Psychotherapy Outcome for Eating Disorders: A Meta-Analysis

Julia B. Hubbard

A dissertation submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Scott Baldwin, Chair
Mikle South
Gary Burlingame
Patrick Steffen
Alan Hawkins

Department of Clinical Psychology

Brigham Young University

June 2013

ABSTRACT

Psychotherapy Outcome for Eating Disorders: A Meta-Analysis

Julia Hubbard
Department of Psychology, BYU
Doctor of Philosophy

The purpose of this project was to summarize psychotherapy outcomes for eating disorders using meta-analysis. Psychotherapy was defined as any psychosocial treatment including face-to-face therapy, self-help, and Internet approaches. All primary studies, meeting inclusion/exclusion criteria from 1980 to 2010, were included. Results suggested that individuals treated with active treatments demonstrate better outcomes than those in control conditions ($\bar{d} = 0.33$, $p < .01$, 95% CI [0.19-0.46]). CBT was the most often occurring treatment in the primary studies and a small effect, favoring CBT, was found when the treatment was compared to all other active treatments ($\bar{d} = 0.16$, $p = .02$, 95% CI [0.03-0.28]). Internet and self-help approaches continue to show promise with Internet treatments demonstrating superior outcomes to control conditions ($\bar{d} = 0.54$, $p < .01$, 95% CI [0.19-0.90]). More research is needed to determine whether these approaches can suffice as stand-alone treatments or if they are best used in addition to already well-established approaches (i.e., individual CBT). The meta-analysis also explored whether treatment type, outcome measure, diagnosis, attrition, and diagnostic severity moderate treatment effect. Finally, the meta-analysis updated and improved upon previous meta-analyses by focusing on randomized controlled trials, including all diagnoses of eating disorder, only combining effect sizes from similar conditions, including all possible studies that meet inclusion criteria, computing and comparing effect sizes for outcome measures beyond those considered primary to eating disorder treatment, and also addressing outcomes for all brands of psychotherapy including traditional talk therapy, self-help, and Internet approaches.

Keywords: eating disorders, psychotherapy outcome, meta-analysis

ACKNOWLEDGEMENTS

I consider life a journey on which I am continuously moving, learning, and growing. I was blessed to have many people impact and shape me on my graduate school journey. I would like to thank Dr. Scott Baldwin for his support and guidance throughout my entire graduate school career and especially during the process of completing my dissertation. His mentorship aided my confidence in and understanding of statistics, the refinement of my writing skills, and my development as a professional. I would like to acknowledge each of my committee members, Drs. Gary Burlingame, Diane Spangler, Mikle South, Patrick Steffen, and Alan Hawkins, for their feedback, encouragement, and support. I am forever grateful to Sterling Brown and Darrell Kelly for the help they provided me during the literature search and coding process.

Throughout life's journey, you never know whom you might meet or who might leave a special mark on your life. I was fortunate to develop lasting friendships with Sarah Christian, Sasha Mondragon, and Ashley Levan. Rachelle Wardle who was like a sister and accepted me as an "honorary" member of her family. Each of these individuals was irreplaceable and an inspiration to me throughout the program.

Lastly, I must thank my family. As any family, we have been through so much together but I would not be who I am today without their love, encouragement, and guidance. My mother who never lets me quit without first trying, my father who has always taught me the day I think I know everything will be the day I stop learning, my brother who is truly my rock and strength who lives his life quietly but his example is louder than any words could ever be, and my sister who has a heart of gold, has always looked up to me, and believed I would never achieve less than my dreams—Thanks for loving me, no matter the distance and through my imperfections. I am eternally grateful and have more love for each of you than you could ever know.

Table of Contents

List of Tables

List of Figures

Psychotherapy Outcome for Eating Disorders: A Meta-Analysis

The eating disorder treatment outcome literature indicates that psychotherapy is effective in reducing binge eating, restriction, and body dissatisfaction. Most research in the field has studied traditional treatments such as medication and face-to-face therapy. Recent research on traditional treatment has focused on improving and extending existing treatments. Additionally, in the last decade, non-face-to-face treatment outcome studies have increased, including studies of Internet/computerized and self-help treatments. With the rise of self-help and Internet treatment modalities, and improvements and advancements in the traditional face-to-face therapies, this area of research is in need of an updated comprehensive meta-analysis that summarizes outcome for eating disorders. Although meta-analyses on eating disorder treatment outcome exist, there are several limitations that can be noted. They are not up-to-date (Brownley, Berkman, Sedway, Lohr, & Bulik, 2007; Cox & Merkel, 1989; Fettes & Peters, 1990; Hartmann, Herzog, & Drinkman, 1992; Laessle, Zoettle, & Pirke, 1987; Lewandowski, Gebing, Anthony, & O'Brien, 1997; Newton & Ciliska, 2006; NICE, 2004; Thomspon-Brenner, Glass, & Westen, 2003; Whitbread & McGown, 1994; Whittal, Agras, & Gould, 1999), focus on single treatments (Lewandowski et al., 1997; Whittal, Agras, & Gould, 1999) single diagnoses (Brownley et al., 2007; Cox & Merkel, 1989; Fettes & Peters, 1990; Hartmann, Herzog, & Drinkman, 1992; Laessle, Zoettle, & Pirke, 1987; Lewandowski et al., 1997; Thomspon-Brenner, Glass, & Westen, 2003; Vocks et al., 2010; Whitbread & McGown, 1994; Whittal, Agras, & Gould, 1999), or do not use the most current standard meta-analytic methods (Fettes & Peters, 1990; Hartmann, Herzog, & Drinkman, 1992; Laessle, Zoetlle, & Pirke, 1987; Newton & Ciliska, 2006; NICE, 2004; Thompson-Brenner, Glass, & Westen, 2003; Vocks et al., 2010; Whitbread & McGown, 1994). This meta-analysis will update the outcome literature for non-

pharmacological interventions, including self-help and Internet treatment approaches, for all

diagnoses of eating disorder.

Overview of Eating Disorders

Eating disorders are classified by a severe disturbance of eating behavior. The American

Psychiatric Association's Diagnostic and Statistical Manual – Fourth Edition (American

Psychiatric Association [DSM-IV-TR], 2000) currently recognizes two specific diagnoses of

eating disorder including: Anorexia Nervosa (AN) and Bulimia Nervosa (BN). A third category,

Eating Disorder Not Otherwise Specified (EDNOS), was included to capture those who have

severe eating behavior disturbances but do not meet full criteria for one of the two specific

diagnoses. Binge-eating disorder (BED) is included within the category of EDNOS in the DSM-

IV-TR and is under consideration as a third specific diagnosis to be included in DSM-V.

Approximately half (50-60%) of adult cases of eating disorders tend to be EDNOS, 30% are BN,

and 10-15% are AN (Fairburn, 2008)[1].

Anorexia Nervosa

People diagnosed with AN over-evaluate their shape and weight and determine their self-

worth based on their evaluation (Fairburn & Harrison, 2003). The lifetime prevalence of the

disorder is approximately 0.5% among females and the incidence of the disorder appears to have

increased in recent decades (DSM-IV-TR, 2000). The starvation present in AN can affect most

of the major organ systems and also can lead to a variety of other physical and mental

---

[1] Other eating-related diagnoses include those such as Pica, Rumination Disorder and Feeding
Disorder of Early Infancy or Childhood. However, these are considered disorders of childhood
and are not included under the eating disorder diagnostic section of the DSM-IV-TR. They are
often considered more atypical diagnoses. For the purpose of this study, I will focus on BN, AN
and BED.

disturbances (DSM-IV-TR, 2000). Thus, AN has one of the highest mortality rates of any psychological disorder (1.2-12.82%).

Bulimia Nervosa

Three criteria need to be present for an individual to meet criteria for BN. Similarly to AN, this disorder includes a cognitive component of over-evaluation of shape and weight. The essential features of BN according to the DSM-IV are binge eating and compensatory behaviors (i.e., dietary restriction, vomiting, or laxative misuse) to prevent weight gain as a result of the binge eating (DSM-IV-TR, 2000). The lifetime prevalence rate of BN is between 1-3% among women. Individuals with BN can also experience physical and mental problems similar to AN, but fatal complications are rare (DSM-IV-TR, 2000).

Eating Disorder Not Otherwise Specified

In the DSM-IV-TR (2000) EDNOS is a residual category for those who experience eating disturbances but do not meet full criteria for AN or BN. These may include individuals who struggle with AN behaviors but have a regular menstrual cycle, those that otherwise meet criteria for BN but binge or use compensatory behaviors infrequently, or behaviors such as repeatedly chewing and then spitting out food. All of these disturbances would currently be considered "subthreshold" and would fall into the EDNOS category (DSM-IV-TR, 2000). The majority of individuals who struggle with eating and body image related issues fall under this diagnosis.

Binge eating disorder. Currently, BED is included within the EDNOS category. However, clinicians and researchers are beginning to view it as a separate diagnosis. This diagnosis includes those who binge on a regular basis but do not follow-up their binge by compensatory behaviors (DSM-IV-TR, 2000). A large number of these individuals typically fall into the obese range of BMI (i.e., above 30; Fairburn, 2008).

Theories and Approaches of Treatment

There are numerous psychological theories of eating disorders, which have led to promising treatments in the current outcome literature. This section reviews prominent theories and approaches for treating eating disorders, specifically highlighting those approaches that will be coded in the meta-analysis. In each section, I describe each theory's conceptualization of the disorder and how the treatment follows from the theory. I discuss how each theory approaches eating disorder diagnoses in general and I note when there are important differences among specific disorders with respect to the theory. I do not focus on EDNOS because EDNOS is treated like BN when binge eating is present and like AN when low weight is present (Fairburn & Harrison, 2003). Because the focus of the meta-analysis is to review the outcomes of each of the treatment types, I will reserve comment on outcome for the meta-analysis.

Face-to-face Therapy

Cognitive behavioral approach. The cognitive-behavioral theory (CBT) of eating disorders is based on the premise that individuals have a dysfunctional view of their self-worth, which they base on concepts such as their body shape, weight, eating, and control (Fairburn, Cooper, & Shafran, 2003). Eating disorders are thought to develop because of a cultural emphasis on thinness that leads individuals to follow strict, black-and-white dieting rules. These rules include restriction of calories and type of food eaten and lead to compensatory behaviors such as diuretics, laxatives, and purging. Such restrictive behavior leads to binge eating, which is present in eating disorder diagnoses other than AN. Emotional disturbance can lead to binge eating as well (Fairburn, Cooper, & Shafran, 2003). Underlying each of these behaviors is the concept of "control." Binge eating or emotional experiences feel out of control so the urge is then to establish some "self-control" or "control" over their eating or bodies through weight

control behaviors (Fairburn, Cooper, & Shafran, 2003). Patients with diagnoses of BN and BED usually end up in a cycle of weight control behavior and binge eating. The onset of AN appears to begin with a need for control in several areas of an individual's life. After failed attempts in most areas, control over eating prevails because it becomes the most successful for the individual (Fairburn, Shafran, & Cooper, 1998).

Cognitive-behavioral treatment uses psychological interventions to address the most central concepts of the theory: dietary restraint, mood intolerance, over-evaluation of eating, weight, and body shape, and control (Fairburn, Cooper, & Shafran, 2003). Fairburn (2008) suggests that the most important aspect of modern CBT treatments for eating disorders is to ultimately change the overvaluation of shape and weight. Treatment typically includes establishing regular meals and eating patterns and decreasing the above listed behaviors, which will decrease the individual's binge and restrictive behavior (Wiser & Telch, 1999). CBT also works to change and restructure negative thoughts related to the body, weight, and shape (Wiser & Telch, 1999).

Dialectical behavior approach. Dialectical behavior therapy (DBT) has been used as a source of treatment for binge eating. Emotion regulation, binge eating, and mindless eating are considered the primary problems in binge eating and, thus, they are the main focus of the treatment. DBT describes a binge as a behavior that is used to regulate emotions or to dampen negative and unwanted emotional states by an individual. The goals of DBT include halting binge eating, mindless eating, decreasing cravings, and decreasing an all-or-nothing attitude related to binge eating (Wiser & Telch, 1999).

The treatment uses interventions in the following areas: mindfulness, distress intolerance, and emotion regulation. Mindfulness is used to bring awareness in the moment to emotions and

other experiences related to the urge to binge. Individuals overcome distress intolerance through crisis survival methods, which are taught in session. These include distraction, self-soothing, improving the moment, and evaluating the pros and cons of tolerating or not tolerating distress (Wiser & Telch, 1999). Lastly, emotion regulation is achieved by fully understanding the emotional state and its triggers, learning the function of the individual's various emotions, reducing the vulnerability that often accompanies negative emotional states, building more positive emotional experiences, and changing emotional states (Wiser & Telch, 1999).

Interpersonal approach. The interpersonal theory (IPT) of eating disorders suggests that the primary problem is disturbed interpersonal relationships (Fairburn, 1997). IPT was initially developed as a treatment for depression and the protocol for BN was designed to resemble the original treatment (Fairburn, 1994). Disturbed interpersonal relationships are described as those that include isolation, interpersonal skill deficits, and dissatisfaction with interpersonal relations (Wiser & Telch, 1999). These factors cause stress in the individual's life and binge eating occurs as a means of controlling and regulating distressing emotions (Wiser & Telch, 1999). The theory incorporates four problem areas of interpersonal disturbance that are discussed within the three stages of interpersonal therapy (IPT) (Wiser & Telch, 1999). The four main problems areas are grief, interpersonal role disputes, role transitions, and interpersonal deficits. Interpersonal role disputes seem to be the most common in those individuals with a diagnosis of BN (64%) (Fairburn, 1997). Role transitions, which often involve establishing independence from parents, are the second most common (36%) (Fairburn, 1997).

The problem areas are identified and discussed throughout three stages of the treatment. The first stage of the therapy is focused on identifying current interpersonal problems and determining which should be the focus of treatment. Individuals diagnosed with BN and BED

often have many interpersonal difficulties; however, they may be unaware of them due to their constant preoccupation with food, shape, and weight (Fairburn, 1997). Identifying these triggers can bring increased understanding to the individual's binge eating episodes. Stage two becomes more patient-led as the individual is encouraged to identify current interpersonal problems and to explore them in an attempt for understanding and change. Lastly, stage three involves relapse prevention and an elaboration of the changes made during treatment.

  Psychodynamic approach. Psychodynamic theory describes eating disorders, specifically AN, as the result of a disturbed body image, incorrect cognitive interpretations of feelings arising from the body, and a sense of ineffectiveness which have all come from dysfunctional patterns of interaction in childhood (Bruch, 1962, 1982). Research in the 20th Century theorized that food was a soothing replacement for an individual, such as a parent, from which the patient had been separated. This was especially true for patients diagnosed with BN. Individuals tend to maintain self-destructive behaviors (i.e., starvation, purging, over-exercise) as a way of punishing the self (Zerbe, 2009). The punishment was needed as the result of an early rejecting or critical caretaker, which established the state of not being "good enough" early on in life. The individual diagnosed with an eating disorder, particularly AN, was driven to do anything they possibly could to hide the fatal flaw of inadequacy (Bruch, 1982).

  Psychodynamic therapy addresses eating disorders by exploring the purpose of food in the family history, the patient's beliefs about food and eating, and understanding current perceptions of food that have not yet been brought to the surface. Further, "…a psychodynamic approach to eating necessitates that the patient look at food as more than a biological necessity for the body but as a test for psychological process with many potential and discoverable meanings" (Zerbe, 2009, p. 351). However, gaining weight and understanding the meaning of

food will produce only temporary changes without a "corrective change" in the body image of the individual (Bruch, 1962). Therapy helps to facilitate an awareness of the feelings and impulses that originate within the eating disorder client. Once these feelings and impulses can be recognized, treatment can help the client to judge the realistic and adaptive quality of their experiences related to food and the body (Bruch, 1962).

Family treatment of eating disorders. Family therapy approaches suggest that the suffering resulting from eating disorders extends beyond the individual with the eating disorder. The responses of family members may differ depending on the length of time the individual displays symptoms, the family structure, and the interactional style of the family (Eisler, Lock, & le Grange, 2009). Despite these varied responses of family members, there are specific ways in which AN typically affects the family as a whole. The family will usually become focused on food and eating, just as the individual diagnosed with AN has been focused. Time begins to feel frozen as the family is afraid of taking risks or trying anything new for fear the situation may become worse (Eisler, Lock, & le Grange, 2009). Individual roles in the family prior to the diagnosis and family roles as a whole may become more pronounced. Lastly, meeting the needs of the other individuals and the family unit becomes nearly impossible and the family develops a sense of helplessness (Eisler, Lock, & le Grange, 2009). Family therapy allows the opportunity to identify mechanisms of the family that may be maintaining the disorder and also introduces a safe place for family members to express how the eating disorder has affected them (Murray, 2003).

The Maudsley form of family-based treatment (FBT) is one treatment often chosen for adolescents diagnosed with AN. The treatment consists of three phases that attempt to help parents develop knowledge surrounding behavioral and psychological strategies that would be

used in an inpatient facility and also the skills needed to implement them in the home (Eisler, Lock, & le Grange, 2009). The first phase places all of the control over eating and weight restoration to the parent. The second phase includes gradually giving some control back to the patient and allowing the adolescent to eat on his or her own (Eisler, Lock, & le Grange, 2009). The final phase includes relapse prevention, an assessment of progress, and directing the adolescent down a path of normal adolescence (Eisler, Lock, & le Grange, 2009).

Hypnosis. Theories of hypnosis suggest that bulimic characteristics may be maintained by hypnotic abilities such as imaginative and dissociative capabilities (Barabasz, 1991). Patients diagnosed with BN typically have higher hypnotizability levels as measured by self-report and individuals diagnosed with AN who binge and purge are more hypnotizable than those who restrict (Mantle, 2003).

Hypnosis has been used as a way to help the patient to initially practice relaxation and develop a greater sense of self-control, specifically over eating, disordered thoughts, and behaviors (Barabasz, 2000; Mantle, 2003). This treatment has been used as an adjunct to CBT where hypnosis is implemented after laying down a cognitive-behavioral framework. However, my focus for this meta-analysis will be outcomes of the treatment when it has been used as a stand-alone intervention in the treatment of eating disorders.

Non-face-to-face Treatments

Self-help. Self-help interventions cover a variety of treatment modalities (i.e., individual versus group) and deliveries (i.e., book, telephone, computer) (Garvin, Striegel-Moore, Kaplan, & Wonderlich, 2001). These approaches are not new treatments but draw on the theories of the typical face-to-face treatments. One example of pure self-help that is often studied in the eating disorder literature is the book, *Overcoming Binge Eating*, by Fairburn (Fairburn, 1995).

There are several advantages and disadvantages to the use of self-help in a bibliotherapy format for the treatment of ED. Self-help treatments are believed to be less stigmatizing and more readily available than individual therapy or specialized treatments (Myers, Swan-Kremeier, Wonderlich, Lancaster, & Mitchell, 2004; Stefano, Bacaltchuk, Blay, & Hay, 2006). However, a con for the use of self-help is that there is no or limited possibility for the therapeutic relationship to grow and strengthen, possibly making it easier for the patient to maintain avoidant behaviors. It is also more difficult to deal with self-harming behaviors (Myers et al., 2004).

Computer/Internet approaches. Similar to self-help treatments, technology, such as the computer and Internet, provide a way for aspects of empirically based treatments to reach those who are unable to seek out treatment or who live where treatment is unavailable. In this way, patients may be effectively treated by the technology alone or the time needed with a therapist may be decreased (Bara-Carril et al., 2003).

Email has been used as an adjunct way for therapists to communicate with their patients. Benefits of the use of email include being readily accessible, quick, and encouraging (Myers et al., 2004). However, it is unclear as of yet how email interventions can address concerns of patients who are in more distress. The therapist may need to contact the patient by phone or may need to encourage individual contact at this point (Myers et al., 2004). Further, use of the Internet decreases the possibility for full confidentiality, which is an ethical concern (Myers et al., 2004).

Computerized CD-ROM software has been developed to eliminate some of the confidentiality concerns of the Internet (Myers et al., 2004). Software is typically used to provide psychoeducation and knowledge to those interested in eating disorders. It generally does not change attitudes and beliefs related to the eating disorder but may be able to do so to a small

extent (Myers et al., 2004). There have also been attempts to turn manualized treatments into CD-ROM self-help versions.

Past Reviews of Eating Disorder Treatments

National Institute for Clinical Excellence (NICE)

The most comprehensive review of eating disorder treatments was completed in 2004 by the National Collaborating Centre for Mental Health and commissioned by the National Institute for Clinical Excellence (NICE). The goal was to develop guidelines for the identification, treatment, and management of eating disorders. Specific questions included an investigation of whether psychological interventions display benefits/harm compared to wait-list control, whether CBT produces benefits or harms compared to other treatments, and whether treatments other than CBT show benefits or harm. They also looked at the effects of medication, a combination of medications and therapy, predictors of response, and follow-up outcomes.

In order to address these questions, the group searched the literature for work published or updated between 1995 and 2002. They attempted to include high-quality empirically based research, which they defined as recently published or updated randomized controlled trials (RCTs) that addressed at least one of the research questions. However, when RCTs were not available, they identified non-randomized controlled studies and pre-post one-group designs that could address the aims of the review. Meta-analysis was completed on the data extracted from the primary studies and statistical and clinical significance were taken into account before conclusions were made.

The NICE (2004) review suggested several conclusions for the treatment of eating disorders. AN can be managed on an outpatient basis by individuals who are knowledgeable in assessing the physical risk associated with eating disorders and also in treatment implementation.

Should an individual require inpatient treatment, the facility should be competent in refeeding, physical monitoring, and appropriate psychosocial interventions. Family interventions should be offered to adolescent patients. Conclusions regarding the treatment of AN were gathered from expert committee reports and the experience of respected authorities with the notation that "directly applicable clinical studies of good quality were absent or not readily available" (NICE, 2004, p. 54). Regarding the treatment of BN and BED, evidence-based practice, specifically CBT, should be implemented or medications should be offered in the case where evidence-based practice cannot be offered. They suggested that families should be included in the treatment when possible. The recommendation that CBT for BN be used first, when available, was drawn as a conclusion from RCTs that were consistent in addressing the research question and of sound statistical quality. All other recommendations regarding the treatment of BN and BED were made based on results from well-conducted clinical studies, as RCTs were not available (NICE, 2004).

Other Meta-Analytic Work

Table 1 summarizes the topic, main conclusions, and number of primary studies included of twelve meta-analyses and reviews that studied psychotherapy outcome for eating disorders. The majority were meta-analyses or included meta-analytic methods in the analysis. These meta-analyses and reviews almost exclusively studied BN except for two that focused on BED (Brownley et al., 2007) and two that focused on eating disorders in general (Newton & Ciliska, 2006; Richards et al., 2000). About half of the meta-analyses and reviews focused on CBT or behaviorally oriented treatments. However, there was one that studied outcomes for Internet interventions (Newton & Ciliska, 2006), one that studied the effects of adding dietary management to therapy (Laessle et al., 1987), one that studied any group treatment for BN

(Fetters & Peters, 1990), one that focused on effective treatments for BN (Whitbread &

McGown, 1994) and one that focused on effective treatments for BED (Vocks et al., 2010). Five

of these meta-analyses and reviews included uncontrolled studies or within-group analyses. All

but three meta-analyses focused on individual treatment (Fettes & Peters, 1990; Hartmann,

Herzog, & Drinkman, 1992; Thompson-Brenner, Glass, & Westen, 2003).

In order to address the desired aims, 92% of the meta-analyses used a random effects

analysis and tests of heterogeneity. Some focused on effect size analyses of outcome measures

that were eating disorder specific (58%) and did not analyze outcomes for other types of

measures. Most of the meta-analyses (92%) make reference to the fact that only published

studies were included in the analysis but only three (25%) of the studies ran analyses to account

for publication bias by inspecting funnel plots and calculating a fail-safe-N (Lewandowski, et al.,

1997; Vocks et al., 2010; Whittal, Agras, & Gould, 1999). In regards to follow-up, meta-analyses

have often attempted to code effect sizes at follow-up (58%); however, the power in the analysis

has been too low to make strong conclusions (Fettes & Peters, 1992; Hartmann, Herzog, &

Drinkman, 1992; Lewandowski et al., 1997).

Several conclusions can be identified from the results of past meta-analytic work. First,

CBT was found to be the most effective choice of treatment for the eating disorder diagnosis

studied (Brownley et al., 2007; NICE, 2004; Richards et al., 2007; Whitbread & McGown, 1994;

Whittal, Agras, & Gould, 1999). Second, there is growing evidence that self-help treatments are

effective in the treatment of eating disorders (Brownley et al., 2007; Vocks et al., 2010). Third,

one meta-analysis examined the effects of Internet treatments and found that the overall effect of

Internet treatment versus control was not statistically significant (Newton & Ciliska, 2006).

Lastly, there is mixed evidence regarding whether individually based treatments are more

effective than a group format (Fettes & Peters, 1990; Hartmann, Herzog, & Drinkman, 1992;

Thompson-Brenner, Glass, & Westen, 2003).

