be more effective at reducing binge eating in some individuals who do not respond to CBT. Therefore, further investigation into DBT is warranted.

Safer, Telch and Agras (2001) also examined the effect of DBT in 31 women who had DSM-IV diagnoses or sub-clinical diagnoses of bulimia nervosa. Treatment was delivered over 20 individual therapy sessions using a treatment manual adapted from Telch and colleagues (2000; 2001). The participants were randomized to either a wait-list control condition or a DBT condition. From admission to discharge, there was a large decrease in both binging (median: 27.0 episodes over prior four weeks vs median: 1.5 episodes over prior four weeks) and purging behaviours (median: 40.0 episodes over prior four weeks vs 1.0 episodes over prior four weeks) for the DBT group, whereas the control group showed no significant change in either binging (median: 22.0 episodes over prior four weeks vs median: 20.0 episodes over prior four weeks) or purging behaviours (median: 28.0 episodes over prior four weeks vs 28.0 episodes over prior four weeks). Other positive outcomes were noted in depression scores, mood regulation scores, and scores on a measure of negative affect (Safer et al., 2001).

A larger, randomized controlled trial of DBT with an active control group has recently been completed (Safer, Robinson, & Jo, 2010). One hundred and one women and men with BED were randomized to either a group-based DBT condition or an active comparison group therapy (ACGT) condition. Both groups were comprised of 20 two-hour group treatment sessions. ACGT was a manual-based intervention that reflected a Rogerian approach and focused on enhancing self-esteem and self-efficacy. Instead of

providing specific skills or techniques, participants were encouraged to develop their own solutions to the problems they faced. The goal of ACGT was to provide a credible treatment that lacked the treatment components found in DBT and other validated treatments for BED. The DBT treatment taught participants mindfulness, emotion regulation, and distress tolerance skills. The DBT group showed higher rates of binge eating abstinence at the end of the treatment program compared to the ACGT program (64% versus 36%). However, at the 12-month follow-up, the abstinence rates between the two groups were not significantly different; the DBT group showed similar rates of abstinence, 64%, compared to the ACGT group, 56%. The drop-out rate in the DBT group was lower (4%) than the ACGT program (33%), which suggests that the DBT program was more appealing to participants (Safer et al., 2010). Further, individuals with higher psychopathology responded better to DBT than ACGT (Robinson & Safer, 2012). Therefore, although the two groups did not produce significantly different outcomes concerning abstinence, these additional findings suggest DBT may still have been superior to ACGT in certain regards.

Safer and colleagues (2010) suggested that due to the similar rates of abstinence for the DBT and ACGT groups at follow-up, the effect of DBT on reducing binge eating may have been solely due to shared therapeutic elements found for both treatments. It is possible that common therapeutic factors account for the majority of improvement in binge eating in DBT. However, it is also possible that specific mechanisms exist for both treatments, but they have not yet been properly measured (see below for a discussion of the current research on the mechanisms of DBT for BED). Further, the DBT treatment did appear to be faster at producing change in participants and was more effective for

participants with higher levels of psychopathology, which suggests that there may be specific differences between the two treatments. These advantages associated with DBT (for BED), as well as the similar rates of abstinence for DBT and CBT that have been found, suggest further research on DBT is needed. As previously stated, DBT could be an alternative treatment approach that may work for some individuals who have not responded to other ESTs for eating disorders.

In addition to the further study of the efficacy of DBT (for BED), study of the mechanisms of DBT is required. Telch and colleagues (2000; 2001) found that individuals who had received DBT reported a weaker urge to eat when in an anxious or angry state compared to both pre-treatment scores (Telch et al., 2000) and a wait-list control group (Telch et al., 2001). These differences demonstrated medium and large effect sizes. However, scores on depression, affect, self-esteem, and emotional regulation measures were not consistently improved by treatment in both studies (Telch et al., 2000; Telch et al., 2001). These findings suggest that DBT may enhance an individual's ability to abstain from binge eating when in a negative emotional state. However, DBT does not necessarily affect the frequency with which individuals experience negative affect. Although substantial effect sizes were not found on depression, affect, self-esteem, or emotional regulation measures when examining the difference in scores between the DBT and ACGT groups, it should be noted that decreases in many of these variables occurred for both groups (Safer et al., 2010). It is possible that both DBT and the active control treatment affected the tendency to binge eat when in a negative emotional state, which, in turn, was related to a decrease in binge eating, and this is why no difference in emotional regulation measures were found between the two groups (Safer et al., 2010).

The effect of DBT on individuals' specific expectancies about eating, the degree to which individuals become impulsive in negative mood states, and the ability of individuals to regulate their emotions, have not been thoroughly examined. These variables could be mediators of treatment. Examining eating expectancies and the belief that eating will bring about a certain consequence, will help determine if individuals who have received DBT (for BED) become less likely to think eating can improve their mood. Examining individuals' levels of impulsiveness when in negative or positive mood states will help determine if individuals who have received DBT become less impulsive when in a heightened emotional state. Finally, examining individuals' ability to regulate their emotions will help determine if individuals who have received DBT become better able to appropriately cope with both negative and positive emotions. Although this study will not examine whether the above-mentioned variables are mediators, this study may flag these variables as mediator candidates that could be investigated in the future.

The development and validation of GSH for BED based on DBT could make an important contribution to the treatment of eating disorders by increasing the variety of treatment options for individuals with BED. Not only may DBTgsh potentially increase the accessibility of ESTs for BED, it may also encourage further research on DBT. Self-help formats are less resource-intensive than traditional psychotherapy and may encourage additional investigation of the viability of DBT for BED. In addition to investigating DBT itself, the existence of self-help manuals from different theoretical backgrounds could be used to help investigate treatment matching. Even if specific patient characteristics cannot be matched to specific treatments to enhance outcome for DBT, some patients may relate to and buy in to some treatments more than others. This

increased buy-in may itself enhance treatment outcome. Therefore, as self-help manuals may form a vital role in stepped care treatment approaches, the availability of multiple validated treatment manuals will be important.

The purpose of this pilot study is to examine a self-help adaptation of DBT for individuals with BED. The self-help manual that was evaluated is based upon the treatment manual used in previous research of DBT for BED (see Safer et al., 2010; Telch et al., 2001). Individuals with BED were randomized to either a DBTgsh condition, hereafter termed *treatment* condition, or a wait-list control condition, termed *wait-list* condition. Individuals in either group were assessed at the beginning of the study and approximately 14 weeks later, when the last chapter of the self-help manual was due to have been read. Individuals in the treatment group were also assessed 6 months later to determine whether any changes observed persist over time. The randomized wait-list control design was used to evaluate this treatment protocol in order to determine whether the treatment protocol was superior to the natural rate of BED recovery (Cachelin, Striegel-Moore, Elder, Pike, Wilfley, & Fairburn, 1999). This study was termed a pilot study as a wait-list control group and not an attention control group or active control group was used. Further, the small sample size of the current study made it underpowered for certain variables and did not allow for a thorough examination of mediators or moderators. This pilot study is the first to examine the efficacy of DBTgsh for BED.

Although not the main focus of this project, the effect of DBTgsh on specific expectancies individuals have about eating, the degree to which individuals become impulsive in negative mood states, and the ability of individuals to regulate their emotions will help in the exploration of the possible effects DBT may have on

individuals' abilities to regulate their emotions and decrease binge eating. The influence DBT has on these variables is examined. This preliminary study will help determine whether larger treatment studies are needed to evaluate DBTgsh.

Hypotheses

This research project examined the following four primary hypotheses:

1) The DBTgsh treatment group members would have lower levels of binge eating frequency over the past 28 days at the end of treatment compared to the wait-list group members. Binge eating frequency was the primary outcome variable for the current study. This hypothesis was based on previous findings with DBT when compared to a wait-list control. Only Telch and colleagues' 2001 study was used to form this hypothesis as its design was most similar to the current study.
2) The treatment group members would have higher levels of binge eating abstinence at the end of treatment, defined as reporting no binge eating within the last 28 days, compared to the wait-list group members. This hypothesis was based on previous findings with DBT (Telch et al., 2001) when compared to a wait-list control.
3) The treatment group members would have higher levels of quality of life at the end of treatment compared to the wait-list group members. This hypothesis was based on previous research that has found individuals with BED had a lower quality of life compared to individuals with obesity without BED (Rieger, Wilfley, Stein, Marino, & Crow, 2005).
4) The treatment group members would have less severe eating disorder psychopathology at the end of treatment compared to the wait-list group

members. This hypothesis was based on previous findings with DBT (Telch et al., 2001) when compared to a wait-list control.

Exploratory Hypotheses

The hypothesized relationships between the effect of DBTgsh treatment and variables concerning eating expectancy, impulsiveness, and emotional regulation were examined in exploratory analyses. The exploratory hypotheses were as follows:

5) The treatment group members would have higher levels of emotional regulation ability compared to wait-list group members at the end of treatment.
6) The treatment group members would have lower levels of impulsiveness triggered by negative or positive emotions compared to the wait-list group members at the end of treatment.
7) Four eating expectancy scale scores (Eating Helps Manage Negative Affect, Eating Is Pleasurable and Useful as a Reward, Eating Leads to Feeling Out of Control, and Eating Alleviates Boredom) would be lower for the treatment group members than the wait-list group members at the end of treatment.

Maintenance Over Time

8) All of the variables discussed in the above hypotheses would remain significantly improved at 6 months post-treatment compared to baseline in the treatment group.

Method

Participants

The target sample size was determined to be 60, including 30 participants in the treatment group and 30 participants in the wait-list group. The study was designed so that individuals in the treatment group received treatment while individuals in the wait-list

group did not. Once individuals in both groups were assessed a second time, individuals in the wait-list group began receiving treatment, as described in detail below. This sample size was determined by examining the power of previous treatment studies examining DBT for BED and accounting for a high rate of attrition. For a complete discussion of the sample size calculations, please see Appendix A. Study participants were recruited from the city of Calgary, Alberta, through local media. I participated in interviews with various media agencies, which resulted in the study being covered by print, radio, and television news sources. The study was described as a treatment for BED that uses a self-help book and telephone support. Both male and female adults interested in participating were asked to contact the Eating Behaviours Laboratory at the University of Calgary. Individuals who contacted the laboratory were read a brief description of what participation in the study would entail and, if they wished to proceed, they were screened for eligibility through the use of a telephone screen that included the eating disorders section of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID; First et al., 1996) with additional probe questions, the psychosis screen from the SCID, and additional questions to assess eligibility, as described below. A complete copy of the screen can be found in Appendix B. Participants had to meet either full BED criteria or subthreshold BED criteria, where binge eating occurs at least once a week for six months as opposed to full criteria, which requires binge eating at least twice a week for six months. Participants with subthreshold BED were included, as evidence suggests that setting the criteria of BED at binge eating once a week more appropriately classifies cases of BED (Wilson & Sysko, 2009). All participants were 18 or older, had graduated from high school or an equivalent, and were able to speak English. Exclusionary criteria were as

follows: a) involvement in concurrent psychotherapy for binge eating (participants were asked if they had received any treatment from any professional specifically concerning their binge eating), b) active psychosis (defined as screening positive for psychosis on the SCID), c) body mass index (BMI) less than 17.5 kg/m^2, d) use of compensatory behaviours at least once a week over the past three months, g) unstable dose of psychotropic medication over the last three months, and h) inability to commit adequate time to assessment and treatment (approximately 2-3 hours a week for 16 weeks in total).

Individuals who were eligible to participate in the study were read a more in-depth description of the study, see Appendix B, which highlighted and discussed the use of the wait-list control group, including that individuals in the wait-list control group would be contacted 14 weeks after the initial assessment. If the individual wished to proceed, their contact information was given to Laurel Wallace, a graduate student in the Eating Behaviours Laboratory, who then contacted participants by phone for their initial assessment interview. After the assessment interview, participants were randomized to either the treatment condition or the wait-list condition. I conducted the randomization and had no access to the assessment information. An urn randomization program, Minim (version 1; Evans, Day, & Royston, n.d.), was used to randomize the participants. Epidemiological data suggested that most participants would be female and previous recruitment experience at the Eating Behaviour Laboratory suggested that most participants would consist of older individuals with a long history of BED. Therefore, participants were stratified between treatments based on age (35 years of age and older was used to separate participants into two groups) and gender in an attempt to ensure an

equal distribution among the treatment and wait-list groups. Laurel Wallace was blind to group assignment for the baseline and post-treatment assessment.

After participants were randomized, those individuals in the treatment group received the self-help workbook as well as support phone calls over a period of 13 weeks. At the end of the 13 weeks, on week 14, participants in both groups were assessed again; those participants in the wait-list group then received the same treatment protocol. Only individuals in the treatment group were assessed 6 months after the end of treatment. Individuals in the wait-list group were not assessed 6 months later, as they would have received treatment and therefore could no longer serve as a wait-list comparison group. Participants received no monetary incentive to participate in treatment, although they were allowed to keep the self-help workbook at the end of treatment. Recruitment and data collection for the entire study spanned from February 10, 2011 until April 1, 2012.

Treatment

A DBT (for BED) self-help manual was given to individuals randomly assigned to the immediate treatment group. The manual is an adaptation of the group treatment manual used in previous studies of DBT for BED (see: Safer et al., 2009; Safer et al., 2010; Telch et al., 2000; Telch et al., 2001). I collaborated with Dr. Debra Safer in developing the self-help manual; for more information, see below. The main purpose of the treatment is to teach individuals three types of skills to aid in emotional regulation. The first is *mindfulness*, which involves increasing the level of awareness an individual brings to the here and now. Not only is the focus on increasing present awareness but also on being nonjudgmental in how the present moment is experienced and attempting to find

the middle path between extremes. The second skill is *distress tolerance*, which involves helping the individual tolerate negative situations, feelings or thoughts and enhancing the ability to accept aversive events that cannot be changed. The third skill is *emotion regulation* and involves increasing the client's ability to identify specific emotions as they are experienced, to determine whether or not they are experiencing the appropriate emotion and how to change emotions if they wish to. The self-help book educates individuals on these skills as well as guides them through activities and exercises to help them become familiar with these skills and start using them in their daily life. The module on interpersonal effectiveness found in the original DBT for BPD manual was not included as it was also not included in the published therapist manual of DBT for BED (Safer et al., 2009).

The manual was designed to be used over thirteen weeks. Each chapter had a specific focus and included homework to work on during the week that participants were reading the chapter. Most chapters were fairly brief (11 pages on average, with a range of eight to 15 pages).

Individuals in the DBT treatment condition attended one, in-person 45-minute orientation session where the self-help manual was distributed and the basic tenets of the treatment were discussed. A script was used in the orientation session and a copy of it can be obtained from the author. This session is based on orientation materials previously used by Safer and colleagues (2010). In addition, participants received six 20-minute support phone calls every two weeks over the 13 weeks of treatment. If participants were not reached during their scheduled appointment time, all efforts were made to rearrange a support session within a week of their appointment. If participants had not received their

support session within a week then they were contacted at their next scheduled support session. The number and format of support sessions were based on previous research. The number of GSH sessions has varied in past research for BED from six to 14 sessions (Carter & Fairburn, 1998; Peterson et al., 1998). A length of six sessions was chosen as it was the mode of the number of sessions typically involved in GSH for BED.

Typically, GSH support sessions focus on encouraging individuals to work through the self help manual, problem solve, use the tools and strategies that are helpful and clarifying any misunderstandings from the manual (Carter & Fairburn, 1998; Wilson et al., 2010). A copy of the telephone support session protocol is in Appendix C. Under the supervision of Dr. Kristin von Ranson, I provided telephone support to participants by asking them the questions on the support form, encouraging their use of the manual, answering any questions that had about the manual, and problem solving with participants as to how they could find time to use the manual or remember strategies discussed in the manual. On a weekly basis I met with Dr. Kristin von Ranson to discuss the support sessions provided in an attempt to ensure I was consistent meeting the objective of the support session, as well as any challenging issues or situations that had arisen.

Treatment Development

Dr. Debra Safer and a post-doctoral student, Sarah Adler, initially adapted the materials presented in Safer, Telch, and Chen (2009) into a self-help manual that accompanied psychoeducational sessions for a study examining the effects of orlistat, a medication for the treatment of obesity, with DBT for BED (Adler & Safer, 2008). The focus of this adaption was on weight loss through reducing binge eating and sticking to a

food plan. For the purposes of the current study, the self-help manual was made into a stand-alone self-help manual that explained DBT and its rationale in clear, simple terms, and which did not rely on additional psychoeducational sessions. I rewrote sections of the self-help manual and edited the manual. Dr. Safer oversaw and approved the edits I made to ensure fidelity with the original manual.

An introduction to the use of the self-help manual was written, as were introduction and summary pages for each chapter. Several chapters were modified to best reflect the original DBT (for BED) manual and to ensure the manual language was clear. For example, a chapter on dialectical dieting in the self-help manual was turned into a chapter that incorporates dialectical thinking, because dieting is not a focus of the original DBT (for BED) manual. A chapter that helps readers review their progress was created, as well as a chapter at the end of the manual that focuses on relapse prevention. Please see Appendix D for further description of the contents of the manual.

After the treatment manual was completed and before the current study was conducted, I carried out a pilot study to evaluate the readability and perceived applicability of the manual. This project received separate ethics approval from the University of Calgary Conjoint Faculties Research Ethics Board. This initial pilot study involved identifying five individuals diagnosed with BED, as assessed using the Eating Disorder Examination (Fairburn, Cooper, & O'Conner, 2008), and asking them to read the manual and provide me with feedback about it in a focus group. Participants were given the manual to read over two months and did not receive any formal support as part of the study in the interim. As participants read the manual they were asked to fill out feedback forms about each chapter they read (see Appendix E for a copy of the feedback

form). The feedback forms asked them to comment about what was useful, what wasn't useful, and what parts of the manual they had difficulty understanding. After the participants read the manual they were all invited to attend a focus group so that they could provide further feedback about the manual (see Appendix F for a copy of the focus group questions). Four of the five participants attended the focus group. The participant who did not attend had not read any of the manual; she reported being too busy to participate. The focus group was recorded and transcribed. Participants were very positive about the manual. They believed the manual contained many useful tools that would help them address their binge eating. They also felt that the manual fit their own experiences related to binge eating very well. Although the pilot study participants were generally positive about the utility of the manual, they offered critiques as well. Both the individual chapter feedback forms and the focus group transcript generated suggested changes to the manual.

I went through both the individual chapter feedback forms as well as the transcript from the focus group and highlighted all changes that were suggested, and made those changes if Dr. Safer and I agreed that they were appropriate. The changes were mostly related to clarifying a sentence or idea or providing further explanation about a concept. For example, instructions on how to use a particular tool called a chain analysis were rewritten for clarity and several long headings were shortened. The largest modification was adding a section in the manual regarding the addiction model of binge eating. Specifically, several participants who highly identified with this model were unclear as to whether and how the addiction model of binge eating would fit with the treatment manual. There is now a section in the manual that discusses how the manual is not based

on the addiction model of binge eating. None of the changes involved changing actual topics or ideas discussed, just how they were presented.

For details of the recruitment, selection of participants and demographics of the focus group, see Appendix G.

Assessments

As stated above, assessments were conducted pre-treatment and approximately 14 weeks later for both the treatment group members and the wait-list group members. A 6 month follow-up assessment was also conducted for individuals in the treatment group only. Each assessment included a combination of self-report measures and a semi-structured interview. After self-report measures were completed online, the interview was completed over the phone as soon afterwards as possible, typically within 72 hours.

A secure online data collection website (SurveyMonkey) was used to collect self-report information for participants' convenience, as this limited the amount of time the telephone assessment took. Several different self-report measures were administered. First, a demographics questionnaire collected information on age, education, occupation, marital status, and ethnicity. A continuous measure of eating pathology and a measure of quality of life was also administered. Questionnaires concerning anxiety and depression were included to help describe the sample. Questionnaires concerning impulsiveness, mood regulation, and eating expectancy were included for exploratory purposes, as DBT may be related to improvement in these variables.

Measures

Structured Clinical Interview for DSM-IV Axis I Disorders – Non-Patient Version (SCID-I, First, Spitzer, Gibbon, & Williams, 2002). The SCID-I is a semi-

structured interview designed to generate both current and lifetime diagnoses based on the DSM-IV diagnostic system. This measure is considered to be a gold standard for diagnosing psychopathology (Haynes, McQuaid, Ancoli-Isreal, & Martin, 2006; Shear et al., 2000). This study used the eating disorder module and the psychotic screen.

Eating Disorder Examination (EDE; Fairburn, et al., 2008). The Eating Disorders Examination (EDE) is a structured interview of eating disorder symptomatology (Fairburn, Cooper, & O'Connor, 2008) that is considered the gold standard for the assessment of eating disorder psychopathology (Berg, Peterson, Frazier, & Crow, 2011). For the current study, only questions relevant to the differential diagnosis of BED were used, including questions on binge eating frequency, behaviours and feelings associated with binge eating, the use of compensatory behaviours (for example, vomiting or laxatives), and height and weight. Height and weight were self-reported for this study as participants were interviewed over the phone. Height and weight were assessed to rule out anorexia nervosa, as required for a diagnosis of BED. Previous research suggests DBT is not effective at reducing weight loss and so self-reported weight was used, which has shown to be less accurate than researchers weighing participants (Gorber, Tremblay, Moher, & Gorber, 2007). The EDE was administered by Laurel Wallace, who was trained in administering the EDE by Dr. Kristin von Ranson and myself. Laurel Wallace met with Dr. von Ranson on a weekly basis during the course of the study for supervision to discuss her assessment of study participants with the EDE and to help maintain consistency in her ratings. Recordings of the interviews were made so that reliability analyses could be conducted.

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 2008). The EDE-Q is a self-report version of the EDE and assesses the level of severity of symptomatology related to eating disorders over the past 28 days. The EDE-Q consists of 36 items and has four subscales: Weight Concern, Shape Concern, Eating Concern and Restraint. The EDE-Q has been shown to correlate substantially with the EDE, for example, the four subscales of the EDE and EDE-Q were found to correlate between the two measures with ranges from $r = .68$ and $r = .78$ (Mond, Hay, Rodgers, Own, & Beumont, 2004). Recent research has found that the internal consistency of the EDE subscales for individuals with BED is lower than when used with individuals with anorexia nervosa or bulimia nervosa (Lucex & Crowther, 1999; Peterson et al., 2007). A study conducted in 2009 using the EDE, which includes the same subscale items as the EDE-Q, found that for individuals with BED the internal consistency of the subscales ranged from .51 to .68 (Grilo et al., 2010). Although alternative subscales have been proposed, no particular set has been agreed upon (Grilo et al., 2010). Still, the EDE-Q is consistently used in research for BED and therefore for comparison purposes these subscales were examined. However, it is important to keep in mind the low cohesiveness of some of the scales. Higher scores on the EDE-Q mean the individual is reporting high levels of eating disorder pathology.

Eating Disorder Quality of Life Scale (EDQLS; Adair et al., 2007). The EDQLS is a quality of life measure specifically designed for both adolescents and adults with eating disorders. This measure contains 40 items and measures quality of life in 12 different domains, which are: school/work, family and close relationships, relationships with others, future, feelings, appearance, leisure, values and beliefs, cognitive, physical

health, psychological health and eating. Individuals with anorexia nervosa or bulimia nervosa in a eating disorders day-treatment program completed this measure and the overall internal consistency of the measure was found to be high (.96), and associations were found with scores on the EDQLS and treatment progress, an individual's current stage of change, psychiatric symptom severity as well as ED symptom severity (Adair et al., 2007). Higher scores on the EDQLS are associated with greater quality of life.

Eating Expectancy Inventory (EEI; Holstein, Smith, & Atlas, 1998). The EEI measures the belief that individuals have about what food does to them. This measure has five subscales: a) Eating Helps Manage Negative Affect, b) Eating Is Pleasurable and Useful as a Reward, c) Eating Leads to Feeling Out of Control, d) Eating Alleviates Boredom, and e) Eating Enhances Cognitive Competence. The first four subscales were used for this study. All subscales have adequate internal consistency (above .78; Holstein et al., 1998). A Higher score on the EEI are means that an individual has stronger beliefs that food is related to affect.

UPPS-P Impulsive Behavior Scale (Lynam, Smith, Whiteside, & Cyders, 2006). The UPPS-P is a 59-item instrument with five subscales: Negative Urgency, Positive Urgency, Lack of Premeditation, Lack of Perseverance, and Sensation Seeking. The five factor structure of the UPPS has been replicated and has demonstrated high reliability (all Cronbach's alpha levels for the five factors have shown to be above .80; Cyders et al., 2007; Smith et al., 2007; Whiteside & Lynam, 2001). This measure has also been found to be associated with various impulsive behaviours (Cyders et al., 2007; Smith et al., 2007). The Negative Urgency and Positive Urgency subscales were examined in this study. These subscales refer to the tendency to engage in impulsive

behaviours when in a negative or positive emotional state, where higher scores mean there is a greater tendency to engage in impulsive behaviours.

Difficulties in Emotion Regulation Scale (DERS; Gratz, & Roemer, 2004). The DERS is a 36-item self-report questionnaire that assesses the ability of individuals to tolerate extreme affect and regulate their own affect. This scale contains six subscales: Non Acceptance of Emotional Responses, Difficulties Engaging in Goal Directed Behavior, Impulse Control Difficulties, Lack of Emotional Awareness, Limited Access to Emotion Regulation Strategies, and Lack of Emotional Clarity. In a sample of university students, the DERS total scale was found to have high internal consistency (.93), and all of the subscales were also found to have high internal consistency (>.80; Gratz, & Roemer, 2004). All of the subscales were examined in this study. Higher scores on the DERS relate to greater difficulty in emotion regulation.

Emotional Eating Scale (EES; Arnow, Kenardy, & Agras, 1995). The EES assesses the degree to which 25 emotions increase ones urge to eat. The EES has three subscales: Anger/Frustration, Anxiety, and Depression. All three subscales were used in this study. This measure has demonstrated adequate reliability of the three subscales (above .72), good stability over a two week period (r = .79), and the ability to discriminate between individuals with BED and individuals with anxiety disorders (Arnow et al., 1995). Unfortunately, due to an error in the online survey form, one emotion item was excluded from the Anger and Frustration subscale (the Irritated item). Whenever this subscale is mentioned in the remainder of the document, the reader will be reminded that this subscale is modified. Higher scores on the EES relate to a greater tendency to engage in emotional eating.

Beck Depression Inventory (BDI-II; Beck, Steer & Brown, 1996). The BDI-II assesses criteria for depressive disorders based on the DSM-IV, and also provides a score that indexes depression severity. This measure consists of 21 items. Internal consistency has been found to be high for college and university students in two different samples, .93 and .81, as well as outpatients, .92 (Beck et al., 1996; Dozois, Dobson, & Ahnberg, 1998). Further, the BDI-II has also shown to have a high test-retest correlation over a one week period, r = .93 (Beck et al., 1996). Higher scores on the BDI mean individuals are reporting more depression symptoms.

Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988). The BAI is a 21 item measure that assesses the level of self-reported symptoms of anxiety, based on a four point scale. The BAI has been shown to have high internal consistency in samples of university students, .91, as well as outpatients with anxiety, .94 (Creamer, Foran, & Bell, 1995; Fydrich, Dowdall, & Chambless, 1992). Test-retest over 11 days for outpatients with anxiety was found to be fair at r = .67 (Fydrich et al., 1992). Higher scores on the BAI mean individuals are reporting more anxiety symptoms.

Data Analysis

All of the statistical tests employed an alpha of .05, were two tailed, and were conducted using SPSS 19.0.0. Two tailed, as opposed to one tailed tests, were used to account for the possibility of a significant effect that was unexpected, for example, binge eating that decreased more in people who didn't receive treatment. All of the scales and subscales that were examined in this study had their internal consistency assessed to ensure that the measures' internal consistency was adequate within the current study. This study involved conducting many separate statistical tests that increased the overall

probability of type I error; however, as this is an exploratory study no adjustment was made to alpha. Effect sizes were calculated, where possible, so that the results were not evaluated merely on their statistical significance but also on the magnitude of the effect, which was hoped to reduce the chance of misinterpreting statistical aberrations.

In order to assess the success of randomization, demographic variables and binge eating frequency within the last 28 days were examined to determine whether the two groups differed at baseline. If any of the variables were significantly different between the two groups at baseline then it was determined if the variable(s) were significantly associated with the dependent variables that were be examined. If a significant association existed, then the impact of the variable was controlled for statistically.

It was expected that there would be missing data due to attrition. Methods of dealing with missing data include analyzing completer cases only, substituting missing values with the mean of that variable, and using the last observation for a participant to fill in all subsequent observations. Each of these methods have been criticized (Donders, van der Heijden, Stijnen, & Moons, 2006) and therefore for the current study a maximum likelihood estimator, the Expectation-Maximization algorithm (EM) was used to generate predicted values for the missing data based on the outcome variables being examined in this study (see Graham, 2009). In short, this algorithm attempts to predict the value that is the most likely to have been reported if the participant had responded. For the pre-treatment and post treatment scores all of the outcome variables at both time points as well as group membership were used to predict missing scores. Only the treatment group members had 6 month post-treatment scores. Therefore, the algorithm was run a second time on the imputed data set with the wait-list participants removed and the outcome

variables at all three time points were used to best predict the 6 month follow-up missing data. It is important to note that the EM method is designed to work only with normally distributed, continuous data. As binge eating is a count variable, all predicted values that were less than zero were converted to zero to best approximate the possible data that could have been generated.

It is also important to note that this method assumes the missing data is either Missing Completely At Random or Missing At Random as opposed to Missing Not At Random. Missing Not At Random could occur if people failed to respond at post-treatment or 6 months post-treatment because they were elevated on the outcome variables they were being assessed on (for example, binge eating). Of course, it is possible that some participants may have failed to respond because they were especially elevated on certain outcome variables. Unfortunately, it is not possible to know this. As seen in the participant flowchart (Figure 1), the most common reason that participants gave about why they were no longer participating was because they no longer had the time to commit to the study, which would suggest that the data are missing at random. Therefore, it was decided that using EM to impute missing values was appropriate. The data set with the imputed values will be referred to as the imputed data set and the data set with missing data will be referred to as the completer data set.

Each hypothesis was tested as described below.

Hypothesis one. A linear regression analysis was conducted for binge eating frequency at post-treatment, with binge eating frequency at baseline and group entered simultaneously as predictors.

Hypothesis two. A logistic regression analysis was used for binge eating abstinence at post-treatment with group membership entered as a predictor.

Hypothesis three. A linear regression analysis was conducted for the overall quality of life score at post-treatment with quality of life at pre-treatment and group membership entered simultaneously as predictors.

Hypothesis four. Five separate linear regression analyses were conducted for the EDE-Q subscale scores and total score. For each analysis, the post-treatment variables were entered as the dependent variables and group membership and the pre-treatment scores for the dependent variable were entered simultaneously as predictors.

Hypothesis five. Nine separate linear regression analyses were conducted, one for each subscale of the two measures of emotional regulation (EES, DERS). For each analysis, the post-treatment variables were entered as the dependent variables and group membership and the pre-treatment scores for the dependent variable were entered simultaneously as predictors.

Hypothesis six. Two separate linear regression analyses were conducted for the Negative Urgency and Positive Urgency subscales of the UPPS-P. For each analysis, the post-treatment variables were entered as the dependent variables and group membership and the pre-treatment scores for the dependent variable were entered simultaneously as predictors.

Hypothesis seven. Four separate linear regression analyses were conducted for the selected Eating Expectancy subscales (Eating Helps Manage Negative Affect, Eating Is Pleasurable and Useful as a Reward, Eating Leads to Feeling out of Control, and Eating Alleviates Boredom). For each analysis, the post-treatment variables were entered

as the dependent variables and group membership and the pre-treatment scores for the dependent variable were entered simultaneously as predictors.

Hypothesis eight. A one by three, within-subjects analysis of variance (ANOVA) was conducted, with variable scores over the three time points, to examine if scores at 6 months post-treatment continued to be significantly different than scores at baseline on the following variables: binge eating frequency, the overall quality of life score, each EDE subscale score, the subscales of the measures of emotional regulation (EES, DERS), two of the subscales of the UPPS-P (Negative Urgency and Positive Urgency), and the selected eating expectancy subscales. Fisher's exact tests were carried out to compare binge eating abstinence rates at times one, two, and three.

Results

Reliability Analysis

Internal consistency, Cronbach's alpha (α), was calculated at baseline for all of the scale scores that were used in the current study. Details of these analyses can be found in Table 1. Except for two EDE-Q subscales (Eating Concern: $\alpha = .58$; Weight Concern: $\alpha = .51$), all α values were above .70, and most were above .80. Due to the low internal consistency at baseline for the eating concern and weight concern subscales, their internal consistency was also examined at post-treatment and 6 months post-treatment. Both subscales at both time points produced α values above .70. Therefore, the two subscales demonstrated low internal consistency only at baseline. Nevertheless, caution should be taken when interpreting the results from those subscales at baseline.

As binge eating, assessed by the EDE, was the primary outcome variable, the reliability of the EDE interviewer's binge eating assessment was examined. Fifteen EDEs

(12% of total EDEs conducted) were randomly selected using a random number generator. Dr. Kristin von Ranson and I conducted consensus coding for these EDEs based on the information contained on the written EDEs. When there was not enough information present in the EDEs to code an item, we listened to audio recordings to ensure we accurately rated the item based upon all available information. We examined the Pearson correlations between our rating of the frequency of binge eating within the last 28 days and the original rater's rating in order to determine the degree of concordance. The correlation was r = 1.00, $p < .05$. There was only one value that was different, 23 versus 24, and this resulted in a correlation of 1.00 when rounded. Further, I listened to recordings of another 20 interviews to ensure that the number of binges recorded on the paper EDEs corresponded to what I heard on the audiotape; all 20 recordings were consistent.

Sample Characteristics and Randomization

A total of 60 participants were randomized to the two groups, 53 of whom were women. They were, on average, 42.80 (*SD* = 10.51) years old, and most were female (88.3%). Three men were randomized to the treatment group and four men were randomized to the wait-list group. Please see Figure 1 for the participant flow diagram. Participants, on average, had binged 19.13 times within the last 28 days at the beginning of the study and had an average BMI of 37.85 kg/m^2. The average BDI score for participants was 19.67 and the average BAI score for participants was 11.33. The majority of participants were Caucasian (91.00%), employed full-time (61.70%), and had an average of 14.54 years of education. Approximately half of the participants were married (46.70%), whereas most others were either single (23.3%) or divorced (23.3%).

Participants in the treatment and wait-list group did not differ from each other on binge eating frequency, BMI, BDI scores, BAI scores, age, gender, ethnicity, employment status, years of education, or marital status. Means, standard deviations, and statistical results for these variables at baseline, compared between the two groups, are presented in Table 2.

Correlations were also examined between all the outcome variables at baseline and can be found in Appendix H. This correlation matrix allows for examination of how the variables are related to one another and is important to keep in mind when examining the pattern of results.

Missing Data

In addition to the approaches to handling missing data discussed above, another approach is to substitute information for the missing data when you have knowledge about what the value likely is. In three instances, participants completed the EDE-Q but did not complete the EDE. The EDE-Q asks participants to self-report the number of days they binged within the last 28 days. For two participants in the treatment group at post-treatment and one participant in the treatment group at 6 months post-treatment, the EDE-Q response was used to answer whether participants were abstinent from binge eating, an answer normally derived from an EDE response. Although the EDE and EDE-Q are not entirely interchangeable, it was deemed appropriate to substitute the EDE-Q information for binge eating abstinence. If participants reported any binge eating, it is likely they were continuing to binge eat. This substitution only occurred for the binge eating abstinence variable for these three participants.

As detailed above, the EM method was used to impute values for the missing data. All analyses were run for both the imputed data set and the completer data set (in which only complete cases were used for each analysis). Almost all of the analyses yielded the same result. Only on three occasions (out of 46 analyses) did the two sets of analyses differ. These are noted and discussed below. These differences occurred when three time points were analyzed. In all cases, significant differences found in the imputed data set became not significant in the completer only data set, whereas the actual means between the two sets of analyses were very similar. This suggests that reduced power in the completer analysis may have caused the difference. Due to the similarity between the two values, the decision was made to report and discuss the values obtained from the completer analysis and not the imputed analysis. It was deemed more relevant to provide actual values obtained through data collection rather than a combination of actual values and predicted values. Therefore, findings from the completer analysis are presented in Tables 3, 4, 5, 6, and 7, and all results from the imputed analysis are in Appendix I. Please note that the analyses termed "completer analyses" include all people who completed a post-treatment assessment. This includes an individual who asked to stop receiving support phone calls and two individuals who stopped answering phone calls when attempts were made to provide support sessions. These participants still completed the majority of the post-treatment assessment. As these participants still had a copy of the manual and could have continued to be affected by the intervention, it was decided that they should be included in the completer data set, as they did complete the assessment.

In addition to the completer analysis and imputed analysis, a last observation carried forward analysis, where missing data is filled in with participant's previous responses, was also conducted and can be found in Appendix J.

Treatment Adherence

The number of support sessions successfully carried out for participants in the treatment group was recorded. On average, participants assigned to the treatment group received 4.73 out of 6 support calls (78.89% of phone calls). The participants who completed the treatment study and wanted to continue to receive support calls received 5.76 out of 6 support calls (96.03% of phone calls). A total of 85% of participants who completed treatment received all six support calls.

How far participants reported having read to in the manual at the time of their last support session was compiled and analyzed. Of those participants who received treatment and completed the second assessment, 62.0% reported completing the manual by the time of their last support session. On average, participants reported having read 92.3% of the manual by the time of their last support session. Only one person reported having read less than 10 chapters of the 13-chapter manual.

Part of the DBTgsh manual asks individuals to track their binge eating, moods, and use of DBT skills using diary cards. As part of this research study, we asked participants to turn in copies of their diary cards at the end of treatment. It was hoped that the diary cards would indicate participants' treatment adherence. Unfortunately, only 71.4% of the participants who completed the treatment and the post-treatment assessment handed in diary cards. Of the participants who completed diary cards, 93% used the cards to track their binge eating over the course of treatment, but only 33% regularly tracked

their emotions using the cards. Due to the incomplete cards, it is not possible to judge whether participants did not use certain DBT skills or if they just did not indicate if they had used certain skills. Unfortunately, the diary cards cannot be used to determine adherence to the overall treatment, although these findings suggest that filling in the highly detailed cards during the course of treatment may be difficult for many participants.

As discussed above, there were several specific purposes to the support sessions provided to participants in the treatment group (e.g., answering questions about the treatment). The phone call interview form in Appendix C was created in an attempt to ensure I met those purposes. As this was the first time a DBTgsh treatment trial was conducted for recurrent binge eating, no adherence form existed. Therefore, to assess adherence, a selection of support session tapes were listened to by Matthew Wilkins, an undergraduate volunteer research assistant, who coded whether 10 specific questions on the form were asked of the participant. A total of 20 sessions (15%) were randomly selected using a random number generator. The recordings were scored using the form found in Appendix K. A tabulation showed that the questions were asked 100% of the time for seven items and 95% of the time for two items. Overall, the nine questions were asked appropriately 98.89% of the time. One question, question five, was not analyzed, as it was only asked if the participant had read to a certain point.

The rater was also asked to briefly summarize some of the content of the support sessions so that a general description of the support sessions could be ascertained. The support provider gave the following suggestions to people who encountered obstacles to working on the treatment: 1) picking and focusing on the skills that work best for them;

2) practicing skills throughout the week, including trying to find a little bit of time each day; 3) using reminders, such as Post-it notes or cue cards, to maintain motivation and reading schedule; 4) encouraging the participant to continue practicing a skill they were having difficulty with; and 5) trying to use discussed relaxation skills to aid with sleep.

The student rater was asked to note other topics brought up and discussed by participants that did not seem directly related to the support session form. Other topics discussed during the course of the phone interviews can be summarized as follows: 1) specific binges and associated feelings, including guilt; 2) commitment and motivation; 3) perfectionism; 4) expectations about how quick change would be; 5) refusal to sign commitment card; 6) successfully avoiding a binge in high risk situations; 7) family history in relation to binge eating, 8) personalizing the manual and how the manual is a good fit; and 9) the effect of significant life stressors in terms of emotional regulation and continuing the treatment.

Drop-out

Of the 60 participants at baseline, 30% in the treatment group and 10% in the wait-list group dropped out from treatment and the post-treatment assessment. The difference in the rate of drop-out between the groups approached statistical significance $\chi^2(1, N = 60) = 3.75,\ p = .053$. Of the individuals in the treatment group at baseline, 37% had dropped out at the 6 month post-treatment assessment. Demographic variables, the primary dependent variables, and the exploratory variables were compared at baseline between people who dropped out at post-treatment and those who did not. Only two variables were significant. Age was significantly related to drop-out, t(58) = -2.24, insofar as individuals who dropped out were younger ($M = 36.55$, $SD = 9.90$) than those

who completed treatment and participated in post-treatment data collection (*M* = 44.20*, SD* =10.22). Also, EES Depression scores were significantly related to drop-out,[1] t(41.62) = -2.22. Individuals who dropped out had higher scores on this subscale (*M* = 20.92*, SD* = 1.78) than those who completed treatment and participated in post-treatment data collection (*M* = 19.18*, SD* =4.06). Please see Table 8 for a complete presentation of means, standard deviations, effect sizes, and statistical comparisons for individuals who completed the study compared to those who dropped out of the study at post-treatment.

Specific Hypotheses

What follows is an examination of each specific hypothesis. First, it is important to point out several procedures that were utilized when examining the data to help ensure results were interpreted correctly. The distribution of each variable discussed was inspected by converting the values to z-scores. Outliers were defined as having a z-score of greater than 3.29 or less than -3.29, as these values constitute the extreme ends of a normal distribution. If outliers were identified, analyses were conducted both with and without the outliers present in order to determine if their presence changed the statistical findings. If the results were no different, then only the results including the outlier are discussed. Please note that assumptions for all statistical tests discussed below were examined; that is, for the regression analysis, normal probability plots were generated for the dependent variables in order to assess whether the data set was approximately normally distributed. That the dependent and independent variables had a linear relationship was also examined graphically, as was the assumption of homogeneity of variances (by examining a graph displaying standardized residuals and predicted values).

[1] The homogeneity of variances assumption was violated according to Levene's Test for Equality of Variances, $F = 5.51$ $p < .05$, so the statistic was corrected accordingly.

For the ANOVA tests, the assumptions of normality were examined by reviewing kurtosis and skewness values, as well as the assumption of sphericity. The data were judged to be in violation of this assumption if the skewness was greater than +/- 2.0 and the kurtosis was +/- 3. If transformations were carried out and the findings were no different than the original, unaltered data are reported rather than the transformed data, which can be difficult to interpret.

It is also important to note that group membership was coded as one for the treatment group and zero for the wait-list group. This has the advantage of making unstandardized beta weights more readily interpretable.

For hypothesis one and three through seven, a linear regression analysis was conducted with the post-treatment variable of interest where the baseline variable of interest and group was entered simultaneously as predictors. For example, for hypothesis one, a linear regression analysis was conducted with binge eating frequency at post-treatment, with binge eating frequency at baseline and group entered simultaneously as predictors. For hypotheses one through seven, means, standard deviations, and effect sizes are presented in Table 3 for both groups at baseline and post-treatment. For hypothesis one through seven, the overall regression model results are found in Table 4, with specific results for each predictor found in Table 5. Group membership was significant for all regression models, except for EDE-Q Restraint scores.

Hypothesis one. Treatment group members reported they binge ate significantly less frequently at post-treatment compared to the wait-list group.[2]

[2] The homogeneity of variances assumption for binge eating at post-treatment was violated. An outlier was also detected at post-treatment in the wait-list group (binge eating frequency = 45). A log-transformation was carried out for binge eating at post-treatment, after a value of one was added to each data point as log transformations cannot be carried out on zeros. The outlier was also removed and the regression analysis

Hypothesis two. A logistic regression analysis was conducted for binge eating abstinence at post-treatment, with group membership entered as a predictor. Binge eating abstinence at baseline was not entered as a predictor because it lacked variability: 98% of participants were not abstinent at baseline. Please note, binge eating abstinence was coded as one and the presence of any binge eating was coded as zero. The treatment group members reported greater higher rates of binge eating abstinence at post-treatment compared to wait-list group members. The treatment was associated with a relative risk of binge eating abstinence of 18.5 and an odds ratio of 26.0.

Hypothesis three. Treatment group members reported significantly higher total quality of life, EDQLS scores, at post-treatment compared to wait-list group members.

Hypothesis four. Group membership was not significantly associated with Restraint scores at post-treatment. Treatment group members did report significantly lower Eating Concern, Weight Concern, Shape Concern,[3] and total EDE-Q scores at post-treatment compared to wait-list group members.

Hypothesis five. Treatment group members reported significantly lower scores on all DERS subscales scores at post-treatment compared to wait-list group members. That is, DERS Non-Acceptance, DERS Goals, DERS Impulse, DERS Awareness, DERS Strategies, and DERS Clarity subscale scores were lower in the treatment group at post-treatment compared to the wait-list group. Treatment group members also reported

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was conducted again. The log transformation and removal of the outlier adequately corrected for the heterogeneity of variances. The findings from the regression analyses did not differ between the two analyses and so the original data are discussed below. The overall regression model test and the individual variable findings for the log-transformed scores with the outlier removed are in Appendix L, Tables L1 and L2 respectively.

[3] An outlier was detected at baseline for the EDE-Q Shape Concern variable. The outlier (2.25) was removed and the analysis was conducted again. The findings from the regression analyses did not differ between the two analyses and so the original data are presented. Please see Appendix L for the overall regression model test and the individual variable findings for the scores with the outlier removed.

significantly lower EES Anger and Frustration,[4] EES Anxiety, and EES Depression scores at post-treatment compared to wait-list group members.

Hypothesis six. Treatment group members reported significantly lower UPPS-P Negative Urgency scores[5] and Positive Urgency scores at post-treatment compared to wait-list group members.

Hypothesis seven. Treatment group members reported significantly lower scores on all EEI subscales (EEI Eating Helps Affect, EEI Eating as a Reward,[6] EEI Eating Leads to Loss of Control, and EEI Eating Alleviates Boredom) at post-treatment compared to wait-list group members.

Hypothesis eight. The variables examined above were also examined over time at baseline, post-treatment, and 6 months post-treatment for the treatment group. For all variables examined in hypothesis eight, except for binge eating abstinence, a separate ANOVA was conducted with the within-subjects factor as time of assessment and the dependent variable as the variable of interest. For example, for the first variable in hypothesis eight, an ANOVA was conducted with the within-subjects factor as time of assessment and the dependent variable as binge eating frequency. Means, standard deviations, and effect sizes are presented in Table 6 for all variables examined under

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[4] Please note, the EES Anger and Frustration subscale that was examined is missing one item for all participants and so caution should be taken when interpreting the results and comparing these findings to other studies that have examined this subscale.

[5] An outlier was detected at baseline for the UPPS-P Negative Urgency variable. The outlier (13.00) was removed and the analysis was conducted again. The findings from the regression analyses did not differ between the two analyses and so the original data are presented. Please see Appendix L for the overall regression model test and the individual variable findings for the scores where the outlier was removed.

[6] An outlier was detected at baseline for the EEI eating as reward variable. The outlier (1.20) was removed and the analysis was conducted again. The findings from the regression analyses did not differ between the two analyses and so the original data are presented. Please see Appendix L, Table L1 and Table L2, for the overall regression model test and the individual variable findings for the scores where the outlier was removed.

hypothesis eight. The overall ANOVA statistical results for each variable examined and the individual post-hoc t-test comparison results are in Table 7.

Hypothesis eight: Binge eating frequency. Binge eating frequency was found to change over time,[7,8] where binge eating frequency was significantly lower at post-treatment compared to baseline. Then, at the 6 month follow-up, binge eating frequency significantly increased compared to the post-treatment assessment, but it was still significantly lower than baseline.

Hypothesis eight: Binge eating abstinence. Bivariate comparisons of rates of binge eating abstinence were made across the three assessments using Fisher's Exact Test. Rates of binge eating abstinence were not significantly different when baseline was compared to post-treatment ($p = .30$), when post-treatment was compared to 6 months post-treatment ($p = .63$), and when baseline was compared to 6 months post-treatment ($p = .30$). Percentages of binge eating abstinence are presented in Table 6.

Hypothesis eight: Quality of life. EDQLS scores were found to change over time,[9] where EDQLS scores were significantly higher at post-treatment compared to baseline and at the 6 month follow-up compared to baseline. EDQLS scores were not significantly different from each other at post-treatment compared to 6 months post-treatment.

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[7] Mauchly's test indicated that the assumption of sphericity had not been violated for binge eating frequency, $\chi^2(2) = 4.25$, *ns*.

[8] Binge eating at post-treatment demonstrated greater than acceptable kurtosis (kurtosis > 3). A log-transformation was carried out for binge eating at post-treatment, after a value of one was added to each data point as log transformations cannot be carried out on zeros, and the analysis was conducted again. The transformation adequately reduced the kurtosis. The findings from the analysis did not differ between the two analyses and so the original data are presented. Please see Appendix L, Table L3, for the findings from the log-transformed scores.

[9] Mauchly's test indicated that the assumption of sphericity had been violated for the quality of life variable, $\chi^2(2) = 6.35$, $p < .05$, therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = .76$).

Hypothesis eight: Eating Disorder Psychopathology. EDE-Q Restraint scores were found to change over time.[10] Restraint scores were not significantly different at post-treatment compared to baseline. However, Restraint scores significantly decreased at the 6 months follow-up compared to post-treatment and baseline scores.

The other EDE-Q scores were found to demonstrate the same pattern over time.[11] The EDE-Q Eating Concern,[12] EDE-Q Weight Concern, EDE-Q Shape Concern, and total EDE-Q scores were found to significantly change over time, where scores were significantly lower at post-treatment compared to baseline and at the 6 months follow-up compared to baseline. Scores were not significantly different at post-treatment compared to 6 months post-treatment.

Hypothesis eight: General Emotion Regulation Ability. All six DERS subscales were found to significantly change over time.[13]

The DERS Non-Acceptance, DERS impulse, DERS awareness, and DERS strategies all demonstrated the same pattern. These four subscale scores were significantly lower at post-treatment compared to baseline and at the 6 months follow-up compared to baseline. These four subscale scores were not significantly different at post-treatment compared to 6 months post-treatment.

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[10] Mauchly's test indicated that the assumption of sphericity had not been violated for EDE-Q Restraint scores, $\chi^2(2) = 2.60$, *ns*.

[11] The individual Mauchly's tests indicated that the assumption of sphericity had not been violated for the analyses of the EDE-Q Eating Concern, EDE-Q Weight Concern, EDE-Q Shape Concern, and total EDE-Q scores, where the following results were found, respectively, $\chi^2(2) = 0.04$, *ns*, $\chi^2(2) = 2.34$, *ns,* $\chi^2(2) = 1.18$, *ns,* and $\chi^2(2) = 0.79$, *ns*.

[12] Please note that the Eating Concern subscale was found to have low internal consistency at baseline and so caution should be taken when interpreting the results.

[13] For three of the DERS subscale analyses, DERS Non-Acceptance, DERS Goals, and DERS Impulse, Mauchly's test indicated that the assumption of sphericity had not been violated, respectively, $\chi2(2) = 3.98$, ns, $\chi2(2) = 3.27$, ns, $\chi2(2) = 10.83$, ns. Whereas for the other three DERS subscle analyses, DERS Awareness, DERS Strategies, and DERS Clarity, Mauchly's test indicated that the assumption of sphericity had been violated, respectively, $\chi2(2) = 6.23$, $p < .05$, $\chi2(2) = 16.83$, $p < .05$, and $\chi2(2) = 12.39$, $p < .05$, therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity, respectively, $\varepsilon = .76$, $\varepsilon = .61$, and $\varepsilon = .66$.

DERS Goals subscale scores were not significantly lower at post-treatment compared to baseline. However, 6 month follow-up scores were significantly lower than both baseline and post-treatment scores. It is important to note that this variable was one of the few that yielded different results when the estimated scores were imputed to replace missing data. When estimated scores were imputed, baseline scores became significantly higher than post-treatment scores, $t(18) = 2.29$, $p < .05$. All other findings were the same. As the mean scores between the dataset with missing data and the data set without missing data were less than a value of .3 different from each other. It is possible that the different finding is due to reduced power with the completers data set. The results from the imputed data set are available in Appendix I, Table I4.

DERS Clarity subscale scores at post-treatment were not significantly different from scores at baseline. However, at the 6 months follow-up, DERS Clarity subscale scores were significantly different from baseline scores, but not post-treatment scores. This variable also yielded different results when the estimated scores were imputed to replace missing data. When estimated scores were imputed, baseline scores became significantly different than post-treatment scores. All other findings were the same. As the mean scores between the dataset with missing data and the data set without missing data were less than a value of .45 different from each other, it is possible that the different finding is due to reduced power with the completers data set. See Appendix I, Table I4 for the imputed data set results.

Hypothesis eight: Emotion Related Eating. All three EES subscales (EES Anger and Frustration,[14] EES Anxiety, and EES Depression), demonstrated the same pattern of

[14] Please note, the EES Anger and Frustration subscale that was examined is missing one item for all participants and so caution should be taken when interpreting the results. EES Anger and Frustration

significant changes over time.[15] Scores were significantly lower at post-treatment compared to baseline and at the 6 months follow-up compared to baseline. These three subscale scores were not significantly different at post-treatment compared to 6 months post-treatment.