Table 1

Past Meta-Analyses Completed in the Area of Psychotherapy Outcome for Eating Disorders

Authors	Topic	Number of Studies	Main Conclusions
Brownley et al., 2007	Randomized controlled trials for BED	8	1. CBT (group or individual is effective) 2. Some evidence for DBT 3. Growing evidence for self-help
Fettes & Peters, 1990	Group treatments for BN	40	1. Pre-post effect size for group treatment: 0.75 2. Group combined with individual is better than group alone 3. No evidence for treatment type as moderator
Lewandowski et al., 1997	CBT for BN	26	1. Similar effects found for both cognitive and behavioral outcomes when compared to a control or alternative therapy
Richards et al. 2000	What works for eating disorders	28	1. Therapy preferred over medications 2. CBT found to be most efficacious
Whittal, Agras, & Gould, 1999	Psychosocial and pharmacological treatments for BN	9	1. CBT treatment of choice for BN in pre-post studies
Newton & Ciliska, 2006	Internet interventions for eating disorders	5	1. No statistical significance found when Internet compared to a Control

Cox & Merkel, 1989	Qualitative review of psychosocial treatments for BN	32	1. 3 high-quality studies found 2. Only 15/32 studies found to be acceptable
Hartmann, Herzog, & Drinkman, 1992	Psychotherapy for BN	9	1. No differences between individual and group 2. More than 15 sessions needed
Vocks et al., 2010	Psychological and Pharmacological treatments for BN	38	1. Psychotherapy and self-help found to be effective 2. Largest effect sizes found for RCTs 3. CBT helps with both eating and body dissatisfaction
Whitbread & McGown, 1994	Effective treatments for BN	19	1. CBT considered "premier" treatment in pre-post studies
Laessle, Zoettle, & Pirke, 1987	Treatment for BN	25	1. Psychological treatment with dietary management (DM) is most effective than those that do not include DM
Thompson-Brenner, Glass, & Westen, 2003	Psychotherapy for BN	27	1. Individual better than group 2. Wider range of outcome metrics need to be studied

Limitations of Previous Meta-Analyses

Previous meta-analyses had four limitations. First, six included uncontrolled designs (Fettes & Peters, 1990; Laessle, Zoettle, & Pirke, 1987; Newton & Ciliska, 2006; NICE, 2004; Vocks et al., 2010, Whitbread & McGown, 1994). Controlled designs increase the reliability of the results and our ability to make predictions regarding treatment of the target population. One meta-analysis did not specify whether separate analyses were computed for the various research

designs included and did not present the results separately for controlled and uncontrolled studies (Hartmann, Herzog, & Drinkman, 1992). Second, one meta-analysis did not report any information about the analysis methods used (Brownley et al., 2007). Thus, it would not be possible to replicate the study without contacting the authors for more information. Additionally, four meta-analyses do not include the most current standard meta-analytic methods, such as using weighted effect sizes and including tests of heterogeneity (Hartmann, Herzog, & Drinkman, 1992; Laessle, Zoetlle, & Pirke, 1987; Thompson-Brenner, Glass, & Westen, 2003; Whitbread & McGown, 1994). Third, four meta-analyses did not review all possible studies that met inclusion criteria but instead limited their search to a limited date range (Brownley et al., 2007; Newton & Ciliska, 2006; NICE, 2004; Whitbread & McGown, 1994). Fourth, in five of the meta-analyses effect size analyses were restricted to outcome measures of binge eating, purging and body dissatisfaction measures rather than also exploring measures of symptoms found to be comorbid with eating disorders (i.e., depression) (Fettes & Peters, 1990; Hartmann, Herzog, & Drinkman, 1992; Laessle, Zoetlle, & Pirke, 1987; Thompson-Brenner, Glass, & Westen, 2003; Whitbread & McGown, 1994). Table 2 summarizes the limitations of previous meta-analyses.

Table 2

Limitations of Previous Meta-Analyses

Authors	Out-dated	Study Single Diagnoses	Study Single Treatments	Uncontrolled Designs	Meta-analytic Methods not Up-to-date	Restricted Range of Studies	Restricted Outcome Measures
Brownley et al., 2007	X	X			X	X	
Fettes & Peters, 1990	X	X		X			X
Lewandowski et al., 1997	X	X	X				
Richards et al., 2000	X						
Whittal, Agras, & Gould, 1999	X	X	X				
Newton & Ciliska, 2006	X			X		X	
Cox & Merkel, 1989	X	X					
Hartmann, Herzog, & Drinkman, 1992	X	X		X	X		X
Vocks et al., 2010	X	X		X			
Whitbread & McGown, 1994	X	X		X	X	X	X
Laessle, Zoettle, & Pirke, 1987	X	X		X	X		X
Thompson-Brenner, Glass, & Westen, 2003	X	X			X		X
NICE, 2004	X				X		X

Current Meta-Analysis

I addressed each of these limitations in the present meta-analysis. First, I focused only on randomized trials that compare psychotherapy to a control or an alternative treatment. Additionally, I ensured that my analyses did not combine effect sizes from disparate comparison conditions. I used the currently accepted best practices in meta-analysis (e.g., random effects analysis, tests of heterogeneity) and followed recommended reporting practices (Liberati et al., 2009). Third, I included all possible primary studies between 1980 and 2010 that met inclusion criteria. Fourth, I added to previous meta-analytic work by computing effect sizes for outcome measures beyond those considered to be primary in eating disorder treatment. Therefore, I included measures of mood, interpersonal interactions, and self-esteem. Fifth, I conducted analyses to assess the impact of attrition and diagnostic severity on the aggregate effect size. Attrition was coded as the number of individuals who did not complete treatment as reported in the study. Diagnostic severity, when reported, was coded as the pre-test global Eating Disorder Examination (EDE) score. This method was chosen because the EDE is the current best accepted standardized diagnostic measure for eating disorders. In addition, I used a piloted coding manual that has been created based on those available in past research and based on variables that have been found to show an effect in eating disorder treatment. I also addressed outcomes for all brands of psychotherapy discussed above, including traditional talk therapy, self-help and Internet approaches.

Aims of Current Meta-analysis

The three aims of this meta-analysis are:

1. To update the outcome literature and include all randomized clinical trials, between the years of 1980 and 2010, that include comparisons of traditional talk therapy, self-help or an Internet approach to a control or alternative therapy.

2. To compare the outcomes of self-help and Internet approaches to control conditions and more traditional treatments.

3. To explore a wider range of moderators than past meta-analyses. I explore the following variables that could moderate outcome:

   - CBT versus all other treatments

   - Specific Diagnosis

   - Format of treatment (i.e., individual versus group)

   - Attrition Rates

   - Diagnostic Severity (Based on pre-test global EDE score)

Hypotheses

1. The eating disorder literature has demonstrated that psychotherapy is effective in the treatment of primary eating disorder symptoms. Further, there is growing evidence for self-help treatments. Therefore, I hypothesize that psychotherapy treatments will be more effective than control conditions in the treatment of eating disorders.

2. In the previous meta-analyses that included CBT, it was found to be the most effective choice for the eating disorder diagnosis studied. Therefore, I hypothesize that CBT will show a larger effect for treatment outcome when compared to other treatments.

3. Fairburn (2008) suggested that eating disorders can be treated transdiagnostically. Therefore, I hypothesize that the specific diagnosis of eating disorder will not significantly influence the relationship between treatment and outcome.

4. Previous meta-analyses have generally found no differences for outcome between individual and group treatments for eating disorders. Therefore, I hypothesize that there will be not be a difference in outcome between individual and group treatments.

5. Research has shown that one-third of eating disorder patients drop out of treatment and thus far the research has suggested that those who discontinue treatment are not a homogenous population in regards to demographics or clinical presentation (Mahon, 2000). Therefore, I hypothesize that an increase in attrition will lead to increased positive treatment outcomes.

Methods

Selection of Studies

Three methods were used for identifying potential studies to include in the meta-analysis. First, I identified past meta-analyses and systematic reviews of psychosocial treatments for eating disorders. The identified meta-analyses included studies published during the time period from 1980-2010. Studies for the current meta-analysis were identified by manually reviewing those used in past meta-analyses. Second, I identified further studies by completing an exhaustive search of *PsycINFO, Medline/PubMed* and *Dissertation Abstracts International* using the following terms: "Anorexia," "AN," "Anorexia Nervosa," "Bulimia," "BN," "Bulimia Nervosa," "Binge-eating disorder," "BED," "Eating Disorder," and "Outcome," or "Psychotherapy Outcome." The present meta-analysis included studies, which were published in the years 1980-2010. Third, I attempted to search for dissertations and unpublished data.

However, I did not locate any dissertations or unpublished studies that met our inclusion criteria. Thus, I statistically assessed for possible publication bias.

Inclusion criteria. To be included in the present meta-analysis, studies needed to compare the outcome of a psychotherapeutic treatment to a control condition or another psychotherapeutic treatment for one or more of the following diagnoses: Bulimia Nervosa, Anorexia Nervosa, Binge-Eating Disorder, and Eating Disorder Not Otherwise Specified. Participants had to be diagnosed according to DSM-III or DSM-IV criteria to ensure the definition of eating disorder remained consistent across included studies. Patients needed to be randomized to condition. All included studies were in English. All decisions regarding which studies to be included in the present study were made *a priori,* before examining the results of the individual studies.

Exclusion criteria. I excluded studies that only included comparisons of psychopharmacological treatments to a control or alternative psychopharmacological treatment. However, in some cases, psychopharmacological studies were included when there was also a possible comparison of a psychosocial treatment to a control or alternative treatment. Case studies and single-subject designs were not included. Studies were also excluded that tested the efficacy of a psychosocial treatment after another treatment had failed. See Appendix A for the list of primary articles that met inclusion criteria for the meta-analysis.

Codes

The identified studies were coded by one graduate student and one advanced undergraduate student under the supervision of a faculty member in the field of psychology. A coding manual (Appendix B) was created and piloted specifically for this study and included definitions, coding categories and formats for all variables of interest encountered in the coding

process. The information gathered was used in order to gain descriptive information of the studies and also to complete moderator and effect size analyses.

Study level codes. I used three criteria to code for information descriptive of the overall study: (a) *Year of Study,* (b) *Disorder Type*: diagnosis focused on in the study, and (c) *Criteria Used for Diagnosis:* standardized diagnostic system used or not (i.e., DSM or ICD criteria).

Comparison level codes. I used eighteen criteria to code information about the comparisons made within the study. The following criteria were used to address which treatments and treatment characteristics should be considered for each diagnosis of eating disorder (Aims 2 and 3): (a) *Level of Severity of the Patient in the Treatment Condition*: coded using pre-test EDE global score when available, (b) *Level of Severity of the Patient in the Comparison Condition:* coded using pre-test EDE global score when available, (c) *Treatment Type:* theory or treatment used in the study, (d) *Comparison Type:* theory or treatment used as the comparison, (e) *Number of Sessions in the Treatment Condition,* (f) *Number of Sessions in the Comparison Condition*, (g) *Attrition in the Treatment Condition*, and (h) *Attrition in the Comparison Condition.* The following codes were used to address which formats of treatment for eating disorders have better outcomes (Aim 3): (i) *Format of Treatment in Treatment Condition:* method of delivery of the treatment (i.e., individual, group, etc.) (j) *Format of Treatment in the Comparison Condition:* method of delivery of the comparison treatment (i.e., individual, group, etc.). The following information was coded in order to take into account the sample size of the treatment or comparison of interest: (k) *Number of Subjects Assigned to the Treatment Condition,* and (l) *Number of Subjects Assigned to the Comparison Condition.*

Measure level codes. Three pieces of measure- and assessment-related information were coded for each comparison within each study: (a) *The timing of the assessment* (i.e., post-test or

follow-up), (b) *Type of Outcome Measure* (i.e., primary or secondary) *Within the Study*, and the (c) *Broad Category of Measure* (i.e., binge or purge).

Effect Size Calculation

The effect size measure used was the standardized mean difference statistic. When possible, the standardized mean difference statistic was computed directly using Hedge's *g* (Hedges & Olkin, 1985, Equation 3, p. 78):

$$g = \frac{\overline{X}_1 - \overline{X}_2}{s_p}$$

where $\overline{X}_1$ and $\overline{X}_2$ are the means for groups 1 and 2, respectively, and s_p is the pooled standard deviation. When standard deviations were not reported, *g* was estimated using methods described in Shadish, Robinson, and Lu (1999). The *Effect Size* (*ES*) program was used to calculate effect sizes when standard information (i.e., means or standard deviations) was missing (Shadish, Robinson, & Lu, 1999). Where results were reported only as nonsignificant, $g = 0.00$ was coded. Where results were reported only as significant, *g* was calculated assuming $p = 0.05$. Hedges and Olkin's (1985) correction was applied to all resulting effect sizes because *g* is biased in small samples. This corrected effect size is considered *d* and was used in the analyses, rather than *g* (Baldwin & Shadish, 2011).

Inter-rater Reliability

To assess inter-rater reliability, an advanced psychology student and I coded each item listed above for $N = 1$ treatment-control comparison from 10 studies (using only one outcome measure per study). Reliability was assessed using the Kappa statistic for categorical variables and Pearson's *r* for continuous variables. If low reliability was found on any of the codes, the codes were discussed, rewritten and then recoded for each study. Reliability was then

recomputed. This process was followed until sufficient reliability was found for each code (Kappa is greater than or equal to 0.80). Specifically, the process was completed two times in order to obtain sufficient reliability. After the second round of reliability coding, for categorical variables, percentage agreement ranged from 90% to 100% with a median of 100%; kappa ranged from 0.90 to 1.00 with a median of 1.00; and for continuous variables, the correlation between raters ranged from $r = 0.76$ to 1.00, with a median of 1.00. With regard to Kappa, Fleiss (1981) stated that "for most purposes, values greater than .75 or so may be taken to represent excellent agreement beyond chance, values below .40 or so may be taken to represent poor agreement beyond chance, and values between .40 and .75 may be taken to represent fair to good agreement beyond chance" (p. 218). Thus, all variables were sufficiently reliable to proceed.

Analysis

Study-level effect sizes were calculated using the process described above and then averaged within a study so that each study produced only one effect size. I then used a random effects model to aggregate effects across studies because I wanted the results to generalize beyond the studies included in the meta-analysis (Baldwin & Shadish, 2011) and I wanted to allow for between-study heterogeneity.

Power was assumed to be a function of the population effect size, number of studies, and degree of heterogeneity among the effect size and was computed according to the methods outlined in Baldwin and Shadish (2011). Power typically increases as the population effect size and number of studies increase and as the degree of heterogeneity decreases (Baldwin & Shadish, 2011). *Stata* (StataCorp, 2001) software was used to complete all statistical analyses. I analyzed treatment versus treatment effect sizes separately from those of treatment versus control conditions. The degree of heterogeneity in effect sizes was assessed with Q and I^2. Influence

analyses were also completed to assess the influence of individual studies on the overall effect sizes as well as heterogeneity. I used meta-regression to assess whether moderator variables, including type of disorder, type of outcome measure (i.e., primary versus secondary) attrition or diagnostic severity, predicted the size of the effect. For diagnostic severity I analyzed the difference in severity between conditions and also whether there was a difference between the average severity for each study. I also used multivariate analyses to identify whether the type of the measure (i.e., eating disorder vs. mood, primary vs. secondary, etc.) may moderate outcome. Measures were coded as "primary" or "secondary" and used in the respective analysis when the authors of the original study indicated that a measure was considered as such in their original analyses. By definition, a measure considered "primary" in statistical analyses is defined as such because the measure assesses for a primary outcome of interest (i.e., 'binge-eating' in the study of eating disorders).

Publication bias. To investigate possible publication bias I used four methods. First, *Stata* (StataCorp, 2001) software was used to create funnel plots, which graphically display the effects of publication bias on the results. Funnel plots are a type of scatter plot that plots the effect size on the x-axis and the standard error of the effect size on the y-axis. Publication bias was identified when funnel plots resulted as asymmetrical meaning that small and negative effects were not present in the results. However, asymmetry can sometimes occur for other reasons such as heterogeneity due to sample size or chance (Baldwin & Shadish, 2011). Second, the effects of publication bias were detected using the trim-and-fill method. This method "trims" the studies causing funnel plot asymmetry and then uses the trimmed funnel plot to estimate the true center of the funnel. The test then provides you with an estimated number of the "missing" studies that would produce a symmetrical plot and also an estimated effect size including the

original and "missing" studies. A notable change in effect size (i.e., medium effect to small effect) could suggest publication bias. Third, I used Egger's regression test (Egger, Davey Smith, Schneider, & Minder, 1997), which tests whether smaller studies tend to have larger effect sizes than would be expected. Significant results suggest that publication bias may be indicated. Fourth, I used Begg's Rank Correlation test (Begg & Mazumdar, 1994), which produces a correlation that represents the relationship between the standardized treatment effect and the variance of the treatment effect. Significant results suggest that publication bias may be indicated.

Publication bias is more difficult to interpret when a comparison includes only a small number of observations. Therefore, I limited my analyses of publication bias to my comparisons with the largest number of observations: treatment versus control and CBT versus alternative active treatment.

Results

Sample Characteristics

The current meta-analysis included 69 studies with 142 comparisons. Nine studies were eliminated from the original 78 during the coding process. Studies were eliminated for the following reasons (Figure 1): one study presented results as completers versus non-completers rather than according to treatment, two studies did not randomly assign participants to treatment, four studies used the same sample of participants as another study already included, one study identified predictors of treatment rather than treatment outcome, and one study excluded participants who met full criteria for an eating disorder diagnosis.
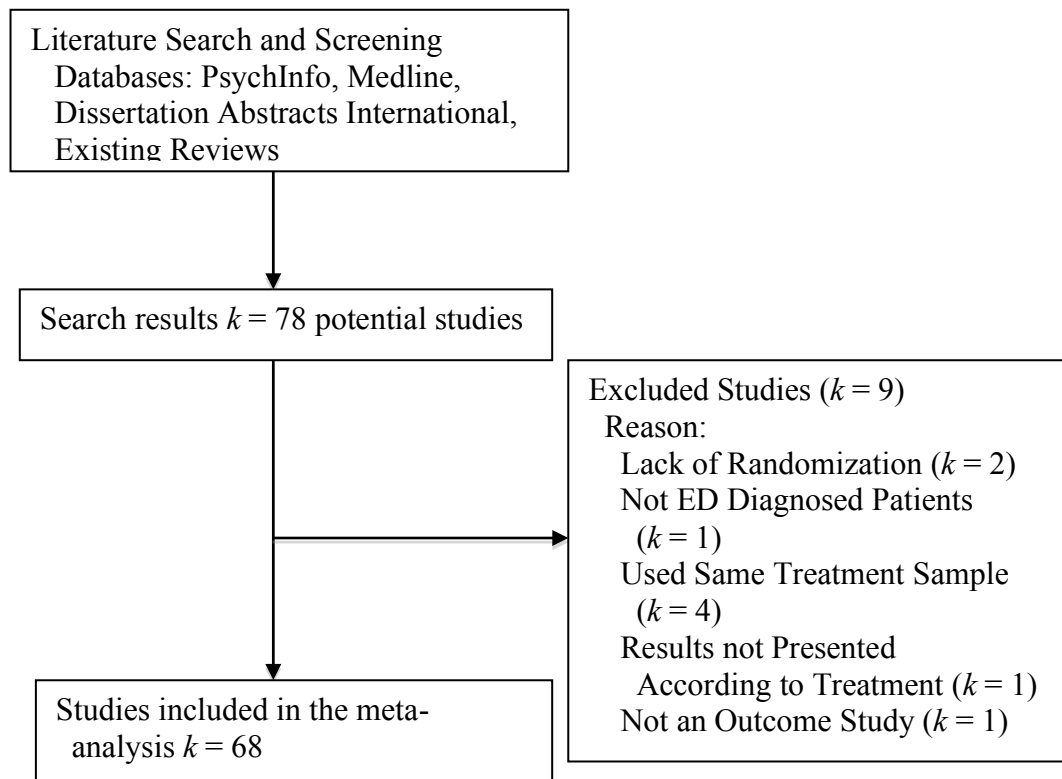
Figure 1. Flow chart describing identification and selection of studies.

A total of ten broad comparison categories, with 142 total comparisons, were compared through effect size analyses: 27 included an active treatment compared to a control, 20 compared Cognitive Behavioral Therapy (CBT) to an alternative active treatment, three compared CBT to Interpersonal Psychotherapy (IPT), six compared CBT to Behavioral Therapy (BT), seven compared family treatments to alternative active treatments, three compared a treatment delivered via the Internet to a control, two compared an active treatment to a treatment delivered via the internet, three compared a self-help treatment to a control, and six compared an active treatment to a self-help treatment. There were also six studies that included a direct comparison of individual and group treatments. In addition, I identified fifteen studies that could be included in an indirect analysis where format of treatment (i.e., individual versus group) was considered a moderator. Of these fifteen studies, three delivered treatment in an individual format and twelve

delivered treatment in a group format. Power was low in all analyses except for those of the

treatment versus control comparison.

Aggregate Effects

Table 3 presents the aggregate effect size and heterogeneity estimates for each

comparison type at both posttest and follow-up (range: six weeks to five years). A positive effect

size suggests that the first condition outperformed the second.

Active treatment versus control. Twenty-seven studies randomized participants to an

active treatment or a control. Figure 2 displays a forest plot of the study-level effect sizes

(aggregated across measures within a study) and 95% confidence intervals for each study, along

with the citation, total sample size for the active treatment versus control comparison, and the

aggregate effect size and confidence interval. Study-level effect sizes are represented by squares,

where the size of the square represents the weight of the study in the analysis. Twenty-two of the

studies contributed a nonsignificant effect size and five studies contributed a significant effect

size. The random-effects average effect size was $\bar{d} = 0.33$ ($p < .01$, 95% CI [0.19-0.46]),

indicating that the treatments outperformed control. This result differed from past meta-analyses

that found strong evidence for or a large effect favoring treatments over control (Fettes & Peters,

1990, $\bar{d} = 0.71$; NICE, 2004, Risk Ratio = 0.30-0.75; & Vocks et al., 2010, $\bar{d} = 0.82/0.84$).

Homogeneity of effect size was rejected, $Q(26) = 38.99$, $p = .05$, suggesting that there is

variability, beyond sampling error, that is impacting the effect size.

A review of the effects contributed by the individual studies included in the analysis

showed that the Lee et al. (1986) study demonstrated a noticeably larger effect ($\bar{d} = 1.28$) than

the other studies ($\bar{d} = -0.22-0.93$). Thus, the analysis of this comparison was repeated without

the Lee et al. (1986) study. Leaving out Lee et al. (1986) reduced the overall effect size from $\bar{d} =$

0.33 to $\bar{d} = 0.30$ ($p = .00$, 95% CI [0.17-0.42]), which is not a considerable reduction and thus

Lee et al. (1986) was included in all future analyses. However, the between-studies variance

component was reduced to $\tau^2 = 0.03$ ($I^2 = 24.4\%$), and heterogeneity was no longer statistically

significant.

Table 3

Effect Sizes for the Overall Comparisons

Comparison	d	k	95% CI	I^2
Posttest				
Treatment versus Control	*0.33	27	0.189, 0.461	**33.3%
CBT versus Alternative Treatment	*0.16	20	0.030, 0.281	0.0%
CBT versus IPT	0.17	3	-0.102, 0.433	0.0%
CBT versus BT	0.17	6	-0.112, 0.458	0.0%
Family versus Alternative Treatment	0.17	6	-0.147, 0.478	**55.5%
Internet versus Control	*0.54	3	0.190, 0.897	44.2%
Alternative Treatment versus Internet	0.12	2	-0.239, 0.482	0.0%
Self-Help versus Control	0.30	3	-0.132, 0.740	55.3%
Alternative Treatment versus Self-Help	-0.07	6	-0.253, 0.105	7.6%
Individual versus Group	0.16	6	-0.045, 0.373	0.0%
Follow-Up				
Treatment versus Control	0.07	13	-0.080, 0.212	0.0%
CBT versus Alternative Treatment	0.12	15	-0.020, 0.261	0.0%
CBT versus IPT	0.11	2	-0.186, 0.414	0.0%
CBT versus BT	0.08	4	-0.287, 0.445	0.0%
Family versus Alternative Treatment	0.16	4	-0.081, 0.390	0.0%
Alternative Treatment versus Internet	0.10	2	-0.292, 0.496	0.0%
Alternative Treatment versus Self-Help	0.06	5	-0.138, 0.251	0.0%
Individual versus Group	0.03	4	-0.205, 0.262	0.0%

*$p < .05$ for the significance test of the aggregate effect size; ** $p < .05$ for the significance test of the homogeneity
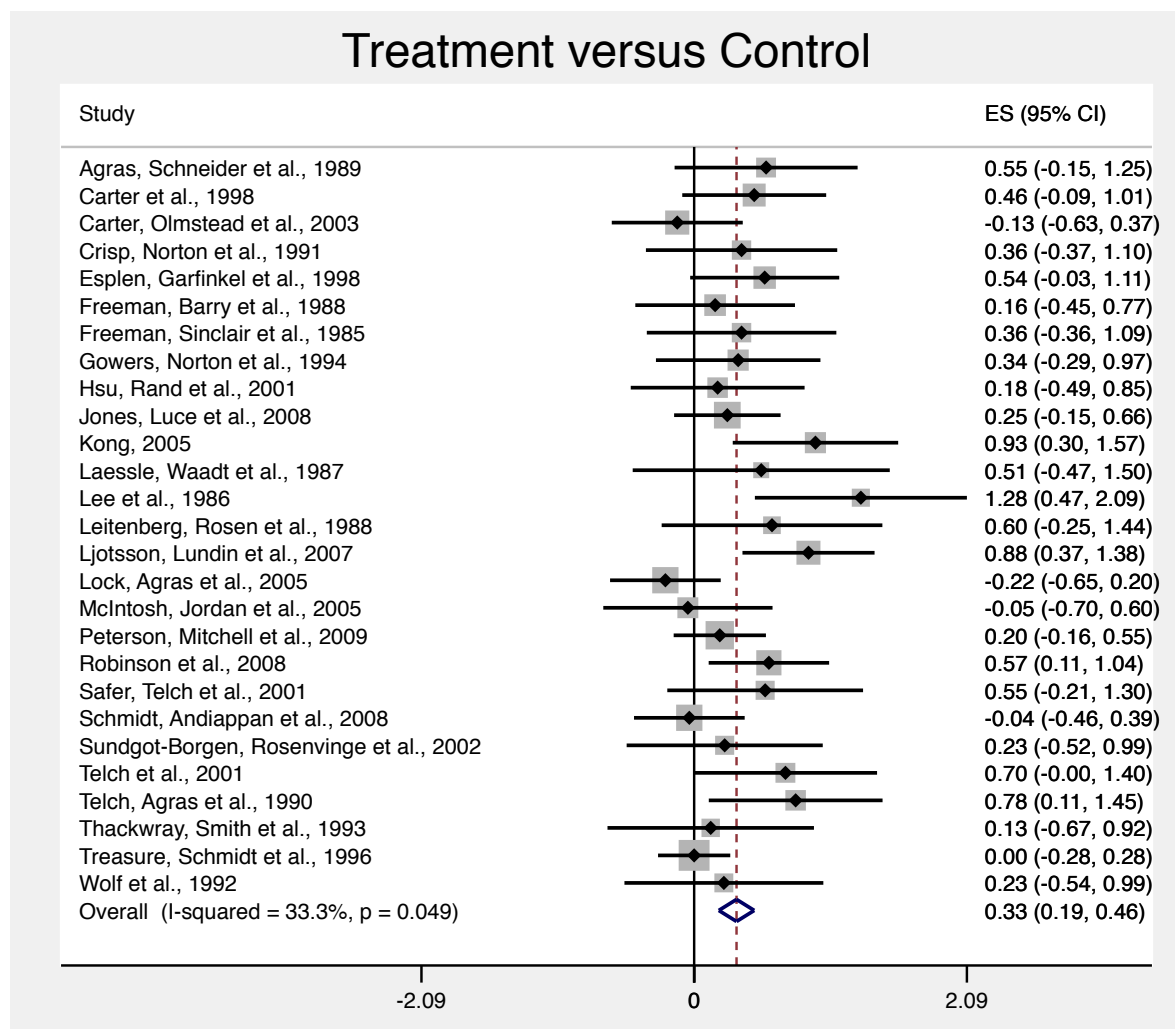
Figure 2. Forest plot of effect sizes for the treatment versus control comparison.

Thirteen studies completed assessments at a follow-up time point after randomizing to

and treating participants in an active treatment or control condition. The random effects

weighted-average effect size was $\bar{d} = 0.07$ ($p = .38$, 95% CI [-0.80-0.21]) and was not

statistically significant. Homogeneity of effect size was not rejected, $Q(12) = 9.65$, $p = .65$, $\tau^2 =$

0.00, and $I^2 = 0.0\%$. Thus, there is not variability, beyond sampling error, impacting the effect

size.

CBT versus all active treatments. Twenty studies randomized participants to CBT or

another active treatment. The random-effects average effect size was $\bar{d} = 0.16$ ($p = .02$, 95% CI

[0.03-0.28]), indicating that CBT outperformed alternative active treatments (Figure 3). The between-studies variance component was $\tau^2 = 0.00$ and $I^2 = 0.0$. Homogeneity of effect size was not rejected, $Q(19) = 13.67$, $p = .80$.

CBT versus Alternative Treatment

Study		ES (95% CI)
Agras, Schneider et al., 1989		0.55 (-0.15, 1.25)
Agras, Walsh et al., 2000		0.23 (-0.12, 0.57)
Bailer, de Zwann et al., 2004		-0.49 (-1.03, 0.05)
Ball et al., 2004		-0.11 (-1.04, 0.81)
Cooper et al., 1995		-0.12 (-0.88, 0.64)
Davis, McVey et al., 1999		0.42 (-0.15, 0.98)
Fairburn, Jones et al., 1991		0.17 (-0.38, 0.72)
Fairburn, Kirk et al., 1986		0.56 (-0.30, 1.42)
Freeman, Barry et al., 1988		0.16 (-0.45, 0.77)
Freeman, Sinclair et al., 1985		0.36 (-0.36, 1.09)
Garner, Rockert et al., 1993		0.54 (-0.05, 1.12)
Griffiths, Hadzi-Pavlovic et al., 1996		0.15 (-0.42, 0.73)
Hsu, Rand et al., 2001		0.18 (-0.49, 0.85)
Leitenberg, Rosen et al., 1988		0.60 (-0.25, 1.44)
McIntosh, Jordan et al., 2005		-0.05 (-0.70, 0.60)
Sundgot-Borgen, Rosenvinge et al., 2002		0.23 (-0.52, 0.99)
Thackwray, Smith et al., 1993		0.13 (-0.67, 0.92)
Wilfley, Welch et al., 2002		0.10 (-0.21, 0.41)
Wilson, Wilfley et al., 2010		0.00 (-0.37, 0.37)
Wolf et al., 1992		0.23 (-0.54, 0.99)
Overall (I-squared = 0.0%, p = 0.802)		0.16 (0.03, 0.28)

-1.44   0   1.44

Figure 3. Forest plot of effect sizes for the CBT versus alternative active treatments comparison.

A review of the comparisons included in the analysis revealed that the Wilson et al. (2010) study was a comparison of CBT in self-help treatment format whereas the other CBT treatments were individual. However, it should be noted that the CBT self-help treatment in Wilson et al. (2010) is therapist-guided. When Wilson et al. (2010) was excluded, the random

effects weighted average effect was $\bar{d} = 0.18$($p = .01$, 95% CI [0.42-0.31]), which is not a considerable difference of effect. The between studies variance component, τ^2, and I^2 did not change and homogeneity of effect size was still not rejected, $Q(18) = 12.92$, $p = .80$.

Fifteen studies completed assessments at a follow-up timing point after randomizing to and treating participants in CBT or alternative active treatment condition. The random-effects average effect size comparing CBT and alternative active treatments at follow-up was $\bar{d} = 0.12$ ($p = .09$, 95% CI [-0.20-0.26]) (Table 3) and was not statistically significant. Homogeneity of effect size was not rejected, $Q(14) = 8.40$, $p = .87$, $\tau^2 = 0.00$, and $I^2 = 0.0\%$.

CBT versus IPT. Three studies randomized participants to CBT or IPT. The random-effects average effect size comparing CBT and IPT was $\bar{d} = 0.17$ ($p = .23$, 95% CI [-0.10-0.43]) and was not significant (Figure 4). Homogeneity of effect size was not rejected, $Q(2) = 0.53$, $p = .77$, $\tau^2 = 0.00$, and $I^2 = 0.00$.

Two studies completed assessments at a follow-up timing point after randomizing to and treating participants in CBT and IPT. The random-effects average effect size comparing CBT and IPT at follow-up was $\bar{d} = 0.11$($p = .46$, 95% CI [-0.19-0.41]) (Table 3) and was not significant. Homogeneity of effect size was not rejected, $Q(1) = 0.19$, $p = .67$, $\tau^2 = 0.00$, and $I^2 = 0.0\%$.
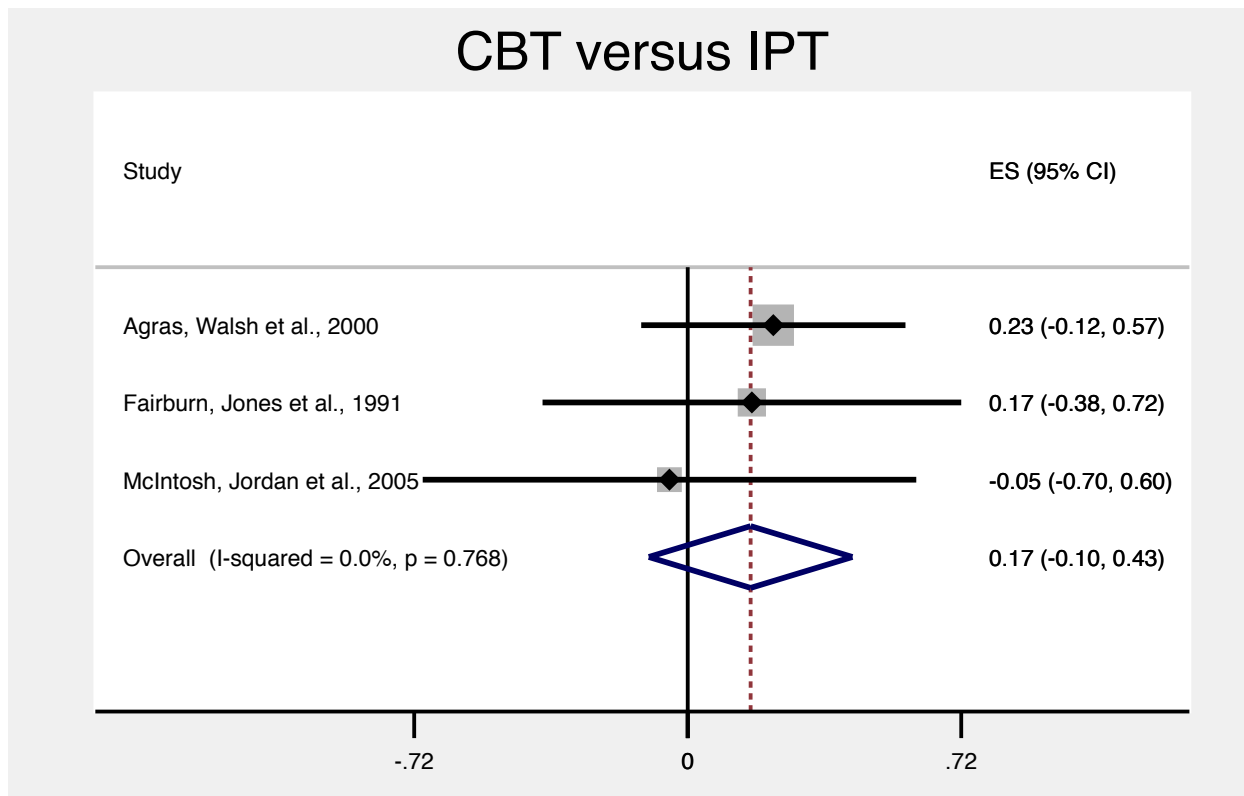
Figure 4. Forest plot of effect sizes for the CBT versus IPT comparison.

CBT versus BT. Six studies randomized participants to CBT or BT. The random-effects

average effect size comparing CBT and BT was $\bar{d} = 0.17$ ($p = .23$, 95% CI [-0.11-0.46]) and was

not significant (Figure 5). Homogeneity of effect size was not rejected, $Q(5) = 0.67$, $p = .99$, $\tau^2 =$

0.00, and $I^2 = 0.0\%$.

Four studies completed assessments at a follow-up timing point after randomizing to and

treating participants with CBT or BT. The random effects weighted-average effect size

comparing CBT and BT at follow-up was $\bar{d} = 0.08$($p = .67$, 95% CI [-0.29-0.45]) (Table 3) and

was also not significant. Homogeneity of effect size was not rejected, $Q(3) = 1.95$, $p = .58$, $\tau^2 =$

0.00, and $I^2 = 0.0\%$.
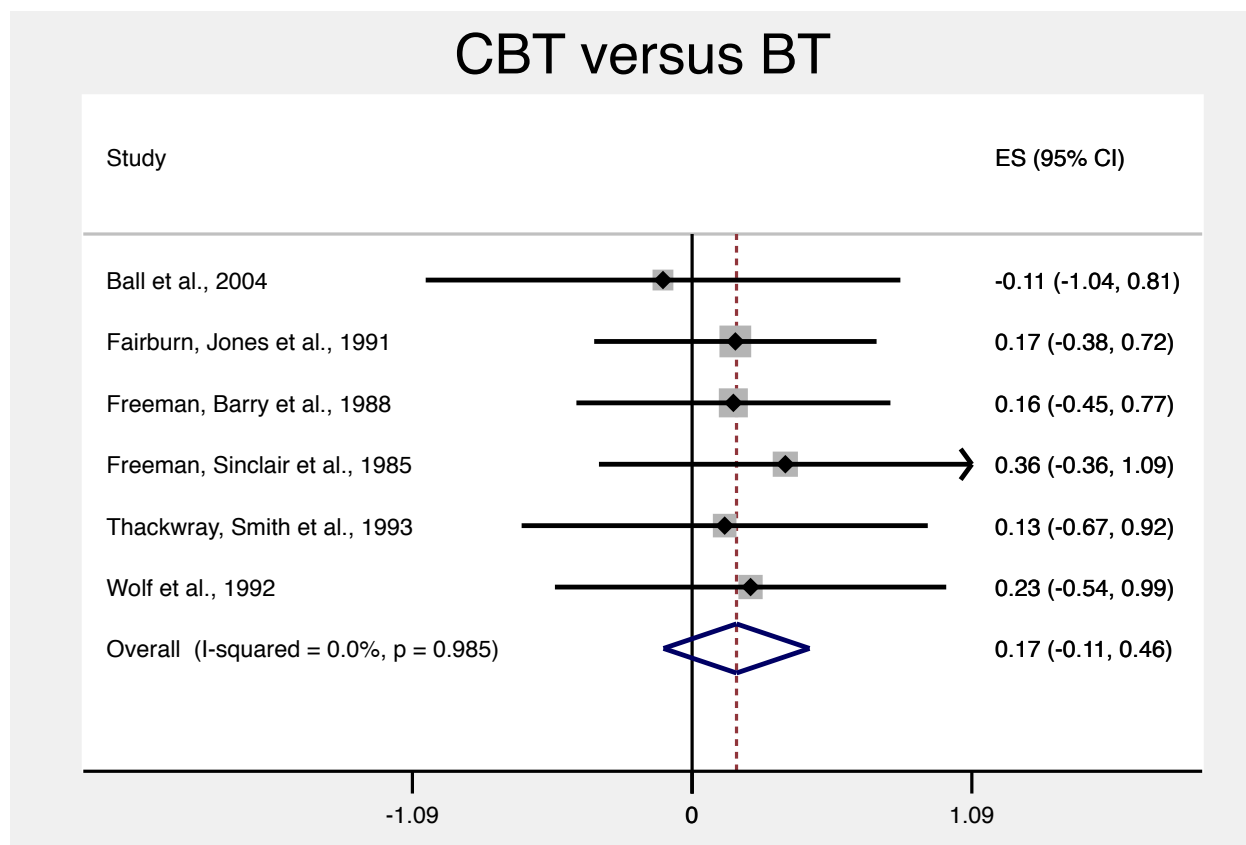
Figure 5. Forest plot of effect sizes for the CBT versus BT comparison.

Family treatment versus all active treatments. Seven studies randomized participants to family treatment or an alternative treatment. The random-effects average effect size comparing family treatments and alternative treatments was $\bar{d} = 0.17$ ($p = .30$, 95% CI [-0.15-0.48]) and was not statistically significant (Figure 6). Homogeneity of effect size was rejected, $Q(5) = 11.24$, $p = .047$, $\tau^2 = 0.08$, and $I^2 = 55.5\%$.

A review of the comparisons included in the analysis revealed that the Eisler et al. (2000) study included the family in both treatment conditions, although, the family was considered "separated" in one of the conditions. When Eisler et al. (2000) was excluded the random effects weighted average effect was $\bar{d} = 0.20$ ($p = .18$, 95% CI [-0.10-0.50]), which is not a considerable difference of effect. The between-studies variance component was $\tau^2 = 0.08$ and $I^2 = 56.8\%$.

Homogeneity of effect size was rejected, $Q(5) = 11.58$, $p = .04$, suggesting that there are significant differences between studies that are impacting the effect size.

Four studies completed assessments at a follow-up timing point after randomizing to and treating participants with family treatment or an alternative active treatment. The random-effects average effect size comparing family treatment and alternative active treatments at follow-up was $\bar{d} = 0.16$ ($p = .20$, 95% CI [-0.08-0.39]) (Table 3) and was not statistically significant. Homogeneity of effect size was not rejected, $Q(3) = 1.70$, $p = .64$, $\tau^2 = 0.00$, and $I^2 = 0.0\%$.

Figure 6. Forest plot of effect sizes for the family treatments versus alternative active treatments comparison.

Internet treatment versus control. Three studies randomized participants to an Internet treatment or control. The random-effects average effect size was $\bar{d} = 0.54$ ($p = .003$, 95% CI

[0.19-0.90]), indicating that Internet treatments outperformed control (Figure 7). The between-studies variance component was $\tau^2 = 0.04$ and $I^2 = 44.2\%$. Homogeneity of effect size was not rejected, $Q(2) = 3.58$, $p = .17$.

Internet versus Control

Study		ES (95% CI)
Jones, Luce et al., 2008		0.25 (-0.15, 0.66)
Ljotsson, Lundin et al., 2007		0.88 (0.37, 1.38)
Robinson et al., 2008		0.57 (0.11, 1.04)
Overall (I-squared = 44.2%, p = 0.167)		0.54 (0.19, 0.90)

-1.38   0   1.38

Figure 7. Forest plot of effect sizes for the Internet treatments versus control comparison.

A leave-one-out analysis was not completed because, with only three studies in the analysis, it is believed that the results may be impacted by imprecision. Further, a review of the studies suggested that a difference could have resulted simply from the different formats of Internet treatments conducted in each study (i.e., nonspecific, therapist-administered, or CBT-specific).

There was only one study that reported follow-up data for this comparison. Jones, Luce et al. (2008) found a small effect ($\bar{d} = 0.05$) favoring Internet treatments over control conditions.

Active treatment versus internet treatment. Two studies randomized participants to an active treatment or Internet treatment. The random-effects average effect size comparing an alternative active treatment and an Internet treatment was $\bar{d} = 0.12$ ($p = .51$, 95% CI [-0.23-0.48]) and was not statistically significant (Figure 8). Homogeneity of effect size was not rejected, $Q(1) = 0.30$, $p = .59$, $\tau^2 = 0.00$, and $I^2 = 0.0\%$.
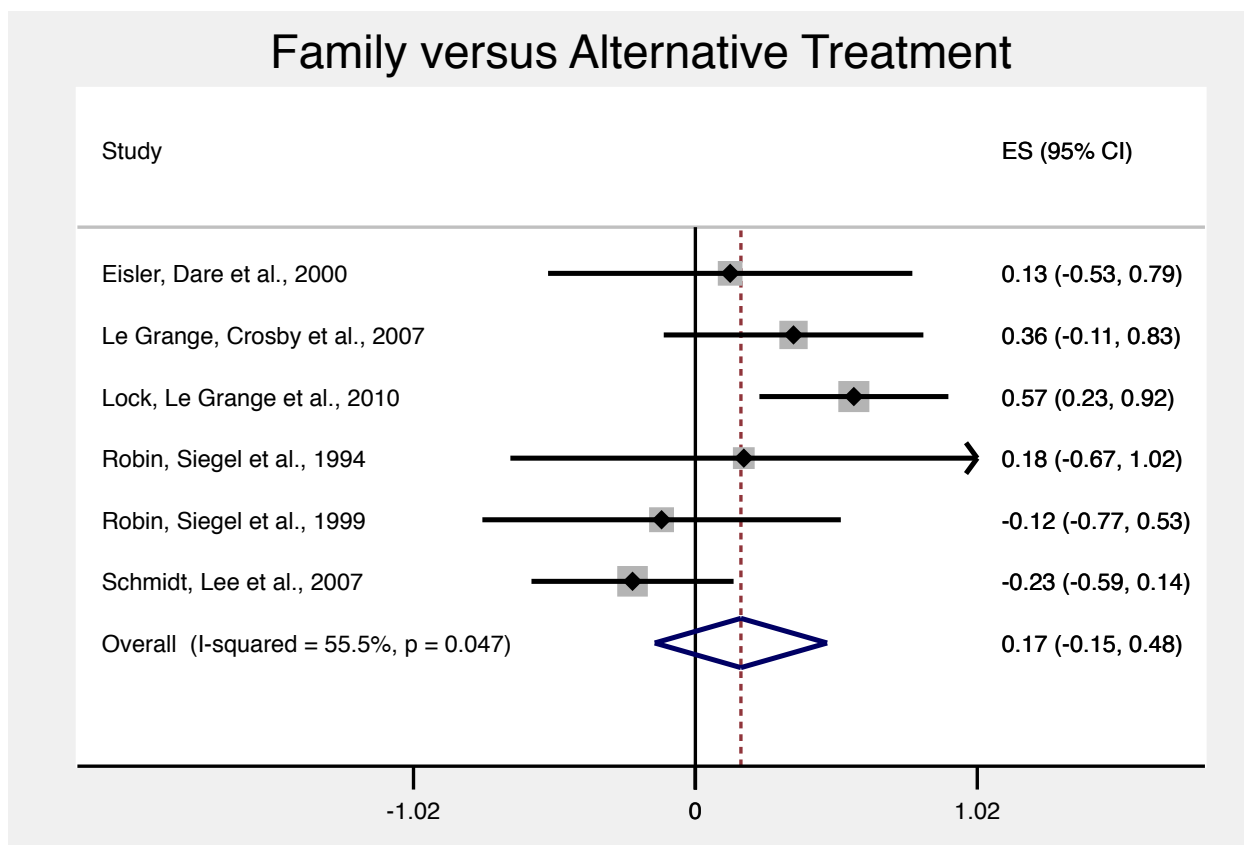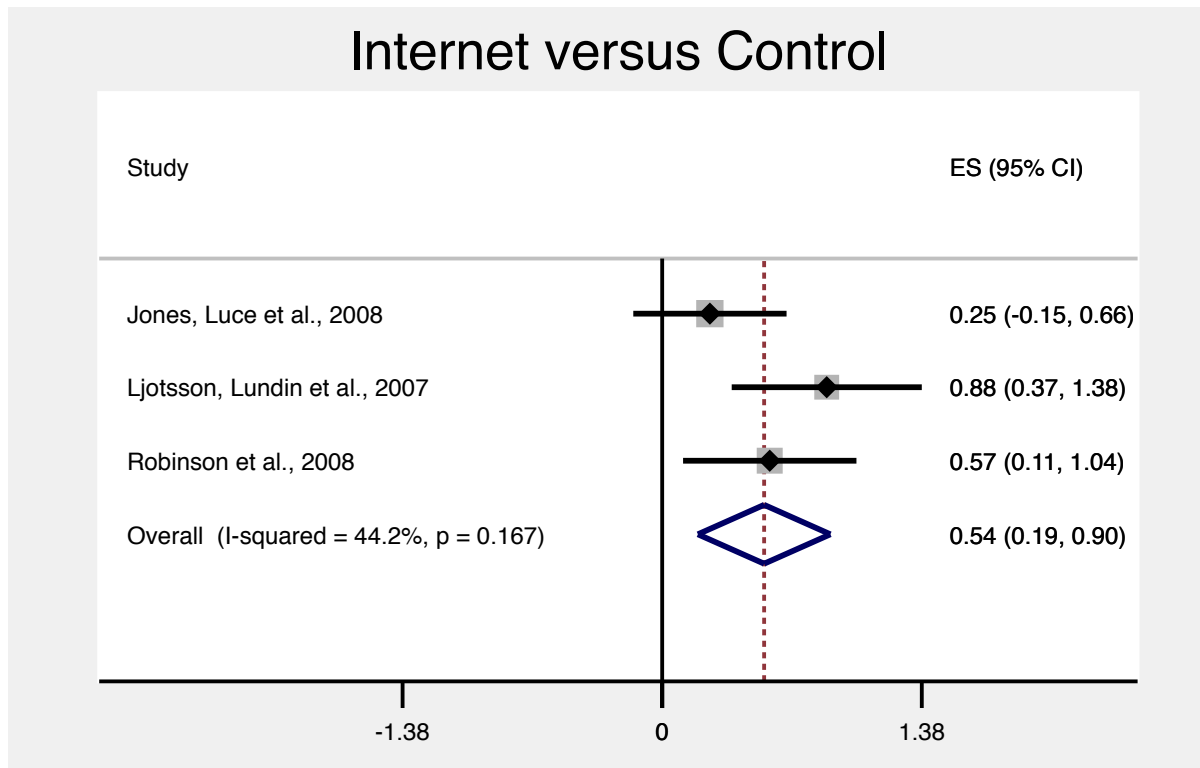

Figure 8. Forest plot of effect sizes for the alternative active treatments versus Internet treatments comparison.

Two studies completed assessments at a follow-up timing point after randomizing to and treating participants with an active treatment or an Internet treatment. The random-effects average effect size comparing active treatments and Internet treatments at follow-up was $\bar{d} = 0.10$ ($p = .61$, 95% CI [-0.29-0.50]) (Table 3) and was also not statistically significant. Homogeneity of effect size was not rejected, $Q(1) = 0.25$, $p = .62$, $\tau^2 = 0.00$, and $I^2 = 0.0\%$.

Self-help treatment versus control. Three studies randomized participants to a self-help treatment or control. The random-effects average effect size comparing self-help treatment and control was $\bar{d} = 0.30$ ($p = .17$, 95% CI [-0.13-0.74]) and was not statistically significant (Figure 9). Homogeneity of effect size was not rejected, $Q(2) = 4.48$, $p = .11$, $\tau^2 = 0.08$, and $I^2 = 55.3\%$.

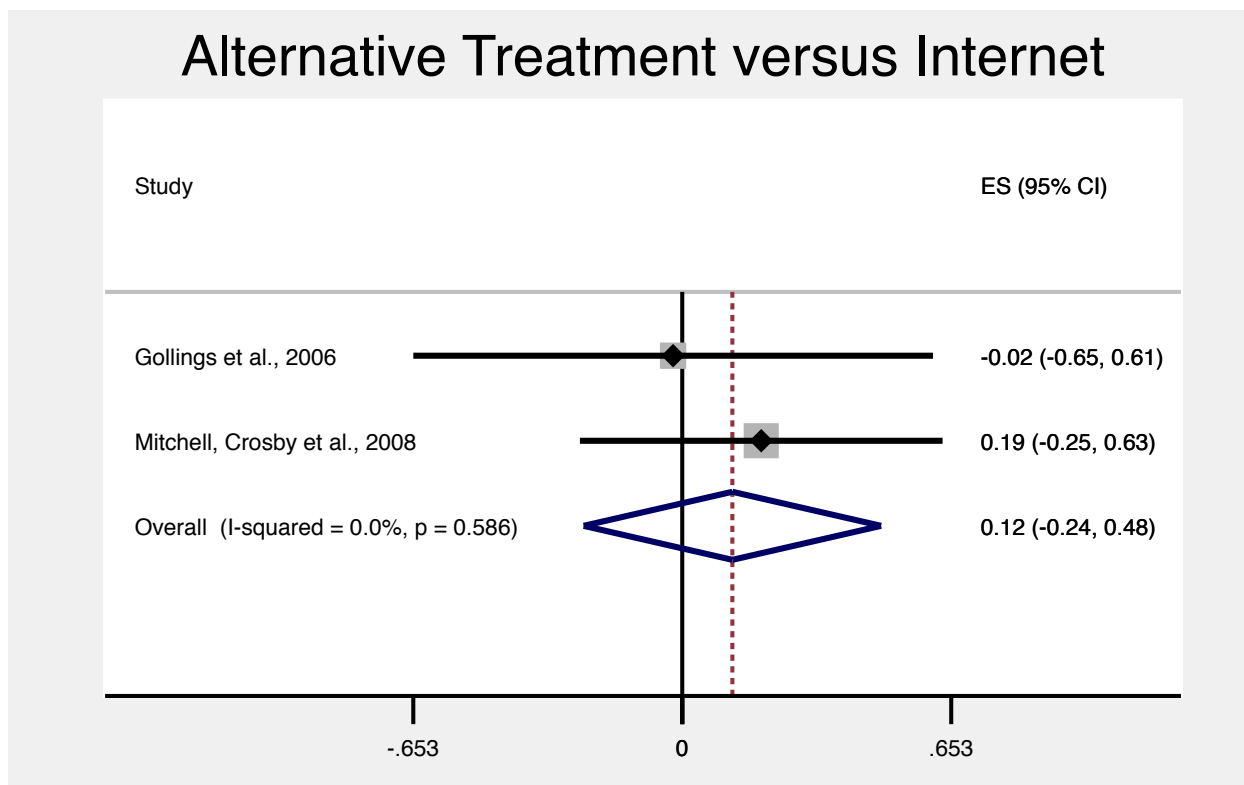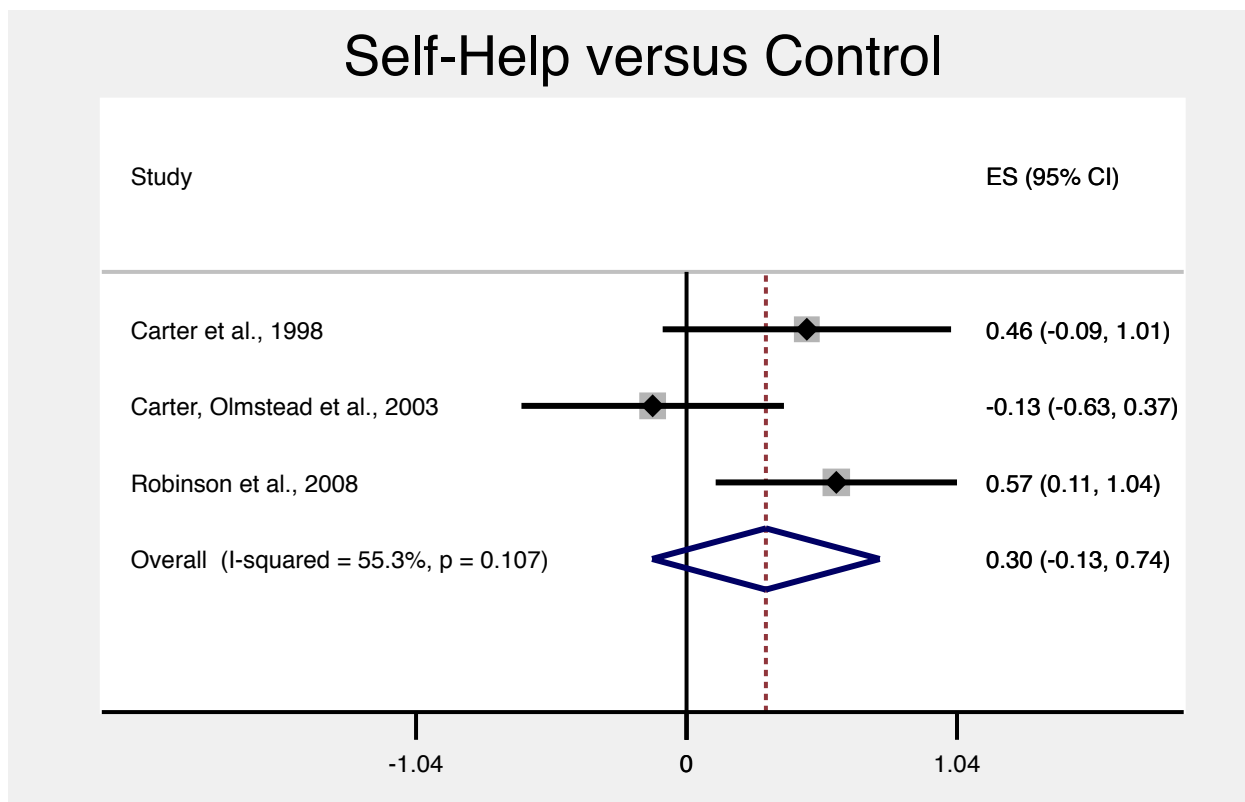*Figure 9.* Forest plot of effect sizes for the self-help treatments versus control comparison.