Hypothesis eight: Impulsivity. UPPS-P Negative Urgency subscale scores[16,17] were found to significantly change over time. UPPS-P Negative Urgency subscale scores were significantly lower at post-treatment compared to baseline and at the 6 months follow-up compared to baseline. UPPS-P Negative Urgency subscale scores were not significantly different from each other at post-treatment compared to 6 months post-treatment.

UPPS-P Positive Urgency subscale scores at post-treatment demonstrated greater than acceptable kurtosis. A log-transformation was carried out for the scores at post-treatment, and the analysis was conducted again. The transformation adequately reduced the kurtosis. Because findings from the analysis differed between the two analyses, the log transformed findings are presented here. There was not a significant effect of time on UPPS-P Positive Urgency subscale scores.[18] The non-transformed data had been

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subscale scores at post-treatment demonstrated greater than acceptable kurtosis. A log-transformation was carried out for the scores at baseline. Unfortunately, the log transformation did not adequately reduce the kurtosis nor did a square root transformation. The original data are presented but caution should be taken when interpreting the results.

[15] For two of the EES subscale analyses, EES Anger and Frustration, and EES Anxiety, Mauchly's test indicated that the assumption of sphericity had not been violated, respectively, $\chi 2(2) = 1.12$, ns, and $\chi 2(2) = 2.33$, ns. For the EES anxiety subscale, Mauchly's test indicated that the assumption of sphericity had been violated, $\chi 2(2) = 8.19$, $p < .05$, therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = .72$).

[16] For the analysis of UPPS-P Negative Urgency, Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(2) = 7.20$, $p < .05$, therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = .74$).

[17] An outlier was detected at baseline (13.00) and removed and the analysis was conducted again. The findings from the analysis did not differ between the two analyses and so the original data are presented. Please see Appendix L, Table L3, for the findings from the scores with the outlier removed.

[18] Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 3.83$, *ns*.

significant. The log transformation resulted in reduced variability between the means, and, because the difference between UPPS-P Positive Urgency scores was small, the transformation resulted in the difference becoming non significant. The means from the transformed data are presented in Appendix L, Table L3, while the means for the non-transformed data are presented in Table 6. Because the log transformed results may be more accurate, they are presented rather than the non-transformed results. It is important to note that this variable was the third and final one that yielded different results when the estimated scores were imputed to replace missing data. When estimated scores were imputed, the results show that there was a significant effect of time on UPPS-P Positive Urgency subscale scores.[19] UPPS-P Positive Urgency subscale scores were significantly lower at post-treatment compared to baseline and at the 6 months follow-up compared to baseline. UPPS-P Positive Urgency subscale scores were not significantly different from each other at post-treatment compared to 6 months post-treatment. See Table I4, in Appendix I, for the statistical analyses from the imputed data set. These findings suggest that if all individuals had participated in the treatment, the UPPS-P Positive Urgency subscale would have been found to be lower at post-treatment and at the 6 months follow-up.

Hypothesis eight: Eating Expectancy. The four EEI subscales (EEI Eating Helps Affect, EEI Eating as a Reward,[20] EEI Eating Leads to Loss of Control, and EEI Eating

[19] Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 2.54$, *ns*.
[20] EEI Eating as a Reward subscale scores at post-treatment demonstrated greater than acceptable kurtosis. An outlier was also detected at baseline (1.20) and removed. A log-transformation was carried out for the scores at post-treatment and the analysis was conducted again. The transformation adequately reduced the kurtosis. The findings from the analysis did not differ between the two analyses and so the original data are presented. Please see appendix L, Table L3, for the findings from the log-transformed scores.

Alleviates Boredom) demonstrated the same pattern of significant changes over time.[21] Scores were significantly lower at post-treatment and at the 6 months follow-up compared to baseline. These three subscale scores were not significantly different at post-treatment compared to 6 months post-treatment.

Discussion

This study sought to determine whether DBTgsh reduced binge eating, improved quality of life, and enhanced emotional regulation at the end of treatment compared to a wait-list. This study also explored whether individuals who received treatment maintained their gains over time. A total of 60 participants with BED were randomized to either a wait-list control group or a treatment group that received DBTgsh. Treatment group members demonstrated significantly less binge eating at the end of treatment compared to wait-list group members. Almost all the other outcome variables examined also improved at discharge for treatment group members compared to wait-list group members. At six months post-treatment, individuals who had received the treatment continued to demonstrate improved outcomes compared to baseline scores on most variables. Specific findings are discussed in detail below.

Binge Eating

Compared to the wait-list group, individuals in the treatment group reported a significant reduction in their binge eating over the last 28 days at post-treatment, 12.67 versus 2.14 binge episodes. Direct comparison of binge eating rates across studies is difficult due to sample variation and different ways of handling missing data; however,

[21] For all of the eating expectancy subscales, EEI Eating Helps Affect, EEI Eating as a Reward, EEI Eating Leads to Loss of Control, and EEI Eating Alleviates Boredom, Mauchly's test indicated that the assumption of sphericity had not been violated, respectively, $\chi 2(2) = 5.01$, ns, and $\chi 2(2) = 3.47$, ns, $\chi 2(2) = 0.81$, ns, and $\chi 2(2) = 2.21$, ns.

the 90% reduction of binge eating from 19.45 to 2.14 binges within the last 28 days at post-treatment appears similar to previous findings from research examining group DBT (Safer et al., 2010) as well as both CBTgsh (Wilson et al., 2010) and individualized CBT (Grilo, Masheb, Wilson, Gueorguieva, & White, 2011) for BED. However, this reduction does not appear to be as well maintained over time with DBTgsh compared to other treatments. Grilo and colleagues (2011) found that at six months after treatment with individualized CBT, participants reported a 28-day binge eating frequency of 2.7, and Safer and colleagues (2010) found a binge eating frequency of 5.0 for group DBT at 6 months post-treatment (Safer, personal communication, 2012). The current study found a 28-day binge eating frequency of 8.1 at 6 months post-treatment. Wilson and colleagues (2010) found 28-day binge eating frequencies at one year post-treatment of 5.6 for individual IPT, 5.7 for CBTgsh, and 8.9 for individual BWL (Wilson, personal communication, 2012).

It is important to point out that, although binge eating abstinence was found to significantly differ between wait-list group members and treatment group members at post-treatment, binge eating abstinence was not found to significantly differ among the three time points for the treatment group. Therefore, the different rates of abstinence over time in the treatment group may be due to random variability. However, it is also possible that the current study was underpowered to detect this effect over time. The binge eating abstinence results provide a useful comparison to other studies and will be discussed below; there is a clear need for replication, and the results should be interpreted cautiously.

The current study found that abstinence rates were 50% at discharge and 30% at 6 months post-treatment. These are based on individuals who completed the second assessment; as such, it is difficult to compare with other studies, which vary in how they handle missing data. Safer and colleagues (2010) had an attrition rate of 4% for individuals who received group DBT. Direct comparison may be particularly informative, as there would be littler difference between last observation carried forward, which they used, and completer only analysis. They found abstinence rates of 64% at post-treatment and 52% at 6 months post-treatment for individuals who received group DBT (Safer et al., 2010). Potential reasons for the current findings of lower abstinence rates and higher binge eating at post-treatment for DBTgsh are discussed below and may include: 1) the treatment was shorter, which resulted in individuals having less time to work on their recovery; 2) sample characteristics; 3) the effect of the interventionist; and 4) the treatment is not as effective as group DBT, possibly due to the lower dose of treatment.

The length of treatment may have influenced outcomes in the current study, as studies vary in the duration of BED treatment. Wilson and colleagues' (2010) IPT, CBT-GSH, and BWL treatments took place over 24 weeks. Safer and colleagues (2010) group DBT and the attention control condition interventions took place over 21 weeks. This is substantially more time for people to work on abstinence compared to the 13-week treatment period of the current study. The current study's 6-month follow-up is also much closer to baseline assessment than these other interventions because the length of treatment was shorter. Individuals in this study may have appeared to not have responded as well, as they had less time to work on their abstinence. However, a CBTgsh study with a treatment duration of 12 weeks (Carter & Fairburn, 1998) did not show the same

decrease in abstinence rates from post-treatment to 6 months post-treatment (as in the current study), which suggests that treatment length may not be responsible for lower levels of abstinence for CBTgsh. Individuals who show a quick improvement due to CBTgsh tend to have better outcomes, and therefore the length of treatment and follow-up may not be as important for CBTgsh (Masheb & Grilo, 2007). It is possible that length of follow-up is more important for DBTgsh as it takes longer for individuals to put their DBTgsh skills into practice.

Sample size and sample differences could have been responsible for the different rates of binge eating abstinence found in the current study compared to other studies. Due to the small sample size in the current study, variations in only a few participants could result in a significant change in abstinence rates. The lack of finding statistical significance between the rates of abstinence supports the possibility that sample variation may be responsible for the current findings. In terms of differences in sample characteristics, it appears that rates of binge eating are fairly consistent between the current study and other CBTgsh and DBT studies. Unfortunately, studies have often varied in other measures used to describe the sample, which makes it difficult to compare the overall level of pathology of this sample to others. Therefore, it is not possible to determine if sample differences are responsible for the different findings. The possibility that random variation alone could be responsible for the different rates of binge eating abstinence suggests that it is imperative to conduct further research on DBTgsh.

Specific influences of the interventionist could have been responsible for lower rates of 6-month post-treatment abstinence rates in the current study compared to previous research, which involved one individual providing all of the support to

participants. Other GSH-BED studies that involved multiple interventionists allow for comparisons to be made between interventionists in order to determine if the interventionist is related to the outcome. Unfortunately, this is not possible to determine in the current study, but it is important to point out that it is possible that features of the interventionist – for example, the interventionist could have had difficulty forming a therapeutic alliance with participants – reduced certain individuals' ability to maintain abstinence over time. It is also possible that features of the interventionist enhanced the treatment and that the current findings would be worse with a different interventionist.

Another possible reason for the lower abstinence rates and higher binge eating rates at 6 months post-treatment in the current study compared to previous findings could have been the dose of the treatment. Clinical contact between the interventionist and participant in the DBTgsh intervention was substantially less than what was provided in group DBT treatment conducted in the Safer and colleagues (2010) study. Safer and colleagues' (2010) study involved 2,400 minutes of therapist intervention delivered in a group format compared to the approximately 165 minutes of intervention delivered individually in the current study. It is possible that the reduced amount of contact between the interventionist and the participant in the current study resulted in participants having more difficulty maintaining their gains. Interestingly, CBTgsh interventions have ranged in the amount of support provided from 105 minutes (Grilo & Masheb, 2005) to 310 minutes (Wilson, Wilfley, Agras, & Bryson, 2010), without an apparent influence on outcome. The amount of guided intervention time may be less important for CBTgsh than for DBT treatment of BED. DBTgsh may be more effective if there were a greater amount of guided intervention time. The self-help manual used in most CBTgsh trials is

Overcoming Binge Eating by Chris Fairburn (1995). Much of this manual's content is fairly basic and straightforward (e.g., working on normalizing eating patterns), and it may be easier to understand the content. The content of *Overcoming Binge Eating* may increase the ability for individuals to put the strategies discussed in this manual into practice. The DBT self-help manual focuses on some complex concepts, such as dialectical thinking. Greater support for individuals who received DBTgsh may allow them to put DBT strategies into practice and be better able to maintain those skills over time. It is also possible the gsh manual in its current forms does not do an adequate job of teaching DBT strategies and that the gsh manual needs further refinement.

Several reasons for the different rates of abstinence between the current study and previous findings have been explored. It is not possible to know the true cause of this difference without further study and replications of the current study. Although binge eating is the primary outcome variable, several other areas of functioning were also assessed in the current study. Examining these additional outcomes will help further evaluate the efficacy of DBTgsh. As opposed to statistical significance, or mean scores, effect sizes provide information about the magnitude of effect. When examining these additional outcomes and how they compare to other research findings, effect sizes will be emphasized. All effect sizes discussed will refer to effect sizes calculated using Cohen's *d*.

Quality of Life

Quality of life significantly improved in treatment group members compared to wait-list group members, and this improvement was maintained in the treatment group at 6 months post follow-up. The differences between the two groups and the magnitude of

change over time in treatment group members (baseline compared to post-treatment and baseline compared to 6 months post-treatment) all demonstrated large effect sizes greater than one. Unfortunately, despite its importance, quality of life is often not examined in treatment studies on GSH for BED, and when it is examined, the existence of different measures of quality of life makes comparisons difficult. For example, three GSH for BED studies (Carrard et al, 2011; Carrard, Crépin, Rouget, Lam, Van der Linden, & Golay, 2011; Peterson, Mitchell, Crow, Crosby, & Wonderlich, 2009) examined quality of life using the Impact of Weight on Quality of Life Short Form (Kolotkin, Crosby, Kosloski, & Williams, 2001), which specifically focuses on the impact of being overweight on quality of life. This measure is different from the one used in the current study, which focuses on a broad range of areas, including leisure, physical health, and relationships. The Impact of Weight on Quality of Life Short Form focuses on a more narrow aspect of quality of life. Because these concepts are likely different, caution should be taken when interpreting the effect sizes.

The current study resulted in a large Cohen's *d* effect size in quality of life when baseline was compared to the end of treatment, whereas two of the studies discussed above found small Cohen's *d* effect sizes (Carrard, Crépin, Rouget, Lam, & Goolay et al., 2011; Peterson et al., 2009) and one study found a medium effect size (Carrard, Crépin, Rouget, Lam, & Van der Linden et al., 2011) when baseline was compared to the end of treatment. It is also important to note that the GSH component of the two studies by Carrard and colleagues (2011) was delivered via email, and the GSH component of the Peterson and colleagues (2009) study was delivered in a group format. Although these findings provide some comparison to the current study, further research is needed using

the same quality of life measure employed in the current study for proper comparison. Currently, it appears that DBTgsh can result in substantial improvement in quality of life over time, and this quality of life does not substantially decrease at 6 months post-treatment, despite an increase in binge eating.

Maintenance of change over time in outcome variables, where post-treatment scores and 6-month scores do not significantly differ, was found not only in the quality of life scores, but also in almost all variables examined. The number of binge eating episodes in the last 28 days is one of the few variables that were found to significantly worsen at six months post treatment compared to post-treatment scores. The maintenance of most other scores at 6 months post-treatment suggests that the treatment had a significant impact that continued after treatment was concluded. Specific results are explored below.

Eating Disorder Pathology

Individuals in the treatment group demonstrated improvement in their level of eating pathology compared to the wait-list group. Total EDE-Q scores, as well as three of the four EDE-Q subscale scores (Eating Concern, Weight Concern, and Shape Concern), demonstrated significant improvement in treatment group members compared to wait-list group members at post-treatment. At 6 months post-treatment, individuals who had received the treatment continued to show improvement in these scores compared to baseline scores. The EDE-Q Restraint subscale was not significantly different for treatment group members compared to wait-list group members at post-treatment. Within the treatment group, the Restraint subscale scores were not different from each other at baseline and post-treatment; however, by 6 months post-treatment, the Restraint subscale

scores had improved significantly compared to baseline and post-treatment scores. This finding suggests that DBTgsh may have impacted Restraint subscale scores, but over a longer time frame than just during the course of treatment.

The majority of GSH treatment research for BED utilizes either the EDE or the EDE-Q, which allows for comparison between the current study and other research studies on treatment for BED. However, caution should be taken, as these two measures are not identical and could produce different effect sizes. The current treatment produced similar, large effects on eating pathology to a trial of CBTgsh compared against a wait-list. The findings were similar except for the Restraint subscale at post-treatment, which improved in the other trial (Carter & Fairburn, 1998) but not the current trial. The current study also found that individuals who received DBTgsh were able to maintain their improvement over 6 months, which is consistent with findings from studies on group DBT, individualized CBT, and CBTgsh (Carter, & Fairburn, 1998; Grilo et al., 2011; Safer et al., 2010). These findings suggest that DBTgsh is able to produce improvement in the area of eating pathology, as measured by the EDE-Q, compared to CBTgsh, individualized CBT-BED, and group DBT.

Emotional Regulation

In addition to the effect of DBTgsh on eating disorder symptoms, the current study also sought to explore if this treatment was associated with the increased ability to regulate emotions, with a decrease in impulsivity related to positive or negative affect and a change in how individuals think about eating.

Results from both the DERS and the EES suggest that, compared to the wait-list group, individuals in the treatment group improved over time in their general ability to

regulate their emotions. Further, there was a reduction in the tendency for emotions to increase the urge to eat. At post-treatment, all subscales of the DERS demonstrated significant improvement in treatment group members compared to wait-list group members, and all subscales were found to be significantly lower at 6 months post-treatment compared to the baseline scores for the treatment group. When baseline subscale scores were compared to 6 months post-treatment subscale scores, medium effects were found for the Non-Acceptance, Goals, Strategies, and Clarity subscales, and large effects were found for the Impulse and Awareness subscales. Two of the DERS subscale scores at post-treatment, Goals and Clarity, were not significantly different from baseline scores, but they were different from baseline scores at 6 months post-treatment. It is possible that the lack of significant findings at post-treatment compared to baseline is due to the small sample size of the study. The lack of significant findings for these two subscale scores is not due to improvement over time in the wait-list group, as their scores stayed the same from baseline to post-treatment.

Few eating disorder treatment studies have examined the impact of treatment on emotional regulation. The few studies carried out on this topic suggest that DBTgsh may produce greater improvement in emotional regulation than mindfulness-based CBT (Leahey, Crowther, & Irwin, 2008), and similar improvements compared to both group DBT (for BED; Safer et al., 2010) and more traditional DBT for individuals with substance dependence and borderline personality disorder (Axelrod, Perepletchikova, Holtzman, & Sinha, 2011). More specifically, these findings suggest that DBTgsh is associated with improvement in the following areas at discharge: a) the ability to accept emotions, as opposed to reacting negatively to them; b) the ability to remain in control of

one's behaviour when experiencing negative emotions; c) the ability to attend to and acknowledge emotions; and d) the belief that things can be done to regulate emotions when in a negative emotional state.

EES scores were also examined to investigate the impact of DBTgsh on the tendency to eat when experiencing emotions. At post-treatment, all subscales of the EES demonstrated significant improvement in treatment group members compared to wait-list group members, and at 6 months post-treatment, individuals who received the treatment continued to show improved scores compared to baseline scores. Differences between the two groups and within the treatment group over time revealed large effect sizes. That is, individuals who received DBTgsh substantially reduced their tendency to eat when experiencing anger and frustration, anxiety, and depression. This reduction has been found in other treatment trials of DBT for BED and BN (Telch et al., 2000; Safer et al., 2001; Safer et al., 2010). As discussed in the results section, caution should be taken with interpretation of the EES Anger and Frustration subscale, as this subscale was missing one item (although it did not appear to substantially affect the internal consistency of the subscale). Findings from the DERS and EES suggest that individuals who receive DBT interventions show improvements in emotion regulation.

Interestingly, several studies using CBT for BED have also examined the impact of treatment on EES subscale scores. Two studies, one utilizing group CBT and one examining both group and individual CBT, also found significant improvement in EES scores at the end of treatment compared to baseline (le Grange, Gorin, Dymek, & Stone, 2002; Ricca et al., 2010). Taken all together, the current research findings suggest that DBTgsh reduced emotional eating and that other DBT based treatments for eating

disorders likely produced similar results. However, other interventions for binge eating also resulted in reductions in the tendency to engage in emotional eating; therefore, this may not be a specific mediator of DBT treatment.

Mechanisms of Change in Emotional Regulation

It is important to note that ACGT, the self-esteem group which served as an attention control group in Safer and colleagues' (2010) study, demonstrated similar improvements in emotional regulation compared to group DBT. Safer and colleagues (2010) also found that both treatment groups demonstrated improvement on emotional eating. These similar findings between groups suggest that DBT may not be the only intervention that improves emotional regulation and that it may not be a specific component of treatment that results in these changes. Safer and colleagues (2010) suggest that common therapeutic factors were responsible for the improvement in emotional regulation for both treatment groups. However, DBTgsh involves substantially less direct clinical contact than group DBT and so one may conclude that there was less opportunity for common therapeutic factors to affect outcome: for example, there was a limited amount of time for a bond to form between client and care provider. Clearly, it depends on what common factors are thought to play a role. This study suggests that a search for those factors now needs to include the consideration that individuals who received a less therapist intensive therapy demonstrated similar results at post-treatment. Further research needs to determine if improvement in emotional regulation occurs in treatment for BED, regardless of the treatment's theoretical orientation, and if any of the current treatments for BED (CBT, IPT, and DBT) have specific mechanisms of change, or whether all interventions act in the same way.

Based on previously discussed research (e.g., Leahey, Crowther, & Irwin, 2008), it appears that some treatments may affect emotion regulation differently. Also, exploratory analyses in several studies suggest that some specific client characteristics interact with the treatment they receive to affect outcome, suggesting that different processes may be occurring for certain treatments. For example, Safer and colleagues (2010) found that individuals who rapidly reduced their binge eating at the beginning of treatment binge ate less at the end of treatment if they received group DBT, as opposed to receiving the attention control condition. Wilson and colleagues (2010) also found that individuals with higher levels of binge eating at baseline responded better to IPT-BED, as opposed to CBTgsh or BWL. Clearly, evidence suggests that not all treatments affect emotional regulation and other treatment variables in the same way. It will take much more investigation, including direct treatment comparison and mediator and moderator analysis, to uncover how various treatments do work and, hopefully, how to maximize their effectiveness.

Negative and Positive Urgency

In addition to a growing body of research examining the relationship between emotional regulation and BED, there has also been interest in the relationship between Negative Urgency and binge eating (Fischer, Smith, & Anderson, 2003; Fischer, & Smith 2008). Findings suggest that individuals who binge eat may have a general tendency to become more impulsive when in certain emotional states and that engaging in binge eating is only one of the consequences of this pattern (Fischer et al., 2003; Fischer, & Smith 2008). Negative urgency and positive urgency are the tendencies to engage in impulsive behaviours when in a negative or positive mood, respectively. These constructs

are thought to be aspects of personality and, therefore, less likely to change compared to measures of current functioning or current state. Negative Urgency and Positive Urgency were examined in the current study to determine if DBTgsh could affect change in these constructs. Negative Urgency and Positive Urgency were found to improve in treatment group members compared to wait-list group members at the end of treatment. Although this improvement was maintained at 6 months post-treatment compared to baseline scores in the treatment group for Negative Urgency, Positive Urgency scores were not significantly different at 6 months post-treatment compared to baseline scores. As discussed in the results section, the lack of a significant finding for Positive Urgency at 6 months post-treatment could have been due to inadequate power to detect the effect as Positive Urgency demonstrated only small effect sizes between the two groups and within the treatment group over time. Negative Urgency, however, demonstrated a medium effect size between groups and over time. Unfortunately, other treatment studies have not examined Negative Urgency and Positive Urgency, so it is not possible to compare the effect DBTgsh has on these variables to other treatments. Not only would it be useful to know how other treatments affect these variables, it would also be useful for future researchers to determine how the DERS scale, the EES scale, and the two urgency scales relate to each other. It is unclear whether these scales measure unique facets of functioning or whether they all tap into an underlying construct.

Eating Expectancies

DBT (for BED) focuses on reducing the reliance on binge eating to regulate emotions. This study sought to explore whether individuals who received DBTgsh also changed the beliefs they have about food and its relationship to emotions. The following

four subscales of the EEI were examined: a) Eating Helps Manage Negative Affect, b) Eating is Pleasurable and Useful as a Reward, c) Eating Leads to Feeling Out of Control, and d) Eating Alleviates Boredom. At post-treatment, all four subscales demonstrated significant improvement in treatment group members compared to wait-list group members, and at 6 months post-treatment, individuals who received the treatment continued to show improved scores compared to baseline scores. Differences both between the two groups and within the treatment group over time, comparing baseline scores to post-treatment and 6 months post-treatment scores, revealed large effect sizes, except for Eating Alleviates Boredom, which demonstrated a medium effect size between the two groups at post-treatment. To date, only one treatment study has administered the EEI to patients, as the EEI has been mainly used in studies to explore potential mechanisms of eating disordered behaviours (Baer, Fischer, & Huss, 2005). The study by Baer and colleagues (2005) found that participants with BED who received a combined mindfulness-based and acceptance-based treatment demonstrated improvement at the end of treatment in the subscales Eating Helps Manage Negative Affect and Eating Leads to Feeling Out of Control, but not Eating Alleviates Boredom, which worsened at the end of treatment. Significance testing was not carried out, but effect sizes calculated using the standard deviation of the normative sample suggest the treatment produced medium and large effects on the two EEI subscales found to improve. As with the UPPS-P findings, the lack of other treatment studies with which to compare the current findings makes it difficult to interpret these results. It is possible that DBTgsh did not directly change EEI scores, but that these scores changed as a result of other factors. Further investigation is warranted. Although the mechanism of change is unclear, it appears that individuals in

the treatment condition not only altered their tendency to respond to emotions by binge eating, but also altered beliefs they had about food's ability to regulate their emotions.

Study Attrition

In addition to the effect of the treatment condition on specific variables, attrition rates can also be examined as a crude metric of the acceptability of an intervention. However, as attrition rates could be affected by the treatment, study design (Deeg, van Tilburg, Smit, & de Leeuw, 2002), and participant characteristics (Mahon, 2000), attrition alone should not be used to evaluate a study. DBTgsh in the current study had an attrition rate of 30%. Previous trials of group DBT for BED have found attrition rates between 0% and 18% (Safer et al., 2001; Safer et al., 2010; Telch et al., 2000; Telch et al., 2001). Examples of attrition rates for other treatments include 30% for CBTgsh, 24% for individualized CBT, and 7% for individualized IPT (Grilo et al., 2011; Wilson et al., 2010). Further studies are needed to determine average attrition rates for different treatments, but it is possible that certain treatments are associated with lower attrition, on average, compared to other treatments. The attrition rate for the current study does not appear to be abnormal compared to other treatments for BED, although it may be higher than other DBT based treatments for eating disorders, which could be associated with delivery of the treatment, i.e., brief over-the-phone support sessions versus frequent, in-person, two-hour long treatment sessions. As discussed above, attrition rates could also differ among studies due to study characteristics or sample differences. In the current study, age was found to predict drop-out. It may be that individuals who are younger had fewer resources, time, or interest in treatment than older individuals. It is possible that studies with different average ages could have different rates of drop-out. Although

younger participants and participants with high EES Depression scores were more likely to drop-out in the current study, further research would be needed to determine if these are specific risk factors of drop-out for DBTgsh, or if the findings are just specific to the current study. Researchers have investigated attrition for many years in eating disorders treatment (Mahon, 2000), and very few stable predictors of attrition have been identified.

It is also important to note that attrition at post-treatment was higher in the treatment group than the waitlist group, although the difference was not statistically significant in this study. It may be that some people in the treatment group stopped participating in the study because of some aspect of the treatment condition. Greater time demands associated with being in the study, ambivalence about stopping binge eating, or dislike of the treatment approach are some of the possible reasons for this higher rate of attrition in the treatment group. It is not possible to know the exact cause as not all participants who dropped out from treatment were successfully contacted after they had dropped out.

Treatment Adherence

In addition to attrition, treatment adherence is also an important component of any treatment trial. For the current study, individuals in the treatment condition who participated in post-treatment data collection received almost all of the six telephone support sessions they were scheduled to receive and they reported having read almost the entire manual by the time of their last support phone call. Further, the support provider was found to have asked most participants all of the questions listed in the support session form. This information suggests that the treatment protocol was adhered to for the most part. Unfortunately, participants appeared to have difficulty completing their diary

cards on a regular basis. Participants may have found completing the diary cards too time consuming, or the importance of completing the diary cards may not have been emphasized enough in the manual.

A validated measure of adherence to DBTgsh during the support sessions would be able to provide a better indication of treatment adherence, as the measure would assess the presence of particular topics and ideas, as opposed to just whether or not the support provider asked a list of questions. Such a measure exists for DBT for borderline personality disorder (Linehan & Korslund, 2003), but it is likely that the form would have to be substantially adapted for use in a DBTgsh study.

Study Strengths

This study is the first to examine DBTgsh for BED. This novel study has several strengths as well as several limitations. Although replication and extension of this research is required, this study provides important information about the potential utility of DBTgsh. The strengths of the current study are as follows. First, this study was a randomized wait-list controlled trial, which allows for the effect of treatment above the natural rate of recovery to be evaluated. Second, this study had sufficient power to detect the primary outcome variable of interest, as the target of recruiting 60 participants for this study was met, there was a lower rate of attrition than anticipated, and the effect size found in the current study was larger than the effect size used to estimate the required sample size. Third, assessment of binge eating was carried out using the gold standard assessment tool for this variable (the EDE), a semi-structured interview. Fourth, the EDE assessor's ratings were assessed for validity with excellent results. Fifth, someone who was not involved in treatment delivery and who was blind to the treatment condition at

admission and post-treatment carried out the assessment. Sixth, individuals were recruited for treatment from the community, both males and females were included in the study, and very few exclusionary criteria were used, which increases the generalizability of the findings to individuals in the community who are interested in receiving treatment. Seventh, treatment adherence was assessed for the intervention, a high level of adherence to the support session format was found, and most people who completed the treatment received all of the six phone calls they were scheduled to have. Eighth, individuals who received treatment were assessed 6 months after treatment to determine if they were able to maintain their changes over time. Finally, statistical procedures were used to evaluate the impact of missing data on the results.

Study Limitations

Despite its strengths, the current study has several limitations, as follows. First, although there was sufficient power to detect change in the primary outcome variable, this study may have lacked power to uncover some effects: for example, changes in binge eating abstinence or UPPS-P Positive Urgency scores. Further, the small sample size made it difficult to investigate mediators and moderators of treatment response. This limitation does not detract from the current findings, but should instead encourage future research to further our understanding of the variables that may relate to change.

Second, this study used a wait-list control group only. A wait-list control group was used to determine if the changes witnessed after treatment were due to the intervention or simply reflected natural rates of recovery. However, a wait-list control group cannot be used to determine if specific aspects of the intervention were effective or if the effects are solely due to common therapeutic factors. Further, it is possible that

individuals in a wait-list control condition are less likely to demonstrate natural remission because they know they are going to receive treatment shortly (Safer et al., 2010). As discussed above, Safer and colleagues (2010) compared group DBT to an attention control group and they found that both groups produced similar responses. Without an attention control group, it is not possible to determine if the treatment results are due to specific aspects of the treatment program. However, as this is a GSH study, the argument can be made that regardless of whether there are specific active components of treatment, this intervention requires very few resources and may provide fairly similar results to much more resource intensive interventions. That is, the current findings suggest that, regardless of the cause of the treatment effects, this intervention should be studied further. After these findings are replicated, the use of more sophisticated control conditions in the future may uncover why this intervention is effective and may allow for improvements to be made.

Third, except for the primary outcome, the other outcome variables were collected using self-report data, which may be subject to greater memory recall biases or other sources of error compared to a structured interview method that involves memory prompts, i.e., the EDE. It is also possible that individuals are more honest or forthright on self-report measures than in an interview (see Keel, Crow, Davis, & Mitchell, 2002). The use of multiple modalities of assessment would be ideal.

Fourth, there were several issues with some of the measures employed in this study. Unfortunately, the Anger and Frustration subscale of the EES was missing one item, which could have affected the validity of the results. Fortunately, this scale has eleven items, all of which assess related affective states, and, despite the missing item,

the internal consistency of the subscale was still high. Further, the factor analysis from the original validation study suggests that the missing item did not load especially high on the subscale compared to the other items (Arnow et al., 1995). Despite the missing item, the Anger and Frustration subscale may still be valid, but this cannot be determined definitively. In addition, two of the EDE-Q subscales had very low internal consistency at baseline. Because the internal consistency of the EDE-Q improved in the current study over time, it is also possible that response patterns may change when individuals fill out the measure twice. It is also possible that low internal consistency in the present study is due to the small sample size. Although the reason for the low reliability is unclear, it suggests that this measure may not have consistently assessed the same thing. The ubiquitous use of the EDE-Q justifies, in part, its use in the current study so that the current findings can be compared to previous research, but the addition of another measure of eating psychopathology would have allowed for greater confidence in the validity of the results.

Fifth, study characteristics resulted in the assessor for this study knowing when individuals were being assessed for their 6 months post-treatment follow-up. It is possible that bias was introduced at the 6 months post-treatment follow-up, as the assessor knew that the participant she was interviewing had received treatment. Further, although participants were prompted at the post-treatment assessment not to discuss anything related to the treatment condition they were in, it is also possible that respondents could have revealed such information. Blind assessment was most critical for the post-treatment assessment, and it appears that the blind was maintained based on anecdotal evidence from the assessor. Unfortunately, the integrity of the interviewer blind was not assessed.

Sixth, although useful, a 6 month post-treatment follow-up does not provide adequate time to assess the long term implications of the treatment. One year and, optimally, two or three year follow-ups, would provide a much better idea of the long lasting implications of treatment. It may be particularly interesting to discover the long-term impact of treatment, as this study provides individuals with the treatment manual that they can continue to refer to if they lapse or have relapses in the future.

Seventh, inclusion criteria for this study required that participants in this study meet subthreshold BED criteria, where individuals binge eat at least once a week, and not full DSM-IV BED criteria, where individuals binge at least twice a week. This may limit the generalizability of the findings to some previous studies that used the full DSM-IV BED criteria. However, proposed criteria for the DSM-5 requires binge eating at least once a week and not twice a week. Therefore, these findings may be more generalizable to future research, if the DSM-5 proposed criteria are finalized.

Eighth, because individuals dropped out of the study it cannot be known how effective DBTgsh is for all individuals. Most of the individuals who stopped receiving treatment did not provide any additional follow-up data. Statistical procedures were used to evaluate the influence of drop-out on the current study, but the values that were generated assumed that the individuals who dropped out of treatment would have responded somewhat similarly to their peers. Although differences between individuals who dropped out and those who completed treatment were taken into account when predicting values that were used for imputation, it is possible that the outcome of individuals who dropped out, if they had completed treatment, would be different from

their predicted outcome. Unfortunately, it is not possible to know this, and this is a limitation of most longitudinal research.

The final limitation concerns the absence of multiple intervention providers. As there was only one person who delivered the intervention, it is impossible to assess the impact of the interventionist on outcome. Although most of the intervention is delivered by a book instead of a person, it is still possible that therapist effects were present, and this study was not able to examine them.

Areas for Future Research

The limitations of the current study temper the conclusions that can be made from the current findings and also suggest areas for future research. In addition to conducting another DBTgsh study with more sophisticated control groups, a larger sample size, longer follow-up times, more comprehensive and valid assessment, cost-effective analyses, and multiple intervention providers, there are other research questions that should also be attended to.

It is not known whether DBTgsh is less effective than group DBT or, if it is less effective, if that is because individuals require additional support sessions to help them understand the concepts taught in DBTgsh. By varying the number of support sessions provided to individuals who are receiving DBTgsh, it would be possible to examine the influence of the number of support sessions on treatment outcome. Administering pure self-help DBT would also allow for the evaluation of the impact of support sessions on treatment outcome. In addition to the number of support sessions, DBTgsh could also be changed so that the support sessions are offered in groups, as opposed to individually. During the course of the study, several participants informed the interventionist that they

would have liked the opportunity to speak to other individuals working through the manual. Providing group-based support sessions would be one way of allowing for this interaction. Another possibility would be to set up an online forum and allow individuals working through the treatment manual to communicate with one another. Either option may provide one way of increasing the impact of the treatment, with little increase in the resources required to deliver the intervention.

In addition to further research on DBTgsh with attention control groups, it will also be important for future research to compare DBTgsh to other active interventions, including group DBT and CBTgsh. Direct comparisons between the treatments would allow for more definitive statements to be made about the effectiveness of the different treatments, as other factors, such as sample characteristics, would be held constant across interventions. Treatment matching could then be the next step after treatment comparisons. Wilson and colleagues' (2010) research serves as an example of how comparisons of different treatments to one another can lay the groundwork for treatment matching in the future. In addition to treatment matching, it would also be useful to examine the effect of one intervention after someone has made insufficient recovery from an initial treatment intervention. For example, individuals could be randomized to a DBTgsh condition or a CBTgsh condition. Individuals in either group who continue to demonstrate significant levels of binge eating after a certain time in one treatment program could then be offered the treatment they had not received. One of the justifications for the development of new treatment approaches is that the current approaches are not effective for all individuals. However, most intervention studies usually find similar rates of recovery. Thus, switching treatment approaches for

individuals when they prove ineffective would be one of the ways to potentially maximize the impact of available treatments. One study that offered treatments to individuals who did not respond at the end of treatment found that most individuals did not benefit from the additional treatment (Mitchell et al., 2002). Therefore, it may be important to not wait to offer the additional treatment until the very end of treatment as participants may feel less self-efficacious after an unsuccessful treatment.

Similar to treatment matching or treatment switching is stepped care, a specific approach to treatment switching where progressively more intensive interventions are delivered to an individual if she or he does not respond to less intensive interventions, such as self-help or guided self-help (Clark et al., 2009). Stepped care may allow for health care programs to maximize their resources by providing the most intensive interventions only to those who need it. Preliminary research suggests that stepped care approaches do not discourage individuals from seeking more intensive treatment if GSH approaches are not effective (Ramklint, Jeansson, Holmgren, & Ghaderi, 2011). First, whether or not DBTgsh is efficacious needs to be examined further. If future research suggests DBTgsh is an efficacious treatment for BED, determining how to use it in a stepped-care approach would be an important next step.

The findings from the current study are preliminary, and further research would improve our understanding of DBTgsh, how it works, and its effectiveness. Nevertheless, it is important to state that a future direction for any treatment research should be on how to disseminate it. It is clear from the research discussed above (e.g., Wallace & von Ranson, 2012; Waller et al., 2012) that there is a significant research practice gap that

will not be overcome just by creating ESTs for eating disorders. Concerted and continuous effort will be needed to translate ESTs into regular clinical practice.

Conclusion

This study is the first evaluation of DBTgsh for recurrent binge eating. This novel intervention may provide an important treatment alternative to CBT and IPT based therapies and can be delivered by therapists within several hours over two and a half months. The current findings suggest that DBTgsh may reduce binge eating, reduce eating disorder psychopathology, increase quality of life, and decrease an individual's tendency to use food to cope with emotions. Further, this intervention may also increase individuals' abilities to regulate their emotions. The existence of and dissemination of GSH approaches for eating disorders will likely play an important role in ensuring individuals have access to treatments that work.

References

Adair, C. E., Marcoux, G. C., Cram, B. S., Ewashen, C. J., Chafe, J., & Cassin, S. E. et al., (2007). Development and multi-site validation of a new condition-specific quality of life measure for eating disorders. *Health and Quality of Life Outcomes, 5*. doi:10.1186/1477-7525-5-23

Adler, S., & Safer D. L. (2008). *Comparing alli/orlistat to alli/orlistat plus Dialectical Behavior Therapy for Overweight Binge Eaters: A Randomized Control Pilot.* Poster presented at the American Psychological Association, Boston, MA.

Agras, W. S., & Telch, C. F. (1998). The effects of caloric deprivation and negative affect on binge eating in obese binge-eating-disordered women. *Behavior Therapy*, *29*, 491-503. doi 10.1016/S0005-7894(98)80045-2

American Psychiatric Association. (2006). *Practice guideline for the treatment of patients with eating disorders.* 3rd ed. Washington, District of Columbia: American Psychiatric Association.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.

Axelrod, S. R., Perepletchikova, F., Holtzman, K., & Sinha, R. (2011). Emotion regulation and substance use frequency in women with substance dependence and borderline personality disorder receiving dialectical behavior therapy. *The American Journal of Drug and Alcohol Abuse, 37,* 37-42. doi: 10.3109/00952990.2010.535582

Baer, R. A., Fischer, S., & Huss, D. B. (2005). Mindfulness and acceptance in the treatment of disordered eating. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 23,* 281-300. doi: 10.1007/s10942-005-0015-9

Bailer U., de Zwaan, M., Leisch, F., Strnad, A., Lennkh-Wolfsberg, C., & El-Giamal, N. et al. (2004). Guided self-help versus cognitive-behavioral group therapy in the treatment of bulimia nervosa. *International Journal of Eating Disorders, 35*, 522-537. doi: 10.1002/eat.20003

Berg, K. C., Peterson, C. B., Frazier, P., & Crow, S. J. (2011). Psychometric evaluation of the eating disorder examination and eating disorder examination-questionnaire: A systematic review of the literature. *International Journal of Eating Disorders, 45,* 428-438. doi: 10.1002/eat.20931

Cachelin, F. R., Striegel-More, R. H., Elder, K. A., Pike, K. M., Wilfley, D. E., & Fairburn, C. G., (1999). Natural course of a community sample of women with binge eating disorder. *International Journal of Eating Disorder, 25,* 45-54. doi: 10.1002/(SICI)1098-108X(199901)25:1<45::AID-EAT6>3.0.CO;2-3

Carrard, I., Crépin, C., Rouget, P., Lam, T., Golay, A., & Van der Linden, M. (2011). Randomised controlled trial of a guided self-help treatment on the Internet for binge eating disorder. *Behaviour Research and Therapy, 49,* 482-491. doi: 10.1016/j.brat.2011.05.004.

Carrard, I., Crépin, C., Rouget, P., Lam, T., Van der Linden, M., & Golay, A. (2011). Acceptance and efficacy of a guided internet self-help treatment program for obese patients with binge eating disorder. *Clinical Practice and Epidemiology in Mental Health, 7*, 8-18. doi: 10.2174/1745017901107010008

Carter, J. C., & Fairburn, C. G. (1998). Cognitive-behavioral self-help for binge eating disorder: a controlled effectiveness study. *Journal of Consulting and Clinical Psychology, 66*, 616-623. doi: 10.1037/0022-006X.66.4.616

Chambless D. L., Baker, M. J., Baucom, D. H., Beutler, L. E., Calhoun, K. S., & Crits-Christoph, P. et al. (1998). Update on Empirically Validated Therapies, II. *The Clinical Psychologist, 51*, 3-16.

Chua J. L., Touyz, S., & Hil, A., J. (2004). Negative mood-induced overeating in obese binge eaters: An experimental study. *International Journal of Obesity and Related Metabolic Disorders, 28.* 606-610, doi:10.1038/sj.ijo.0802595

Clark, D. M., Layard, R., Smithies, R., Richards, D. A., Suckling, R., Wright, B. (2009). Improving access to psychological therapy: Initial evaluations of two UK demonstration sites. *Behaviour Research and Therapy, 47,* 910-920. doi: 10.1016/j.brat.2009.07.010

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155-159. doi: 10.1037/0033-2909.112.1.155

Cyders, M. A., Smith, G. T., Spillane, N. S., Fischer, S., Annus, A. M., & Peterson, C. (2007). Integration of impulsivity and positive mood to predict risky behavior: Development and validation of a measure of positive urgency. *Psychological Assessment, 19*, 107-118. doi: 10.1037/1040-3590.19.1.107

Deeg, D. J. H., van Tilburg, T., Smit, J. H., & de Leeuw, E. D. (2002). Attrition in the Longitudinal Aging Study Amsterdam: The effect of differential inclusion in side studies. *Journal of Clinical Epidemiology, 55*, 319-328. doi: 10.1016/S0895-4356(01)00475-9

De Lusignan, S., Chan, T., Parry, G., Dent-Brown, K., & Kendrick, T. (2011). Referral to a new psychological therapy service is associated with reduced utilisation of healthcare and sickness absence by people with common mental health problems: a before and after comparison. *Journal of Epidemiology and Community Health, 66.* doi: 10.1136/jech.2011.139873

den Boer, P. C. A. M., Wiersma, D., & van den bosch, R., J. (2004). Why is self-help neglected in the treatment of emotional disorders? A meta-analysis. *Psychological Medicine, 34,* 959-971. doi: 10.1017/S003329170300179X

Donders, A. R., van der Heijden, G. J., Stijnen, T. & Moons, K. G. (2006). Review: A gentle introduction to imputation of missing values. *Journal of Clinical Epidemiology, 59,* 1087-1091. doi: 10.1016/j.jclinepi.2006.01.014

Durand, M. A., & King, M. (2003). Specialist treatment versus self-help for bulimia nervosa: a randomised controlled trial in general practice. *British Journal of General Practice, 53,* 371-377.

Ehlers, A., Gene-Cos, N,. & Perrin, S. (2009). Low recognition of post-traumatic stress disorder in primary care. *London Journal of Primary Care, 1*, 36-42.

Evans, S., Day, S., Royston, P. *''MINIM'': A program for randomising patients to treatment groups in clinical trials by the method of minimisation* (Version 1) [Software]. Available from: University of York Web site: http://www-users.york.ac.uk/~mb55/guide/minim.htm Accessed December, 2010.

Fairburn, C. (1995). *Overcoming Binge Eating*. New York, NY: The Guilford Press.

Fairburn, C. G., & Beglin, S. (2008). Eating Disorder Examination Questionnaire (EDE-Q 6.0). In C. G. Fairburn, (Ed.). *Cognitive Behaviour Therapy and Eating Disorders* (pp. 309-313). New York: Guilford Press.

Fairburn, C. G., Cooper, Z., & O'Connor, M. (2008). Eating Disorder Examination (16.0D). In C. G. Fairburn, (Ed.). *Cognitive Behaviour Therapy and Eating Disorders.* New York: Guilford Press.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39,* 175-191. doi: 10.3758/BF03193146

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B.W. (2002). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Non-patient Edition. (SCID-I/NP)*. New York: Biometrics Research, New York State Psychiatric Institute.

Fischer, S. & Smith, G. T. (2008). Binge eating, problem drinking, and pathological gambling: Linking behavior to shared traits and social learning. *Personality and Individual Differences, 44,* 789-800. doi: 10.1016/j.paid.2007.10.008

Fischer, S., Smith, G. T., & Anderson, K. G. (2003). Clarifying the role of impulsivity in bulimia nervosa. *International Journal of Eating Disorders, 33,* 406-411. doi: 10.1002/eat.10165

Garfield, L. (1996). Some problems associated with "validated" forms of psychotherapy. *Clinical Psychology: Science and Practice, 3*, 218-229. doi: 10.1111/j.1468-2850.1996.tb00073.x

Gorber, S. C., Tremblay, M., Moher, D., & Gorber, B. (2007). A comparison of direct vs. self-report measures for assessing height, weight and body mass index: a systematic review. *Obesity Reviews, 8*, 307-326. doi: 10.1111/j.1467-789X.2007.00347.x

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology, 60,* 549-576, doi: 10.1146/annurev.psych.58.110405.085530

Grilo, C. M. (2007). Guided self-help for binge-eating disorder. In J. D. Latner, & Wilson, G. T. (Eds.), *Self-help approaches for obesity and eating disorders: research and practice* (pp. 73-91). New York: Guilford Press.

Grilo, C. M., & Masheb, R. M., & Wilson, G. T. (2005). Efficacy of cognitive behavioral therapy and fluoxetine for the treatment of binge eating disorder: A randomized double-blind placebo-controlled comparison. *Biological Psychiatry, 57,* 301-309. doi: 10.1016/j.biopsych.2004.11.002

Grilo, C. M., Masheb, R. M., Wilson, G. T., Gueorguieva, R., & White, M, A. (2011). Cognitive–behavioral therapy, behavioral weight loss, and sequential treatment for obese patients with binge-eating disorder: A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 79*, 675-685. doi: 10.1037/a0025049

Grucza, R. A., Przybeck, T. R., & Cloninger, C. R. (2007). Prevalence and correlates of binge eating disorder in a community sample. *Comprehensive Psychiatry, 48,* 124-131. doi: 10.1016/j.comppsych.2006.08.002

Haedt-Matt, A. A., & Keel, P. K. (2011). Revisiting the affect regulation model of binge eating: A meta-analysis of studies using ecological momentary assessment. *Psychology Bulletin, 137,* 660-681. doi: 10.1037/a0023660

Hudson, J., Hiripi, E., Pope, H., & Kessler, R. (2006). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological Psychiatry, 61,* 348-358. doi: 10.1016/j.biopsych.2006.03.040

Kazdin, A. E. (2008). Evidence-based treatment and practice: new opportunities to bridge clinical research and practice, enhance the knowledge base, and improve patient care. *The American Psychologist. 63,* 146-159. doi: 10.1037/0003-066X.63.3.146

Keel, P. K., Crow, S., Davis, T. L., & Mitchell, J. E. (2002). Assessment of eating disorders: Comparison of interview and questionnaire data from a long-term follow-up study of bulimia nervosa. *Journal of Psychosomatic Research, 53,* 1043-1047. doi: 10.1016/S0022-3999(02)00491-9

Kessler, R. C., Merikangas, K. R., & Wang, P. S. (2007). Prevalence, comorbidity, and service utilization for mood disorders in the United States at the beginning of the twenty-first century. *Annual Review of Clinical Psychology. 3,* 137-158. doi: 10.1146/annurev.clinpsy.3.022806.091444

Klingemann, H., Sobell, M. B., & Sobell, L. C. (2009). Continuities and changes in self-change research. *Addiction*, *105*, 1510-1518. doi: 10.1111/j.1360-0443.2009.02770.x

Kolotkin, R. L., Crosby, R. S., Kosloski, K. D., & Williams, G. R. (2001). Development of a brief measure to assess quality of life in obesity. *Obesity Research, 9,* 102-111. doi: 10.1038/oby.2001.13

Kuhn, P. (2011). Improving access to psychological therapies: Systemic therapy in the Newham pilot site. *Journal of Family Therapy, 33*, 400-414. doi: 10.1111/j.1467-6427.2011.00545.x

Leahey, T. M., Crowther, J. H., & Irwin, S. R. (2008). A cognitive-behavioral mindfulness group therapy intervention for the treatment of binge eating in bariatric surgery patients. *Cognitive and Behavioral Practice, 15*, 364-375. doi: 10.1016/j.cbpra.2008.01.004

le Grange, D., Gorin, A., Dymek, M., & Stone, A. (2002). Does ecological momentary assessment improve cognitive behavioural therapy for binge eating disorder? A pilot study. *European Eating Disorders Review, 10,* 316-328. doi: 10.1002/erv.469

Lewis, G., Anderson, L., Araya, R., Elgie, R., Harrison, G., & Proudfoot, J. et al. (2003). *Self-help interventions for mental health problems.* Report to the Department of Health R&D Programme.

Linehan, M. M. (1993). *Cognitive-Behavioral Treatment of Borderline Personality Disorder.* New York: Guilford

Linehan. M., Armstrong. H. E., Suarez, A., Allmon, D., & Heard, H. L. (1991). Cognitive-behavioral treatment of chronically parasuicidal borderline patients. *Archives of General Psychiatry, 48*, 1060–64.

Linehan, M. M., Comtois, K. A., Murray, A. M., Brown, M. Z., & Gallop, R. J. et al. (2006). Two year randomized controlled trial and follow-up of dialectical behavior therapy vs therapy by experts for suicidal behaviors and borderline personality disorder. *Archives of General Psychiatry, 62,* 1–10.

Linehan, M. M., & Korslund, K. E. (2003). *Dialectal Behavior Therapy Adherence Manual*. Seattle: University of Washington.

Lynam, D. R., Smith, G. T., Whiteside, S. P., & Cyders, M. A. (2006). *The UPPS-P: Assessing five personality pathways to impulsive behavior* (Technical Report). West Lafayette: Purdue University.

Mahon, J., (2000). Dropping out from psychological treatment for eating disorders: What are the issues? *European Eating Disorders Review, 8,* 198-216. doi: 10.1002/(SICI)1099-0968(200005)8:3<198::AID-ERV356>3.0.CO;2-3

Masheb, R. M., & Grilow, C. M. (2007). Rapid response predicts treatment outcomes in binge eating disorder: Implications for stepped care. *Journal of Consulting and Clinical Psychology, 75*, 639-644. doi: 10.1037/0022-006X.75.4.639

Masson, P. C. (2009). Exploring impulsiveness: Comparisons between women with binge eating disorder and women with alcohol dependence. Unpublished master's thesis, University of Calgary, Calgary, Alberta.

Mitchell, J. E., Halmi, K., Wilson, G. T., Agras, W. S., Kraemer, H., Crow, S. (2002). A randomized secondary treatment study of women with bulimia nervosa who fail to respond to CBT. *International Journal of Eating Disorders*, *32*, 271-281. doi: 10.1002/eat.10092

Mond, J. M., Hay, P. J., Rodgers, B., Own, C., & Beumont, P. J. V. (2004). Validity of the Eating Disorder Examination Questionnaire (EDE-Q) in screening for eating disorders in community samples. *Behaviour Research and Therapy, 42*, 551-567. doi: 10.1016/S0005-7967(03)00161-X

Newman, M. G., Szkodny, L. E., Llera, S. J., & Przeworski, A. (2011). A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: Is human contact necessary for therapeutic efficacy? *Clinical Psychology Review, 31*, 89-103. doi: 10.1016/j.cpr.2010.09.008

National Collaborating Centre for Mental Health. (2004). *Eating Disorders; Core interventions in the treatment and management of anorexia nervosa, bulimia nervosa and related eating disorders.* London: The British Psychological Society.