A leave-one-out analysis was completed which suggested that leaving out the Carter, Olmstead et al. (2003) study would demonstrate a medium effect rather than a small effect. However, with only three studies in the analysis, it is believed that the results may be impacted by the low power of the analysis. Further, a review of the studies suggested that the difference could have resulted simply from the different formats of self-help treatment conducted in each

study (i.e., unsupported, pure/guided, or CBT-specific). Thus, the Carter, Olmstead et al. (2003) study was not left out in other analyses.

There was only one study that reported follow-up data for this comparison. Carter et al. (1998) found a small effect ($\bar{d}$ = -0.19) favoring control conditions over self-help treatments.

Active treatment versus self-help treatment. Six studies randomized participants to an alternative active treatment or self-help treatment. The random-effects average effect size comparing an alternative active treatment and self-help was $\bar{d}$ = -0.07 (p = .42, 95% CI [-0.25-0.11]) and was not statistically significant (Figure 10). Homogeneity of effect size was not rejected, $Q(5) = 5.41$, $p = .37$, $\tau^2 = 0.00$, and $I^2 = 7.6\%$.
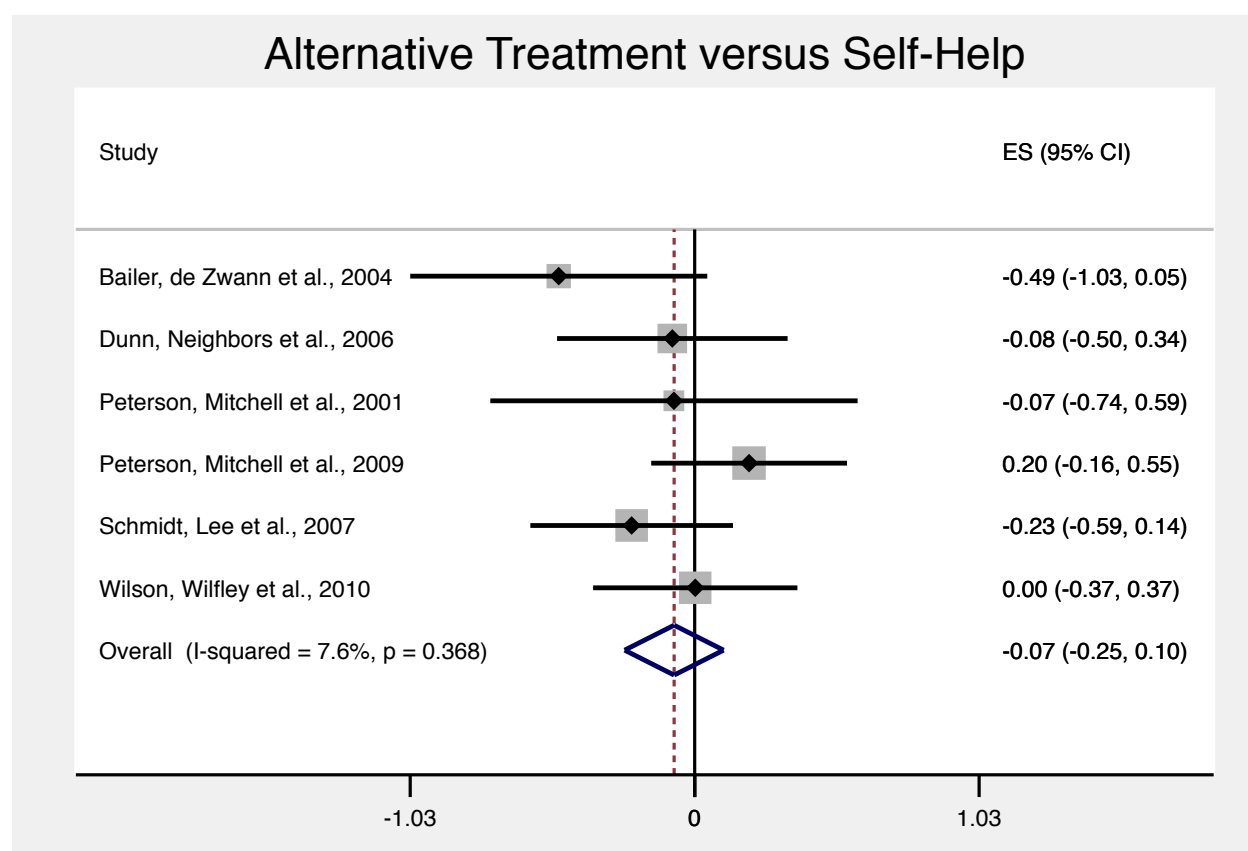
Figure 10. Forest plot of effect sizes for the alternative active treatments versus self-help treatments comparison.

A review of the comparisons included in the analysis revealed that the Schmidt et al. (2007) study was a comparison of family therapy versus self-help whereas the other alternative treatments are individual. When Schmidt et al. (2007) was excluded, the random-effects average effect was $\bar{d}$ = -0.04 (p = .74, 95% CI [-0.24-0.17]), which is not a considerable difference of effect. The between studies variance component, τ^2 did not change, I^2 increased only slightly (11.4%) and homogeneity of effect size was still not rejected, $Q(4)$ = 4.52, p = .34.

Five studies completed assessments at a follow-up timing point after randomizing to and treating participants with an active treatment or self-help treatment. The random-effects average effect size comparing an active treatment and self-help treatment at follow-up was $\bar{d}$ = 0.06 (p = .57, 95% CI [-0.14-0.25]) (Table 3) and was not statistically significant. Homogeneity of effect size was not rejected, $Q(4)$ = 1.13, p = .89, τ^2 = 0.00, and I^2 = 0.0%.

Individual versus group. This comparison was first analyzed including only those studies that directly compared individual and group treatments. Six studies randomized participants to an individual treatment or a group treatment. The random-effects average effect size comparing individual and group treatments was $\bar{d}$ = 0.16 (p = .13, 95% CI [-0.05-0.37]) and was not statistically significant (Figure 11). Homogeneity of effect size was not rejected, $Q(5)$ = 1.67, p = .89, τ^2 = 0.00, and I^2 = 0.0%.

Four studies completed assessments at a follow-up timing point after randomizing to and treating participants with an individual or group treatment. The random-effects average effect size comparing individual and group treatments at follow-up was $\bar{d}$ = 0.03 (p = .81, 95% CI [-0.21-0.26]) (Table 3) and was also not statistically significant. Homogeneity of effect size was not rejected, 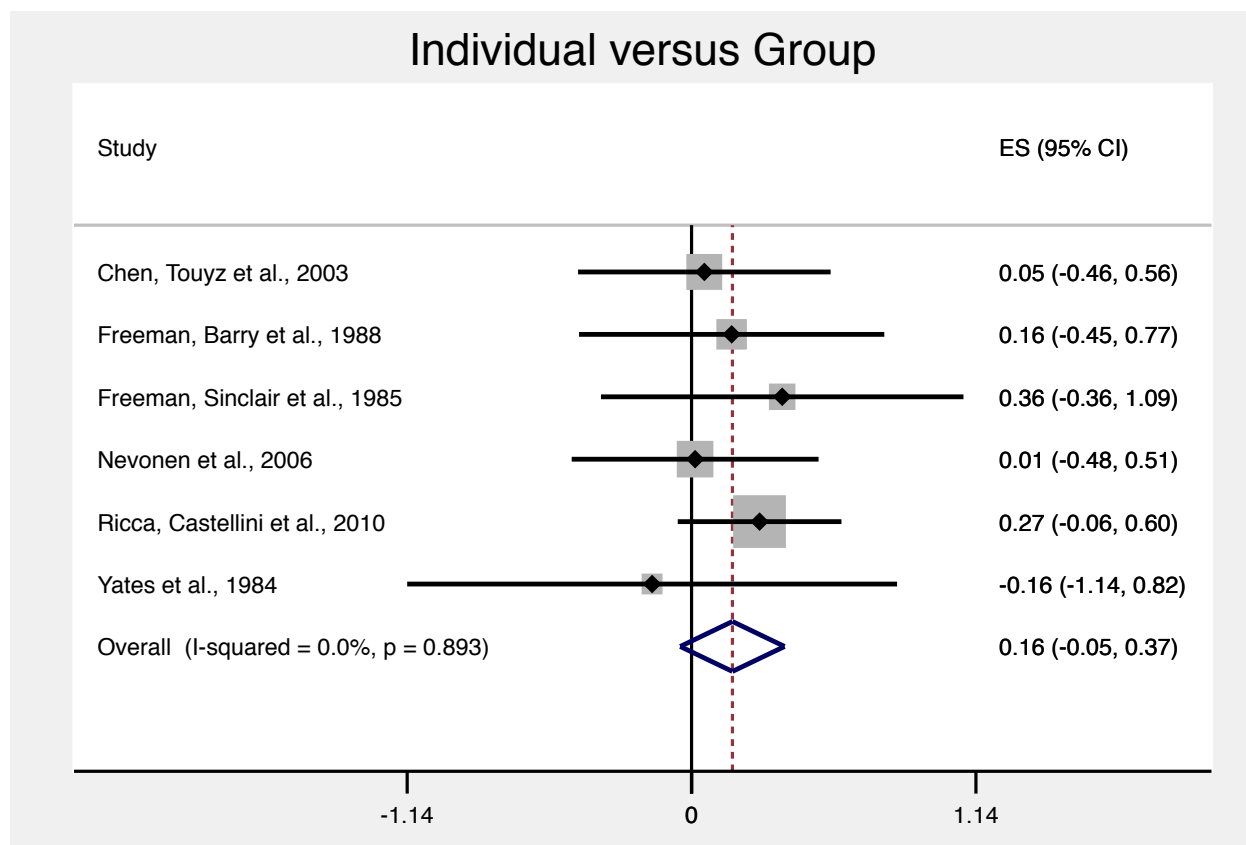$Q(3)$ = 0.74, p = .86, τ^2 = 0.00, and I^2 = 0.0%. Multivariate analyses were not completed, as there were not enough observations to complete the analyses.

Figure 11. Forest plot of effect sizes for the individual treatments versus group treatments

comparison.

I also compared individual and group treatments indirectly between studies using meta-

regression. Results suggest that the format of treatment was not a significant predictor of effect

size (β = -0.19, *p* =.47, 95% CI [-0.76—0.37]).

Publication Bias

I evaluated publication bias in my largest comparisons ($k \geq 10$), which was the treatment

versus control and CBT versus alternative treatment comparisons. Contour-enhanced funnel

plots can help researchers decide whether asymmetry is related to statistical significance

(suggesting publication bias). The center of the graph is the area that represents low statistical

significance, or below 90% confidence that publication bias is present. The light grey area

suggests moderate statistical significance with 90-95% confidence that publication bias is present

and the dark gray areas suggest high statistical significance and 95-99% confidence. However,

asymmetry could be due to other reasons and funnel plots are not as effective at detecting

publication bias when there are only a few studies included in the analysis. In the comparisons

that included the greatest number of studies the majority of the effect sizes contributed from the

studies were in the low statistical significance range but most of the effects also fell above zero.

This result suggests that publication bias may be present given that negative effects are not seen.

Figures 12 and 13 show the results of the contour-enhanced funnel plots for these comparisons.
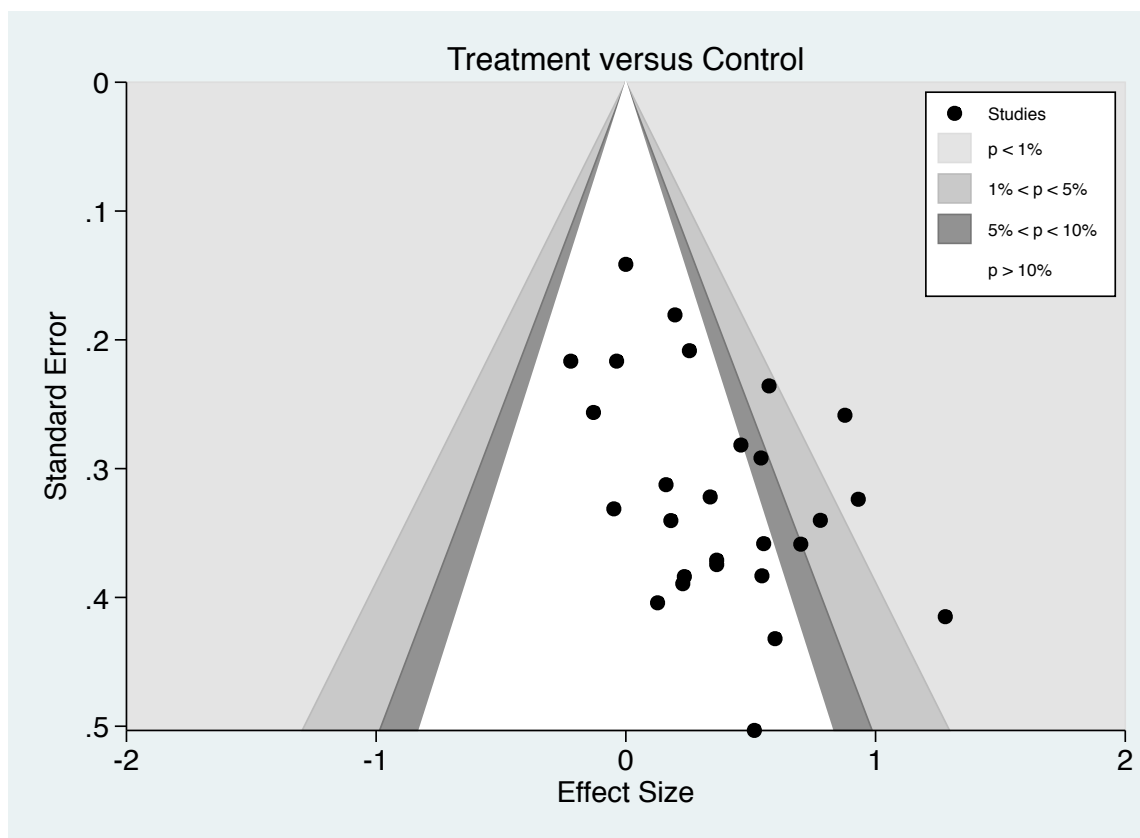
Figure 12. Contour enhanced funnel plot for the active treatment versus control
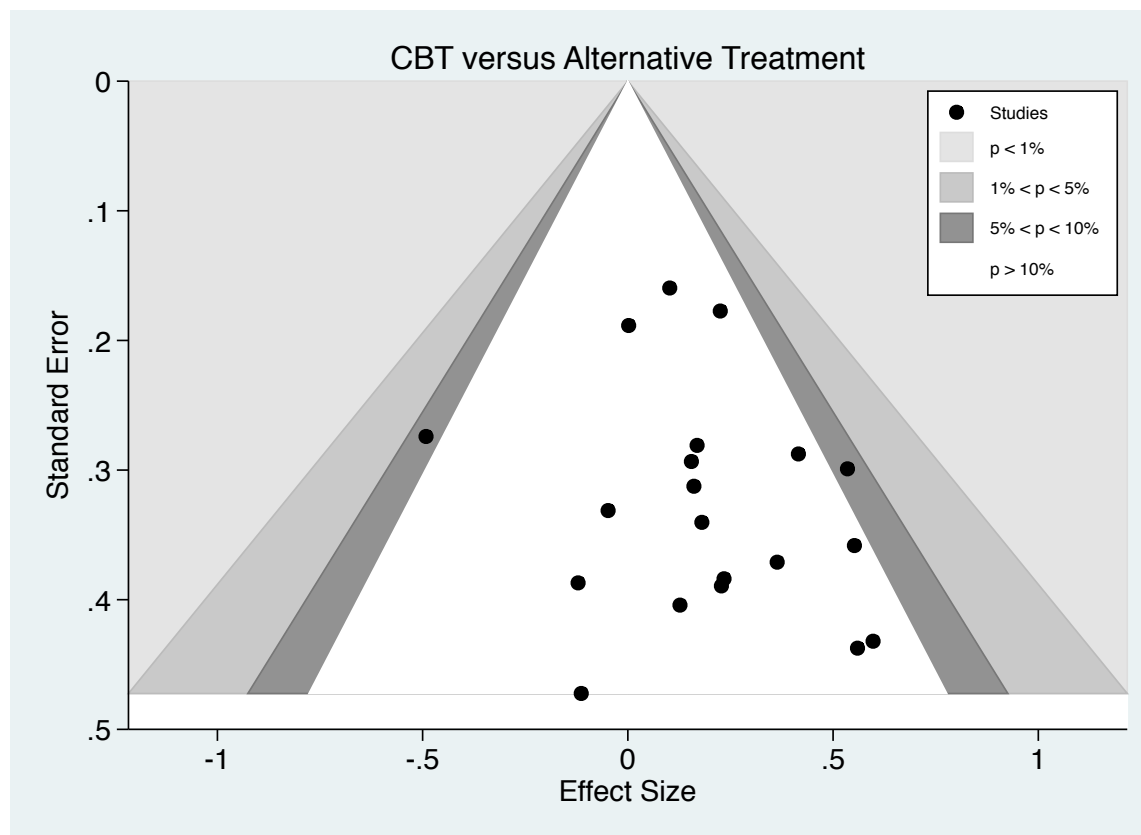
comparison.

Figure 13. Contour enhanced funnel plot for the CBT versus alternative active treatments comparison.

Table 4 presents the results of the rank correlation test, regression test, and the trim-and-fill analysis for the largest comparisons. The results of the rank correlation test were not significant for either comparison, and thus, these results argue against publication bias. The regression test for the CBT versus alternative treatment comparison was also not significant. However, the results of the test were statistically significant ($p < .05$) for the treatment versus control comparison suggesting that publication bias may be indicated. In the treatment versus control comparison, the trim-and-fill analysis suggested that ten additional studies would need to be added to the data. These additional studies reduced $\bar{d}$ to 0.13 (a 61% reduction). In the CBT versus alternative treatment comparison, the trim-and-fill analysis suggested that four additional

studies would need to be added to the data. These additional studies reduced $\bar{d}$ to 0.10 (a 38% reduction).

In sum, the publication bias analyses were inconsistent. In the treatment versus control comparison, only the rank correlation test results argued against publication bias. Therefore, there is some evidence suggesting that this comparison was influenced by publication bias. Specifically, the funnel plot suggests that negative effects are not present and the trim-and-fill analysis suggests that, if ten studies were added to make the plot symmetrical, the effect size would be reduced from medium to small but still favoring active treatments over control. In the CBT versus alternative treatment comparison, results of both the rank correlation and regression tests were not significant and the trim-and-fill analysis suggests that adding four studies would reduce the effect size, but not significantly change the original result. Thus, publication bias does not seem to be impacting the results in this comparison.

Table 4

Results of Publication Bias Analyses

	Rank Correlation	Regression Test	Trim and Fill	
Comparison Condition			Trimmed Studies	$\bar{d}'$
Treatment versus Control	$z = 1.58$	$bias = 1.98^{*}$	10	0.13
CBT versus Alternative Treatment	$z = 0.88$	$bias = 0.60$	4	0.10

Note. $* = p < .05$; $\bar{d}' =$ adjusted aggregate effect size

Moderator Effects: Univariate Analyses

Univariate analyses of moderator effects were completed for the comparisons where results suggested variance was left unaccounted for by the overall comparison. The results for univariate analyses of moderator effects for the treatment versus control, family treatment versus alternative treatment, Internet versus control, self-help versus control and treatment versus self-help comparisons are presented in this section.

Treatment versus control. I used meta-regression to explore whether the following study characteristics moderated effect size: disorder type, attrition, and diagnostic severity. Five studies in this comparison studied Anorexia Nervosa (AN), sixteen studied Bulimia Nervosa (BN), four studied Binge Eating Disorder (BED), one studied Eating Disorder Not Otherwise Specified (EDNOS), and one studied more than one diagnosis.

Descriptive statistics for attrition and diagnostic severity can be found in Tables 5-7. Diagnostic severity, when reported, was coded as the average global EDE score for each condition. There were four studies that included this information in the treatment versus control comparison.

The type of disorder was not found to be a significant predictor of effect size in any of the comparisons where a sufficient number of observations to complete the analysis were present (Table 8).

For both attrition and severity, I used the difference score between conditions in my analysis (Tables 9 and 10). For example, the difference between attrition in the active treatments ($M = 6.27$) and control ($M = 6.09$) was 0.18. The difference of 0.18 was used in the moderator analysis of attrition for the treatment versus control comparison. I also analyzed the average severity as a moderator of effect size (Table 11). Attrition, the difference between conditions in

diagnostic severity, nor the average diagnostic severity was a significant predictor of effect size in any analysis comparing active treatments and control.

Table 5

Descriptive Statistics for Attrition and Diagnostic Severity by Condition

Comparison	Observations	*M*	*SD*	Range
Treatment versus Control				
Attrition	886	-1.33	6.63	-20.0, 14.0
Severity	4	-0.03	0.18	-0.30, 0.07
CBT versus Alternative Treatment				
Attrition	18	-0.48	3.90	-11.0, 5.00
Severity	4	0.78	1.49	-0.10, 3.00
CBT versus IPT				
Attrition	3	1.77	3.04	-1.04, 5.00
Severity	1	-0.10		
CBT versus BT				
Attrition	4	-0.03	0.98	-1.04, 1.00
Severity	1	0.22		
Internet versus Control				
Attrition	3	3.18	2.95	1.00, 6.54
Severity	1	-0.30		
Alternative Treatment versus Internet				
Attrition	2	3.50	3.54	1.00, 6.00
Severity	1	13.00		
Self-Help versus Control				
Attrition	3	1.29	4.59	-2.00, 6.54
Severity	1	0.07		
Treatment versus Self-help				
Attrition	5	-1.90	5.02	-8.67, 5.00
Severity	3	0.03	0.03	0.00, 0.05
Family versus Alternative Treatment				
Attrition	5	0.60	1.14	-1.00, 2.00
Severity	2	-0.10	0.00	-0.10, -0.10
Individual versus Group				
Attrition	2	1.5	0.71	1.00, 2.00

Table 6

Descriptive Statistics for Attrition

Comparison	Treatment Mean	Treatment Standard Deviation	Comparison Mean	Comparison Standard Deviation
Treatment vs. Control	6.27	7.61	6.09	7.48
Family Treatment vs. Alternative Treatment	7.11	3.41	6.11	3.41
Internet vs. Control	7.87	5.15	5.23	2.84
Self-Help vs. Control	4.76	6.42	7.18	2.20
Treatment vs. Self-Help	9.03	5.19	12.91	8.40

Table 7

Descriptive Statistics for Severity

Comparison	Treatment Mean	Treatment Standard Deviation	Comparison Mean	Comparison Standard Deviation
Treatment vs. Control	3.35	0.47	3.38	0.56
Self-Help vs. Control	3.69	0.02	3.60	0.00
Treatment vs. Self-Help	2.77	0.11	2.74	0.12

Table 8

Analyses of Disorder Type as a Moderator Variable

Comparison	Coefficient	SE	p	95% CI	I^2	Observations
Treatment vs. Control					16.56%	23
Anorexia vs. Bulimia	-0.23	0.18	.23	-0.61, 0.15		
Anorexia vs. BED	-0.33	0.19	.17	-0.81, 0.15		
Bulimia vs. BED	-0.10	0.19	.59	-0.49, 0.29		
Family Treatment vs. Alternative Treatment					6.71%	6
Anorexia vs. Bulimia	-0.02	0.23	.94	-0.65, 0.61		
Treatment vs. Self-Help					0.00%	4
Bulimia vs. BED	-0.57	0.30	.20	-1.86, 0.72		

Table 9

Analyses of Attrition as a Moderator Variable

Comparison	Coefficient	SE	*p*	95% CI	I^2	Observations
Treatment vs. Control	0.02	0.02	.21	-0.01, 0.06	31.49%	27
Family Treatment vs. Alternative Treatment	0.17	0.07	.05	0.00, 0.33	0.00%	7
Internet vs. Control	0.06	0.09	.56	-0.31, 0.43	63.17%	3
Self-Help vs. Control	0.05	0.02	.08	-0.01, 0.12	0.00%	3
Treatment vs. Self-Help	-0.02	0.09	.25	-0.31, 0.09	0.00%	6

Table 10

Analyses of Diagnostic Severity as a Moderator Variable

Comparison	Coefficient	SE	*p*	95% CI	I^2	Observations
Treatment vs. Control	-2.14	0.78	.11	-5.50, 1.22	0.00%	4
Self-Help vs. Control	-19.36	10.09	.31	-147.63, 108.91	0.00%	3
Treatment vs. Self-Help	0.07	2.41	.98	-5.83, 5.97	0.00%	8

Note. Severity based on pre-test global EDE score.