Newnham, E. A., & Page, A. C. (2009). Bridging the gap between best evidence and best practice in mental health. *Clinical Psychology Review, 30*, 127-142. doi: 10.1016/j.cpr.2009.10.004

Peterson, C. B., Mitchell, J. E., Crow, S. J., Crosby, R. D., & Wonderlich, S. A. (2009). The Efficacy of Self-Help Group Treatment and Therapist-Led Group Treatment for Binge Eating Disorder. *The American Journal of Psychiatry, 166,* 1347-1354. doi: 10.1176/appi.ajp.2009.09030345

Peterson, C. B., Mitchell, J. E., Engbloom, S., Nugent, S., Mussell, M. P., & Crow, S. J. et al, (2001). Self-help versus therapist-led group Cognitive-Behavioral Treatment of binge eating disorder at follow-up. *International Journal of Eating Disorders, 30,* 363-374. doi: 10.1002/eat.1098

Ramklint, M., Jeansson, M., Holmgren, S., & Ghaderi, A. (2011). Guided self-help as the first step for bulimic symptoms: Implementation of a stepped-care model within specialized psychiatry. *International Journal of Eating Disorders, 45,* 70-78. doi: 10.1002/eat.20921

Ricca, V., Castellini, G., Mannucci, E., Lo Sauro, C., Ravaldi, C., & Rotella, C. M., et al. (2010). Comparison of individual and group cognitive behavioral therapy for binge eating disorder. A randomized, three-year follow-up study, *Appetite, 55,* 656-665. doi: 10.1016/j.appet.2010.09.019

Rieger, E., Wilfley, D. E., Stein, R. I., Marino, V., & Crow, S. J. (2005). A comparison of quality of life in obese individuals with and without binge eating disorder. *International Journal of Eating Disorders, 37,* 234-240. doi: 10.1002/eat.20101

Robinson, A. H., & Safer, D. L. (2012). Moderators of dialectical behavior therapy for binge eating disorder: Results from a randomized controlled trial. *International Journal of Eating Disorders, 45*, 597-602. doi: 10.1002/eat.20932

Safer, D. L., Robinson, A. H., & Jo, B. (2010). Outcome from a randomized controlled trial of group therapy for binge eating disorder: Comparing Dialectical Behavior Therapy adapted for binge eating to an active comparison group therapy. *Behaviour Therapy, 41,* 106-120. doi: 10.1016/j.beth.2009.01.006

Safer, D., L., Telch, C., F., & Agras, W. (2001). Dialectical behavior therapy for bulimia nervosa. *American Journal of Psychiatry, 158,* 632–34. doi: 10.1176/appi.ajp.158.4.632

Safer, D. L., Telch, C. F., Chen, E. Y. (2009). *Dialectical Behaviour Therapy for Binge Eating and Bulimia*. New York: Guildford Press.

Shafran R., Clark, D. M., Fairburn, C. G., Arntz, A., Barlow, D. H., & Ehlers, A. et al. (2009). Mind the gap: Improving the dissemination of CBT. *Behavior Research & Therapy, 47*, 902-909. doi: 10.1016/j.brat.2009.07.003,

Stein, R. I., Kenardy, J., Wiseman, C. V., Dounchis, J. Z., Arnow, B. A., & Wifley, D. E. (2006). What's driving the binge in binge eating disorder? A prospective examination of precursors and consequences. *International Journal of Eating Disorder, 40,* 195-203. doi: 10.1002/eat.20352

Stobie, B., Taylor, T., Quigley, A., Ewing, S., & Salkovskis, P. M. (2007). "Contents may vary": A pilot study of treatment histories of OCD patients. *Behavioural and Cognitive Psychotherapy, 35*, 273-282. doi: 10.1017/S135246580700358X

Striegel-Moore, R. H., Wilson, G. T., DeBar, L., Perrin, N., Lynch, F., & Rosselli., F. et al. (2010). Cognitive behavioral guided self-help for the treatment of recurrent binge eating. *Journal of Consulting and Clinical Psychology, 78*, 312-321. doi: 10.1037/a0018915

Turner, R. M. (2000). Naturalistic evaluation of dialectical behavior therapy-oriented treatment for borderline personality disorder. *Cognitive and Behavioral Practice*, 7, 413–19. doi: 10.1016/S1077-7229(00)80052-8

Telch, C. F., Agras, W. S., & Linehan, M. M. (2000). Group dialectical behavior therapy for binge-eating disorder: A preliminary, uncontrolled trial. *Behavior Therapy, 31,* 569-582. doi: 10.1016/S0005-7894(00)80031-3

Telch, C., F., Agras, W., & Linehan, M., M. (2001). Dialectical behavior therapy for binge eating disorder. *Journal of Consulting and Clinical Psychology, 69*, 1061–65. doi: 10.1037/0022-006X.69.6.1061

Traviss, G. D., Heywood-Everett, S., & Hill, A. J., (in press). Understanding the 'guide' in guided self-help for disordered eating: A qualitative process study. *Psychology*

and Psychotherapy: Theory, Research, and Practice. doi: 10.1111/j.2044-8341.2011.02049.x

von Ranson, K. M., & Robinson, K. E. (2006). Who is providing what type of psychotherapy to eating disorder clients? A survey. *International Journal of Eating Disorders, 39*, 27-34. doi: 10.1002/eat.20201

Wallace, L. M., & von Ranson, K. M. (2012). Perceptions and use of empirically-supported psychotherapies among eating disorder professionals. *Behaviour Research and Therapy, 50,* 215-223. doi: 10.1016/j.brat.2011.12.006,

Waller, G., Stringer, H., & Meyer, C. (2012). What cognitive behavioural techniques do therapists report using when delivering cognitive behavioral therapy for eating disorders? *Journal of Consulting and Clinical Psychology, 80,* 171-175. doi: 10.1037/a0026559

Whiteside, U. Chen, E., Neighbors C., Hunter, D., Lo, T., & Larimer, M. (2007). Difficulties regulating emotions: Do binge eaters have fewer strategies to modulate and tolerate negative affect? *Eating Behaviors, 8,* 162-169. 10.1016/j.eatbeh.2006.04.001

Wilson, G. T., & Sysko, R. (2009). Frequency of binge eating episodes in bulimia nervosa and binge eating disorder: Diagnostic considerations. *International Journal of Eating Disorders, 42*, 603-610. doi: 10.1002/eat.20726

Wilson, G. T., Wilfley, D. E., Agras, W. S., & Bryson, S. W. (2010). Psychological treatments of binge eating disorder. *Archives of General Psychiatry, 67*, 94-101. doi: 10.1001/archgenpsychiatry.2009.170

Table 1

Internal Consistency for Measures at Baseline (N = 60)

Measure	Internal Consistency (Cronbach's alpha)
EDQLS Total Score	.90
EDE-Q	
Restraint	.73
Eating Concern	.58
Shape Concern	.75
Weight Concern	.51
Total EDE-Q	.75
EES	
Anger and Frustration	.89
Anxiety	.88
Depression	.77
DERS	
Non-Acceptance	.92
Goals	.89
Impulse	.92
Awareness	.82
Strategies	.91
Clarity	.74
UPPS-P	
Negative Urgency	.86
Positive Urgency	.95
EEI	
Eating Helps Manage Negative Affect	.92
Eating Is Pleasurable and Useful as a Reward	.85
Eating Leads to Feeling Out of Control	.73
Eating Alleviates Boredom	.78
BDI	.89
BAI	.89

Note. EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, EES = Emotional Eating Scale; DERS = Difficulties in Emotion Regulation Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory; BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory.

Table 2

Comparison of Demographic Variables at Baseline Between Individuals in the Treatment and Wait-list Groups

Outcome measure	Treatment Group % or Mean (*SD*; *n* = 30)	Wait-list Group % or Mean (*SD*; *n* = 30)	Statistics	*p*	Mean Difference	Confidence Interval	Cohen's *d*
Objective Binge Frequency in Last 28 days	18.66 (13.41)	19.60 (11.91)	$t(58) = -0.29$	*ns*	-0.93	-7.42, 5.56	-0.07
BDI	20.18 (10.85)	19.47 (9.64)	$t(58) = -0.15$	*ns*	0.41	-4.88, 5.70	0.07
BAI	10.07 (8.34)	12.89 (9.65)	$t(58) = 1.34$	*ns*	-3.12	-7.79, 1.54	-0.31
Age (years)	41.31 (10.67)	43.43 (9.59)	$t(58) = -0.46$	*ns*	-1.27	-6.73, 4.20	-0.21
Gender (Female)	90.0%	86.7%	$\chi^2(1) = 0.16$	*ns*			
BMI kg/m^2	37.10 (8.81)	38.83 (8.86)	$t(58) = 0.86$	*ns*	-1.95	-6.50, 2.59	-0.19
Marital Status							
Single	13.33%	33.33%					
Married	60.00%	33.33%					
Common-Law	3.33%	10.00%					
Divorced	23.33%	23.33%					
Widowed	0%	0%	$\chi^2(3) = 5.86$	*ns*			
Ethnicity							
Asian	0%	3.33%					
Black/African	0%	3.33%					
Caucasian/European	93.10%	90.00%					
Indigenous/ Aboriginal	0%	0%					

Note. (+) Treatment group has higher value; (-) Treatment group has lower value; BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory; BMI = body mass index (kg/m^2).

Table 2 (continued)

Comparison of Demographic Variables at Baseline Between Individuals in the Treatment and Wait-list Groups

Outcome measure	Treatment Group % or Mean (*SD*; *n* = 30)	Wait-list Group % or Mean (*SD*; *n* = 30)	Statistics	*p*	Mean Difference	Confidence Interval	Cohen's *d*
Ethnicity							
Latin American	0%	0%					
Middle Eastern	3.45%	0%					
Multiracial	3.45%	3.32%	$\chi^2(4) = 2.98$	*ns*			
Employment Status							
Unemployed	23.33%	10.00%					
Employed part-time	20.00%	10.00%					
Employed full-time	53.33%	70.00%					
Retired	3.33%	10.00%	$\chi^2(3) = 4.28$	*ns*			
Years of Education	13.90 (4.07)	15.17 (3.21)	$t(58) = -1.33$	*ns*	-1.27	-3.18, 0.64	-0.34

Note. (+) Treatment group has higher value; (-) Treatment group has lower value.

Table 3

Completer Analysis: Outcome Variable Comparison Between Individuals in the Treatment and Wait-list Groups at Baseline and at Post-treatment

	Baseline Means (SD)			Post-Treatment Means (SD)		
Outcome measure	Treatment Group (*n*= 30)	Wait-list Group (*n*= 30)	Effect Size (*d*)	Treatment Group (*n*= 23)	Wait-list Group (*n*= 27)	Effect Size (*d*)
Objective Binge Frequency in last 28 days	19.45 (13.62)	18.48 (11.36)	-0.08	2.14 (3.62)[a]	12.67 (10.52)	1.49
Rate of binge eating abstinence last 28 days#	2.70%	0.00%		50.00%[b]	3.70%	
EDQLS Total Score	119.17 (20.00)	118.48 (17.38)	0.04	143.13 (19.69)	118.63 (17.46)	1.32
EDE-Q						
Restraint	3.88 (1.30)	3.07 (1.22)	-0.64	3.28 (1.38)	3.04 (1.19)	-0.19
Eating Concern	4.16 (1.11)	4.61 (1.36)	0.36	2.33 (1.04)	3.58 (1.37)	1.04
Weight Concern	5.37 (0.99)	5.01 (0.85)	-0.39	4.03 (1.09)	4.92 (1.25)	0.76
Shape Concern	5.78 (0.90)	5.43 (1.15)	-0.34	4.16 (1.47)	5.49 (1.23)	0.99
Total Scale Score	4.80 (0.67)	4.53 (0.83)	-0.36	3.45 (1.04)	4.26 (0.97)	0.81
DERS						
Non-Acceptance	16.94 (6.07)	17.59 (6.81)	0.10	12.00 (4.89)	18.22 (6.61)	1.08
Goals	15.96 (4.89)	16.30 (4.33)	0.07	13.90 (5.14)	17.26 (4.17)	0.72
Impulse	16.00 (6.65)	16.18 (5.76)	0.03	12.17 (5.08)	16.18 (6.09)	0.72
Awareness	18.74 (4.42)	17.55 (4.26)	-0.27	15.03 (4.63)	17.70 (4.54)	0.58
Strategies	19.61 (8.29)	20.77 (6.86)	0.15	15.36 (7.28)	21.42 (7.96)	0.80
Clarity	13.17 (3.80)	12.59 (3.26)	-0.16	11.25 (3.34)	13.74 (3.96)	0.68

Note. (+) Effect size favours treatment group; (-) Effect size favours control group; [#] = value is a percentage and not mean; [a] = for this variable $n = 22$; [b] = for this variable $n = 24$; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table 3 (continued)

Completer Analysis: Outcome Variable Comparison Between Individuals in the Treatment and Wait-list Groups at Baseline and at Post-treatment

	Baseline Means (SD)			Post-Treatment Means (SD)		
Outcome measure	Treatment Group (*n*= 30)	Wait-list Group (*n*= 30)	Effect Size (*d*)	Treatment Group (*n*= 23)	Wait-list Group (*n*= 27)	Effect Size (*d*)
EES						
Anger/Frustration	39.89 (8.08)	39.48 (10.91)	-0.04	27.53 (9.56)	37.97 (10.27)	1.05
Anxiety	28.52 (8.73)	29.44 (8.00)	0.11	20.09 (7.27)	28.44 (7.98)	1.10
Depression	19.61 (3.68)	19.04 (4.26)	-0.14	14.13 (5.28)	18.70 (3.96)	0.99
UPPS-P						
Negative Urgency	35.56 (6.87)	35.74 (6.27)	0.03	30.75 (7.13)	35.11 (6.45)	0.64
Positive Urgency	30.82 (9.50)	29.30 (10.63)	-0.15	27.74 (6.42)	30.67 (10.88)	0.34
EEI						
Eating Helps Affect	5.24 (1.05)	5.36 (0.97)	0.12	3.93 (1.27)	5.16 (0.92)	1.12
Eating as a Reward	5.35 (1.26)	5.45 (1.27)	0.08	4.14 (0.90)	5.07 (1.22)	0.88
Eating Leads to Loss of Control	5.83 (0.75)	5.62 (0.85)	-0.26	4.57 (1.25)	5.57 (0.75)	1.00
Eating Alleviates Boredom	5.20 (1.05)	5.04 (1.56)	-0.12	4.00 (1.41)	4.92 (1.39)	0.66

Note. (+) Effect size favours treatment group; (-) Effect size favours control group; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory

Table 4

Completer Analysis of the Impact of Treatment on Outcomes at Post-treatment: Overall Linear and Logistic Regression Model Results

Outcome measure	Test Statistic (*df*)	Test Value
Objective Binge Frequency in last 28 days	*F*(2,46)	12.08*
Rate of binge eating abstinence last 28 days	$\chi 2$(1)	16.08*
EDQLS Total Score	*F*(2,47)	29.20*
EDE-Q		
Restraint	*F*(2,47)	3.62*
Eating Concern	*F*(2,47)	15.47*
Weight Concern	*F*(2,47)	13.31*
Shape Concern	*F*(2,47)	23.75*
Total Scale Score	*F*(2,47)	15.85*
DERS		
Non-Acceptance	*F*(2,47)	24.19*
Goals	*F*(2,47)	18.24*
Impulse	*F*(2,47)	23.83*
Awareness	*F*(2,47)	13.69*
Strategies	*F*(2,47)	25.67*
Clarity	*F*(2,47)	13.93*
EES		
Anger/Frustration	*F*(2,47)	23.57*
Anxiety	*F*(2,47)	10.72*
Depression	*F*(2,47)	19.45*
UPPS-P		
Negative Urgency	*F*(2,47)	25.44*
Positive Urgency	*F*(2,47)	29.10*
EEI		
Eating Helps Affect	*F*(2,47)	16.73*
Eating as a Reward	*F*(2,47)	14.48*
Eating Leads to Loss of Control	*F*(2, 47)	15.00*
Eating Alleviates Boredom	*F*(2,47)	24.19*

Note. * = $p < .05$; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table 5

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	95% Confidence Interval
Objective binge frequency in last 28 days					
Baseline	0.17	0.09	*t*(46) = 1.79	0.04	-.02, 0.36
Group	-10.69	2.30	*t*(46) = -4.65*	0.30	-15.33, -6.06
Rate of binge eating abstinence last 28 days					
Group	-3.26	1.10	*Wald* (1) = 8.81*		0.04, 0.33
EDQLS Total Score					
Baseline	0.59	0.12	*t*(47) = 5.05*	0.24	0.35, 0.82
Group	24.09	4.27	*t*(47) = 5.64*	0.30	15.49, 32.69
EDE-Q					
Restraint					
Baseline	0.36	0.14	*t*(47) = 2.60*	0.12	0.08, 0.64
Group	-0.06	0.36	*t*(47) = -0.17	0	-0.79, 0.67
Eating Concern					
Baseline	0.48	0.13	*t*(47) = 3.80*	0.18	0.22, 0.73
Group	-1.04	0.31	*t*(47) = -3.30*	0.14	-1.67, -0.40
Weight Concern					
Baseline	0.67	0.16	*t*(47) = 4.14*	0.23	0.34, 0.99
Group	-1.14	0.30	*t*(47) = -3.84*	0.20	-1.73, -0.54

Note. * = $p < .05$; Sr^2 = squared part correlation; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire.

Table 5 (continued)

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	Confidence Interval
EDE-Q					
Shape Concern					
Baseline	0.79	0.15	*t*(47) = 5.34*	0.30	0.49, 1.09
Group	-1.60	0.31	*t*(47) = -5.18*	0.28	-2.22, -0.98
Total Scale Score					
Baseline	0.72	0.16	*t*(47) = 4.51*	0.26	0.40, 1.05
Group	-1.00	0.24	*t*(47) = -4.11*	0.21	-1.49, -0.51
DERS					
Non-Acceptance					
Baseline	0.55	0.11	*t*(47) = 5.19*	0.28	0.34, 0.76
Group	-5.86	1.35	*t*(47) = -4.35*	0.20	-8.57, -3.15
Goals					
Baseline	0.61	0.12	*t*(47) = 5.15*	0.31	0.37, 0.84
Group	-3.15	1.06	*t*(47) = -2.96*	0.10	-5.29, -1.01
Impulse					
Baseline	0.60	0.10	*t*(47) = 6.06*	0.38	0.40, 0.81
Group	-3.90	1.21	*t*(47) = -3.21*	0.11	-6.34, -1.46
Awareness					
Baseline	0.59	0.13	*t*(47) = 4.62*	0.29	0.33, 0.85
Group	-3.37	1.10	*t*(47) = -3.06*	0.12	-5.58, -1.16

Note. * = $p < .05$; Sr^2 = squared part correlation; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table 5 (continued)

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	Confidence Interval
DERS					
Strategies					
Baseline	0.57	0.13	*t*(47) = 4.47*	0.27	0.31, 0.83
Group	-2.82	0.89	*t*(47) = -3.17*	0.14	-4.61, -1.03
Clarity					
Baseline	0.57	0.13	*t*(47) = 4.47*	0.27	0.31, 0.83
Group	-2.82	0.89	*t*(47) = -3.17*	0.14	-4.61, -1.03
EES					
Anger/Frustration					
Baseline	0.61	0.12	*t*(47) = 5.13*	0.28	0.37, 0.85
Group	-10.69	2.29	*t*(47) = -4.68*	0.23	-15.29, -6.09
Anxiety					
Baseline	0.29	0.13	*t*(47) = 2.31*	0.08	0.04, 0.55
Group	-8.09	2.09	*t*(47) = -3.88*	0.22	-12.28, -3.89
Depression					
Baseline	0.65	0.14	*t*(47) = 4.64*	0.25	0.37, 0.93
Group	-4.94	1.10	*t*(47) = -4.50*	0.23	-7.15, -2.73
UPPS-P					
Negative Urgency					
Baseline	0.71	0.11	*t*(47) = 6.43*	0.42	0.49, 0.93
Group	-4.24	1.42	*t*(47) = -2.99*	0.09	-7.09, -1.39

Note. * = $p < .05$; Sr^2 = squared part correlation; DERS = Difficulties in Emotion Regulation Scale; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale.

Table 5 (continued)

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	Confidence Interval
UPPS-P					
Positive Urgency					
Baseline	0.66	0.09	*t*(47) = 7.30*	0.50	0.47, 0.84
Group	-4.92	1.79	*t*(47) = -2.75*	0.07	-8.53, -1.32
EEI					
Eating Helps Affect					
Baseline	0.52	0.14	*t*(47) = 3.72*	0.17	0.24, 0.80
Group	-1.16	0.28	*t*(47) = -4.21*	0.22	-1.72, -0.61
Eating as a Reward					
Baseline	0.45	0.11	*t*(47) = 4.08*	0.22	0.23, 0.67
Group	-0.89	0.27	*t*(47) = -3.34*	0.14	-1.43, -0.35
Eating Leads to Loss of Control					
Baseline	0.61	0.16	*t*(47) = 3.81*	0.18	0.29, 0.93
Group	-1.13	0.26	*t*(47) = -4.41*	0.25	-1.65, -0.61
Eating Alleviates Boredom					
Baseline	0.70	0.11	*t*(47) = 6.21*	0.41	0.47, 0.92
Group	-1.04	0.30	*t*(47) = -3.50*	0.13	-1.64, -0.44

Note. * = $p < .05$; Sr^2 = squared part correlation; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table 6

Completer Analysis: Comparison of Outcome Variables at Baseline, Post-treatment, and Six-month Follow-up for the Treatment Group

Outcome measure	Baseline Mean (*SD; n* = 19)	Post-Treatment Mean (*SD; n* = 19)	6 Months Post-Treatment Mean (*SD; n* = 19)	Effect Size (*d)* Baseline vs: Post-Treatment	6 Months Post-Treatment
Objective binge frequency in last 28 days*	18.74 (13.81)[a]	2.47 (3.79)[b]	8.11 (11.34)[c]	1.85	0.85
Rate of binge eating abstinence last 28 days[#]	3.30%[a]	52.20%[a]	30.00%[a]		
EDQLS Total Score*	118.79 (19.45)[a]	143.26 (18.40)[b]	139.47 (20.69)[b]	1.29	1.03
EDE-Q					
Restraint*	3.96 (1.19)[a]	3.41 (1.44)[a]	2.52 (1.34)[b]	0.42	1.14
Eating Concern*	4.06 (1.16)[a]	2.33 (1.05)[b]	2.34 (1.13)[b]	1.57	1.50
Weight Concern*	5.29 (1.05)[a]	4.10 (1.02)[b]	3.77 (1.30)[b]	1.15	1.29
Shape Concern*	5.64 (0.93)[a]	4.20 (1.43)[b]	3.95 (1.61)[b]	1.22	1.33
Total Scale Score*	4.74 (0.69)[a]	3.51 (1.03)[b]	3.14 (1.09)[b]	1.43	1.80
DERS					
Non-Acceptance*	16.68 (6.48)[a]	12.21 (5.18)[b]	12.26 (5.79)[b]	0.77	0.72
Goals*	15.58 (4.79)[a]	13.83 (4.96)[a]	12.00 (4.31)[b]	0.36	0.79
Impulse*	15.95 (6.24)[a]	11.68 (4.45)[b]	11.47 (4.71)[b]	0.80	0.82
Awareness*	19.37 (4.50)[a]	15.52 (4.90)[b]	15.72 (4.47)[b]	0.82	0.81
Strategies*	18.89 (8.0.)[a]	15.06 (6.86)[b]	15.00 (7.69)[b]	0.52	0.50

Note. * = $p < .05$; (+) Effect size represents improvement compared to baseline. For each variable, the same letter in the superscript denotes that the time points were similar; different letters in the superscript indicates that there were significant differences between time points according to follow-up t-tests presented in the results section; [#] = value is a percentage and not a mean and Fisher's Exact Test was used to compare values; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table 6 (continued)

Completer Analysis: Comparison of Outcome Variables at Baseline, Post-treatment, and Six-month Follow-up for the Treatment Group

Outcome Measure	Baseline Mean (*SD; n* = 19)	Post-Treatment Mean (*SD; n* = 19)	6 Months Post-Treatment Mean (*SD; n* = 19)	Effect Size (*d*) Baseline vs: Post-Treatment	Effect Size (*d*) Baseline vs: 6 Months Post-Treatment
DERS					
Clarity*	13.26 (4.08)[a]	11.56 (3.57)[ab]	10.63 (3.58)[b]	0.44	0.69
EES					
Anger/Frustration*	39.48 (8.82)[a]	27.36 (8.84)[b]	27.50 (11.90)[b]	1.37	1.16
Anxiety*	27.21 (8.92)[a]	19.31 (6.18)[b]	18.31 (8.31)[b]	1.05	1.03
Depression*	19.26 (3.93)[a]	14.37 (5.13)[b]	13.53 (5.79)[b]	1.08	1.18
UPPS-P					
Negative Urgency*	35.16 (6.97)[a]	30.36 (6.89)[b]	30.63 (7.65)[b]	0.69	0.62
Positive Urgency	30.88 (10.06)	25.74 (6.30)	27.42 (6.46)	0.63	0.42
EEI					
Eating Helps Affect*	5.24 (1.14)[a]	3.92 (1.28)[b]	4.19 (0.99)[b]	1.09	0.99
Eating as a Reward*	5.36 (1.39)[a]	4.09 (0.96)[b]	4.37 (1.32)[b]	1.08	0.73
Eating Leads to Loss of Control*	5.83 (0.81)[a]	4.60 (1.26)[b]	4.65 (0.97)[b]	1.19	1.33
Eating Alleviates Boredom*	5.43 (0.86)[a]	4.24 (1.34)[b]	4.38 (1.41)[b]	1.08	0.93

Note. * = $p < .05$; (+) Effect size represents improvement compared to baseline. For each variable, the same letter in the superscript denotes that the time points were similar; different letters in the superscript indicates that there were significant differences between time points according to follow-up t-tests; DERS = Difficulties in Emotion Regulation Scale; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table 7

Completer Analysis: Analyses of Variance, Post-hoc Analysis (Least Significant Differences), and Fisher's Exact Test Results Comparing Outcomes Between Baseline, Post-treatment, and Six-month Follow-up for the Treatment Group

		Post-Hoc Analysis Results *t*(18)		
Outcome measure	Overall Model Results F (df)	Baseline & Post-treatment	Baseline & 6 Months Post-treatment	Post-treatment & 6 Months Post-treatment
Objective binges within last 28 days	16.98 (2, 36)*	5.40*	3.26*	-2.70*
Binge eating abstinence#		$p = .30$	$p = .30$	$p = .63$
EDQLS Total Score	17.82 (1.52, 27.44)*	4.83*	4.21*	1.29
EDE-Q				
Restraint	10.26 (2, 36)*	1.56	-4.12*	-3.52*
Eating Concern	23.12 (2, 36)*	-6.03*	-5.89*	0.03
Weight Concern	19.76 (2, 36)*	-5.37*	-5.15*	1.39
Shape Concern	18.55 (2. 36)*	-5.51*	-5.13*	0.81
Total Scale Score	33.32 (2, 36)*	-6.09*	-7.12*	1.96
DERS				
Non-Acceptance	5.29 (2, 36)*	-2.93*	-2.35*	0.04
Goals	6.26 (2, 36)*	-1.52	-3.36*	-2.34*
Impulse	11.87 (1.36, 24.47)*	-3.54*	-3.73*	0.36
Awareness	8.11 (2, 36)*	-3.15*	-3.01*	-0.28
Strategies	4.94 (1.23, 22.11)*	-2.29*	-2.32*	0.01
Clarity	4.06 (1.32, 23.72)*	-1.74	-2.24*	1.71

Note. * = $p < .05$; # =Fisher's Exact Test was used; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table 7 (continued)

Completer Analysis: Analyses of Variance, Post-hoc Analysis (Least Significant Differences), and Fisher's Exact Test Results Comparing Outcomes Between Baseline, Post-treatment, and Six-month Follow-up for the Treatment Group

		Post-Hoc Analysis Results *t*(18)		
Outcome measure	Overall Model Results F (df)	Baseline & Post-treatment	Baseline & 6 months Post-treatment	Post-treatment & 6 Months Post-treatment
EES				
Anger/Frustration	16.90 (2, 36)*	-5.39*	-4.47*	-0.06
Anxiety	9.85 (2, 36)*	-3.34*	-3.70*	-0.57
Depression	15.29 (2, 36)*	-4.02*	-4.30*	1.19
UPPS-P				
Negative Urgency	8.35 (1.49, 26.76)*	-3.25*	-2.97*	-0.32*
Positive Urgency#				
EEI				
Eating Helps Affect	12.53 (2, 36)*	-3.95*	-3.78*	-1.29
Eating as a Reward	9.17 (2, 36)*	-3.91*	-2.76*	-1.17
Eating Leads to Loss of Control	18.41 (2, 36)*	-4.86*	-5.36*	-0.22
Eating Alleviates Boredom	7.98 (2, 36)*	-3.25*	-2.97*	-0.51

Note. * = $p < .05$; # = statistical assumption not met, for transformed results see Appendix L, Table M3; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table 8

Comparison of Demographics and Outcome Variables at Baseline Between Study Completers and Drop-outs

Variable	Drop-out % or Mean (*SD*; *n* = 12)	Completer % or Mean (*SD*; *n* = 48)	Statistics	Mean Difference	Confidence Interval	Cohen's *d*
Age (years)	36.92 (9.53)	44.27 (10.31)	$t(58) = -2.24$*	-7.35	-13.92, -0.78	0.74
Gender						
Female	100.00%	85.42%	*Fisher's Exact Test*			
Male	0%	14.58%	= *.33*			
BMI (kg/m^2)	42.04 (13.32)	36.80 (7.04)	$t(14.68) = 1.31$	5.23	-3.38, 13.85	-0.51
Marital Status						
Single	25.00%	22.92%				
Married	58.33%	43.75%				
Common-Law	0%	8.33%				
Divorced	16.67%	25.00%				
Widowed	0%	0%	$X^2(3) = 1.74$			
Ethnicity						
Asian	0%	2.13%				
Black/African	0%	2.13%				
Caucasian/European	91.67%	91.49%				
Indigenous/Aboriginal	0%	0%				
Latin American	0%	0%				
Middle Eastern	0%	2.13%				
Multiracial	8.33%	2.13%	$X^2(4) = 1.85$			

Note. * = $p < .05$; (+) Completer group has higher value; (-) Completer group has lower value; BMI = body mass index.

Table 8 (continued)

Comparison of Demographics and Outcome Variables at Baseline Between Study Completers and Drop-outs

Variable	Drop-out % or Mean (*SD*; *n* = 12)	Completer % or Mean (*SD*; *n* = 48)	Statistics	Mean Difference	Confidence Interval	Cohen's *d*
Employment Status						
Unemployed	8.33%	18.75%				
Employed part-time	16.67%	14.58%				
Employed full-time	66.67%	60.42%				
Retired	8.33%	6.25%	$X^2(3) = .78$			
Years of Education	13.33 (3.94)	14.85 (3.59)	$t(57) = -1.28$	-1.51	-3.89, 0.85	0.40
Objective Binge						
Frequency in last 28 days	19.42 (13.30)	19.06 (12.39)	$t(58) = 0.09$	0.35	-7.76, 8.47	-0.02
EDQLS Total Score	115.08 (22.89)	118.71 (18.52)	$t(58) = -0.59$	-3.62	-16.17, 8.92	0.17
EDE-Q						
Restraint	3.55 (1.39)	3.46 (1.36)	$t(58) = 0.21$	0.09	-0.79, 0.97	-0.06
Eating Concern	4.22 (1.48)	4.42 (1.26)	$t(58) = -0.49$	-0.21	-1.05, 0.63	-0.14
Weight Concern	5.20 (1.25)	5.09 (0.95)	$t(58) = 0.33$	0.11	-0.55, 0.76	-0.10
Shape Concern	5.74 (0.84)	5.55 (1.04)	$t(58) = 0.58$	0.19	-0.46, 0.84	-0.20
Total Scale Score	4.68 (0.85)	4.63 (0.77)	$t(58) = 0.18$	0.04	-0.46, 0.55	-0.06
DERS						
Non-Acceptance	16.08 (7.14)	17.24 (6.55)	$t(58) = -0.54$	-1.16	-5.47, 3.15	0.17
Goals	15.67 (5.09)	15.94 (4.56)	$t(58) = -0.18$	-0.27	-3.29, 2.74	0.05
Impulse	15.33 (5.38)	16.04 (6.34)	$t(58) = -0.36$	-0.71	-4.69, 3.28	0.12
Awareness	20.58 (4.79)	17.87 (4.39)	$t(58) = 1.88$	2.71	-0.18, 5.60	-0.59
Strategies	21.17 (7.32)	19.98 (7.73)	$t(58) = 0.48$	1.19	-3.75, 6.13	-0.16
Clarity	14.64 (3.86)	12.69 (3.57)	$t(58) = 1.67$	1.96	-0.39 ,4.30	-0.52

Note. * = $p < .05$; (+) Completer group has higher value; (-) Completer group has lower value; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

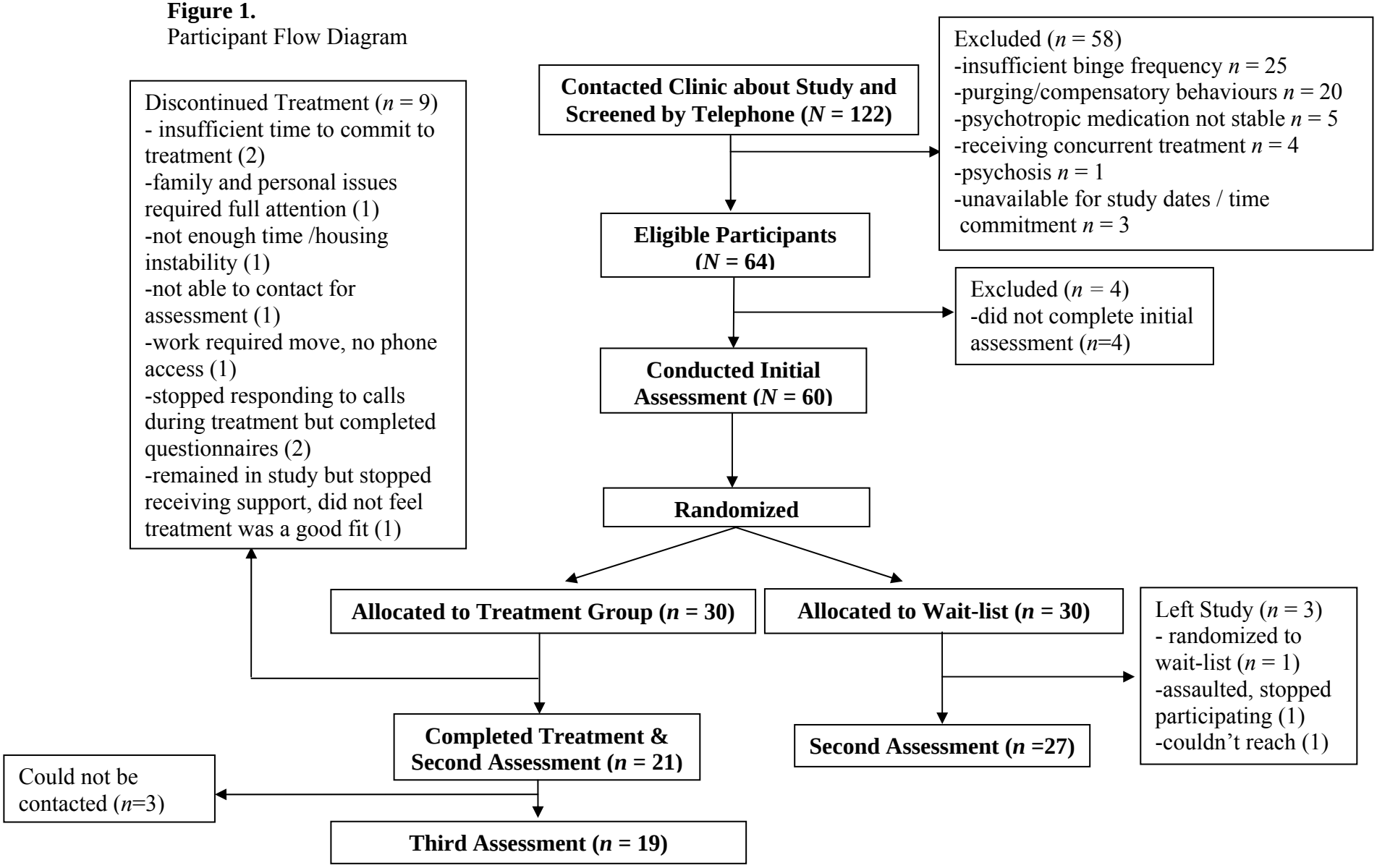
Table 8 (continued)

Comparison of Demographics and Outcome Variables at Baseline Between Study Completers and Drop-outs

Variable	Drop-out % or Mean (*SD*; *n* = 12)	Completer % or Mean (*SD*; *n* = 48)	Statistics	Mean Difference	Confidence Interval	Cohen's *d*
EES						
Anger/Frustration	40.27 (7.39)	39.25 (9.84)	*t*(58) = 0.32	1.01	-5.08, 7.10	-0.12
Anxiety	29.17 (6.95)	28.83 (8.10)	*t*(58) = 0.13	0.33	-4.77, 5.43	-0.04
Depression	20.91 (1.78)	19.18 (4.05)	*t*(41.62) = 2.21*	1.73	0.16, 3.30	-0.59
UPPS-P						
Negative Urgency	36.25 (5.43)	35.43 (6.65)	*t*(58) = 0.39	0.81	-3.34, 4.97	-0.13
Positive Urgency	28.25 (6.97)	29.81 (10.16)	*t*(58) = -0.50	-1.56	-7.78, 4.67	0.18
EEI						
Eating as a Reward	5.28 (0.78)	5.43 (1.24)	*t*(58) = -0.38	-0.15	-0.93, 0.63	0.15
Eating Helps Affect	5.22 (0.78)	5.31 (1.02)	*t*(58) = -0.27	-0.08	-0.72, 0.55	0.01
Eating Leads to Loss of Control	5.67 (0.43)	5.71 (0.84)	*t*(30.16) = 0.02	0.04	-0.54, 0.46	-0.06
Eating Alleviates Boredom	5.17 (1.33)	5.14 (1.32)	*t*(58) = -0.06	-0.02	-0.82, -0.88	0.02
BDI	23.19 (12.01)	18.79 (9.57)	*t*(58) = 1.35	4.40	-2.11, 10.91	-0.41
BAI	11.86 (11.59)	11.20 (8.49)	*t*(58) = 0.22	0.66	-5.26, 6.58	-0.06

Note. (+) Completer group has higher value; (-) Completer group has lower value; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory; BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory.

Figure 1.
Participant Flow Diagram



Appendix A

Sample Size Determination

In order to determine the target sample size, effect sizes of the three studies that have previously been conducted with DBT (for BED) were examined (Telch et al., 2000; Telch et al., 2001; Safer et al., 2010). As CBTgsh interventions have been found to be equally as effective as other ESTs (i.e., IPT or CBT) for eating disorders (Bailer et al., 2004; Durand & King, 2003; Wilson et al., 2010) it was assumed that individual psychotherapy interventions when adapted to GSH format do not necessarily become less effective for the treatment of eating disorders. In addition, several recent meta-analyses have found no difference between the outcome of participants who received GSH compared to individual psychotherapy for both the treatment of depression and the treatment of anxiety (Cuijpers et al., 2010; den Boer et al., 2004). In these meta-analyses (Cuijpers et al., 2010; den Boer et al., 2004) the number of GSH treatment sessions was often substantially fewer than the number of individual psychotherapy sessions, as is also found in GSH treatment research on eating disorders (Bailer et al., 2004; Wilson et al., 2010).

As binge eating is the primary outcome measure, the effect of DBT on binge eating was used to estimate sample size. To estimate sample size for the current study, the effect of DBT on binge eating both within the treatment group (pre-treatment compared to post-treatment) and between the treatment group and control group was examined. This ensured the sample size was based on the lower of the two effect sizes and that adequate power was available to detect both the impact of the intervention over time and the impact of the intervention compared to the wait-list.

All three DBT studies have examined the frequency of binge eating over the past 28 days in participants at the beginning of the treatment program compared to the end of the treatment program. Using Cohen's *d*, the following effect sizes have been found: 1.20 (Telch et al., 2000), 1.6 (Telch et al., 2001), and 2.0 (Safer et al., 2010).

Only one of the studies on DBT has examined the frequency of binge eating cessation in participants at the end of the treatment program compared to a wait list program. Telch and colleagues' (2000) study did not involve a control group and Safer and colleagues' (2010) study involved an active control group as opposed to a wait-list control group. A wait-list control group comparison which involves no intervention will likely show a greater effect of intervention than an active control group that attempts to control for the effect of common therapeutic factors. Therefore, in an attempt to generate an accurate effect size estimate only Telch and colleagues's (2001) study was used to estimate effect size. Telch and colleagues (2001) found a standardized effect size (Cohen's *d*) of 1.5.

In order to be most conservative, the lowest effect size, 1.2, was used. The computer program G*power was used to estimate sample size (Faul, Erdfelder, Lang, & Buchner, 2009). The estimated total sample size needed for the current study was 32 participants, 16 for each group. This sample size was calculated for a t-test of two groups with an alpha of .05 and power at .95, with an effect size of 1.2. A high power value was used to decrease the risk of Type II error. However, it is also important to account for attrition. On average, studies of GSH for BED typically find an attrition rate of 20% (Carter & Fairburn, 1997; Grilo, Masheb, & Wilson, 2005; Wilson et al., 2010), whereas studies of DBT have found an average attrition rate of 7% (Safer et al., 2010; Telch et al.,

2000; Telch et al., 2001). However, these GSH-BED studies all involved more strict inclusion criteria and an in person screening interview which may have resulted in participants in these studies being less likely to drop out. To ensure adequate power, a drop-out rate of 45% was used to estimate the sample size. Therefore, in order to attempt to have 16 participants in each group at the end of treatment this study sought to recruit 30 individuals per group, for a total of 60 participants.

Appendix B

Telephone Screen

Eligible for study? □ Yes □ No Participant name: _____ Interview date/time:_____ To be interviewed by:_____

A Randomized Wait-List Controlled Trial of Dialetical Behaviour Therapy Guided Self-Help for Binge Eating Disorder: A Pilot Study

Date of screen*:* _____

Initials of screener: _____

This is the phone script which should be used for the first phone contact. All **bolded** text should be read to the prospective participant.

Hello. Thank you for contacting us about the treatment study we are currently conducting.

We are currently evaluating the effectiveness of a guided self-help treatment for people who binge eat. The treatment would involve you reading through a book that teaches different skills and techniques to overcome binge eating. In addition, you would receive several brief, 20 minute, supportive phone calls as you read through the treatment manual to help answer any questions you have. This study has two different groups. You would be randomly assigned, like the flip of a coin, to one of these two groups. The first group would receive the treatment right away and the

second group would receive the treatment in approximately 13 weeks. The treatment would require that you read approximately 15 pages a week for 13 weeks, participate in three to five interviews, and fill out questionnaires.

Are you interested in hearing more about this study?

If NO: **Thank you for expressing interest in this research project** (end phone call)**.**

If YES: **That's great to hear. I am going to ask you a few questions to get a better idea of whether you have the type of problem the manual is designed to treat. If it seems that the manual is a good fit for you I will invite you for a more comprehensive interview.**

Do you have any questions?

First I'd like to ask you for some contact information and some other basic information.

What 2 or 3 phone numbers can we use to reach you?

_____

_____

_____

What is your preferred phone number? _____

Is it okay if I call one working day before your appointment just to remind you?

□ Yes □ No

Is it okay to leave messages at this number? If we call, we would identify ourselves as being from the University of Calgary, and would leave a contact phone number.

□ Yes □ No

What is your email address? _____

How old are you? _____ years

IF NOT YET 18, INELIGIBLE FOR STUDY. SKIP TO F, P. 11.

How many years of education have you completed?

IF PARTICIPANT DID NOT GRADUATE HIGH SCHOOL INELIGIBLE FOR STUDY. SKIP TO F, P. 11.

Are you currently receiving any treatment for binge eating? If so, what type of treatment (who is administering the treatment? What is the purpose of the treatment?)

IF RECEIVING ANY TREATMENT SPECIFICALLY RELATED TO REDUCING BINGE EATING, INELIGIBLE FOR STUDY. SKIP TO F, P. 11.

Are you currently on any medication for a mental health problem? If so, what is the name of the medication, what is the dosage (if known) and what is it for?

How long have you been taking each medication at the current dose?

IF TAKING ANY MEDICATION FOR A MENTAL HEALTH PROBLEM WITH A DOSAGE THAT HAS CHANGED IN THE LAST THREE MONTHS INELIGIBLE FOR STUDY. SKIP TO F, P. 11.

This treatment study would require reading approximately 15 pages a week and completing various homework exercises for 13 weeks. This would likely take approximately 2-3 hours a week for 13 weeks. You would also be involved in up to 4 telephone assessments over a period of up to 12 months. The assessments may take up to two hours and would occur every 3-6 months. Do you have the time to commit to the project over the next 12 months?

IF PARTICIPANT IS UNABLE TO MAKE THE TIME COMMITMENT, INELIGIBLE FOR STUDY. SKIP TO F, P. 11.

**********SECTION B: PSYCHOTIC SCREEN**********

SCID Pyschotic Screen removed due to copyright.

********** SECTION C: EATING DISORDER SCREEN **********

SCID Eating Disorders Screen removed due to copyright.

**********SECTION D: DISTRESS SCREEN**********

Before we continue I just wanted to check in with you about the questions we just asked.

1. **On a scale from 1 to 5, how distressing did you find the questions about eating disorder symptoms?**

Not Distressed	A Little Distressed	Somewhat Distressed	Very Distressed	Extremely Distressed
1	2	3	4	5

Comments:

If reports any distress (>1):

Thank you for letting me know. There are several resources that you can use to talk with someone further about this. Are you interested in hearing more about a list of local services, such as the Crisis Support Line and the Calgary Counselling Centre?

(If yes) **I can either read the list to you or email it to you. What would you prefer? (Respond accordingly, obtain email address if appropriate, and then proceed to the appropriate section.)**

****

Reminder: If current binge eating disorder and no history of psychosis, eligible for study. Go to section E. If no current binge eating disorder or a history of psychosis, ineligible for study. Go to section F.

****

**********SECTION E: ELIGIBLE FOR STUDY PARTICIPATION**********

Thank you very much for taking the time to answer my questions. You are eligible for the study. I will tell you a little bit more about the study now so that you can decide whether or not you would like to participate.

As I mentioned earlier, we are currently in the process of testing a new type of guided self-help treatment for people with binge eating problems. If you choose to participate in this study you will be randomly assigned to one of two groups, like the flip of a coin:

If you are assigned to the <u>immediate treatment condition</u> you will receive the treatment manual and supportive sessions right away. You would participate in a telephone interview that focuses on your binge eating, which will take approximately 40 minutes, and you be asked to fill out several questionnaires about binge eating and emotions that will take approximately one hour. You would then be asked to come to the University of Calgary approximately one week later and receive the treatment manual and participate in a half hour introduction session. You would be expected to read through the approximately 150 page manual within thirteen weeks. This would require reading approximately 15 pages a week. The various exercises described in the manual would also take one to two hours to

complete every week. You would also be contacted six times, approximately every 2 weeks, for a 20-minute supportive phone conversation to help you work through the treatment manual. You would be asked to fill out questionnaires and be interviewed, by phone, at the end of the 13 weeks of reading the treatment manual and then again six months later.

If you are assigned to the <u>delayed treatment condition</u> you would receive the treatment manual and supportive sessions after approximately 13 weeks. You would participate in a telephone clinical interview about your binge eating, which will take approximately 40 minutes, and be asked to fill out several questionnaires about binge eating and emotions that will take approximately one hour. This would occur two times before you received the treatment manual. The first time would occur right away and the second interview would occur in approximately 13 weeks. You would then be asked to come to the University of Calgary approximately one week after the second interview and receive the treatment manual and participate in a half hour introduction session. You would be expected to read through the approximately 150 page manual within thirteen weeks. This would require reading approximately 15 pages a week. The various exercises in the manual would also likely take one to two hours to complete every week. You would also be contacted six times, approximately every 2 weeks, for a 20 minute supportive phone conversation to help you work through the treatment manual. As we will continue to be interested to see how you are doing, we will ask you to participate in a phone interview and fill out questionnaires at the end of the treatment and then six months later after the end of the treatment.

So, to summarize, if you choose to participate in this study, you will be randomly assigned (like the flip of a coin) to either an immediate or a delayed treatment condition. The difference between these conditions will mainly be when you would receive the treatment manual: now or in 13 weeks. We need to have some people wait for treatment so that we can see whether or not the people who get treatment right away do better than the people who don't. If we don't have this information it will be much more difficult for us to know whether or not the treatment really works. Making some people wait in this study will help us make sure that we are giving people helpful treatment in the future.

Do you have any questions? (answer questions**)**

Are you interested in participating in this study?

No ____ **I completely understand. Thank you for your time. May I have your permission to keep your name and contact you in the future to see if you might be interested in participating in another research project?**

No ____ **I completely understand. We will not be contacting you in the future, and thank you for your time.** (End phone call).

Yes ____ **Great. Thank you so much for your time.** (End phone call).

Yes ____ **Great. Let's go ahead and set up a time for your first interview** (End phone call).

(Proceed to schedule initial assessment interview, answer any questions, and then end phone call).

**********SECTION F: INELIGIBLE FOR STUDY PARTICIPATION**********

IF INELIGIBLE FOR STUDY: **Thank you very much for your interest but unfortunately, you do not meet the requirements for this study. May I have your**

permission to keep your name and contact you in the future to see if you might be interested in participating in another research project?

No ____ **I completely understand. We will not be contacting you in the future, and thank you for your time.** (End phone call).

Yes ____ **Great. Thank you so much for your time.** (End phone call).

Date (dd/mm/yy): _____
Time Start: _____
Time End: _____
Participant
ID Number: _____
Interviewer: _____

Appendix C

Phone Call Interview Form

How have you been doing with your eating since we last spoke?

Have you had any questions about the material in the Toolbox that you have read?

List content clarified:

What page have you currently read to in the Toolbox? Progress:

Ask if they have been filling out a diary card every (or almost every) week (Circle):

Yes No

Ask if they have been completing a chain analysis every (or almost every) week (Circle):

Yes No

Have you found the material in the Toolbox helpful since we last spoke? If so, what in particular? (Look for and reinforce successes! If nothing was helpful ask about previous readings. If participant has not found any of the material helpful determine why and encourage further reading)

Is there anything getting in the way of you using the Toolbox? List any road blocks preventing participant from working on treatment and possible ways to ameliorate:

This is your ____ check in. In order to complete the treatment in 13 weeks you currently should have read up to Chapter _____.

Describe any other topics discussed not listed above:

Appendix D

Information About the Treatment Manual: An Emotion Regulation Approach to Stop Binge Eating

The treatment manual contains thirteen chapters that teach the reader about DBT for BED. Below is a description of what each chapter entails. Please note that each chapter also has summary pages at the beginning and end of the chapter highlighting what is contained in the chapter. Most chapters contain several different exercises that allow participants to practice the concepts or tools discussed in the chapter. Each chapter also contains a section detailing the homework participants are to complete, which is designed to help develop competence using the tools and skills discussed.

Chapter One: Learning From the Past: How this Treatment is Different

Reasons why past attempts to stop binge eating may have failed are discussed. The emotion regulation model of binge eating is explained and readers complete several exercises that help them explore how their binge eating is connected with their emotions.

Chapter Two: Making a Commitment

This chapter involves several different exercises that help individuals decide whether or not they wish to give up binge eating as well as highlighting the advantages that may come to them from not binge eating. Participants are also asked to reflect on their values and determine whether or not binge eating is consistent with those values. Finally, at the end of the chapter participants are asked to make a commitment to stop binge eating.

Chapter Three: Discussing Treatment Goals and Getting Started

The different goals for treatment are discussed (e.g., stop behaviours that interfere with using the workbook, stop binge eating). Readers are also introduced to diary cards, which are used to keep track of their binge eating, their use of their treatment skills, and their emotions. This chapter introduces the first mindfulness skill participants will learn, called Wise Mind. Wise Mind involves making decisions without being ruled purely by emotions or logic, but instead making reasoned decisions based on logic and emotions.

Chapter Four: Becoming your Own Behaviour Therapist

This chapter focuses on learning how to use a tool called Chain Analysis. The Chain Analysis is used to deconstruct a specific binge eating event. The tool involves participants writing out the initial trigger of their binge and then the series of behaviours, emotions, and thoughts that ultimately led to their binge. Readers are then asked to think about what they could have done differently at various points in the chain of events.

Chapter Five: Being Dialectical and Being Mindful

The skill of Dialectical Thinking is introduced, which involves becoming more flexible in one's thinking and trying to reduce black and white thinking. The skill Observe is also introduced which is another mindfulness skill that requires people to become active observers in their life.

Chapter Six: Becoming a More Skilful Observer

Additional skills are introduced that focus on observation skills. The skills involve observing events without judgement, carrying out activities one at a time (not multitasking), and working within the constraints of a situation rather than addressing a problem based on how things should be.

Chapter Seven: Keeping on Track

This chapter allows readers to review their progress to date in terms of what skills they have learned and also whether their binge eating has decreased, increased, or stayed the same. Different sections of this chapter are written for individuals depending on whether or not their binge eating has decreased.