Table 11

Analyses of the Average Diagnostic Severity as a Moderator Variable

Comparison	Coefficient	SE	*p*	95% CI	I^2	Observations
Treatment vs. Control	-4.28	1.56	.11	-11.00, 2.45	0.00%	4
Self-Help vs. Control	-38.73	20.19	.31	-295.27, 217.81	0.00%	3
Treatment vs. Self-Help	0.14	4.82	.98	-11.66, 11.93	0.00%	8

Note. Severity based on pre-test global EDE score.

Family treatment versus alternative treatment. Four studies in this comparison studied Anorexia Nervosa (AN), two studied Bulimia Nervosa (BN), and one studied more than one diagnosis. Analysis of disorder type as a moderator was not significant (Table 8). Results suggest that as attrition increases in the family treatment conditions, there is an increase in the effect size favoring the family treatment, $\beta = 0.17$, $p < .05$, 95% CI [0.00—0.33] (Table 9). A moderator analysis identifying whether diagnostic severity may moderate effect size suggested a collinear relationship.

Internet versus control. Attrition was not found to significantly moderate effect size in this comparison (Table 9). Conclusions cannot be drawn regarding the impact of diagnostic severity on the effect size, as there were insufficient observations to complete the analysis.

Alternative treatment versus Internet. Neither attrition (Table 9) nor diagnostic severity (Tables 10 and 11) was a significant predictor of effect size in any analysis.

Self-help versus control. One study included participants diagnosed with BN, three studied included BED, and two studies included multiple diagnoses. Analysis of disorder type as a moderator of effect size was not significant (Table 8). Neither attrition (Table 9) nor diagnostic severity (Tables 10 and 11) was significant predictors of effect size in any analysis.

Moderator Effects: Multivariate Analyses

In the overall analyses, the effect sizes were aggregated across measures. Another way of looking at the data is according to measure type. Table 12 presents the effect sizes by measure type for those conditions in which the overall analyses produced a significant aggregate effect size.

Table 12

Effect Size by Measure Type

Comparison	Mood	Binge	Purge	Eat	Weight/ Body	Self-Esteem	Interpersonal	Global
Treatment versus Control	*0.28	*0.58	*0.59	*0.32	*0.21	*0.21	*0.21	*0.39
CBT versus Alternative Treatment	0.13	0.15	0.21	*0.23	0.12	0.12	0.14	*0.55
Internet versus Control	*0.38	0.46	1.01	0.39	0.48	0.28	-0.07	*0.89

*$p < .05$

Treatment versus control. Measures were coded according to their broad outcome type: mood (Beck Depression Inventory, $k = 33$), binge eating (Eating Disorder Inventory-Bulimia, $k = 34$), purging (Frequency of Episodes of Vomiting, $k = 9$), eat/hunger (Eating Disorder Examination-Eating Concern, $k = 29$), weight/body (Eating Disorder Inventory-Drive for Thinness, $k = 33$), self-esteem (Rosenberg Self-Esteem Scale, $k = 30$), interpersonal (Morgan Russell Assessment Schedule-Socioeconomic, $k = 14$), and global eating disorder symptoms (Eating Disorder Examination-Global, $k = 16$). The most common occurring measure in each category is listed in parentheses. I compared eating disorder measures to all other measures, individual type of eating disorder measure (i.e., binge, purge, body, hunger, etc.) to all other measures, and primary versus secondary measures. Given that within-study correlations among these measures were not available, I repeated the multivariate analysis three times, setting the within-study correlation to .25, .5 or .75. The analyses were not sensitive to within study correlation so I will report the analysis assuming a within-study correlation of .5.

Effect sizes were larger for eating disorder measures compared to all other measures. The omnibus test for the multivariate analyses tests the null hypothesis that all average effect sizes

are zero. Assuming a within-study correlation of .5, the average effect size for eating disorder measures ($\bar{d} = 0.38, p \leq .01$) significantly differed from the effect size for other measures ($\bar{d} = 0.24, p \leq .01$; difference $= 0.14$; $\chi^2(1) = 4.36, p = .04$) suggesting that treatment had a larger effect on eating disorder measures than all other measures.

When types of eating disorder measure were considered individually, measures of mood ($\bar{d} = 0.28, p \leq .01$), binge eating ($\bar{d} = 0.58, p \leq .01$), purging ($\bar{d} = 0.59, p \leq .01$), eating/hunger ($\bar{d} = 0.32, p \leq .01$), weight/body ($\bar{d} = 0.21, p \leq .01$), self-esteem ($\bar{d} = 0.21, p = 0.02$), interpersonal ($\bar{d} = 0.21, p = 0.03$), and global eating disorder symptoms ($\bar{d} = 0.39, p \leq .01$) all demonstrated effects that were significantly different from zero. The effect for measures of binge eating significantly differed from the effect for mood ($p = .02$), eating/hunger ($p = .03$), weight/body ($p = .02$), self-esteem ($p = .02$), and interpersonal ($p = .02$). The effect size for measures of global eating disorder symptoms significantly differed from the effect for weight/body ($p = .04$).

Effect sizes were also larger for measures considered primary in the statistical analyses of the original study versus those considered secondary. The average effect size for primary measures ($\bar{d} = 0.69, p \leq .01$) significantly differed from the effect size for secondary measures ($\bar{d} = 0.19, p \leq .01$; difference $= 0.5$, $\chi^2(1) = 7.21, p = .007$) suggesting that treatment had a larger effect on primary measures than secondary measures. At follow-up, the average effect size for primary measures ($\bar{d} = 0.00$) did not significantly differ from the effect size for secondary measures ($\bar{d} = -0.06$; $\chi^2(4) = 0.47, p = .79$) suggesting that there was not a difference of effect for treatment on primary and secondary measures.

CBT versus alternative treatments. Effect sizes were larger for eating disorder

measures compared to all other measures. Only eating disorder ($p = .007$) measures were

statistically significant from zero. Assuming a within-study correlation of .5, the average effect

size for eating disorder measures ($\bar{d} = 0.17$) did not significantly differ from the effect size for

other measures ($\bar{d} = 0.11; \chi^2(1) = 0.78, p = .38$) suggesting that there was no difference of effect

for CBT on eating disorder measures and all other measures.

When types of eating disorder measure were considered individually, measures of

eating/hunger ($\bar{d} = 0.22, p = .01$) and global eating disorder symptoms ($\bar{d} = 0.54, p = .02$)

demonstrated effects that were significantly different from zero. The effect size for these

measures did not significantly differ from each other.

Effect sizes were smaller for measures considered primary in the statistical analyses of

the original study versus those considered secondary. However, neither primary nor secondary

measures demonstrated an effect size that was significantly different from zero. Assuming a

within-study correlation of .5 in this analysis, the average effect size for primary measures

($\bar{d} = 0.00$) did not significantly differ from the effect size for secondary measures ($\bar{d} = 0.06$;

$\chi^2(1) = 0.15, p = .70$) suggesting that there was not a difference of effect for CBT on primary

and secondary measures. At follow-up, the average effect size for primary measures ($\bar{d} = 0.00$)

did not significantly differ from the effect size for secondary measures

($\bar{d} = -0.02; \chi^2(4) = 0.04, p = .98$) suggesting that there was not a difference of effect for CBT on

primary and secondary measures.

CBT versus IPT. Effect sizes were larger for eating disorder measures compared to all

other measures. However, neither the effect size for eating disorder measures nor the effect size

for other measures was statistically significant from zero. Assuming a within-study correlation of .5, the average effect size for eating disorder measures ($\bar{d}$ = 0.24) did not significantly differ from the effect size for other measures ($\bar{d}$ = 0.02; $\chi^2(1)$ = 2.59, p = .12) suggesting that there was no difference of effect for CBT on eating disorder measures and all other measures.

When types of eating disorder measure were considered individually, measures of eating/hunger ($\bar{d}$ = 0.38, p = .03) and global eating disorder symptoms ($\bar{d}$ = 0.44, p = .02) demonstrated effects that were significantly different from zero. The effect size for these measures did not significantly differ from each other.

There were not enough observations to complete the analysis comparing primary and secondary measures.

CBT versus BT. Effect sizes were larger for eating disorder measures compared to all other measures. However, neither the effect size for eating disorder measures nor the effect size for other measures was statistically significant from zero. Assuming a within-study correlation of .5, the average effect size for eating disorder measures ($\bar{d}$ = 0.21) did not significantly differ from the effect size for other measures ($\bar{d}$ = 0.07; $\chi^2(1)$ = 0.76, p = .38) suggesting that there was no difference of effect for CBT on eating disorder measures and all other measures.

When types of eating disorder measure were considered individually, none of the types of measures demonstrated an effect that was significantly different from zero.

There were not enough observations to complete the analysis comparing primary and secondary measures.

Family treatment versus alternative treatment. Effect sizes were larger for eating disorder measures compared to all other measures. However, neither the effect size for eating

disorder measures nor the effect size for other measures was statistically significant from zero. Assuming a within-study correlation of .5, the average effect size for eating disorder measures ($\bar{d} = 0.22$) did not significantly differ from the effect size for other measures ($\bar{d} = 0.10; \chi^2(1) = 0.58, p = .45$) suggesting that there was no difference of effect for family treatments on eating disorder measures and all other measures.

When types of eating disorder measure were considered individually, measures of global eating disorder symptoms ($\bar{d} = 0.35, p = .02$) demonstrated an effect that was significantly different from zero.

Effect sizes were smaller for measures considered primary in the statistical analyses of the original study versus those considered secondary. Only secondary measures ($p = .05$) demonstrated an effect that was significantly different from zero. Assuming a within-study correlation of .5 in this analysis, the average effect size for primary measures ($\bar{d} = 0.21$) did not significantly differ from the effect size for secondary measures ($\bar{d} = 0.32; \chi^2(1) = 0.43, p = .51$) suggesting that there was not a difference of effect for family treatments on primary and secondary measures. At follow-up, the average effect size for primary measures ($\bar{d} = 0.19$) did not significantly differ from the effect size for secondary measures ($\bar{d} = 0.39; \chi^2(2) = 5.99, p = .05$) suggesting that there was not a difference of effect for family treatments on primary and secondary measures.

Internet versus control. Effect sizes were larger for eating disorder measures compared to all other measures. Both eating disorder measures ($p = .005$) and other measures ($p = .02$) were statistically significant from zero. However, assuming a within-study correlation of .5, the average effect size for eating disorder measures ($\bar{d} = 0.66$) did not significantly differ from the

effect size for other measures ($\bar{d} = 0.34$; $\chi^2(1) = 2.07, p = .15$) suggesting that there was no difference of effect for Internet treatments on eating disorder measures and all other measures.

When types of eating disorder measure were considered individually, measures of global eating disorder symptoms ($\bar{d} = 0.89, p < .01$) demonstrated an effect that was significantly different from zero. The effect size for measures of global eating disorder symptoms significantly differed from the effect for weight/body ($p < .01$).

Effect sizes were larger for measures considered primary in the statistical analyses of the original study versus those considered secondary. Only primary measures ($p = .02$) demonstrated an effect that was significantly different from zero. Assuming a within-study correlation of .5 in this analysis, the average effect size for primary measures ($\bar{d} = 0.89$) did not significantly differ from the effect size for secondary measures ($\bar{d} = 0.58$; $\chi^2(1) = 0.32, p = .57$) suggesting that there was not a difference of effect for Internet treatments on primary and secondary measures.

Alternative treatment versus Internet. Effect sizes were smaller for eating disorder measures compared to all other measures. However, neither the effect size for eating disorder measures nor the effect size for other measures was statistically significant from zero. Assuming a within-study correlation of .5, the average effect size for eating disorder measures ($\bar{d} = 0.09$) did not significantly differ from the effect size for other measures ($\bar{d} = 0.22$; $\chi^2(1) = 0.57, p = .45$) suggesting that there was no difference of effect for alternative treatments on eating disorder measures and all other measures.

When types of eating disorder measure were considered individually, none of the types of measures demonstrated an effect that was significantly different from zero.

There were not enough observations to complete the analysis comparing primary and secondary measures.

Self-help versus control. Effect sizes were larger for eating disorder measures compared to all other measures. However, neither the effect size for eating disorder measures nor the effect size for other measures was statistically significant from zero. Assuming a within-study correlation of .5, the average effect size for eating disorder measures ($\bar{d} = 0.38$) did not significantly differ from the effect size for other measures ($\bar{d} = 0.19; \chi^2(1) = 0.57, p = .45$) suggesting that there was no difference of effect for self-help treatments on eating disorder measures and all other measures.

There were not enough observations to complete the analysis comparing the effects of individual types of eating disorder measures.

Effect sizes were larger for measures considered primary in the statistical analyses of the original study versus those considered secondary. Neither primary measures nor secondary measures demonstrated an effect that was significantly different from zero. Assuming a within-study correlation of .5 in this analysis, the average effect size for primary measures ($\bar{d} = 0.71$) did not significantly differ from the effect size for secondary measures ($\bar{d} = 0.20; \chi^2(1) = 1.64, p = .20$) suggesting that there was not a difference of effect for self-help treatments on primary and secondary measures.

Alternative treatment versus self-help. Effect sizes were larger for eating disorder measures compared to all other measures. However, neither the effect size for eating disorder measures nor the effect size for other measures was statistically significant from zero. Assuming a within-study correlation of .5, the average effect size for eating disorder measures ($\bar{d} = -0.06$)

did not significantly differ from the effect size for other measures

($\bar{d}$ = -0.13; $\chi^2(1)$ = 0.23, p = .63) suggesting that there was no difference of effect for alternative

treatments on eating disorder measures and all other measures.

There were not enough observations to complete the analysis comparing the effects of

individual types of eating disorder measures.

Effect sizes were similar for measures considered primary in the statistical analyses of the

original study and those considered secondary. Neither primary measures nor secondary

measures demonstrated an effect that was significantly different from zero. Assuming a within-

study correlation of .5 in this analysis, the average effect size for primary measures ($\bar{d}$ = -0.11)

did not significantly differ from the effect size for secondary measures ($\bar{d}$ = -0.10;

$\chi^2(1)$ = 0.01, p = .92), suggesting that there was not a difference of effect for alternative

treatments on primary and secondary measures. At follow-up, the average effect size for primary

measures ($\bar{d}$ = 0.03) did not significantly differ from the effect size for secondary measures

($\bar{d}$ = -0.01; $\chi^2(3)$ = 0.17, ρ = .92) suggesting that there was not a difference of effect for

alternative treatments on primary and secondary measures.

Discussion

Overall Effects

Treatment versus control. The results of this meta-analysis suggest that participants

diagnosed with eating disorders receiving psychological treatment fared better than participants

in a control condition. Overall, a small effect ($\bar{d}$ = 0.33) was found favoring active treatments

over control conditions. When considering the effect size in terms of distribution overlap, *U3*,

the result suggests that the participants receiving active treatment were 67% more likely to

experience a superior outcome than those participants in the control condition. This result is consistent with the conclusions of Fettes and Peters (1990), the NICE (2004) analysis, and Vocks et al. (2010), which suggested that individuals diagnosed with eating disorders should be treated with psychotherapy.

Nevertheless, results of this meta-analysis suggest a small effect favoring treatment over control whereas previous analyses suggest a large effect (Fettes & Peters, 1990: $\bar{d}$ = 0.71; NICE, 2004, Risk Ratio [RR]: 0.30-0.75; and Vocks et al., 2010: $\bar{d}$ = 0.82/0.84). NICE (2004) results suggested insufficient evidence for the superiority of various treatments over treatment as usual for anorexia nervosa. However, CBT-BN, CBT-BED, IPT-BED, DBT-BED were all stated to demonstrate strong evidence for superiority of treatment over waitlist control conditions (Risk Ratio = 0.30-0.75) suggesting that exposure to an active treatment decreased risk for future problems with eating disorder symptoms. Yet, results differed from the present meta-analysis in that interventions were compared individually to control, dichotomous outcomes were considered, and thus, a risk ratio effect size was used to assess the probability of superior outcome for treatment over control.

The effect sizes reported in Fettes and Peters (1990) and Vocks et al. (2010) are also treatment versus control effects. However, the effects are the result of studying group treatment alone (Fettes & Peters, 1990) or single diagnoses (i.e., BED) and restricted treatment categories (i.e., binge eating alone) (Vocks et al., 2010). Further, the RCTs included in the Vocks et al. (2010) analysis were only CBT interventions. Thus, the results could only be extended to CBT interventions for eating disorders.

Tests of variability suggested that the small effect favoring treatment over control was impacted by factors beyond sampling error. However, neither disorder type, attrition, nor

diagnostic severity was found to be significant predictors of effect size. Therefore, results do not indicate that the effect size is significantly impacted by the number of people who drop out of the treatment or control conditions, a difference in diagnostic severity between conditions, or the type of disorder studied.

Aggregating across measures in the overall comparison could artificially reduce the effect size. Thus, it is possible the effect sizes for treatment outcome on eating disorder/primary symptom measures are most representative of the current treatment effect. Results suggest that type of outcome measure impacts the effect size with treatments showing a larger effect on eating disorder measures ($\bar{d} = 0.38$) than all other measure types and on primary measures ($\bar{d} = 0.69$) versus secondary measures. These effect sizes, specifically the effect demonstrated on primary measures, are considered moderate to large and are more consistent with the results demonstrated in past meta-analyses. Therefore, it seems that measures specific to the symptoms of the disorder studied (i.e., eating disorders), and especially those considered the primary outcome measure in the analyses, are likely to show the strongest effects. Theoretically, this suggests active treatments for eating disorders are currently best addressing the primary symptoms of eating disorders (i.e., binge eating, purging, etc.). However, comorbid symptoms and disorders (i.e., depression) are not addressed as effectively in comparison. Finally, there was consistent evidence when active treatments were compared to a control that publication bias might have slightly inflated the aggregate effects.

CBT versus alternative treatments. Consistent with past meta-analyses (Brownley et al., 2007; NICE, 2004; Richards et al., 2000; Whitbread & McGown, 1994; Whittal, Agras, & Gould, 1999), CBT was found to be more effective when compared to all alternative active treatments. Specifically, CBT demonstrated a small effect ($\bar{d} = 0.16$) when compared to all

alternative active treatments and participants in CBT conditions were 56% more likely to experience a superior outcome. However, previous meta-analyses differed from the present work in that two were outcome reviews that summarized results without statistical analyses (Brownley et al., 2007, Richards et al., 2000), one presented effect sizes only by outcome type (Binge Frequency: $\bar{d}$ = 1.28; Purge Frequency: $\bar{d}$ = 1.22; Depression: $\bar{d}$ = 1.31 and Eating Attitudes: $\bar{d}$ = 1.35) rather than an aggregate effect (Whittal, Agras, & Gould, 1999), and one study presented the effect size of CBT ($\bar{d}$ = 1.72) and other treatments ($\bar{d}$ = 0.87) without directly comparing them with statistical analysis (Whitbread & McGown, 1994).

When CBT was compared to other commonly studied treatments (BT and IPT) in the meta-analysis, a significant difference between treatments was not found. This was inconsistent with conclusions from the NICE (2004) analysis, which suggested strong evidence that there is a difference between CBT-BN and CBT-IPT with CBT-BN being superior by end of treatment in cessation of binge eating (RR=0.77) and purging (RR=0.76). However, the NICE analysis concluded that it was unlikely there is a difference between CBT-BN and IPT-BN at follow-up and there was insufficient evidence regarding the difference between CBT-BN and BT. The result of no difference between CBT and BT, and also CBT and IPT, has been found in other research (Fairburn et al., 1991). However, research has suggested that in the long term, patients treated with CBT are more likely to experience lasting effects from treatment (Fairburn et al., 1993).

It is possible these comparisons were impacted by allegiance effects as there was often a strong tie between the lead researchers in the primary studies and the main treatment studied. All variance was accounted for in the overall comparisons of CBT versus alternative treatments,

CBT versus IPT, and CBT versus BT. Therefore, univariate analyses of moderator effects were not completed and differences in multivariate analyses were not found.

Follow-up. When possible, follow-up analyses were completed. A significant result was not found in any of the comparisons, which suggests that, regardless of treatment, the outcome experienced by the participants becomes more similar as time continues post treatment. Significant results were also not found when multivariate analyses comparing primary and secondary measures were completed. This potentially suggests gains made in treatment are not maintained over time or the outcome experienced with regard to eating disorder symptoms and comorbid mood symptoms becomes more similar over time. Consistent with past research, follow-up analyses are underpowered. From a clinical perspective, it will be important to gain insight not only into the best treatment for eating disorders but also the treatment which will help individuals maintain gains and continued remission from eating disordered symptoms. Thus, more research is still needed to confidently identify which treatments might demonstrate the best long-term outcomes.

Is CBT the Treatment of Choice?

In the present meta-analysis, CBT treatments were found to be more effective when compared to all other active treatments and this result was consistent with past meta-analyses (Brownley et al., 2007; NICE, 2004; Richards et al., 2000; Whitbread & McGown, 1994; Whittal, Agras, & Gould, 1999). Thus, the question is raised whether CBT may be the treatment of choice for eating disorders. However, when CBT was directly compared to other treatments, such as BT and IPT, a difference in effect was not found. While these results may have been surprising or unexpected, there is research that supports the finding of no difference between active treatments in the areas of other mental health diagnoses. Wampold, Minami, Baskin, and

Tierney (2002) completed a meta-analysis comparing the effects of cognitive therapies and other therapies for the treatment of depression. They concluded that all "bona fide" psychological treatments are effective for depression. In other words, when comparing active treatments against each other, there is a tendency to find no difference and, generally, all treatments show some effect. Research has suggested that common factors across treatments account for a considerable amount of improvement found in treatment (Lambert & Ogles, 2004). This does not mean that there are not unique aspects of treatments that are contributing to change but does suggest that common factors are important and should be incorporated into treatment. Thus, while CBT has appeared as an initial "front runner," as a commonly studied effective treatment for eating disorders, new treatments are coming to the forefront and showing promise. Consistent with the findings of Wampold et al. (2002), it might be the case that many different treatments that emerge for the treatment of eating disorders will show some effect. Future research should continue to compare the various treatments for eating disorders directly in order to continue to fuel our knowledge base and to ensure we are keeping with the best-known practices in the treatment of eating disorders.

Format of Treatment

Individual versus group. I analyzed individual versus group treatments both when they were compared directly within a study, and also indirectly with the format of treatment as a moderator of outcome. A difference between individual and group treatments was not found in any analysis, whether the treatments were compared directly or when analyzed as a moderator, which would suggest that the treatment formats are considered equally effective in this study. Results of past meta-analyses have been inconclusive with some finding no difference between the formats (Brownley, et al., 2007, & Hartman, Herzog, & Drinkman, 1992), one finding that

group is most effective when combined with an alternative treatment type such as individual therapy (Fettes, & Peters, 1990; Pre/Post ES for group alone: 0.75; Pre/Post ES for group plus another treatment: 1.25) and one finding that, based on the treatment completers that recovered (defined as cessation of binge and purge symptoms), individual treatment (45.6%) is better than group (26.7%) (Thompson-Brenner, Glass, & Westen, 2003). Results of this meta-analysis are consistent with those found in Brownley, et al. (2007) and Hartman, Herzog, and Drinkman (1992). However, these past meta-analyses differed from the present in that pre/post effect sizes were used (Fettes, & Peters, 1990), effect sizes for conditions were not compared directly (Thompson-Brenner, Glass, & Westen, 2003), meta-analytic methods were not used (Brownley et al., 2007) or a restricted range of outcome measures was used (Hartman, Herzog, & Drinkman, 1992).

Family Treatment. Several studies included a comparison of a family treatment versus an alternative active treatment. In the present meta-analysis, a difference was not found between family and alternative treatments. However, moderator analyses suggested attrition is impacting the effect size. Specifically, results suggest that as the number of people who drop out of the family treatment condition increases, the effect size favors that condition. Thus, one could hypothesize that those individuals who are not benefitting from the treatment are dropping out, leaving only those experiencing a positive outcome, which results in a better outcome for the family treatment when compared to an alternative condition. It is evident in the comparison of family and alternative treatment conditions that there is a relationship between attrition and the effects of treatment. It is important the impact of attrition on treatment outcome is considered in future primary studies and meta-analyses. Research has shown that dropping out of treatment affects one-third or more of eating disorder patients involved in treatment and thus far the

research has suggested that drop-outs are not a homogenous population in regards to demographics or clinical presentation (Mahon, 2000). It has been difficult to study dropout rates in eating disorder research even though attrition rates seem to affect results. This appears due to a lack of a clear definition for dropout in experiments, dropouts not included in analyses or separate analyses not being completed on dropouts (Mahon, 2000). Despite this difficulty, it will be important for future research to consider the impact attrition may be having on results so that adequate insight regarding treatment outcome can be gained.

Internet Therapy and Self-help Treatments

Research has suggested growing evidence for self-help treatments in the treatment of those diagnosed with eating disorders (Brownley et al., 2007 & Vocks et al., 2010). When compared to a control condition, a medium effect ($\bar{d}$ =0.54) was found suggesting that those in Internet conditions are 75% more likely to experience a superior outcome. There was no difference between conditions when self-help treatments were compared to a control. There was also not a significant effect when alternative active treatments were compared to either Internet or self-help treatments. The results in the present analyses regarding self-help treatments are not consistent with the results of previous meta-analyses that suggest growing evidence in support of the treatment (Brownley et al., 2007 & Vocks et al., 2010). Overall, more research will be needed regarding Internet and self-help formats in the treatment of eating disorders in the future.