Chapter Eight: Mindful Eating and Urge Surfing

Two additional skills are introduced in this chapter, called Mindful Eating and Urge Surfing. Mindful Eating involves having individuals slow down their eating and eating with full awareness and focus. Urge Surfing involves having the reader practice sitting with the urge to binge eat and not acting on it. This skill allows individuals to see the difference between having an urge and acting on it.

Chapter Nine: Mindfulness of Your Current Emotion and Radical Acceptance

Mindfulness of Your Current Emotion is a skill that is introduced in this chapter, which uses the previously introduced mindfulness skills to help individuals become more aware of their emotional experiences. The other skill discussed in this chapter is Radical Acceptance and this involves working on accepting emotions and sitting with them.

Chapter Ten: Decreasing Vulnerability to Emotion Mind and Building Mastery

Readers learn about six areas of their life that could make them more resilient to binge eating; they are asked to assess whether or not they attend to these areas and if they don't, how to begin doing so. The areas are: treating and taking care of physical illness, balanced eating, avoiding or reducing use of mood altering substances, balanced sleep, getting exercise, doing activities that increase competence and confidence.

Chapter Eleven: Building Positive Experience: Steps for Increasing Positive Emotions

The importance of ensuring that individuals have positive experiences, rather than just trying to reduce negative experiences, is discussed. Different ideas are given to the reader for how to increase the number of positive events in their lives. Readers are also introduced to the importance of being mindful when experiencing positive experiences.

Chapter Twelve: Distress Tolerance

Several different skills are introduced in this chapter to help individuals deal with high stress situations and highly emotional situations. The skills include half-smiling (forcing oneself to smile slightly when distressed), using distraction, and self-soothing. The importance of using Distress Tolerance skills only when necessary, and facing emotions directly when possible, are also discussed.

Chapter Thirteen: Planning for the Future: Avoiding Relapse

In the final chapter of the manual, the reader is asked to reflect on their commitment to stop binge eating, reviews the skills that they found most useful, make a plan of how to avoid high risk (for binge eating) situations, discuss long term goals, and plan out how to deal with a lapse or relapse if it occurs.

Appendix E

Individual Chapter Evaluation Form

Please fill out this form for each chapter you read. Be as specific as possible; refer to particular page numbers as appropriate.

What did you like about this chapter?

_____

_____

_____

_____

_____

What did you not like about this chapter?

_____

_____

_____

_____

_____

Do you think what you learned will be helpful? How so?

_____

_____

_____

_____

Are there any sections you didn't understand?

Are there any sections that should have been longer or clearer?

Is there anything we haven't asked you that you'd suggest be changed about this chapter?

Appendix F

Focus Group Questions

Note: These questions were used only as a guide. Additional questions were asked based on statements made by participants in the focus group.

The following statement was first read to participants to introduce the focus group:

> "The purpose of this focus group is to hear from you what your overall impressions are of the manual. Even if you have not completed finishing the manual we are still very interested in what you think about it. We both want to hear what you liked and what you didn't like about the manual. Please be completely honest with us as we are really interested in hearing what we could change about the manual to make it better. I'd like to ask first for general feedback, and then I will ask for some more specific feedback."

1. What were your general impressions of the treatment?
2. Were the skills **explained** in a way that you understood?
3. Was the homework assigned in a way that made sense?
4. In general, did you feel that the manual was **effective in teaching** you the material clearly?
5. What would you **change** about the way the **material is presented** in the manual? Are there ways you think it could be presented more clearly? (Is the language used in the manual easy to understand? Is it too simple or too complex?)

"Now more specifically, we have some ideas and concepts in particular that we want to ask you about to see if the manual was clear in teaching these ideas to you. The ideas and concepts are sometimes difficult to understand and I am really interested in

hearing about whether or not we were able to explain them in the manual in a way that made sense."

6. Did you **understand** the emotional regulation model? (Were you able to fill in the blank emotion regulation model?)
7. Was the idea of invalidating environments **clearly described**?
8. Was the structure of the Diary Card **easy to understand**? (Were you able to fill in a blank card?)
9. **Did you understand** the difference between the Reasonable Mind, Emotion Mind, and Wise Mind?
10. Were you **able** to **fill** in a chain analysis?
11. Was the idea of Dialectical thinking **clear**? Were you able to practice it?
12. Was the idea of Radical Acceptance **clear**? Were you able to practice it?
13. Do you think the treatment will be **helpful** in reducing binge eating?
14. Do you think the skills taught in the treatment would be **helpful** in coping with stressful situations?
15. Does the emotion regulation model of binge eating **make sense**? Do you think this is true for you?
16. What did you think about the other actual ideas and concepts presented in the manual? (Did you agree with them?)
17. Did you **agree** with the concept of invalidating environments? Do you think this may apply to you?

Appendix G

Methods of Pilot Study of Manual Readability and Applicability

The purpose of the pilot study was to determine if individuals with BED were able to understand the material in the way it was presented, whether they thought the material applied to them, and if they thought it would help them reduce or eliminate their binge eating. Individuals were recruited from a list of participants who had previously participated in research in the University of Calgary Eating Behaviours Laboratory and who had consented to be contacted in the future for further opportunities to participate in research. They were contacted over the phone, read a brief description of the study, and asked if they were interested in participating. The individuals interested in participating were then assessed using the screen found in Appendix M. The only inclusion criteria for this study were that participants have BED (defined in the same manner discussed above; binge eating that occurs at least once a week for 6 months), be over the age of 18, and be able to read and write English fluently. Individuals who participated in this study received $10 to compensate their parking expenses related to attending the initial interview and the focus group interview.

Out of the seven individuals that were screened, five were eligible to participate and agreed to participate. The two ineligible individuals no longer met criteria for BED. Participants in the pilot study were comprised of 4 Caucasians, and one individual of Middle Eastern decent. Participants' average age was 52 years old.

Eligible participants came to the University of Calgary Eating Behaviours Laboratory and were interviewed using the Eating Disorder Examination by Laurel Wallace. After participants were interviewed they were given a copy of the manual and

asked to complete their reading of it over two months. As they read the manual they were also asked to complete chapter feedback forms that were filled out online using the website SurveyMonkey. As stated above, after participants read the manual they were invited to attend a focus group to discuss the manual. Four of the five participants chose to attend the focus group interview which lasted for approximately 90 minutes.

Appendix H: Correlation Matrix of Outcome Variables at Baseline

Table H1

Correlation Matrix of Outcome Variables at Baseline (N = 60)

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Binge Eating Frequency																					
2. EDQLS Total Score	-.32*																				
EDE-Q																					
3. Restraint	.01	.16																			
4. Eating Concern	.25	-.37*	-.06																		
5. Shape Concern	.26*	-.51*	.06	.52*																	
6. Weight Concern	.22	-.44*	.03	.54*	.69*																
7. Total EDE-Q	.26*	-.39*	.44*	.73*	.79*	.78*															
DERS																					
8. Non-Acceptance	.20	-.52*	-.19	.38*	.37*	.33*	.30*														
9. Goals	.13	-.46*	-.11	.11	.43*	.30*	.23	.43*													
10. Impulse	.14	-.53*	-.24	.35*	.40*	.40*	.30*	.52*	.58*												
11. Awareness	-.03	-.20	-.34*	.06	.04	.20	-.04	.04	.01	.10											
12. Strategies	.27*	-.65*	-.25	.33*	.47*	.31*	.28*	.69*	.70*	.79*	.10										
13. Clarity	.07	-.42*	-.23	.10	.24	.32*	.12	.42*	.36*	.47*	.60*	.55*									
EES																					
14. Anger and Frustration	.22	-.32*	.00	.16	.36*	.47*	.34*	.21	.54*	.36*	.12	.35*	.29*								
15. Anxiety	.21	-.22	-.11	.33*	.25	.31*	.27*	.28*	.29*	.29*	-.08	.32*	.32*	.56*							
16. Depression	.08	-.26*	-.05	.13	.37*	.32*	.25	.11	.36*	.39*	.04	.35*	.34*	.66*	.58*						
UPPS-P																					
17. Positive Urgency	.19	-.53*	.09	.22	.50*	.26*	.37*	.23	.31*	.33*	.06	.32*	.23	.42*	.12	.16					
18. Negative Urgency	.19	-.55*	-.20	.19	.56*	.35*	.29*	.26*	.51*	.55*	.04	.56*	.32*	.54*	.22	.42	.68*				
EEI																					
19. Eating Helps Manage Negative Affect	.10	-.33*	.13	.19	.35*	.40*	.38*	.24	.45*	.44*	-.07	.32*	.36*	.69*	.62*	.65*	.24	.38*			
20. Eating Is Pleasurable and Useful as a Reward	-.03	-.17	.10	.03	.30*	.02	.16	-.05	.35*	.13	-.14	.12	.09	.35*	.20	.42*	.27*	.35*	.54*		
21. Eating Leads to Feeling Out of Control	.27*	-.30*	.11	.36*	.42*	.35*	.41*	.34*	.23	.22	.14	.29*	.25	.34*	.16	.33*	.18	.26*	.31*	.21	
22. Eating Alleviates Boredom	-.15	-11	.03	.10	.03	.06	.09	-.04	.16	.15	.07	.04	.11	.44*	.28*	.53*	.07	.11	.55*	.53*	.30*

Note. * = $p < .05$

Appendix I

Tables of Results Where Missing Values Are Imputed

Table I1

Outcome Variable Comparison Between Individuals in the Treatment and Wait-list Groups at Baseline and at Post-treatment Where Missing Values Were Imputed using the Expectation-Maximization Procedure

	Baseline Means (SD)			Post-treatment Means (SD)		
Outcome measure	Treatment Group (*n*= 30)	Wait-list Group (*n*= 30)	Effect Size (*d*)	Treatment Group (*n*= 30)	Wait-list Group (*n* =30)	Effect Size (*d*)
Objective Binge Frequency in last 28 days	18.67 (13.17)	19.60 (11.91)	0.07	2.50 (3.62)	12.50 (10.52)	1.41
Rate of binge eating abstinence last 28 days#	3.30%	0%		53.30%	3.30%	
EDQLS Total Score	118.93 (21.13)	117.03 (17.62)	0.10	144.06 (20.31)	117.19 (18.59)	1.38
EDE-Q						
Restraint	3.23 (1.27)	3.73 (1.41)	0.37	3.13 (1.31)	3.15 (1.30)	0.02
Eating Concern	4.09 (1.15)	4.67 (1.38)	0.46	2.17 (1.17)	3.66 (1.36)	1.18
Weight Concern	5.17 (1.15)	5.06 (0.86)	-0.01	3.95 (1.10)	5.00 (1.24)	0.90
Shape Concern	5.72 (0.87)	5.45 (1.12)	-0.27	4.06 (1.43)	5.56 (1.23)	1.13
Total Scale Score	4.68 (.71)	4.60 (.85)	-0.10	3.33 (1.04)	4.34 (1.02)	0.98
DERS						
Non-Acceptance	16.65 (6.60)	17.37 (6.75)	0.11	11.01 (5.64)	18.07 (7.13)	1.11
Goals	15.73 (4.90)	16.03 (4.42)	0.06	13.56 (4.78)	17.02 (4.45)	0.75
Impulse	15.43 (6.17)	16.37 (6.14)	0.15	11.70 (5.11)	16.45 (6.77)	0.80
Awareness	19.03 (4.63)	17.80 (4.50)	-0.27	14.73 (4.96)	17.89 (4.82)	0.65
Strategies	19.77 (8.29)	20.66 (6.96)	0.12	15.24 (6.79)	21.30 (7.95)	0.82
Clarity	12.73 (3.25)	13.42 (4.10)	0.19	11.11 (3.50)	13.56 (4.16)	0.64

Note. (+) Effect size favours treatment group; (-) Effect size favours control group; # = value is a percentage and not mean; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table I1 (continued)

Outcome Variable Comparison Between Individuals in the Treatment and Wait-list Groups at Baseline and at Post-treatment Where Missing Values Were Imputed using the Expectation-Maximization Procedure

	Baseline Means (SD)			Post-treatment Means (SD)		
Outcome measure	Treatment Group (n= 30)	Wait-list Group (n= 30)	Effect Size (d)	Treatment Group (n= 30)	Wait-list Group (n =30)	Effect Size (d)
EES						
Anger/Frustration	39.43 (8.32)	39.49 (10.44)	0.01	25.95 (9.74)	37.51 (10.60)	1.14
Anxiety	28.30 (8.14)	29.50 (7.60)	0.15	19.16 (7.52)	28.02 (8.08)	1.14
Depression	19.73 (3.39)	19.33 (4.15)	-0.11	14.12 (4.70)	18.70 (3.89)	1.07
UPPS-P						
Negative Urgency	35.67 (6.85)	35.53 (6.02)	-0.02	30.11 (6.49)	34.98 (6.82)	0.73
Positive Urgency	30.06 (9.03)	28.93 (10.21)	-0.12	25.98 (6.71)	29.99 (10.88)	0.46
EEI						
Eating Helps Affect	5.16 (1.00)	5.42 (.94)	0.27	3.72 (1.21)	5.08 (1.01)	1.23
Eating as a Reward	5.34 (1.21)	5.47 (1.21)	0.01	4.00 (.98)	5.03 (1.16)	0.96
Eating Leads to Loss of Control	5.79 (0.73)	5.61 (0.81)	-0.23	4.43 (1.20)	5.54 (0.77)	1.13
Eating Alleviates Boredom	5.21 (1.08)	5.09 (1.52)	0.27	3.80 (1.56)	4.96 (1.34)	0.80

Note. (+) Effect size favours treatment group; (-) Effect size favours control group; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table I2

Analysis of the Impact of Treatment on Outcomes at Post-treatment: Overall Linear and Logistic Regression Model Results with Missing Values Imputed Using Expectation-Maximization

Outcome measure	Test Statistic (*df*)	Test Value
Objective Binge Frequency in last 28 days	$F(2,57)$	15.05*
Rate of binge eating abstinence last 28 days	$\chi 2(1)$	21.30*
EDQLS Total Score	$F(2,57)$	40.79*
EDE-Q		
Restraint	$F(2,57)$	3.35*
Eating Concern	$F(2,57)$	28.71*
Weight Concern	$F(2,57)$	22.45*
Shape Concern	$F(2,57)$	30.94*
Total Scale Score	$F(2,57)$	26.82*
DERS		
Non-Acceptance	$F(2,57)$	27.68*
Goals	$F(2,57)$	19.50*
Impulse	$F(2,57)$	33.73*
Awareness	$F(2,57)$	23.75*
Strategies	$F(2,57)$	32.86*
Clarity	$F(2,57)$	21.44*
EES		
Anger/Frustration	$F(2,57)$	25.32*
Anxiety	$F(2,57)$	15.11*
Depression	$F(2,57)$	23.46*
UPPS-P		
Negative Urgency	$F(2,57)$	25.20*
Positive Urgency	$F(2,57)$	35.31*
EEI		
Eating Helps Affect	$F(2,57)$	21.14*
Eating as a Reward	$F(2,57)$	17.53*
Eating Leads to Loss of Control	$F(2, 57)$	22.47*
Eating Alleviates Boredom	$F(2,57)$	27.76*

Note: * = $p < .05$; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table I3

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment with Missing Values Imputed Using Expectation-Maximization

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	95% Confidence Interval
Objective Binge Frequency in last 28 days					
Baseline	0.15	0.08	*t*(57) = 1.97	.04	0, 0.31
Group	-9.86	1.95	*t*(57) = -5.04*	.29	-13.77, -5.95
Rate of binge eating abstinence last 28 days					
Group	-3.50	1.08	*Wald*(1) = 10.49*		
EDQLS Total Score					
Baseline	0.62	0.10	*t*(57) = 5.99*	.26	0.41, 0.83
Group	25.69	3.98	*t*(57) = 6.46*	.30	17.73, 33.66
EDE-Q					
Restraint					
Baseline	0.31	0.12	*t*(57) = 2.59*	0.10	0.07, 0.56
Group	-0.13	0.33	*t*(57) = -0.41	0.25	-0.79, 0.52
Eating Concern					
Baseline	0.57	0.11	*t*(57) = 5.24*	.24	0.35, 0.79
Group	-1.16	0.28	*t*(57) = -4.15*	.15	-1.71, -0.60
Weight Concern					
Baseline	0.66	0.13	*t*(57) = 5.22*	.27	0.41, 0.91
Group	-1.13	0.25	*t*(57) = -4.49*	.19	-1.63, -0.63

Note. * = $p < .05$; Sr^2 = squared part correlation; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire.

Table I3 (continued)

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment with Missing Values Imputed Using Expectation-Maximization

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	Confidence Interval
EDE-Q					
Shape Concern					
Baseline	0.80	0.14	*t*(57) = 5.71*	.27	0.52, 1.09
Group	-1.72	0.28	*t*(57) = -6.14*	.31	-2.28, -1.16
Total Scale Score					
Baseline	0.79	0.14	*t*(57) = 5.65*	.29	0.51, 1.06
Group	-1.06	0.22	*t*(57) = -4.94*	.22	-1.50, -.63
DERS					
Non-Acceptance					
Baseline	0.56	0.10	*t*(57) = 5.35*	.25	0.35, 0.77
Group	-6.66	1.37	*t*(57) = -4.87*	.21	-9.40, -3.92
Goals					
Baseline	0.56	0.11	*t*(57) = 5.18*	.28	0.34, 0.78
Group	-3.30	0.99	*t*(57) = -3.32*	.12	-5.29, -1.31
Impulse					
Baseline	0.67	0.09	*t*(57) = 7.08*	.40	0.48, 0.85
Group	-4.12	1.14	*t*(57) = -3.61*	.10	-6.41, -1.83
Awareness					
Baseline	0.67	0.11	*t*(57) = 6.11*	.36	0.45, 0.89
Group	-4.00	1.00	*t*(57) = -4.00*	.15	-6.00, -1.99

Note. * = $p < .05$; Sr^2 = squared part correlation; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table I3 (continued)

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment with Missing Values Imputed Using Expectation-Maximization

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	Confidence Interval
DERS					
Strategies					
Baseline	0.65	0.09	*t*(57) = 6.90*	.38	0.46, 0.84
Group	-5.47	1.42	*t*(57) = -3.84*	.12	-8.33, -2.62
Clarity					
Baseline	0.63	0.11	*t*(57) = 5.78*	.34	0.41, 0.85
Group	-2.89	0.80	*t*(57) = -3.62*	.13	-4.49, -1.29
EES					
Anger/Frustration					
Baseline	0.58	0.12	*t*(57) = 4.87*	.22	0.34, 0.82
Group	-11.52	2.23	*t*(57) = -5.17*	.25	-15.99, -7.06
Anxiety					
Baseline	0.36	0.12	*t*(57) = 2.90*	.10	0.11, 0.60
Group	-8.43	0.190	*t*(57) = -4.43*	.22	-12.24, -4.62
Depression					
Baseline	0.61	0.13	*t*(57) = 4.85*	.23	0.36, 0.87
Group	-4.82	0.95	*t*(57) = -5.09*	.25	-6.72, -2.92
UPPS-P					
Negative Urgency					
Baseline	0.65	0.11	*t*(57) = 6.11*	.35	0.44, 0.86
Group	-4.96	1.35	*t*(57) = -3.68*	.12	-7.65, -2.26

Note. * = $p < .05$; Sr^2 = squared part correlation; DERS = Difficulties in Emotion Regulation Scale; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale.

Table I3 (continued)

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment with Missing Values Imputed Using Expectation-Maximization

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	Confidence Interval
UPPS-P					
Positive Urgency					
Baseline	0.68	0.08	*t*(57) = 8.03*	.50	0.51, 0.85
Group	-4.77	1.62	*t*(57) = -2.95*	.07	-8.01, -1.54
EEI					
Eating Helps Affect					
Baseline	0.53	0.13	*t*(57) = 3.88*	.15	0.25. 0.80
Group	-1.21	0.26	*t*(57) = -4.64*	.21	-1.74. -0.69
Eating as a Reward					
Baseline	0.43	0.10	*t*(57) = 4.16*	.18	0.22. 0.63
Group	-0.98	0.24	*t*(57) = -3.98*	.17	-1.47. -0.48
Eating Leads to Loss of Control					
Baseline	0.67	0.15	*t*(57) = 4.54*	.20	0.38. 0.97
Group	-1.23	0.23	*t*(57) = -5.41*	.29	-1.68. -0.77
Eating Alleviates Boredom					
Baseline	0.71	0.11	*t*(57) = 6.30*	.35	0.48. 0.93
Group	-1.24	0.29	*t*(57) = -4.25*	.16	-1.82. -0.66

Note. * = $p < .05$; Sr^2 = squared part correlation; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table I4

Comparison of Outcome Variables at Baseline, Post-treatment, and Six-month Follow-up for the Treatment Group with Missing Values Imputed Using Expectation-Maximization

Outcome measure	Baseline Mean (*SD; n* = 30)	Post-Treatment Mean (*SD; n* = 30)	6 months Post Treatment Mean (*SD*; *n* = 30)	*F* value (*df*)	Effect Size (*d*) Baseline vs Post-Treatment	Effect Size (*d*) Baseline vs 6 months Post-Treatment
Objective Binge Frequency in last 28 days	18.67 (13.17)[a]	2.50 (3.75)[b]	7.47 (9.95)[c]	31.67 (1.57, 45.49)*	1.91	0.97
Rate of binge eating abstinence last 28 days	3.30%[a]	53.30%[a]	26.70%[a]	*ns*		
EDQLS Total Score	118.93 (21.13)[a]	144.06 (20.31)[b]	138.60 (18.10)[b]	25.14 (2, 58)*	1.21	1.00
EDE-Q						
Restraint	3.73 (1.41)[a]	3.15 (1.30)[a]	2.48 (1.15)[b]	10.53 (1.57, 45.47)*	0.43	0.98
Eating Concern	4.09 (1.15)[a]	2.17 (1.17)[b]	2.36 (0.97)[b]	40.69 (2, 58)*	1.65	1.63
Weight Concern	5.17 (1.15)[a]	3.95 (1.10)[b]	3.79 (1.08)[b]	23.46 (2, 58)*	1.08	1.24
Shape Concern	5.72 (0.87)[a]	4.06 (1.43)[b]	3.94 (1.37)[b]	33.84 (2. 58)*	1.44	1.59
Total Scale Score	4.68 (0.71)[a]	3.33 (1.04)[b]	3.14 (.94)[b]	45.67 (2, 58)*	1.54	1.87
DERS						
Non-Acceptance	16.65 (6.60)[a]	11.01 (5.64)[b]	12.29 (4.91)[b]	11.93 (2, 58)*	0.92	0.76
Goals	15.73 (4.90)[a]	13.56 (4.78)[b]	12.20 (3.68)[b]	8.47 (2, 58)*	0.45	0.82
Impulse	15.43 (6.17)[a]	11.70 (5.11)[b]	11.43 (3.93)[b]	14.76 (2, 58)*	0.66	0.79
Awareness	19.03 (4.63)[a]	14.73 (4.96)[b]	15.57 (4.09)[b]	15.04 (2, 58)*	0.90	0.79

Note. * = $p < .05$; (+) Effect size favours treatment group; (-) Effect size favours control group. For each variable, the same letter in the superscript denotes that the time points were similar; different letters in the superscript indicates that there were significant differences between time points according to follow-up t-tests; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table I4 (continued)

Comparison of Outcome Variables at Baseline, Post-treatment, and Six-month Follow-up for the Treatment Group with Missing Values Imputed Using Expectation-Maximization

Outcome measure	Baseline Mean (*SD; n* = 30)	Post-Treatment Mean (*SD; n* = 30)	6 months Post Treatment Mean (*SD*; *n* = 30)	*F* (*df*)	Effect Size (*d*) Baseline vs Post-Treatment	Effect Size (*d*) Baseline vs 6 months Post-Treatment
DERS						
Strategies	19.77 (8.29)[a]	15.24 (6.79)[b]	15.25 (6.65)[b]	11.62 (1.39, 40.31)*	0.60	0.60
Clarity	13.42 (4.10)[a]	11.11 (3.50)[b]	10.37 (3.02)[b]	11.01 (1.41, 40.78)*	0.61	0.86
EES						
Anger/Frustration	39.43 (8.32)[a]	25.95 (9.74)[b]	28.38 (9.78)[b]	26.89 (2, 58)*	1.49	1.22
Anxiety	28.30 (8.14)[a]	19.16 (7.52)[b]	18.87 (6.86)[b]	20.46 (2, 58)*	1.17	1.26
Depression	19.73 (3.39)[a]	14.12 (4.70)[b]	13.83 (4.82)[b]	32.31 (1.67, 48.58)*	1.39	1.44
UPPS-P						
Negative Urgency	35.67 (6.85)[a]	30.11 (6.49)[b]	29.96 (6.60)[b]	18.40 (1.62, 47.01)*	0.83	0.85
Positive Urgency	30.06 (9.03)[a]	25.98 (6.71)[b]	26.44 (5.87)[b]	5.18 (2, 58)*	0.52	0.48
EEI						
Eating Helps Affect	5.16 (1.00)[a]	3.72 (1.21)[b]	4.17 (0.84)[c]	24.10 (2, 58)*	1.30	1.08
Eating as a Reward	5.34 (1.21)[a]	4.00 (0.98)[b]	4.34 (1.11)[b]	18.97 (2, 58)*	1.22	0.86
Eating Leads to Loss of Control	5.79 (0.73)[a]	4.43 (1.20)[b]	4.61 (0.82)[b]	35.30 (2, 58)*	1.41	1.52
Eating Alleviates Boredom	5.21 (1.08)[a]	3.80 (1.56)[b]	4.27 (1.22)[b]	15.23 (2, 58)*	1.07	0.82

Note. * = $p < .05$; (+) Effect size favours treatment group; (-) Effect size favours control group. For each variable, the same letter in the superscript denotes that the time points were similar; different letters in the superscript indicates that there were significant differences between time points according to follow-up t-tests; DERS = Difficulties in Emotion Regulation Scale; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Appendix J

Tables of Results Where Missing Values Have Been Filled in with the Last Observation Carried Forward

Table J1

Outcome Variable Comparison Between Individuals in the Treatment and Wait-list Groups at Baseline and at Post-treatment Where Missing Values Were Imputed using the Last Observation Carried Forward Procedure