The future of Internet treatments. It has been consistently documented that individuals with eating disorders are often reluctant to seek out treatment due to shame or embarrassment regarding their struggles (Doyle, Hopf, & Franko, 2011). Thus, the Internet has been touted as the medium that may increase treatment and prevention efforts as it would facilitate treatment to more people and possibly encourage those previously afraid to seek treatment, to do so. The

Internet can be used to deliver information or communication (i.e., between patient and therapist) (Winzelberg, Luce, & Abascal, 2004). Treatment can be considered synchronous (i.e., telemedicine, real time online chat room with therapist guidance, etc.) or asynchronous (i.e., patient works alone and checks in with therapist via email). In the present study, the treatments in the Internet versus control condition were all asynchronous and the treatments in the alternative treatment versus Internet condition were both asynchronous. Doyle, Hopf, and Franko (2011) describe the benefits of Internet approaches as follows: "The specific merits of Internet-based programs for eating disorder prevention and treatment include (1) anonymity, (2) varying models of care, (3) program reach, and (4) technological benefits provided by current Internet capabilities" (p. 441). Doyle, Hopf, and Franko (2011) recognize that risks such as breach of confidentiality and worsening of symptoms without means for therapist help could occur. They recommend conducting a thorough assessment to ensure compatibility of the client and treatment program and maintaining high levels of security (i.e., password protection) throughout the treatment program (Doyle, Hopf, & Franko, 2011). Overall, consistent with the results of this meta-analysis, Internet approaches are deemed promising as a tool for the treatment and prevention of eating disorders (Winzelberg, Luce, & Abascal, 2004). Further, the Internet is a medium that could provide treatments in a self-help format that include interventions of psychoeducation, structured therapeutic components, an online support group or a virtual world that could desensitize individuals to eating in public places or help them imagine feeling comfortable at a gym (Winzelberg, Luce, & Abascal, 2004). These self-help Internet treatments could also allow opportunities for therapist guidance. However, more research, especially an increase in randomized controlled trials, will be needed and ethical issues will need to be resolved before Internet approaches can be considered strong stand-alone treatments.

A Transdiagnostic Approach

Several of the treatment versus treatment comparisons in this meta-analysis suggest no difference between treatments including: CBT versus IPT, CBT versus BT, family treatment versus alternative treatment, alternative treatment versus Internet, and alternative treatment versus self-help. Many now argue that eating disorders share a similar pathology and may seem more related than different. This could indicate the possibility that they could all be treated similarly with a transdiagnostic approach. A recent study compared the effects of Fairburn's Enhanced Cognitive Behavioral Therapy for eating disorders (CBT-E) when the treatment was used for those diagnosed using DSM-IV criteria with BN and EDNOS (Fairburn et al., 2009). A minority of the participants was also diagnosed with BED as outlined by the DSM-V research criteria. Results suggest that it is possible to treat eating disorder patients transdiagnostically and that symptom severity in a waiting list control group remained similar to pretreatment levels (Fairburn et al., 2009). Further, it was found that more than half of the eating disorder patients had eating disorder features which were less than one standard deviation above the community mean at post-treatment and follow-up. Similarly to the present meta-analysis, and also a previous meta-analysis (Fettes & Peters, 1990) eating disorder diagnosis was not found to be a moderator of treatment (Fairburn et al., 2009). Although significantly underweight individuals (i.e., those diagnosed with AN) were not included in this study, CBT-E is intended to treat the pathology of the eating problems, rather than a specific diagnosis. Therefore, the treatment could be used transdiagnostically because recent research has suggested that eating disorders share common core pathology such as the cognitive overvaluation of shape and weight (Fairburn, 2008).

When Another Treatment has Failed

Recall that in those meta-analyses that included CBT, the treatment was found to be the most effective choice for the eating disorder diagnosis studied (Brownley et al., 2007; NICE, 2004; Richards et al., 2007; Whitbread & McGown, 1994; Whittal, Agras, & Gould, 1999). NICE (2004) specifically recommends CBT as the first line treatment for BN and BED. When the initial search for studies was completed, several articles were found that studied the effectiveness of treatments after CBT had failed. These studies were not included in the present meta-analysis as they were deemed different from the aims of the meta-analysis and there were few published studies of this nature at the time of the search. A review of the literature suggests that when individuals do not respond to CBT, antidepressant medications and IPT have been suggested as suitable second level treatments (Mitchell, 2002). No significant differences were found between either treatment in the effectiveness in treating individuals with BN after CBT had failed. Cooper and Fairburn (2011) have also proposed that reasoning for individuals not responding to CBT may be that the treatment is not specific enough and these individuals may require CBT-E Broad, the extended version of Fairburn's revised treatment for eating disorders. The Broad version of CBT-E includes interventions that address perfectionism, mood intolerance, core low self-esteem and interpersonal difficulties. Cooper and Fairburn (2011) recently concluded, "…the simpler focused form of the treatment should be viewed as the default form of CBT-E as it is easier to learn and implement, with the new, more complex form being reserved for patients of the type that previously benefited least from the treatment" (p. 401).

Limitations

The first limitation present throughout this meta-analysis is the issue of low power in the analyses. The low power in the follow-up analyses was consistent with previous research (Fettes

& Peters, 1992; Hartmann, Herzog, & Drinkman, 1992; Lewandowski et al., 1997). At first glance in the present meta-analysis, power seems strong with 69 studies and 142 total comparisons. However, when separated out into "like" comparisons (i.e., treatment versus control), power decreases as not every comparison "fits" with every category. Second, it is also the case that the treatments included in some comparisons differed (i.e., stemmed from a similar theory but included an intervention different from other treatments) from others and were unable to be included in any category. Third, the results of moderator and multivariate analyses were also impacted by low power. Fourth, I limited the primary studies to RCTs and, thus, some settings where that type of study would be difficult could be missing. So, it is possible my collection of primary studies is not completely representative of the population of eating disorder patients.

Treating patients diagnosed with AN continues to be a concern. Despite transdiagnostic treatment not being suggested by NICE (2004), the present meta-analysis was consistent with previous meta-analyses and research favoring transdiagnostic treatment of eating disorders, in that diagnosis was not found to be a moderator of treatment outcome. This would suggest that eating disorders can be treated similarly, regardless of diagnosis. However, power continues to be an issue in these analyses. Demographically, 39 studies included participants diagnosed with AN. Yet, some of these studies also specifically studied AN while other studies had the general inclusion criteria that participants with any eating disorder diagnosis could be treated within the study. Further, when these studies are categorized into the respective comparisons of "best fit," the total number of studies within each comparison that include participants with AN is much smaller. Thus, the majority of the primary studies in each comparison focused on individuals with a diagnosis of bulimia or binge eating disorder. Research should continue to identify

whether AN may be best treated in a transdiagnostic sense or whether specific interventions might be warranted.

Future Research

Eating disorders are still a growing topic today and, what people do know, often leads them to believe that eating disorders are nearly impossible to treat due to motivation and depth of pathology (Agras, Brandt, Bulik et al., 2004). However, recent research is suggesting that eating disorders, including AN, can successfully be treated and could possibly be treated transdiagnostically. This meta-analysis has used the best-known meta-analytic methods to update the literature regarding treatment outcome for eating disorders. Results suggest that active treatments, specifically CBT, are recommended over control and some alternative treatments for eating disorders. In the future, more research is needed regarding which treatments may be "second line" if a first line treatment such as CBT has failed. Continued research regarding the specific components and interventions that can be added to or combined with CBT treatments and are effective for eating disorders will also be needed. Further, it is anticipated that the popularity of self-help and Internet treatments will continue to grow, and thus, research should continue to examine their effectiveness.

Results suggested attrition can have an impact on treatment outcome, and that significant differences are not found between the format of treatment or diagnosis type. In the largest comparison, active treatments versus control, effects for active treatments were strongest on primary and, specifically, eating disordered symptom measures. A goal for future treatments might be to continue to effectively treat the main symptoms of eating disorders (i.e., binge eating and purging) while also improving the treatment of comorbid symptoms and disorders (i.e., depression). Overall, potential moderators of treatment will be an important component of

research in the future, as they will play a role in increasing our understanding of what is effective when treating eating disorders.

References

Agras, W. S., Brandt, H. A., Bulik, C. M., Dolan-Sewell, R., Fairburn, C. G., Jimerson, D. C., …
Wilfley, D. E. (2004). Report of the National Institutes of Health workshop on
overcoming barriers to treatment research in anorexia nervosa. *International Journal of
Eating Disorders, 35,* 509-521.doi: 10.1002/eat.10261

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

Bacaltchuk, J., Trefiglio, R. P., de Oliveira, I. R., Lima, M. S., & Mari, J. J. (1999).
Antidepressants versus psychotherapy for bulimia nervosa: A systematic review. *Journal
of Clinical Pharmacy and Therapeutics, 24,* 23-31.

Baldwin, S. A., & Shadish, W. R. (2011). A primer on meta-analysis in clinical psychology.
Journal of Experimental Psychology, 2, 294-317.doi: 10.5127/jep.009610

Barabasz, M. (1991). Hypnotizability in bulimia. *International Journal of Eating Disorders, 10,*
117-120. doi:10.1002/1098-108X(199101)10:1<117::AID-EAT2260100113>3.0.CO;2-T

Barabasz, M. (2000). Hypnosis in the treatment of eating disorders. In L. M. Hornyak & J. P.
Green (Eds.), *Healing from within: The use of hypnosis in women's health care*, (pp. 233-
253). Washington, DC: American Psychological Association.

Begg, C. B., & Mazumdar, M. (1994). Operating characteristics of a rank correlation test for
publication bias. *Biometrics, 50(4)*, 1088-1101.

Bara-Carril, N., Williams, C. J., Pombo-Carril, M. G., Reid, Y., Murray, K., Aubin, S.,
…Schmidt, U. (2003). A preliminary investigation into the feasibility and efficacy of a
CD-ROM-based cognitive-behavioral self-help intervention for bulimia nervosa.
International Journal of Eating Disorders, 35, 538-548.doi: 10.1002/eat.10267

Bowers, W. A., & Andersen, A. E. (2007). Cognitive-behavior therapy with eating disorders: The role of medications in treatment. *Journal of Cognitive Psychotherapy: An International Quarterly, 21,* 16-27. doi: 10.1891/088983907780493359

Brownley, K. A., Berkman, N. D., Sedway, J. A. Lohr, K. N., & Bulik, C. M. (2007). Binge eating disorder treatment: A systematic review of randomized controlled trials. *International Journal of Eating Disorders, 40,* 337-348.doi: 10.1002/eat

Bruch, H. (1962). Perceptual and conceptual disturbances in anorexia nervosa. *Psychosomatic Medicine, 24,* 187-194. Retrieved from http://www.psychosomaticmedicine.org.erl.lib.byu.edu/cgi/content/short/24/2/187??=

Bruch, H. (1982). Psychotherapy in anorexia nervosa. *International Journal of Eating Disorders, 1,* 3-14.doi: 10.1002/1098-108X(198222)1:4<3::AID-EAT2260010402>3.0.CO;2-D

Bulik, C. M., Berkman, N. D., Brownley, K. A., Sedway, J. A., & Lohr, K. N. (2007). Anorexia nervosa treatment: A systematic review of randomized controlled trials. *International Journal of Eating Disorders, 40,* 310-320.doi: 10.1002/eat20367

Cooper, Z., & Fairburn, C. G. (2011). The evolution of "enhanced" cognitive behavior therapy for eating disorders: Learning from treatment nonresponse. *Cognitive and Behavioral Practice, 18,* 394-402. doi: 1077-7229/11/394—402$1.00/0

Cox, G. L., & Merkel, W. T. (1989). A qualitative review of psychosocial treatments for bulimia. *The Journal of Nervous and Mental Disease, 177,* 77-84.

Davis, R., & Olmsted, M. P. (1992). Cognitive-behavioral group treatment for bulimia nervosa: Integrating psychoeducation and psychotherapy. In H. Harper-Giuffre, & K. R. MacKenzie (Eds.), *Group psychotherapy for eating disorders* (pp. 71-103). American Psychiatric Publishing, Inc.

Doyle, C. D., Hopf, R. B., & Franko, D. L. (2011). Innovative approaches to prevention and intervention: The Internet. In D. LeGrange & J. Lock (Eds.), *Eating disorders in children and adolescents: A clinical handbook* (pp. 440-454). New York, NY: The Guilford Press.

Egger, M., Davey Smith, G., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple graphical test. *British Medical Journal, 315,* 629-634.

Eisler, I., Lock, J., & le Grange, D. (2009). Family-based treatments for adolescents with anorexia nervosa. In C. M. Grilo, & J. E. Mitchell (Eds.), *The treatment of eating disorders: A clinical handbook* (pp. 150-174). New York: The Guilford Press.

Fairburn, C. G. (1981). A cognitive behavioural approach to the treatment of bulimia. *Psychological Medicine, 11,* 707-711.doi: 10.1017/S0033291700041209

Fairburn, C. G., (1994). Interpersonal psychotherapy for bulimia nervosa. *The Clinical Psychologist, 47*(4), 21-22.

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

Fairburn, C. G. (1997). Interpersonal psychotherapy for bulimia nervosa. In D. M. Garner, & P. E. Garfinkel (Eds.), *Handbook of treatment for eating disorders* (pp. 278-294). New York, NY: The Guilford Press.

Fairburn, C. G. (2008). *Cognitive behavior therapy and eating disorders*. New York, NY: The Guilford Press.

Fairburn, C. G., & Harrison, P. J. (2003). Eating disorders. *The Lancet, 361,* 407-416.

Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A "transdiagnostic" theory and treatment. *Behaviour Research and Therapy, 41,* 509-528. doi: 10.1016/S0005-7967(02)00088-8

Fairburn, C. G., Shafran, R., & Cooper, Z. (1998). A cognitive behavioural theory of anorexia nervosa. *Behaviour Research and Therapy, 37,* 1-13. doi: 10.1016/S0005-7967(98)00102-8

Fettes, P. A., Peters, J. M. (1992). A meta-analysis of group treatments for bulimia nervosa. *International Journal of Eating Disorders, 11,* 97-110.doi: 10.1002/1098-108X(199203)11:2<97::AID-EAT2260110202>3.0.CO;2-H

Fleiss, J. L., (1981). *Statistical methods for rates and proportions.* New York, Wiley.

Garvin, V., Striegel-Moore, R. H., Kaplan, A., & Wonderlich, S. A. (2001). The potential of professional developed self-help interventions for the treatment of eating disorders. In R. H. Striegel-Moore, & L. Smolak (Eds.), *Innovative directions in research and practice* (pp. 153-172). Washington DC: American Psychological Association.

Hartmann, A., Herzog, T., & Drinkmann, A. (1992). Psychotherapy of bulimia nervosa: What is effective? A meta-analysis. *Journal of Psychosomatic Research, 36,* 159-167.doi: 10.1016/0022-3999(92)90024-V

Hedges, L. V., & Olkin, I. (1985).*Statistical methods for meta-analysis.* Orlando, FL: Academic Press.

Laessle, R. G., Zoettl, C., Pirke, K-M. (1987). Meta-analysis of treatment studies for bulimia. *International Journal of Eating Disorders, 6,* 647-653.doi: 10.1002/1098-108X(198709)6:5<647::AID-EAT2260060508>3.0.CO;2-H

Lambert, M. J., & Ogles, B. M. (2004). The efficacy and effectiveness of psychotherapy. In M. J. Lambert (Ed.); *Bergin and Garfield's handbook of psychotherapy and behavior change* (5th Ed.) (139-193). New York: Wiley & Sons, Inc.

Lewandowski, L. M., Gebing, T. A., Anthony, J. L., & O'Brien, W. H. (1997). Meta-analysis of cognitive-behavioral treatment studies for bulimia. *Clinical Psychology Review, 17,* 703-718. doi: 10.1016/S0272-7358(97)00026-3

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gotzsche, P. C., Ioannidis, J. P., et al. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: Explanation and elaboration. *British Medical Journal*, *339*, b2700. doi: 10.1136/bmj.b2700

Mahon, J. (2000). Dropping out from psychological treatment for eating disorders: What are the issues? *European Eating Disorders Review, 8,* 198-216.

Mantle, F. (2003). Eating disorders: The role of hypnosis. *Paediatric Nursing, 15,* 42-45.

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

Murphy, S., Russell, L., & Waller, G. (2005). Integrated psychodynamic therapy for bulimia nervosa and binge eating disorder: Theory, practice and preliminary findings. *European Eating Disorders Review, 13,* 383-391.doi: 10.1002/erv.672

Murray, T. (2003). Wait not, want not: Factors contributing to the development of anorexia nervosa and bulimia nervosa. *The Family Journal, 11,* 276-280.doi: 10.1177/1066480703252470

Myers, T. C., Swan-Kremeier, L., Wonderlich, S., Lancaster, K., & Mitchell, J. E. (2004). The use of alternative delivery systems and new technologies in the treatment of patients with

eating disorders. *International Journal of Eating Disorders, 36,* 123-143.doi: 10.10002/eat.20032

Nakash-Eisikovits, O., Dierberger, A., & Westen, D. (2002). A multidimensional meta-analysis of pharmacotherapy for bulimia nervosa: Summarizing the range of outcomes in controlled clinical trials. *Harvard Review of Psychiatry, 10,* 193-211.doi: 10.1093/hrp/10.4.193

National Clinical Practice Guideline Number CG9, National Collaborating Centre for Mental Health, National Institute for Clinical Excellence. (2004). *Eating disorders: Core interventions in the treatment and management of anorexia nervosa, bulimia nervosa and related eating disorders.* Retrieved from http://www.nice.org.uk/Guidance/CG9

Newton, M. S., & Ciliska, D. (2006). Internet-based innovations for the prevention of eating disorders: A systematic review. *Eating Disorders, 14,* 365-384. doi: 10.1080/10640260600952522

Richards, P. S., Baldwin, B. M., Frost, H. A., Clark-Sly, J. B., Berrett, M. E., & Hardman, R. K. (2000). What works for treating eating disorders? Conclusions of 28 outcome reviews. *Eating Disorders, 8,* 189-206. doi: 10.1080/10640260008251227

Shadish, W. R., Robinson, L., & Lu, C. (1999). *ES: A computer program and manual for effect size calculation.* Minneapolis, MN: Assessment Systems.

StataCorp. (2001). Statistical software: Release 11.1. College Station, TX: Stata Corporation.

Stefano, S. C., Bacaltchuk, J., Blay, S. L., & Hay, P. (2006). Self-help treatments for disorders of recurrent binge eating: A systematic review. *ActaPsychiatricaScandinavica, 113,* 452-459.doi: 10.1111/j.1600-0447.2005.00735.x

Thompson-Brenner, H., Glass, S., & Westen, D. (2003). A multidimensional meta-analysis of psychotherapy for bulimia nervosa. *Clinical Psychology: Science and Practice, 10,* 269-287. doi: 10.1093

Vanderlinden, J., & Vandereycken, W. (1988). The use of hypnotherapy in the treatment of eating disorders. *International Journal of Eating Disorders, 7,* 673-679.doi: 0.1002/1098-108X(198809)7:5<673::AID-EAT2260070511>3.0.CO;2-R

Vocks, S., Tuschen-Caffier, B., Pietrowsky, R., Rustenbach, S. J., Kersting, A., & Herpertz, S. (2010). Meta-analysis of the effectiveness of psychological and pharmacological treatments for binge eating disorder. *International Journal of Eating Disorders, 43,* 205-217.doi: 10.1002/eat.20696

Wampold, B. E., Minami, T., Baskin, T. W., & Tierney, S. C. (2002). A meta – (re) analysis of the effects of cognitive therapy versus 'other therapies' for depression. *Journal of Affective Disorders, 68,* 159-165.

Whitbread, J., & Mcgown, A. (1994). The treatment of bulimia nervosa: What is effective? A meta-analysis. *International Journal of Clinical Psychology, 21,* 32-44.

Whittal, M. L., Agras, W. S., & Gould, R. A. (1999). Bulimia nervosa: A meta-analysis of psychosocial and pharmacological treatments. *Behavior Therapy, 30,* 117-135.doi: 10.1016/S0005-7894(99)80049-5

Winzelberg, A. J., Taylor, C. B., Sharpe, T., Eldredge, K. L., Dev, P., & Constantinou, P. S. (1997). Evaluation of a computer-mediated eating disorder intervention program. *International Journal of Eating Disorders, 34,* 339-349.doi: 0.1002/(SICI)1098-108X(199812)24:4<339::AID-EAT1>3.0.CO;2-J

Winzelberg, A. J., Luce, K. H., & Abascal, L. B. (2004). Internet-based treatment strategies. In

    C. G. Fairburn & K. D. Brownell (Eds.), *Eating disorders and obesity: A comprehensive*

    handbook, (pp.279-296). New York: The Guilford Press.

Wiser, S., & Telch, C. F. (1999). Dialectical behavior therapy for binge-eating disorder.

    Psychotherapy in Practice, 55, 755-768.doi: 10.1002/(SICI)1097-

    4679(199906)55:6<755::AID-JCLP8>3.0.CO;2-R

Zerbe, K. J. (2009). Psychodynamic therapy for eating disorders. In C. M. Grilo, & J. E. Mitchell

    (Eds.), *The treatment of eating disorders: A clinical handbook* (pp. 339-358). New York:

    The Guilford Press.

Appendix A

Articles Coded in the Meta-Analysis

1. Agras, W. S., Schneider, J. A., Arnow, B., Raeburn, S. D., & Telch, C. F. (1989). Cognitive-behavioral and response-prevention treatments for bulimia nervosa. *Journal of Consulting and Clinical Psychology, 57*(2), 215-221.

Comparisons

1. Cognitive-Behavioral Therapy w/Response Prevention of vomiting vs. Wait-list Control
2. Cognitive-Behavioral Therapy vs. Wait-list Control
3. Self-monitoring of caloric intake and purging behaviors vs. Wait-list Control
4. Cognitive-Behavioral Therapy w/Response prevention vs. Cognitive-Behavioral Therapy alone
5. Cognitive-Behavioral Therapy w/Response Prevention vs. Self-monitoring of caloric intake and purging behaviors
6. Cognitive-Behavioral Therapy vs. Self-monitoring of caloric intake and purging behaviors

Measures

1. Purge Frequency
2. Beck Depression Inventory
3. Food Preoccupation
4. Dieting
5. Maturity

Timing

1. Post-treatment
2. 6-month follow-up

2. Agras, W. S., Walsh, B. T., Fairburn, C. G., Wilson, G. T., & Kraemer, H. C. (2000). A multicenter comparison of cognitive-behavioral therapy and interpersonal psychotherapy for bulimia nervosa. *Arch Gen Psychiatry, 57*, 459-466.

Comparisons

1. Cognitive-Behavioral Therapy vs. Interpersonal Therapy

Measures

1. Eating Disorder Examination – binges
2. Eating Disorder Examination – purges
3. Body Mass Index
4. Eating Disorder Examination – global
5. Eating Disorder Examination – restraint
6. Eating Disorder Examination – weight concerns
7. Eating Disorder Examination – shape concerns
8. Eating Disorder Examination – eating concerns
9. Inventory of Interpersonal Problems

10. Rosenberg Self-esteem Scale
11. Hopkins Symptom Checklist-90-Revised
12. Social Adjustment Scale

Timing

1. Post-treatment
2. 4-month follow-up
3. 8- & 12-month follow-up

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

Comparisons

1. Cognitive-Behavioral Therapy vs. self-help

Measures

1. Binge eating frequency
2. Vomiting frequency
3. Use of laxatives
4. Meal frequency
5. Body Mass Index
6. Beck Depression Inventory
7. Eating Disorder Inventory- Drive for thinness
8. Eating Disorder Inventory- Bulimia
9. Eating Disorder Inventory- Body Dissatisfaction
10. Eating Disorder Inventory-Ineffectiveness
11. Eating Disorder Inventory- Perfectionism
12. Eating Disorder Inventory- Interpersonal Distrust
12. Eating Disorder Inventory- Interoceptive Awareness
13. Eating Disorder Inventory- Maturity Fears
14. Eating Disorder Inventory- Asceticism
15. Eating Disorder Inventory- Impulse Regulation
16. Eating Disorder Inventory- Social Insecurity

Timing

1. Post-treatment
2. 1-year follow-up

4. Ball, J. & Mitchell, P. (2004). A randomized controlled study of cognitive behavior therapy and behavioral family therapy for anorexia nervosa patients. *Eating Disorders, 12,* 303-314. doi:10.1080/10640260490521389

Comparisons

    1. Cognitive-Behavioral Therapy vs. Behavioral Family Therapy

Measures

    1. Body Mass Index
    2. Morgan-Russell Assessment Schedule
    3. Eating Disorders Examination
    4. Anorectic Behavior Observation Scale
    5. Eating Disorders Inventory – Body Dissatisfaction
    6. Eating Disorders Inventory – Interoceptive Awareness
    7. Eating Disorders Inventory – Perfectionism
    8. Beck Depression Inventory – Cognitive
    9. State-Trait Anxiety Inventory – Y1

Timing

    1. Post-treatment
    2. 6-month follow-up

5. Bloomgarden, A., & Calogero, R. M. (2008). A randomized experimental test of the efficacy of EMDR treatment on negative body image in eating disorder inpatients. *Eating Disorders, 16,* 418-427. doi:10.1080/10640260802370598

Comparisons

    1. Standard Residential Treatment (SRT) vs. SRT/Eye Movement
       Desensitization and Reprocessing

Measures

    1. Body Image Memory Questionnaire
    2. Body Investment Scale
    3. Appearance Schemas Inventory
    4. Body Dissatisfaction subscale of Eating Disorder Inventory- 2
    5. Sociocultural Attitudes toward Appearance Questionnaire-Revised
    6. Eating Attitudes Test-26
    7. Beck Depression Inventory
    8. Dissociative Experiences Scale

Timing

    1. Post-treatment
    2. 3-month follow-up
    3. 12-month follow-up

6. Carter, F. A., McIntosh V. V. W., Joyce, P. R., Sullivan, P. F., & Bulik, C. M. (2003). Role of exposure with response prevention in cognitive-behavioral therapy for bulimia

nervosa: Three-year follow-up results. *International Journal of Eating Disorders, 33,* 127-135. doi:10.1002/eat.10126

Comparisons

1. Only Cognitive-Behavioral Therapy completed vs. neither Cognitive-Behavioral Therapy nor Behavioral Therapy
2. Both Cognitive-behavioral Therapy and Behavioral Therapy completed vs. neither Cognitive-behavioral therapy nor Behavioral Therapy
3. Only Cognitive-Behavior Therapy completed vs. both Cognitive-Behavioral Therapy and Behavioral Therapy completed

Measures

1. Binge Frequency
2. Vomiting Frequency
3. Purge Frequency
4. Dieting
5. Body Dissatisfaction
6. Eating Disorder Inventory - drive for thinness
7. Eating Disorder Inventory – bulimia subscale
8. Eating Disorder Inventory - body dissatisfaction subscale
9. Hamilton Depression Rating Scale
10. Global Assessment of Functioning

Timing

1. 3-year follow-up

7. Cooper, P. J., & Steere, J. (1995). A comparison of two psychological treatments for bulimia nervosa: Implications for models of maintenance. *Behaviour Research and Therapy, 33*(8), 875-885.

Comparisons

1. Cognitive-Behavioral Therapy (in absence of explicit exposure instructions) vs. Exposure-Response Prevention (in absence of cog restructuring)

Measures

1. Bulimic episodes per month
2. Self-induced vomiting per month
3. Eating Disorder Examination-Dietary restraint
4. Self-Regulation Questionnaire-Dietary restraint
5. Eating Disorder Examination-Shape Concern
6. Eating Disorder Examination-Weight concern

7. Important of shape and weight (geometric mean of 2 Eating Disorder Examination items)
8. Eating Attitudes Test
9. Body Satisfaction Questionnaire
10. Global mental state (PSE) – Present State Examination
11. Montgomery-Asberg Depression Rating Scale
12. Beck Depression Inventory
13. Anxiety Inventory – State
14. Anxiety Inventory – Trait
15. Self-esteem- Rosenberg Self-Esteem Scale
16. Body weight- Matched pop mean weight
17. Desired weight

Timing

1. Post-treatment
2. 12-month follow-up

8. Dare, C., Eisler, I., Russell, G., Treasure, J., & Dodge, L. (2001). Psychological therapies for adults with anorexia nervosa: Randomised controlled trial of out-patient treatments. *British Journal of Psychiatry, 178,* 216-221.

Comparisons

1. Focal psychotherapy vs. routine (control)
2. Family therapy vs. routine (control)
3. Cognitive-analytic therapy vs. routine (control)
4. Focal Psychotherapy vs. Family Therapy
5. Cognitive-analytic therapy vs. Focal Psychotherapy
6. Cognitive-analytic therapy vs. Family therapy

Measures

1. Weight
2. Body Mass Index
3. Average Body Weight
4. Morgan Russell Assessment Schedule -A Nutritional
5. Morgan Russell Assessment Schedule -B Menstrual
6. Morgan Russell Assessment Schedule -C Psychiatric
7. Morgan Russell Assessment Schedule -D psychosexual
8. Morgan Russell Assessment Schedule -E Socio-economic
9. Morgan Russell Assessment Schedule -Ave Average

Timing

1. Post-treatment
2. 1 year follow-up

9. Davis, R., McVey, G., Heinmaa, M., Rockert, W., & Kennedy, S. (1999). Sequencing of cognitive-behavioral treatments for bulimia nervosa. *International Journal of Eating Disorders, 25,* 361-374.

Comparisons

    1. PE + Cognitive-Behavioral Therapy vs. PE (psychoeducation) alone

Measures

    1. Eating Disorder Examination-binging episodes
    2. Eating Disorder Examination -purging episodes
    3. Percent in complete remission from binging and purging
    4. Eating Disorder Examination –Global

Timing

    1. Post-treatment
    2. 16-week follow-up

10. Dean, H. Y., Touyz, S. W., Rieger, E., & Thornton, C. E. (2008). Group motivational enhancement therapy as an adjunct to inpatient treatment for eating disorders: A preliminary study. *European Eating Disorders Review, 16,* 256-267. doi:10.1002/erv.851

Comparisons

    1. MET (motivational enhancement therapy) vs. Treatment as usual

Measures

    1. Anorexia Nervosa Stages of Change Questionnaire
    2. Burdens
    3. Benefits
    4. Avoidance
    5. Self-efficacy scale
    6. Treatment engagement
    7. Beck Depression Inventory - II
    8. Eating Disorder Inventory -II Drive for thinness
    9. Eating Disorder Inventory -II Bulimia
    10. Eating Disorder Inventory -II Body dissatisfaction
    11. Eating Disorder Inventory -II Ineffectiveness
    12. Eating Disorder Inventory -II Perfectionism
    13. Eating Disorder Inventory -II Interpersonal distrust
    14. Eating Disorder Inventory -II Interoceptive awareness
    15. Eating Disorder Inventory -II Maturity fears
    16. Eating Disorder Inventory -II Asceticism
    17. Eating Disorder Inventory -II Impulse regulation
    18. Eating Disorder Inventory -II Social insecurity
    19. Eating Disorder Examination -Q Restraint

20. Eating Disorder Examination -Q Eating concern
21. Eating Disorder Examination -Q Shape concern
22. Eating Disorder Examination -Q Weight concern
23. Eating Disorder Examination -Q Binges
24. Eating Disorder Examination -Q Vomiting episodes
25. Eating Disorder Examination -Q Laxative abuse
26. Eating Disorder Examination -Q Diuretic abuse
27. Eating Disorder Examination -Q Excessive exercise

Timing

1. Post-treatment
2. 6-week follow-up

11. Dunn, E. C., Neighbors, C., & Larimer, M. E. (2006). Motivational enhancement therapy and self-help treatment for binge eaters. *Psychology of Addictive Behaviors, 20*(1), 44-52. doi:10.1037/0893-164X.20.1.44

Comparisons

1. Motivational Enhancement Therapy vs. Self-help only

Measures

1. Bingeing
2. Vomiting
3. Use of laxatives
4. Fasting
5. Excessive exercise
6. Weight concern
7. Shape concern
8. Eating concern
9. Restraint
10. Global severity

Timing

1. Post-intervention
2. 4-month follow-up

12. Eisler, I., Simic, M., Russell, G. F. M., & Dare, C. (2007). A randomized controlled treatment trial of two forms of family therapy in adolescent anorexia nervosa: A five-year follow-up. *Journal of Child Psychology and Psychiatry, 48*(6), 552-560. doi:10.1111/j.1469-7610.2007.01726.x

Comparisons

1. Conjoint Family Therapy vs. separated family therapy

Measures

    1. Percent Average Body Weight
    2. Body Mass Index
    3. Morgan Russell Assessment Schedule -A Nutrition
    4. Morgan Russell Assessment Schedule -B Menstrual
    5. Morgan Russell Assessment Schedule -C Psychiatric
    6. Morgan Russell Assessment Schedule -D psychosexual
    7. Morgan Russell Assessment Schedule -E Socio-economic
    8. Morgan Russell Assessment Schedule -Ave Average

Timing

    1. Post-treatment
    2. 5-year follow-up

13. Esplen, M. J., Garfinkel, P. E., Olmsted, M., Gallop, R. M., & Kennedy, S. (1998). A randomized controlled trial of guided imagery in bulimia nervosa. *Psychological Medicine, 28,* 1347-1357.

Comparisons

    1. Guided imagery vs. control

Measures

    1. Drive for thinness
    2. Bulimia
    3. Body dissatisfaction
    4. Ineffectiveness
    5. Perfectionism
    6. Interpersonal distrust
    7. Interoceptive awareness
    8. Maturity fears

Timing

    1. Post-treatment

14. Fairburn, C. G., Jones, R., Peveler, R. C., Carr, S. J., Solomon, R. A., O'Connor, M. E., Burton, J., & Hope, R. A. (1991). Three psychological treatments for bulimia nervosa: A comparative trial. *Archives of General Psychiatry, 48,* 463-469.

Comparisons

    1. Cognitive Behavioral Therapy vs. Interpersonal Therapy
    2. Cognitive-Behavioral Therapy vs. Behavioral Therapy
    3. Interpersonal Therapy vs. Behavioral Therapy

<u>Measures</u>

       1. Objective bulimic episodes
       2. Dietary restraint
       3. Self-induced vomiting
       4. Laxative misuse
       5. Body Mass Index
       6. Attitudes to shape
       7. Attitudes to weight
       8. Eating Attitudes Test
       9. Symptom Checklist-90 – global
       10. Beck Depression Inventory
       11. Social Adjustment Scale

<u>Timing</u>

       1. Post-treatment

15. Fairburn, C. G., Jones, R., Peveler, R. C. Hope, R. A., & O'Connor, M. (1993). Psychotherapy and bulimia nervosa: Longer-term effects of interpersonal psychotherapy, behavior therapy, and cognitive behavior therapy. *Archives of General Psychiatry, 50,* 419-428.

<u>Comparisons</u>

       1. Cognitive Behavioral Therapy vs. Interpersonal Therapy
       2. Cognitive-Behavioral Therapy vs. Behavioral Therapy
       3. Interpersonal Therapy vs. Behavioral Therapy

<u>Measures</u>

       1. Objective bulimic episodes
       2. Self-induced vomiting
       3. Laxative misuse
       4. Dietary restraint
       5. Attitudes to shape
       6. Attitudes to weight
       7. Eating attitudes Test
       8. Symptom Checklist-90 – global
       9. Beck Depression Inventory
       10. Rosenberg Self-esteem Scale
       11. Social Adjustment Scale
       12. Body Mass Index

<u>Timing</u>

       1. Post-treatment
       2. 4-month follow-up

3. 8-month follow-up
4. 12-month follow-up

16. Fairburn, C. G., Kirk, J., O'Connor, M., & Cooper, P. J. (1986). A comparison of two psychological treatments for bulimia nervosa. *Behaviour Research and Therapy, 24*(6), 629-643.

Comparisons

    1. Cognitive-Behavioral Therapy vs. Short-term Focal therapy

Measures

    1. Global clinical score
    2. Frequency of bulimic episodes
    3. Frequency of episodes of vomiting
    4. Eating Attitudes Test total score
    5. Actual weight (%Matched Population Mean Weight)
    6. Desired weight (%Matched Population Mean Weight)
    7. Present State Examination total symptom score
    8. Montgomery-Asberg Depression Rating Scale total score
    9. Social Adjustment Scale-M overall role area score

Timing

    1. Post-treatment
    2. 4-month follow-up
    3. 8-month follow-up
    4. 12-month follow-up

17. Fairburn, C. G., Peveler, R. C., Jones, R., Hope, R. A., & Doll, H. A. (1993). Predictors of 12-month outcome in bulimia nervosa and the influence of attitudes to shape and weight. *Journal of Consulting and Clinical Psychology, 61*(4), 696-698.

Comparisons

    1. Cognitive-Behavioral Therapy vs. Cognitive-Behavioral Therapy
    behavioral focus
    2. Cognitive-Behavioral Therapy vs. Interpersonal Therapy
    3. Cognitive-Behavioral Therapy behavioral focus vs. Interpersonal
       Therapy

Measures

    1. Eating Disorder Examination
    2. Symptom Checklist-90
    3. Rosenberg Self-Esteem Scale
    4. Personality Diagnostic Questionnaire

Timing

    1. Post-treatment
    2. 4-month follow-up
    3. 8-month follow-up
    4. 12-month follow-up

18. Freeman, C. P. L., Barry, F., Dunkeld-Turnbull, J., & Henderson, A. (1988). Controlled trial of psychotherapy for bulimia nervosa. *British Medical Journal, 296,* 521-525.

Comparisons

    1. Cognitive-Behavioral Therapy vs. control
    2. Behavioral Therapy vs. control
    3. Group vs. control
    4. Cognitive-Behavioral Therapy vs. Behavioral Therapy
    5. Cognitive-Behavioral Therapy vs. Group
    6. Behavioral Therapy vs. Group

Measures

    1. Bulimic investigatory test
    2. Eating Attitudes Test Total
    3. Eating Attitudes Test Bulimia
    4. Eating Attitudes Test Dieting
    5. Eating Attitudes Test Oral control
    6. Eating Disorder Inventory Drive for thinness
    7. Eating Disorder Inventory Bulimia
    8. Eating Disorder Inventory Body dissatisfaction
    9. Eating Disorder Inventory Ineffectiveness
    10. Eating Disorder Inventory Perfectionism
    11. Eating Disorder Inventory Interpersonal distrust
    12. Eating Disorder Inventory Interoceptive awareness
    13. Eating Disorder Inventory Maturity fears
    14. Eating Disorder Inventory Self-esteem
    15. Montgomery and Asberg depression scale
    16. Depression
    17. Anxiety
    18. Outward irritability
    19. Inward irritability

Timing

    1. Post-treatment
    2. 3-month follow-up

19. Furber, G., Steele, A., & Wade, T. D. (2004). Comparison of six- and eight-session cognitive guided self-help for bulimia nervosa. *Clinical Psychologist, 8*(2), 64-69. doi:10.1080/1328420041233130404027

Comparisons

1. 6 session cognitive guided self-help vs. 8 session cognitive guided self-help

Measures

1. Objective binges
2. Average over last 3 months
3. Vomiting episodes
4. Average over last 3 months

Timing

1. Post-treatment

20. Garner, D. M., Rockert, W., Davis, R., Garner, M. V., Olmsted, M. P. & Eagle, M. (1993). Comparison of cognitive-behavioral and supportive-expressive therapy for bulimia nervosa. *The American Journal of Psychiatry, 150*(1), 37-46.

Comparisons

1. Cognitive-Behavioral Therapy. vs Supportive-expressive therapy

Measures

1. Vomiting episodes in last 28 days
2. Binge eating episodes in last 28 days
3. Eating Attitudes Test Dieting
4. Eating Attitudes Test Bulimia and food preoccupation
5. Eating Attitudes Test Oral Control
6. Eating Attitudes Test Total
7. Eating Disorder Examination Dietary Restraint
8. Eating Disorder Examination Attitudes toward shape
9. Eating Disorder Examination Attitudes toward weight

Timing

1. Post-treatment
2. 3-month follow-up
3. 6-month follow-up
4. 1 year follow-up

21. Ghaderi, Ata (2006). Does individualization matter? A randomized trial of standardized (focused) versus individualized (broad) cognitive behavior therapy for bulimia nervosa. *Behaviour Research and Therapy, 44,* 273-288. doi:10.1016/j.brat.2005.02.004

Comparisons

1. Standardized focused Cognitive-Behavioral Therapy vs. Individualized broad Cognitive-Behavioral Therapy

Measures

1.Eating Disorder Examination Objective binges
2. Eating Disorder Examination Objective Binge Episodes (OBE): Eating Disorder Inventory/28 days
3. Eating Disorder Examination Abstinence from OBE
4. Eating Disorder Examination Self-induced vomiting
5. Eating Disorder Examination Vomiting: Eating Disorder Inventory/28 days
6. Eating Disorder Examination Excessive exercise
7. Eating Disorder Examination Abstinence from compensation
8. Beck Depression Inventory
9. Rosenberg Self-Esteem Scale
10. Body Satisfaction Questionnaire
11. Perceived social support
12. Eating Disorder Examination Restraint
13. Eating Disorder Examination Eating concern
14. Eating Disorder Examination Shape concern
15. Eating Disorder Examination Weight concern
16. Eating Disorder Examination EDE-Q total score
17. Eating Disorder Inventory Dieting
18. Eating Disorder Inventory Bulimia
19. Eating Disorder Inventory Body dissatisfaction
20. Eating Disorder Inventory Ineffectiveness
21. Eating Disorder Inventory Perfectionism
22. Eating Disorder Inventory Interpersonal distrust
23. Eating Disorder Inventory Interoceptive awareness
24. Eating Disorder Inventory Total score

Timing

1. Post-treatment
2. 6-month follow-up

22. Gollings, E. K., & Paxton, S. J. (2006). Comparison of internet and face-to-face delivery of a group body image and disordered eating intervention for women: A pilot study. *Eating Disorders, 14,* 1-15. doi:10.1080/10640260500403790

Comparisons

       1. Face-to-face vs. internet

Measures

       1. Body Satisfaction Questionnaire
       2. Body Image Avoidance Questionnaire
       3. Dutch Eating Behavior Questionnaire-R
       4. Extreme Weight Loss Behaviors
       5. Eating Disorder Inventory-Drive for Thinness
       6. Bulimia Test-R
       7. Binge Episode-FREQ
       8. Eating Disorder Examinantion- Q
       9. Beck Depression Inventory
       10. State/Trait Anxiety Inventory
       12. Rosenberg Self-Esteem Scale

Timing

       1. Post-treatment
       2. 2-month follow-up

23. Gowers, S. G., Clark, A., Roberts, C., Griffiths, A., Edwards, V., Bryan, C., Smethurst, N., Byford, S., & Barrett, B. (2007). Clinical effectiveness of treatments for anorexia nervosa in adolescents: Randomised controlled trial. *British Journal of Psychiatry, 191,* 427-435. doi:10.1192/bjp.bp.107.036764

Comparisons

       1. In-patient vs. Out-patient
       2. Specialized outpatient vs. General out-patient
       3. In-patient vs. General outpatient
       4. In-patient vs. Specialized outpatient

Measures

       1. Food intake
       2. Menstruation
       3. Mental state
       4. Psychosexual adjustment
       5. Socio-economic status
       6. Average Outcome Scale
       7. Body Mass Index
       8. Weight for height
       9. Eating Disorder Inventory total
       10. Family Assessment Device
       11. Mood and Feelings Questionnaire
       12. Health of the Nation Outcome Scales for Children and Adolescents,

clinician
13. Health of the Nation Outcome Scales for Children and Adolescents, self

<u>Timing</u>

1. Post-treatment (1 year)
2. 1 year follow-up (2 years)

24. Griffiths, R. A., Hadzi-Pavlovic, D., &Channon-Little, L. (1994). A controlled evaluation of hypnobehavioural treatment for bulimia nervosa: Immediate pre-post treatment effects. *European Eating Disorders Review, 2*(4), 202-220.

<u>Comparisons</u>

1. Hypnobehavioural vs. waiting list control
2. Cognitive Behavioral Therapy vs. waiting list control
3. Cognitive-Behavioral Therapy vs. Hypnobehavioral

<u>Measures</u>

1. Patient Information Checklist
2. Eating Disorder Examination
3. Eating Attitudes Test
4. Eating Disorder Inventory
5. The Harvard Group Scale of Hypnotic Susceptibility
6. Self-monitoring of binging
7. Self-monitoring of purging

<u>Timing</u>

1. Post-treatment

25. Hsu, L. K. G., Rand, W., Sullivan, S., Liu, D. W., Mulliken, B., McDonagh, B., & Kaye, W. H. (2001). Cognitive therapy, nutritional therapy and their combination in the treatment of bulimia nervosa. *Psychological Medicine, 31,* 871-879.

<u>Comparisons</u>

1. Cognitive therapy vs. control
2. Nutritional therapy vs. control
3. Combination cognitive and nutritional vs. control
4. Cognitive Therapy vs. Nutritional Therapy
5. Cognitive Therapy vs. Combined
6. Nutritional therapy vs. combined

<u>Measures</u>

1. Eating Disorder Inventory

2. Intake Inventory
3. Self-report of binge/purge
4. Hamilton Depression Rating Scale
5. Dysfunctional Attitudes Scale
6. Self-control Scale

Timing

1. Post-treatment

26. Jacobi, C., Morris, L., Beckers, C., Bronisch-Holtze, J., Winter, J., Winzelberg, A. J., & Taylor, C. B. (2007). Maintenance of internet-based prevention: A randomized controlled trial. *International Journal of Eating Disorders, 40*(2), 114-119. doi:10.1002/eat

Comparisons

1. Internet prevention vs. Waitlist control

Measures

1. Eating Disorder Examination-Q restraint
2. Eating Disorder Examination-Q eating concern
3. Eating Disorder Examination-Q weight concern
4. Eating Disorder Examination-Q shape concern
5. Eating Disorder Inventory-2 drive for thinness
6. Eating Disorder Inventory-2 body dissatisfaction
7. Weight Concerns Scale
8. Knowledge Test
9. Symptom Checklist-90
10. Body Mass Index

Timing

1. Post-treatment
2. 3-month follow-up

27. Jones, M., Luce, K. H., Osborne, M. I., Taylor, K., Cunning, D., Doyle, A. C., Wilfley, D. E., & Taylor, C. B. (2008). Randomized, controlled trial of an internet-facilitated intervention for reducing binge eating and overweight in adolescents. *Pediatrics, 121,* 453-462. doi:10.1542/peds.2007-1173

Comparisons

1. Online intervention vs. waitlist control

Measures

1. Body Mass Index
2. Binge Eating Behavior

3. Dietary fat and sugar intake (PACE measure)
4. Center for Epidemiologic Studies Depression Scale
5. Program Adherence

Timing

1. Post-treatment
2. 9-month follow-up

28. Jones, R., Peveler, R. C., Hope, R. A., & Fairburn, C. G. (1993). Changes during treatment for bulimia nervosa: A comparison of three psychological treatments. *Behaviour Research and Therapy, 31*(5), 479-485.

Comparisons

1. Cognitive-Behavioral Therapy vs. Behavioral Therapy
2. Cognitive-Behavioral Therapy vs. Interpersonal Therapy
3. Interpersonal Therapy vs. Behavioral Therapy

Measures

1. Binge eating
2. Purging
3. Eating Attitudes Test
4. Beck Depression Inventory
5. Rosenberg Self-Esteem Scale

Timing

1. Post-treatment

29. Kirkley, B. G., Schneider, J. A., Stewart, A., & Bachman, J. A. (1985). Comparison of two group treatments for bulimia. *Journal of Consulting and Clinical Psychology, 53*(1), 43-48.

Comparisons

1. Cognitive-Behavioral Therapy group vs. nondirective group

Measures

1. Food records
2. Beck Depression Inventory
3. Spielberger State-trait personality inventory
4. Assertion Invetory
5. Eating Attitudes Test
6. Eating Disorder Inventory

Timing

1. Post-treatment
2. 3-month follow-up

30. Kong, S. (2005). Day treatment programme for patients with eating disorders: Randomized controlled trial. *Journal of Advanced Nursing, 51*(1), 5-14.

Comparisons

1. Day treatment program vs. control (receiving traditional outpatient IPT, Cognitive-Behavioral Therapy, PT)

Measures

1. Eating Disorder Examination
2. Eating Disorder Inventory - 2
3. Beck Depression Inventory
4. Rosenberg Self-Esteem Scale

Timing

1. Post-treatment

31. Laessle, R. G., Beumont, P. J. V., Butow, P., Lennerts, W., O'Connor, M., Pirke, K., M., Touyz, S. W., & Waadt, S. (1991). A comparison of nutritional management with stress management in the treatment of bulimia nervosa. *British Journal of Psychiatry, 159,* 250-261.

Comparisons

1. Nutritional management vs. stress management

Measures

1. Binge frequency
2. Vomiting frequency
3. Calories/day
4. Drive for thinness
5. Body dissatisfaction
6. Perfectionism
7. Interoceptive awareness
8. Eating Attitudes Test total
9. Ineffectiveness
10. Interpersonal distrust
11. Maturity fears
12. Beck Depression Inventory
13. State/Trait Anxiety Inventory – state
14. State/Trait Anxiety Inventory – trait

Timing

1. Post-treatment
2. 6-month follow-up
3. 12-month follow-up

32. Le Grange, D., Crosby, R. D., Rathouz, P. J., & Leventhal, B. L. (2007). A randomized controlled comparison of family-based treatment and supportive psychotherapy for adolescent bulimia nervosa. *Archives of General Psychiatry, 64*(9), 1049-1056.

<u>Comparisons</u>

1. Family-based treatment vs. supportive psychotherapy

<u>Measures</u>

1. Eating Disorder Examination Objective binge eating
2. Eating Disorder Examination Subjective binge eating
3. Eating Disorder Examination Vomiting
4. Eating Disorder Examination All compensatory behaviors
5. Eating Disorder Examination Restraint
6. Eating Disorder Examination Weight concern
7. Eating Disorder Examination Shape concern
8. Eating Disorder Examination Eating concern
9. Eating Disorder Examination Global
10. Rosenberg Self-esteem scale
11. Beck Depression Inventory

<u>Timing</u>

1. Post-treatment
2. 6-month follow-up

33. Lee, N. F., & Rush, A. J. (1986). Cognitive-behavioral group therapy for bulimia. *International Journal of Eating Disorders, 5*(4), 599-615.

<u>Comparisons</u>

1. Cognitive-Behavioral Therapy group vs. control

<u>Measures</u>

1. Beck Depression Inventory
2. Hamilton Rating Scale for Depression
3. State/Trait Anxiety Inventory state
4. State/Trait Anxiety Inventory trait
5. Symptom Checklist-90 Somatization
6. Symptom Checklist-90 Obsessive-compulsive
7. Symptom Checklist-90 Interpersonal sensitivity
8. Symptom Checklist-90 Depression
9. Symptom Checklist-90 Anxiety

10. Symptom Checklist-90 Hostility
11. Symptom Checklist-90 Phobic anxiety
12. Symptom Checklist-90 Paranoid ideation
13. Symptom Checklist-90 Psychoticism

Timing

1. Post-treatment
2. 4-month follow-up

34. Leitenberg, H., Rosen, J. C., Gross, J., Nudelman, S., & Vara, L. S. (1988). Exposure plus response-prevention treatment of bulimia nervosa. *Journal of Consulting and Clinical Psychology, 56*(4), 535-541.

Comparisons

1. Exposure plus response prevention in single setting vs. control
2. Exposure plus response prevention in multiple settings vs. control
3. Cognitive-Behavioral Therapy w/o ERP vs. control
4. Exposure plus response prevention in single setting vs. Exposure plus response prevention in multiple settings
5. Cognitive-Behavioral Therapy w/0 ERP vs. Exposure plus response prevention in single setting
6. Cognitive-Behavioral Therapy w/0 ERP vs. Exposure plus response prevention in multiple settings

Measures

1. Eating Attitudes Test
2. Beck Depression Inventory
3. Lawson Social Self-esteem
4. Rosenberg Self-esteem scale
5. Body size distortion

Timing

1. Post-treatment
2. 6-month follow-up

35. Lock, J., Couturier, J., &Agras, W. S. (2006). Comparison of long-term outcomes in adolescents with anorexia nervosa treated with family therapy. *Journal of the Academy of Child and Adolescent Psychiatry, 45*(6), 666-672. doi:101097/01.chi.0000215152.61400.ca

Comparisons

1. Short-term family therapy vs. LT family therapy

Measures

     1. Body Mass Index
     2. Global Eating Disorder Examination
     3. Eating Disorder Examination eating restraint
     4. Eating Disorder Examination eating concern
     5. Eating Disorder Examination shape concern
     6. Eating Disorder Examination weight concern

Timing

     1. 3.96-year follow-up (range of 2.3 to 6 years)

36. McIntosh, V. V. W., Jordan, J., Carter, F. A., Luty, S. E., McKenzie, J. M., Bulik, C. M., Frampton, C. M. A., & Joyce, P. R. (2005). Three Psychotherapies for anorexia nervosa: A randomized, controlled trial. *American Journal of Psychiatry, 162*(4), 741-747.