	Baseline Means (SD)			Post-Treatment Means (SD)		
Outcome measure	Treatment Group (*n*= 30)	Wait-list Group (*n*= 30)	Effect Size (*d*)	Treatment Group (*n*= 30)	Wait-list Group (*n*= 30)	Effect Size (*d*)
Objective Binge Frequency in last 28 days	18.67 (13.17)	19.60 (11.91)	-0.07	5.97 (9.42)[a]	14.37 (11.86)	0.79
Rate of binge eating abstinence last 28 days#	3.30%	0.00%		40.00%[b]	3.30%	
EDQLS Total Score	118.93 (21.13)	117.03 (17.62)	-0.10	137.30 (23.51)	117.17 (17.70)	0.98
EDE-Q						
Restraint	3.73 (1.41)	3.23 (1.27)	-0.37	3.27 (1.44)	3.21 (1.25)	-0.04
Eating Concern	4.09 (1.15)	4.67 (1.38)	0.46	2.69 (1.29)	3.74 (1.46)	0.76
Weight Concern	5.17 (1.15)	5.06 (0.86)	-0.11	4.15 (1.18)	4.99 (1.23)	0.70
Shape Concern	5.72 (0.87)	5.45 (1.12)	-0.27	4.49 (1.46)	5.50 (1.20)	0.76
Total Scale Score	4.68 (0.71)	4.60 (0.85)	-0.10	3.65 (1.03)	4.36 (1.00)	0.70
DERS						
Non-Acceptance	16.65 (6.60)	17.37 (6.75)	0.11	12.87 (6.00)	17.93 (6.59)	0.80
Goals	15.73 (4.90)	16.03 (4.42)	0.06	14.16 (5.09)	16.90 (4.34)	0.58
Impulse	15.43 (6.17)	16.37 (6.14)	0.15	12.50 (4.84)	16.37 (6.42)	0.69
Awareness	19.03 (4.63)	17.80 (4.50)	-0.27	16.19 (5.21)	17.93 (4.73)	0.35
Strategies	19.77 (8.29)	20.66 (6.96)	0.12	16.51 (7.82)	21.25 (7.95)	0.60
Clarity	13.42 (4.10)	12.73 (3.25)	-0.19	11.95 (3.97)	13.77 (3.86)	0.46

Note. (+) Effect size favours treatment group; (-) Effect size favours control group; [#] = value is a percentage and not mean; [a] = for this variable $n = 22$; [b] = for this variable $n = 24$; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table J1 (continued)

Outcome Variable Comparison Between Individuals in the Treatment and Wait-list Groups at Baseline and at Post-treatment Where Missing Values Were Imputed using the Last Observation Carried Forward Procedure

	Baseline Means (SD)			Post-Treatment Means (SD)		
Outcome measure	Treatment Group (*n*= 30)	Wait-list Group (*n*= 30)	Effect Size (*d*)	Treatment Group (*n*= 30)	Wait-list Group (*n*= 30)	Effect Size (*d*)
EES						
Anger/Frustration	39.43 (8.32)	39.49 (10.44)	0.01	29.95 (10.41)	38.13 (9.86)	0.81
Anxiety	28.30 (8.14)	29.50 (7.60)	0.15	21.83 (7.66)	28.60 (7.60)	0.89
Depression	19.73 (3.39)	19.33 (4.15)	-0.11	15.83 (5.82)	19.03 (3.91)	0.66
UPPS-P						
Negative Urgency	35.67 (6.85)	35.53 (6.02)	-0.02	31.97 (7.40)	34.97 (6.17)	0.44
Positive Urgency	30.06 (9.03)	28.93 (10.21)	-0.12	26.93 (6.51)	30.17 (10.50)	0.38
EEI						
Eating Helps Affect	5.16 (1.00)	5.42 (0.94)	0.27	4.15 (1.24)	5.24 (0.91)	1.01
Eating as a Reward	5.34 (1.21)	5.47 (1.21)	0.11	4.40 (1.06)	5.13 (1.21)	0.64
Eating Leads to Loss of Control	5.79 (0.73)	5.61 (0.81)	-0.23	4.81 (1.22)	5.57 (0.72)	0.78
Eating Alleviates Boredom	5.21 (1.08)	5.09 (1.52)	-0.09	4.28 (1.46)	4.99 (1.37)	0.50

Note. (+) Effect size favours treatment group; (-) Effect size favours control group; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table J2

Analysis of the Impact of Treatment on Outcomes at Post-treatment: Overall Linear and Logistic Regression Model Results with Missing Values Imputed Using Last Observation Carried Forward

Outcome measure	Test Statistic (*df*)	Test Value
Objective Binge Frequency in last 28 days	*F*(2,57)	10.23*
Rate of binge eating abstinence last 28 days	$\chi 2$(1)	13.57*
EDQLS Total Score	*F*(2,57)	32.80*
EDE-Q		
Restraint	*F*(2,57)	10.57*
Eating Concern	*F*(2,57)	16.84*
Weight Concern	*F*(2,57)	18.98*
Shape Concern	*F*(2,57)	21.70*
Total Scale Score	*F*(2,57)	16.93*
DERS		
Non-Acceptance	*F*(2,57)	32.45*
Goals	*F*(2,57)	27.84*
Impulse	*F*(2,57)	24.41*
Awareness	*F*(2,57)	23.00*
Strategies	*F*(2,57)	36.64*
Clarity	*F*(2,57)	23.63*
EES		
Anger/Frustration	*F*(2,57)	22.81*
Anxiety	*F*(2,57)	10.37*
Depression	*F*(2,57)	15.16*
UPPS-P		
Negative Urgency	*F*(2,57)	32.30*
Positive Urgency	*F*(2,57)	37.72*
EEI		
Eating Helps Affect	*F*(2,57)	17.84*
Eating as a Reward	*F*(2,57)	16.43*
Eating Leads to Loss of Control	*F*(2,57)	13.17*
Eating Alleviates Boredom	*F*(2,57)	29.62*

Note. * = $p < .05$; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table J3

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment with Missing Values Imputed Using Last Observation Carried Forward

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	95% Confidence Interval
Objective binge frequency in last 28 days					
Baseline	0.33	0.10	*t*(57) = 3.13*	0.14	.12, 0.54
Group	-8.09	2.58	*t*(57) = -3.14*	0.14	-13.26, -2.93
Rate of binge eating abstinence last 28 days					
Group	-2.96	1.08	*Wald* (1) = 7.48*		0.01, 0.43
EDQLS Total Score					
Baseline	0.69	0.11	*t*(57) = 6.46*	0.42	0.48, 0.91
Group	18.81	4.12	*t*(57) = 4.56*	0.27	10.55, 27.07
EDE-Q					
Restraint					
Baseline	0.52	0.11	*t*(57) = 4.59*	0.27	0.29, 0.75
Group	-0.20	0.31	*t*(57) = -0.66	0.01	-0.81, 0.41
Eating Concern					
Baseline	0.57	0.12	*t*(57) = 4.67*	0.28	0.32, 0.81
Group	-0.72	0.31	*t*(57) = -2.31*	0.08	-1.35, -0.10
Weight Concern					
Baseline	0.68	0.13	*t*(57) = 5.23*	0.32	0.42, 0.93
Group	-0.92	0.26	*t*(57) = -3.55*	0.18	-1.43, -0.40

Note. * = $p < .05$; Sr^2 = squared part correlation; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire.

Table J3 (continued)

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment with Missing Values Imputed Using Last Observation Carried Forward

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	Confidence Interval
EDE-Q					
Shape Concern					
Baseline	0.78	0.14	$t(57) = 5.51$*	0.35	0.50, 1.07
Group	-1.23	0.28	$t(57) = -4.33$*	0.25	-1.80, -0.66
Total Scale Score					
Baseline	0.70	0.14	$t(57) = 4.86$*	0.29	0.41, 0.99
Group	-1.00	0.24	$t(57) = -3.43$*	0.17	-1.21, -0.32
DERS					
Non-Acceptance					
Baseline	0.64	0.09	$t(57) = 6.89$*	0.45	0.45, 0.82
Group	-4.61	1.21	$t(57) = -3.80$*	0.20	-7.04, -2.18
Goals					
Baseline	0.68	0.10	$t(57) = 6.83$*	0.45	0.48, 0.88
Group	-2.54	0.91	$t(57) = -2.77$*	0.11	-4.37, -0.71
Impulse					
Baseline	0.65	0.09	$t(57) = 7.44$*	0.49	0.47, 0.82
Group	-3.26	1.06	$t(57) = -3.08$*	0.14	-5.38, -1.14
Awareness					
Baseline	0.71	0.11	$t(57) = 6.54$*	0.42	0.49, 0.93
Group	-2.62	0.99	$t(57) = -2.65$*	0.11	-4.60, -0.64

Note. * = $p < .05$; Sr^2 = squared part correlation; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table J3 (continued)

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment with Missing Values Imputed Using Last Observation Carried Forward

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	Confidence Interval
DERS					
Strategies					
Baseline	0.74	0.69	*t*(57) = 7.88*	0.52	0.55, 0.93
Group	-4.07	1.42	*t*(57) = -2.86*	0.12	-6.92, -1.22
Clarity					
Baseline	0.69	0.11	*t*(57) = 6.46*	0.42	0.47, 0.90
Group	-2.29	0.78	*t*(57) = -2.95*	0.13	-3.85, -0.73
EES					
Anger/Frustration					
Baseline	0.64	0.11	*t*(57) = 5.55*	0.35	0.41, 0.87
Group	-8.14	2.13	*t*(57) = -3.83*	0.20	-12.40, -3.88
Anxiety					
Baseline	0.33	0.12	*t*(57) = 2.76*	0.12	0.09, 0.57
Group	-6.37	1.87	*t*(57) = -3.40*	0.17	-10.12, -2.62
Depression					
Baseline	0.69	0.15	*t*(57) = 4.67*	0.28	0.39, 0.98
Group	-3.47	1.10	*t*(57) = -3.16*	0.15	-5.68, -1.27
UPPS-P					
Negative Urgency					
Baseline	0.75	0.10	*t*(57) = 7.67*	0.50	0.56, 0.95
Group	-3.09	1.24	*t*(57) = -2.48*	0.10	-5.59, -0.60

Note. * = $p < .05$; Sr^2 = squared part correlation; DERS = Difficulties in Emotion Regulation Scale; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale.

Table J3 (continued)

Completer Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcome Variable at Post-treatment with Missing Values Imputed Using Last Observation Carried Forward

Outcome measure	*B*	*SE(B)*	Statistic (*df*) and value	sr^2	Confidence Interval
UPPS-P					
Positive Urgency					
Baseline	0.67	0.08	*t*(57) = 8.42*	0.55	0.51, 0.83
Group	-3.99	1.52	*t*(57) = -2.62*	0.11	-7.04, -0.95
EEI					
Eating Helps Affect					
Baseline	0.53	0.13	*t*(57) = 4.09*	0.23	0.27, 0.79
Group	-0.95	0.25	*t*(57) = -3.76*	0.20	-1.45, -0.44
Eating as a Reward					
Baseline	0.51	0.10	*t*(57) = 4.94*	0.30	0.31, 0.72
Group	-0.65	0.25	*t*(57) = -2.63*	0.11	-1.15, -0.16
Eating Leads to Loss of Control					
Baseline	0.61	0.15	*t*(57) = 3.98*	0.22	0.30, 0.91
Group	-0.85	0.23	*t*(57) = -3.67*	0.19	-1.32, -0.39
Eating Alleviates Boredom					
Baseline	0.74	0.10	*t*(57) = 7.22*	0.48	0.53, 0.95
Group	-0.79	0.27	*t*(57) = -2.97*	0.14	-1.33, -0.26

Note. * = $p < .05$; Sr^2 = squared part correlation; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Table J4

Comparison of Outcome Variables at Baseline, Post-treatment, and Six-month Follow-up for the Treatment Group with Missing Values Imputed Using Last Observation Carried Forward

Outcome measure	Baseline Mean (*SD; n* = 30)	Post-Treatment Mean (*SD; n* = 30)	6 Months Post-Treatment Mean (*SD; n* = 30)	Overall Model Results *F* (df)	Effect Size (*d*) Baseline vs: Post-Treatment	Effect Size (*d*) Baseline vs: 6 Months Post-Treatment
Objective binge frequency in last 28 days*	18.67 (13.17)[a]	5.97 (9.42)[b]	9.53 (11.89)[c]	17.87 (1.48, 43.05)*	1.12	0.73
Rate of binge eating abstinence last 28 days[#]	3.30%[ab]	40.00%[a]	26.70%[b]			
EDQLS Total Score*	118.93 (21.13)[a]	137.30 (23.51)[b]	134.90 (24.13)[b]	20.15 (1.40, 40.74)*	0.82	0.70
EDE-Q						
Restraint*	3.73 (1.41)[a]	3.27 (1.44)[a]	2.70 (1.39)[b]	9.97 (1.59, 46.13)*	0.32	0.73
Eating Concern*	4.09 (1.15)[a]	2.69 (1.29)[b]	2.70 (1.33)[b]	23.69 (2, 58)*	1.15	1.12
Weight Concern*	5.17 (1.15)[a]	4.15 (1.18)[b]	3.93 (1.36)[b]	19.96 (1.58, 45.73)*	0.87	0.99
Shape Concern*	5.72 (0.87)[a]	4.49 (1.46)[b]	4.33 (1.60)[b]	19.73 (2. 58)*	1.05	1.12
Total Scale Score*	4.68 (0.71)[a]	3.65 (1.03)[b]	3.42 (1.12)[b]	26.91 (1.50, 43.54)*	1.18	1.38
DERS						
Non-Acceptance*	16.54 (6.69)[a]	12.62 (5.95)[b]	12.65 (6.30)[b]	8.65 (1.61, 44.99)*	0.62	0.60
Goals*	15.79 (4.97)[a]	14.16 (5.18)[a]	13.03 (4.96)[b]	7.18 (1.66, 46.53)*	0.32	0.55
Impulse*	15.48 (6.28)[a]	12.45 (4.92)[b]	12.34 (5.06)[b]	11.49 (1.29, 36.17)*	0.54	0.55
Awareness*	18.83 (4.57)[a]	15.89 (5.02)[b]	15.99 (4.78)[b]	9.98 (1.46, 40.94)*	0.61	0.61
Strategies*	19.79 (8.44)[a]	16.42 (7.94)[b]	16.45 (8.39)[b]	7.64 (1.20, 33.60)*	0.41	0.40

Note. * = $p < .05$; (+) Effect size represents improvement compared to baseline. For each variable, the same letter in the superscript denotes that the time points were similar; different letters in the superscript indicates that there were significant differences between time points according to follow-up t-tests presented in the results section; [#] = value is a percentage and not a mean and Fisher's Exact Test was used to compare values; EDQLS = Eating Disorder Quality of Life Scale; EDE-Q = Eating Disorders Examination Questionnaire, DERS = Difficulties in Emotion Regulation Scale.

Table J4 (continued)

Comparison of Outcome Variables at Baseline, Post-treatment, and Six-month Follow-up for the Treatment Group with Missing Values Imputed Using Last Observation Carried Forward

Outcome Measure	Baseline Mean (*SD; n* = 30)	Post-Treatment Mean (*SD; n* = 30)	6 Months Post-Treatment Mean (*SD; n* = 30)	Overall Model Results F (df)	Effect Size (*d*) Baseline vs: Post-Treatment	Effect Size (*d*) Baseline vs: 6 Months Post-Treatment
DERS						
Clarity*	13.34 (4.14)[a]	11.81 (3.97)[b]	11.16 (4.06)[b]	6.11 (1.31, 36.57)*	0.38	0.53
EES						
Anger/Frustration*	39.43 (8.32)[a]	29.95 (10.41)[b]	30.04 (12.14)[b]	17.46 (1.67, 48.33)*	1.01	0.92
Anxiety*	28.30 (8.14)[a]	21.83 (7.66)[b]	21.20 (9.02)[b]	11.02 (1.52, 44.04)*	0.82	0.83
Depression*	19.73 (3.39)[a]	15.83 (5.82)[b]	15.30 (6.34)[b]	13.25 (1.24, 36.10)*	0.85	0.91
UPPS-P						
Negative Urgency*	35.67 (6.85)[a]	31.97 (7.40)[b]	31.98 (7.91)[b]	11.33 (1.46, 42.30)*	0.52	0.50
Positive Urgency	30.06 (9.03)	26.93 (6.51)	27.63 (6.71)	3.43 (1.52, 44.15)	0.40	0.31
EEI						
Eating Helps Affect*	5.16 (1.00)[a]	4.15 (1.24)[b]	4.31 (1.03)[b]	13.82 (1.45, 42.07)*	0.90	0.84
Eating as a Reward*	5.34 (1.21)[a]	4.40 (1.06)[b]	4.59 (1.24)[b]	10.90 (1.62, 46.88)*	0.83	0.61
Eating Leads to Loss of Control*	5.79 (0.73)[a]	4.82 (1.22)[b]	4.83 (1.05)[b]	17.94 (1.61, 46.74)*	0.99	1.08
Eating Alleviates Boredom*	5.21 (1.08)[a]	4.28 (1.46)[b]	4.35 (1.50)[b]	10.23 (1.66, 48.19)*	0.73	0.67

Note. * = $p < .05$; (+)Effect size represents improvement compared to baseline. For each variable, the same letter in the superscript denotes that the time points were similar; different letters in the superscript indicates that there were significant differences between time points according to follow-up t-tests; DERS = Difficulties in Emotion Regulation Scale; EES = Emotional Eating Scale; UPPS-P = UPPS-P Impulsive Behavior Scale; EEI = Eating Expectancy Inventory.

Appendix K

Support Session Adherence Form

Today's Date (dd/mm/yy): _____

ID Number: _____

Support Session Number: _____

Instructions: For each question, please rate whether or not you heard the question asked.

KEY: 0 = No; 1 = Yes; 9 = Not Applicable

Rating

1. How have you been doing with your eating since we last spoke? ___
2. Have you had any questions about the material in the Toolbox that you have read? ___
    a) If there were specific questions were the questions answered or was the person informed of when they would read about the material related to their question? ___
3. What page have you currently read to in the Toolbox? ___
4. Ask if they have been filling out a diary card every (or almost every) week. ___
5. Ask if they have been completing a chain analysis every (or almost every) week. ___
6. Have you found the material in the Toolbox helpful since we last spoke? ___
    a) If participants did not find the material helpful were they encouraged to read further? ___
7. Is there anything getting in the way of you using the Toolbox? ___

a) If there was something getting in the way, were suggestions made to overcome obstacles? ___

b) Describe the specific suggestions given.

_____

_____

_____

8. Describe the other topics discussed

_____

_____

_____

Total time in minutes: ___

Appendix L

Tables of Results Where Outliers are Removed or Scores Were Transformed

Table L1

Analysis of the Impact Treatment on Outcomes at Post-treatment: Overall Linear and Logistic Regression Model Results Where Outliers were Removed or Scores Transformed

Outcome measure	Test Statistics (*df*)	Test Value
Objective Binge Frequency in Last 28 days[ot]	2, 45	$F = 23.91$*
UPPS-P		
Negative Urgency[o]	2, 46	$F = 25.46$*
EDE-Q		
Shape Concern[o]	2, 46	$F = 20.51$*
EEI		
Eating as a Reward[o]	2, 46	$F = 14.03$*

Note. * = $p < .05$; [o] = outlier removed; [t] = transformed; UPPS-P= UPPS-P Impulsive Behaviour Scale; EDE-Q = Eating Disorders Examination Questionnaire; EEI = Eating Expectancy Inventory.

Table L2

Linear and Logistic Regression Analysis of the Impact of Treatment and Baseline Scores on Each Outcomes Variable at Post-treatment with Outliers Removed or Scores Transformed

Outcome measure	*B*	*SE*(*B*)	*t*	sr^2	Confidence Interval
Objective Binge Frequency in Last 28 days[ot]					
Baseline	0.02	0.01	2.50*	.07	0, 0.04
Group	-1.55	0.24	-6.51*	.46	-2.03, -1.07
UPPS-P					
Negative Urgency[o]					
Baseline	0.82	0.12	6.55*	.44	0.57, 1.07
Group	-4.66	1.41	-3.31*	.11	-7.49, -1.83
EDE-Q					
Shape Concern[o]					
Baseline	0.69	0.16	4.17*	.20	0.35, 1.02
Group	-1.63	0.31	-5.32*	.32	-2.24, -1.01
EEI					
Eating as a Reward[ot]					
Baseline	0.52	0.12	4.13*	.23	0.26, 0.77
Group	-0.94	0.27	-3.49*	.16	-1.48, -0.40

Note. * = $p < .05$; [o] = outlier removed; [t] = transformed; UPPS-P= UPPS-P Impulsive Behaviour Scale; EDE-Q = Eating Disorders Examination Questionnaire; EEI = Eating Expectancy Inventory.

Table L3

Comparison of Outcome Variables at Baseline, Post-treatment, and Six-month Follow-up for the Treatment Group Where Outliers Were Removed or Scores Transformed

Outcome measure	Baseline Mean	Post-Treatment Mean	6 months Post-treatment Mean	*F* (df)
Objective Binge Frequency in Last 28 days[ot]	2.62 (1.04)[a]	0.81 (0.91)[b]	1.42 (1.32)[c]	29.03 (2, 36)*
EEI				
Eating as a Reward[o]	1.70 (0.18)[a]	1.39 (0.22)[b]	1.44 (0.33)[b]	11.81 (2, 34)*
UPPS-P				
Negative Urgency[o]	36.39 (4.58)[a]	30.82 (6.78)[a]	31.28 (7.32)[b]	12.05 (2, 34)*
Positive Urgency[o]	3.37 (0.35)[a]	3.22 (0.24)[b]	3.28 (0.26)[ab]	2.85 (2, 36)

Note. * = $p < .05$; [o] = outlier removed; [t] = transformed; UPPS-P= UPPS-P Impulsive Behaviour Scale; EEI = Eating Expectancy Inventory

Appendix M

Telephone Screening Questionnaire for

Pilot Study of Manual Readability and Applicability

Emotion Regulation Treatment for Binge Eating Disorder:

Treatment Manual Evaluation Pilot Study

Date of screen*:* _____

Initials of screener: _____

Eligible for study? ☐ Yes ☐ No

Participant name: _____
Interview date/time:_____
To be interviewed by:_____

This is the phone script which should be used for the first phone contact. All **bolded** text should be read to the prospective participant.

Hi, my name is Philip Masson, I am a clinical psychology graduate student at the University of Calgary in the Eating Behaviours Laboratory.

You have participated in past research we have conducted at the Eating Behaviours Laboratory. When you participated, you indicated that it was okay to contact you in the future if you might be eligible for another study. We've just started another study that you might be eligible for, and I'm wondering if you would be interested in hearing more about it and finding out if you are eligible. (If no, thank them for their previous participation and ask if we may contact them again in the future**.**)

We are currently developing a self-help manual for a particular type of eating disorder. We are interested in hearing people's perspective on the manual. This study would require that you read approximately 25 pages a week over six weeks. It would also require that you attend an initial interview, within the next two weeks,

which would take about 30 minutes as well as one focus group, in about 7 weeks, which would take about two hours.

Are you interested in hearing more about this study?

If NO: **If you would not like to participate in this trial project, may we contact you again when we test the manual further? However, it is important to note that the next project will involve assigning people randomly to two groups, one of which will not receive the manual.**

IF NO: **Thank you for your previous participation in our research projects. May we keep your name so that we can possibly contact you again in the future?**

IF YES: **Thank you for your interest in this upcoming research project. I would like to take a moment and make sure I have your up to date contact information. You will be contacted about this future research project in approximately three to four months.**

If YES: **That's great to hear. I am going to ask you a few questions to get a better idea of whether you have the type of problem the manual is designed to treat. If it seems that the manual is a good fit for you I will invite you for a more complete in person interview where the manual will be distributed.**

Do you have any questions?

Please list the phone numbers that we can use to reach you:

_____

_____

_____

What is your preferred phone number? _____

Is it okay if I call one working day before your appointment just to remind you?

□ Yes □ No

A5) **Is it okay to leave messages at this number? If we call, we would identify ourselves as being from the University of Calgary, and would leave a contact phone number.**

□ Yes □ No

A6) **How old are you?** _____ years

IF NOT YET 18, INELIGIBLE FOR STUDY. SKIP TO D, P. 6.

********** SECTION B: EATING DISORDER SCREEN **********

Removed due to copyright.

****

Reminder: If no past or current binge eating disorder, ineligible for study. Go to section D.

****

**********SECTION C: ELIGIBLE FOR STUDY PARTICIPATION**********

Thank you very much for taking the time to answer my questions. You are eligible for the study. I will tell you a little bit more about the study now so that you can decide whether or not you would like to participate.

As I mentioned earlier, we are currently in the process of developing a manual for a new type of self-help treatment for people with binge eating problems. We would like people with binge eating problems to review the self-help manual and let us know what they think about it. We would need individuals to read through the manual in approximately six weeks. The manual is about 150 pages long and so would require you read approximately 25 pages each week. This study would also involve attending an initial interview, within the next two weeks, which would take about 30 minutes as well as one focus group, in about 7 weeks, which would take about two hours. You can keep the manual you read, and also receive a free copy of the revised manual if we change it after this study.

(Proceed to schedule initial assessment interview, answer any questions and then end phone call).

**********SECTION D: INELIGIBLE FOR STUDY PARTICIPATION**********

IF INELIGIBLE FOR STUDY: **Thank you very much for your interest but unfortunately, you do not meet the requirements for this study. May I have your permission to keep your name and contact you in the future to see if you might be interested in participating in another research project?**

No ____ **I completely understand. We will not be contacting you in the future, and thank you for your time.** (End phone call).

Yes ____ **Great. Thank you so much for your time.** (End phone call).

Appendix N

CONSORT 2010 Checklist of Information to Include when Reporting a Randomized Trial

Selection/topic	Item number	Checklist item	Reported on page number
Title and abstract	1a	Identification as a randomized trial in the title	i
	1b	Structured summary of trial design, methods, results, and conclusions	ii
Introduction			
Background and objectives	2a	Scientific background and explanation of rationale	1-16
	2b	Specific objectives or hypotheses	16-17
Methods			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	17-20
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	NA
Participants	4a	Eligibility criteria for participants	17-19
	4b	Settings and locations where the data were collected	18
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	20-22
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	25-30
	6b	Any changes to trial outcomes after the trial commenced, with reasons	NA
Sample size	7a	How sample size was determined	18, 107-109
	7b	When applicable, explanation of any interim analyses and stopping guidelines	NA
Randomization:			
Sequence	8a	Method used to generate the random allocation sequence	19
generation	8b	Type of randomization; details of any restriction	19
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	19
Implementation	10	Who generated the random allocation sequence, who enrolled participants,	19

		and who assigned participants to interventions	
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	20
	11b	If relevant, description of the similarity of interventions	NA
Results			
Participant flow	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	106
	13b	For each group, losses and exclusions after randomization, together with reasons	106
Recruitment	14a	Dates defining the periods of recruitment and follow-up	20
	14b	Why the trial ended or was stopped	NA
Baseline data	15	A table showing baseline demographics and clinical characteristics for each group	90-91
Numbers analysed	16	For each group, numbers of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	31-32, 36-38 92-93, 99-100
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	92-102
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	43
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	NA
Harms	19	All important harms or unintended effects in each group	NA
Discussion			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and if relevant, multiplicity of analyses	68-72
Generalisability	21	Generalizability (external validity, applicability) of the trial findings	52-55, 72
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	67-72