Comparisons

     1. Cognitive-Behavioral Therapy vs. control
     2. Interpersonal Therapy vs. control
     3. Cognitive-Behavioral Therapy vs. Interpersonal Therapy

Measures

     1. Weight
     2. Body Mass Index
     3. Body fat
     4. Eating Disorder Examination Restraint
     5. Eating Disorder Examination Eating concerns
     6. Eating Disorder Examination Weight concerns
     7. Eating Disorder Examination Shape concerns
     8. Eating Disorder Inventory Drive for thinness
     9. Eating Disorder Inventory Bulimia
     10. Eating Disorder Inventory Body dissatisfaction
     11. Eating Disorder Inventory Ineffectiveness
     12. Eating Disorder Inventory Perfectionism
     13. Eating Disorder Inventory Distrust
     14. Eating Disorder Inventory Interpersonal awareness
     15. Eating Disorder Inventory Maturity fears
     16. Eating Disorder Inventory Asceticism
     17. Eating Disorder Inventory Impulsivity
     18. Eating Disorder Inventory Insecurity
     19. Global Assessment of Functioning
     20. Hamilton Depression Rating Score

Timing

1. Post-treatment

37. Mitchell, J. E., Crosby, R. D., Wonderlich, S. A., Crow, S., Lancaster, K., Simonich, H., Swan-Kremeier, L., Lysne, C., & Myers, T. C. (2008). A randomized trial comparing the efficacy of cognitive-behavioral therapy for bulimia nervosa delivered via telemedicine versus face-to-face. *Behaviour Research and Therapy, 46,* 581-592. doi:10.1016/j.brat.2008.02.004

<u>Comparisons</u>

1. Cognitive-Behavioral Therapy face-to-face vs. Cognitive-Behavioral Therapy via telemedicine

<u>Measures</u>

1. Objective binge-eating
2. Purging
3. Objective binge-eating and purging
4. Objective binge-eating
5. Purging
6. Both
7. Objective binge-eating
8. Purging
9. Both
10. Eating Disorder Examination Restraint
11. Eating Disorder Examination Eating concerns
12. Eating Disorder Examination Shape concerns
13. Eating Disorder Examination Weight concerns
14. Hamilton Depression
15. Rosenberg Self-Esteem Scale
16. Physical component
17. Mental component

<u>Timing</u>

1. Post-treatment
2. 3-month follow-up
3. 12-month follow-up

38. Mitchell, J. E., Pyle, R. L., Pomeroy, C., Zollman, M., Crosby, R., Seim, H., Eckert, E. D., & Zimmerman, R. (1993). Cognitive-behavioral group psychotherapy of bulimia nervosa: Importance of logistical variables. *International Journal of Eating Disorders, 14*(3), 227-287.

<u>Comparisons (Cognitive-Behavioral Therapy group therapy)</u>

1. A1 (high abstinence, high intensity, 45 hours, 12 group dinners) vs. A2 (high abstinence, low intensity, 22.5 hours, 6 group dinners)

2. A1 (high abstinence, high intensity, 45 hours, 12 group dinners) vs. B1 (low abstinence, high intensity, 45 hours, 12 group dinners)
3. A1 (high abstinence, high intensity, 45 hours, 12 group dinners) vs. B2 (low abstinence, low intensity, 22.5 hours, 6 group dinners)
4. A2 (high abstinence, low intensity, 22.5 hours, 6 group dinners) vs. B1 (low abstinence, high intensity, 45 hours, 12 group dinners)
5. A2 (high abstinence, low intensity, 22.5 hours, 6 group dinners) vs. B2 (low abstinence, low intensity, 22.5 hours, 6 group dinners)
6. B1 (low abstinence, high intensity, 45 hours, 12 group dinners) vs . B2 (low abstinence, low intensity, 22.5 hours, 6 group dinners)

Measures

1. Binge episodes per week
2. Binge time per week
3. Vomit epidsodes per week
4. Laxative use per week
5. Abstinent days per week
6. Global Severity
7. Global improvement
8. Hamilton depression
9. Hamilton anxiety
10. Global improvement
11. Symptom Checklist-90 Global severity
12. Symptom Checklist-90 Positive symptoms total
13. Symptom Checklist-90 Positive symptoms distress
14. Beck Depression Inventory
15. Weissman Social Adjustment Work
16. Weissman Social Adjustment Social
17. Weissman Social Adjustment Extended Family
18. Eating Disorder Inventory Drive for thinness
19. Eating Disorder Inventory Bulimia
20. Eating Disorder Inventory Maturity fears
21. Eating Disorder Inventory Ineffectiveness
22. Eating Disorder Inventory Perfectionism
23. Eating Disorder Inventory Interpersonal distrust
24. Eating Disorder Inventory Interoceptive awareness
25. Eating Disorder Inventory Body dissatisfaction

Timing

1. Post-treatment

39. Nevonen, L., & Broberg, A. G. (2006). A comparison of sequenced individual and group psychotherapy for patients with bulimia nervosa. *International Journal of Eating Disorders, 39*(2), 117-127.

Comparisons

    1. individual vs. group

Measures

1. Binge eating days per week
2. Compensation days per week
3. Dietary restraint
4. Weight phobia
5. Eating Disorder Inventory subscales 1-3
6. Eating Disorder Inventory subscales 4-11
7. Inventory of Interpersonal problems
8. Symptom Checklist-90 Global Scale Index
9. Beck Depression Inventory

Timing

    1. Post-treatment
    2. 1 year follow-up
    3. 2.5-year follow-up

   40. Ordman, A. M., & Kirschenbaum, D. S. (1985). Cognitive-behavioral therapy for bulimia: An initial outcome study. *Journal of Consulting and Clinical Psychology, 53*(3), 305-313.

Comparisons

    1. Full intervention Cognitive-Behavioral Therapy (cognitive restructuring, ERP, behavioral contracting, process-oriented) vs. brief intervention Cognitive-Behavioral Therapy

Measures

    1. Binge questionnaire
    2. Body Cathexis test
    3. Eating Attitudes Test
    4. Eating Patterns Questionnaire
    5. Symptom Checklist-90
    6. Beck Depression Inventory
    7. Family adaptability and cohesion evaluation scale
    8. Family environment scale
    9. Attitudes toward women scale
    10. Calories of food consumed
    11. SUD rating immediately after
    12. Highest SUD rating given
    13. Duration in minutes of SUD over 50

14. Subjective measure of client's urge to vomit
15. Highest SUV
16. Duration in minutes of SUV over 10
17. Frequency of vomiting per day
18. Number of days per week w/o episode

Timing

1. Post-treatment

41. Peterson, C. B., Mitchell, J. E., Engbloom, S., Nugent, S., Mussell, M. P., Crow, S. J., & Thuras, P. (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.

Comparisons

1. Therapist led vs. partial self-help
2. Therapist led vs. structured self-help
3. Structured self-help vs. Partial self-help

Measures

1. Objective binge
2. Total binge
3. Hours binged
4. % abstinent from objective binge for last week
5. % abstinent from total binge for last week
6. Three-factor eating questionnaire Restraint
7. Three-factor eating questionnaire Disinhibition
8. Three-factor eating questionnaire Hunger
9. Beck Depression Inventory
10. Hamilton Depression Rating Scale
11. Body Satisfaction Questionnaire
12. Rosenberg Self-esteem scale
13. Body Mass Index

Timing

1. Post-treatment
2. 1 month follow-up
3. 6-month follow-up
4. 1 year follow-up

42. Riva, G., Bacchetta, M., Baruffi, M., & Molinari, E. (2002). Virtual-reality-based multidimensional therapy for the treatment of body image disturbances in binge eating disorders: A preliminary controlled study. *IEEE Transactions on Information Technology in Biomedicine, 6*(3), 224-234. doi:10.1109/TITB.2002.802372

Comparisons

    1. Virtual reality based multidimensional therapy vs. nutritional groups based on Cognitive-Behavioral Therapy model

Measures

    1. Minnesota Multiphasic Personality Inventory- 2
    2. Eating Disorder Inventory
    3. DIET
    4. State/Trait Anxiety Inventory
    5. Assertion inventory
    6. Weight efficacy life-style questionnaire
    7. University of Rhode Island change assessment scale
    8. Body Satisfaction scale
    9. Body image avoidance questionnaire
    10. Figure rating scale
    11. Contour drawing rating scale

Timing

    1. Post-treatment

43. Riva, G., Bacchetta, M., Cesa, G., Conti, S., & Molinari, E. (2003). Six-month follow-up of in-patient experiential cognitive therapy for binge eating disorders. *Cyber Psychology & Behavior, 6*(3), 251-258.

Comparisons

    1. Cognitive-Behavioral Therapy vs. Experiential cognitive therapy
    2. Experiential cognitive therapy vs. nutritional groups
    3. Cognitive Behavioral Therapy vs. nutritional groups

Measures

    1. Eyesenck Personality Inventory
    2. Eating Disorder Inventory-2
    3. Dieter's inventory of eating temptations
    4. Beck Depression Inventory
    5. Rathus Assertiveness Schedule
    6. Rosenberg Self-esteem Scale
    7. Weight efficacy life-style questionnaire
    8. University of Rhode Island Change Assessment Scale
    9. Body Satisfaction Scale
    10. Body Image Avodiance Questionnaire

11. Contour Drawing Rating Scale

<u>Timing</u>

1. Post-treatment
2. 6-month follow-up

44. Robinson, P., Serfaty, M. (2008). Getting better byte by byte: A pilot randomized controlled trial of email therapy for bulimia nervosa and binge eating disorder. *European Eating Disorders Review, 16,* 84-93. doi:10.1002/erv.818

<u>Comparisons</u>

1. Therapist administered email therapy vs. control
2. Unsupported self-directed writing vs. control
3. Therapist administered email therapy vs. Unsupported self-directed writing

<u>Measures</u>

1. Beck Depression Inventory
2. Bulimia Investigatory Test Edinburgh
3. Desired weight
4. Linguistic inquiry and word count
5. Word count

<u>Timing</u>

1. Post-treatment
2. 3-month follow-up

45. Schmidt, U., Andiappan, M., Grover, M., Robinson, S., Perkins, S., Dugmore, O., Landau, S., Treasure, J., Eisler, I., & Williams, C. (2008). Randomised controlled trial of CD-ROM-based cognitive-behavioural self-care for bulimia nervosa. *The British Journal of Psychiatry, 193,* 493-500. doi:10.1192/bjp.193.6.500

<u>Comparisons</u>

1. CD-ROM w/o support followed by flexible number of therapist sessions vs. 3 month waiting list followed by 15 sessions of Cognitive-Behavioral Therapy

<u>Measures</u>

1. Eating Disorder Examination
2. Objective binge episodes
3. Vomiting

<u>Timing</u>

1. Post-treatment

46. Schmidt, U., Lee, S., Beecham, J., Perkins, S., Treasure, J., Yi, I., Winn, S., Robinson, P., Murphy, R., Keville, S., Johnson-Sabine, E., Jenkins, M., Frost, S., Dodge, L., Berelowitz, M., &Eisler, I. (2007). *The American Journal of Psychiatry, 164*(4), 591-598

Comparisons

1. Family therapy vs. Cognitive-Behavioral Therapy guided self-care

Measures

1. Body Mass Index
2. Abstinence Objective binging
3. Abstinence Vomiting
4. Abstinence Both
5. Subclinical Objective Binging
6. Subclinical Vomiting
7. Subclinical Both
8. Clinical Objective Binging
9. Clinical Vomiting
10. Clinical Both
11. Number of days of strict dieting per week
12. Number of days of fasting per week
13. Inappropriate weight and shape concerns
14. Food-related fear and disgust
15. Food-related preoccupation

Timing

1. Post-treatment
2. 6-month follow-up

47. Sundgot-Borgen, J., Rosenvinge, R. B., & Schneider, L. S. (2002). The effect of exercise, cognitive therapy, and nutritional counseling in treating bulimia nervosa. *Medicine & Science in Sports & Exercise, 34*(2), 190-195.

Comparisons

1. Physical exercise program vs. control
2. Nutritional advice vs. control
3. Physical exercise program vs. Nutritional advice

Measures

1. Binge eating
2. Purging
3. Body Mass Index
4. Physical activity

5. Peak O2 uptake
6. Eating Disorder Inventory Drive for thinness
7. Eating Disorder Inventory Bulimia
8. Eating Disorder Inventory Body dissatisfaction

Timing

1. Post-treatment
2. 6-month follow-up
3. 18-month follow-up

48. Telch, C. F., &Agras, S. (2001). Dialectical behavior therapy for binge eating disorder. *Journal of Consulting and Clinical Psychology, 69*(6), 1061-1065. doi:10.1037//022-006>.69.6.1061

Comparisons

1. Group Dialectical Behavior Therapy vs. control

Measures

1. Binge days
2. Binge episodes
3. Weight
4. Eating Disorder Examination Weight concerns
5. Eating Disorder Examination Shape concerns
6. Eating Disorder Examination Eating concerns
7. Eating Disorder Examination Restraint
8. Binge eating scale
9. Negative mood regulation scale
10. Emotional eating scale Anger
11. Emotional eating scale Anxiety
12. Emotional eating scale Depression
13. Positive Affect
14. Negative Affect
15. Beck Depression Inventory
16. Rosenberg Self-esteem Scale

Timing

1. Post-treatment
2. 3-month follow-up
3. 6-month follow-up

49. Thackwray, D. E., Smith, M. C., Bodfish, J. W., & Meyers, A. W. (1993). A comparison of behavioral and cognitive-behavioral interventions for bulimia nervosa. *Journal of Consulting and Clinical Psychology, 61*(4), 639-645.

Comparisons

    1. Cognitive-Behavioral Therapy vs. attention placebo
    2. Behavioral Therapy vs. attention placebo
    3. Cognitive Behavioral Therapy vs. Behavioral therapy

Measures

    1. Binge-purge
    2. Beck Depression Inventory
    3. Rathus Assertiveness Scale
    4. Rosenbaum Self-control rating scale
    5. Eating Disorder Inventory Drive for thinness
    6. Eating Disorder Inventory Bulimia
    7. Eating Disorder Inventory Ineffectiveness
    8. Eating Disorder Inventory Perfectionism

Timing

    1. Post-treatment
    2. 6-month follow-up

50. Treasure, J., Schmidt, U., Troop, N., Tiller, J., Todd, G., &Turnbull, S. (1996). Sequential treatment for bulimia nervosa incorporating a self-care manual. *British Journal of Psychiatry, 168,* 94-98.

Comparisons

    1. Sequential treatment group (8 weeks with self-care manual followed by up to 8 of Cognitive-Behavioral Therapy) vs. 16 sessions of Cognitive-Behavioral Therapy

Measures

    1. Binging
    2. Vomiting
    3. Use of laxatives
    4. Exercising
    5. Bulimia Investigation Test Edinburgh

Timing

    1. Post-treatment
    2. 18-month follow-up

51. Wilfley, D. E., Welch, R., Stein, R. I., Spurrell, E. B., Cohen, L. R. Saelens, B. E., Dounchis, J. Z., Frank, M. A., Wiseman, C. V., & Matt, G. E. (2002). A randomized

comparison of group cognitive-behavioral therapy and group interpersonal psychotherapy for the treatment of overweight individuals with binge-eating disorder. *Archives of General Psychiatry, 59*, 713-721.

Comparisons

    1. 20 sessions Cognitive-Behavioral Therapy vs. 20 sessions IPT

Measures

    1. Binge days
    2. Eating Disorder Examination Restraint
    3. Eating Disorder Examination Shape concerns
    4. Eating Disorder Examination Weight concerns
    5. Eating Disorder Examination Eating concerns
    6. Total Global Scale Index
    7. Total Rosenberg Self-esteem scale
    8. Symptom checklist depression
    9. Inventory of interpersonal problems
    10. Social adjustment scale
    11. Body mass index

Timing

    1. Post-treatment
    2. 4-month follow-up
    3. 8-month follow-up
    4. 12-month follow-up

52. Wilson, G. T., Eldridge, K. L., Smith, D., & Niles, B. (1991). Cognitive-behavioral treatment with and without response prevention for bulimia. *Behaviour Research and Therapy, 29*(6), 575-583.

Comparisons

    1. Cognitive-Behavioral Therapy w/ ERP vs. Cognitive-Behavioral Therapy w/o ERP

Measures

    1. Eating Disorder Examination weight
    2. Eating Disorder Examination attitudes toward shape
    3. Eating Disorder Inventory Perfectionism
    4. Eating Disorder Inventory Interoceptive awareness
    5. Eating Disorder Inventory Ineffectiveness
    6. Eating Disorder Inventory Interpersonal distrust
    7. Eating Disorder Inventory Maturity fears
    8. Beck Depression Inventory
    9. Social Adjustment Scale

10. Eating Satisfaction Questionnaire
11. Symptom Checklist-90
12. Rosenberg Self-esteem Scale

Timing

1. Post-treatment
2. 3-month follow-up
3. 12-month follow-up

53. Wolf, E. M., & Crowther, J. H. (1992). An evaluation of behavioral and cognitive-behavioral group interventions for the treatment of bulimia nervosa in women. *International Journal of Eating Disorders, 11*(1), 3-15.

Comparisons

1. Behavioral vs. control
2. Cognitive-Behavioral Therapy vs. control
3. Cognitive Behavioral Therapy vs. Behavioral Therapy

Measures

1. Biweekly frequency of binging
2. Biweekly frequency of use of extreme weight control measures
3. Eating Disorder Inventory Drive for thinness
4. Eating Disorder Inventory Bulimia
5. Eating Disorder Inventory Body dissatisfaction
6. Eating Disorder Inventory Ineffectiveness
7. Eating Disorder Inventory Perfectionism
8. Eating Disorder Inventory Interoceptive awareness

Timing

1. Post-treatment
2. 1 month follow-up
3. 3-month follow-up

54. Wilson, G. T., Rossiter, E., Kleifield, E. I., & Lindholm, L. (1986). Cognitive-behavioral treatment of bulimia nervosa: A controlled evaluation. *Behaviour Research and Therapy, 24*(3), 277-288.

Comparisons

1. Verbal cognitive restructuring vs. cognitive restructuring plus exposure and vomit prevention

Measures

1. Binge

2. Vomit
3. Eating Habits Checklist
4. Eating Self-efficacy Questionnaire
5. Beck Depression Inventory
6. Rathus Assertiveness Scale
7. Semantic Differential
8. Symptom Checklist-90 Somaticism
9. Symptom Checklist-90 Obsessive-compulsive
10. Symptom Checklist-90 Interpersonal sensitivity
11. Symptom Checklist-90 Depression
12. Symptom Checklist-90 Anxiety
13. Symptom Checklist-90 Hostility
14. Symptom Checklist-90 Phobic anxiety
15. Symptom Checklist-90 Paranoia
16. Symptom Checklist-90 Psychoticism
17. Symptom Checklist-90 Global Score Index
18. Positive Symptom Distress Index
19. Positive Symptoms Total

Timing

1. Post-treatment
2. 6-month follow-up
3. 1 year follow-up

55. Yates, A. J., & Sambrailo, F. (1984). Bulimia nervosa: A descriptive and therapeutic study. *Behaviour Research and Therapy, 22*(5), 503-517.

Comparisons

1. Cognitive-Behavioral Therapy group vs. Cognitive-Behavioral Therapy plus specific behavioural instruction

Measures

1. Eating Attitudes Test
2. Binge Scale Questionnaire
3. Binging-purging diaries
4. Eyesenck Personality Questionnaire
5. Carroll Rating Scale for Depression
6. Coopersmith Self-esteem inventory
7. Institute of Personality and Ability Testing Anxiety Scale

Timing

1. Post-treatment
2. 6-week follow-up

56. Laessle, R. G., Waadt, S. & Pirke, K. M. (1987). A structured behaviorally oriented group treatment for bulimia nervosa. *Psychotherapy Psychosomatics, 48,* 141-145.

Comparisons

1. structurally behaviorally-oriented stress management group treatment vs. waiting list control

Measures

1. binges per week
2. vomiting per week
3. drive for thinness
4. bulimia
5. body dissatisfaction
6. ineffectiveness
7. perfectionism
8. interpersonal distrust
9. interoceptive awareness
10. maturity fears
11. Beck Depression Inventory Depression

Timing

1. Post
2. Follow-up

57. Robin, A. L., Siegel, P. T., Kopeke, T., Moye, A. W., & Tice, S. (1994). Family therapy versus individual therapy for adolescent females with anorexia nervosa. *Developmental and Behavioral Pediatrics, 15,* 111-116.

Comparisons

1. behavioral family systems therapy vs. ego oriented individual therapy

Measures

1. BMI
2. Eating attitudes
3. Body dissatisfaction
4. Body Satisfaction Questionnaire
5. Ineffectiveness Scale
6. Interoceptive Awareness
7. Interpersonal Distrust
8. Teen Beck Depression Inventory
9. Child behavior checklist internalizing behavior score
10. Eating conflict
11. General conflict

<u>Timing</u>

1. Post

58. Robin, A. L. Siegel, P. T., Moye, A. W., Gilroy, M., Dennis, A. B., Sikand, A. (1999). A controlled comparison of family versus individual therapy for adolescents with anorexia nervosa. *Journal of American Academy of Child Adolescent Psychiatry, 38,* 1482-1489.

<u>Comparisons</u>

1. 1. behavioral family systems therapy vs. ego oriented individual therapy

<u>Measures</u>

1. BMI
2. Eating Attitudes Test
3. Beck Depression Inventory
4. Child Behavior Checklist Internalizing
5. Eating Disorder Inventory Interoceptive Awareness
6. Eating Disorder Inventory Ineffectiveness
7. Eating Disorder Inventory Interpersonal Distrust
8. Eating Disorder Inventory Maturity Fears
9. Eating Disorder Inventory Perfectionism

<u>Timing</u>

1. Post
2. Follow-up

59. Safer, D. L., Telch, C. F., &Agras, W. S. (2001). Dialectical behavior therapy for bulimia nervosa. *American Journal of Psychiatry, 158,* 632-634.

<u>Comparisons</u>

1. dialectical behavior therapy vs. waiting list

<u>Measures</u>

1. negative mood regulation scale score
2. beck depression inventory
3. emotional eating scale anger/frustration
4. emotional eating scale anxiety
5. emotional eating scale depression
6. multidimensional personality scale
7. positive and negative affect schedule subscale scores positive affect
8. positive and negative affect schedule subscale scores negative affect

9. Rosenberg self-esteem scale score

<u>Timing</u>

1. Post

60. Telch, C. F., Agras, W. S., Rossiter, E. M., Wilfley, D., & Kenardy, J. (1990). Group cognitive-behavioral treatment for the nonpurginb bulimic: An initial evaluation. *Journal of Consulting and Clinical Psychology, 58,* 629-635. doi: 10.1037/0022-006X.58.5.629

<u>Comparisons</u>

1. Cognitive-Behavioral therapy group vs. waiting list control

<u>Measures</u>

1. days binged past week
2. number of binges past week
3. weight in kg
4. beck depression inventory
5. food preoccupation factor
6. diet factor
7. maturity factor

<u>Timing</u>

1. post

61. Treasure, J., Todd, G., Brolly, M., Tiller, J., Nehmed, A., & Denman, F. (1995). A pilot study of a randomized trial of cognitive analytical therapy for adult anorexia nervosa. *Behavior Research and Therapy, 33,* 363-367.

<u>Comparisons</u>

1. cognitive analytical therapy vs. educational behavioral therapy

<u>Measures</u>

1. BMI
2. Weight at 1 year
3. Mean weight gain
4. Self-rated improvement
5. Nutrition
6. Psychosexual adjustment
7. Socioeconomic adjustment
8. Menstrual pattern
9. Mental state
10. Average score

Timing

1. post (1 year)

62. Carter, J. C., & Fairburn, C. G. (1998). Cognitive-behavioral self-help for binge eating disorder: A controlled effectiveness study. *Journal of Counseling and Clinical Psychology, 66,* 616-623.

Comparisons

1. Pure self-help vs. guided self-help
2. Pure self-help vs. control
3. Guided self-help vs. control

Measures

1. Binge Eating/28 days
2. Global
3. Restraint
4. Eating Concern
5. Shape Concern
6. Weight Concern
7. BMI
8. Psychiatric Symptoms
9. Knowledge

Timing

1. post
2. 3 month follow-up
3. 6 month follow-up

63. Carter, J. C., Olmstead, M. P., Kaplan, A. S., McCabe, R. E., Mills, J. S., & Aime, M. Ps. (2003). Self-help for bulimia nervosa: A randomized controlled trial. *American Journal of Psychiatry, 160,* 973-978.

Comparisons

1. CBT self-help vs. nonspecific self-help
2. CBT self-help vs. waiting list control
3. Nonspecific self-help vs. waiting list control

Measures

1. Restraint
2. Eating Concern
3. Shape Concern
4. Weight Concern

5. Beck Depression Inventory
6. Rosenberg Self-esteem scale
7. Inventory of Interpersonal Problems

Timing

1. Post

64. Chen, E., Touyz, S. W., Beaumont, P. J. V., Fairburn, C. G., Griffiths, R., Butow, P., Russell, J., Schotte, D. E., Gertler, R., & Basten, C. (2003). Comparison of group and individual cognitive-behavioral therapy for patients with bulimia nervosa. *Wiley Periodicals, 33*(3), 241-254. doi: 10.1002/eat.10137

Comparisons

1. individual CBT versus group CBT

Measures

1. Objective Binging
2. Subjective Binging
3. Objective and Subjective Binging
4. Vomiting
5. Laxatives
6. Overexercise
7. BMI
8. Eating Disorder Examination Restraint
9. Eating Disorder Examination Weight Concern
10. Eating Disorder Examination Shape Concern
11. Eating Disorder Examination Total
12. Eating Disorder Inventory Drive for thinness
13. Eating Disorder Inventory Bulimia
14. Eating Disorder Inventory Body dissatisfaction
15. Eating Disorder Inventory Perfectionism
16. Eating Disorder Inventory Interpersonal Distrust
17. Eating Disorder Inventory Interoceptive Awareness
18. Eating Disorder Inventory Impulse Regulation
19. State Anxiety
20. Trait anxiety
21. Beck depression inventory
22. Rosenberg self-esteem scale
23. Symptom checklist-90 global severity scale
24. Social Adjustment Scale- modified

Timing

1. post
2. 3 month follow-up
3. 6 month follow-up

65. Crisp, A. H., Norton, K., Gowers, S., Halek, C., Bowyer, C., Yeldham, D., Levett, G., & Bhat, A. (1991). A controlled study of the effect of therapies aimed at adolescent and family psychopathology in anorexia nervosa. *British Journal of Psychiatry, 159,* 325-333.

Comparisons

1. inpatient vs. outpatient individual and family psychotherapy
2. outpatient group vs. no further treatment
3. inpatient vs. outpatient group
4. inpatient vs. no further treatment
5. outpatient individual and family psychotherapy vs. outpatient group
6. outpatient individual and family psychotherapy vs. no further treatment

Measures

1. Menstruation
2. Nutrition
3. Mental State
4. Sexual adjustment
5. Socio-economic adjustment
6. Global Score

Timing

1. post
2. follow-up (1 year)

66. Eisler, I., Dare, C., Hodes, M., Russell, G., Dodge, E., & LeGrange, D. (2000). Family therapy for adolescent anorexia nervosa: The results of a controlled comparison of two family interventions. *Journal of Child Psychology and Psychiatry, 41,* 727-736.

Comparisons

1. conjoint family therapy vs. separated family therapy

Measures

1. average body weight
2. %ABW
3. body mass index
4. bulimic symptoms
5. Morgan Russell Nutritional
6. Morgan Russell Menstrual
7. Morgan Russell Mental State
8. Morgan Russell Psychosexual

9. Morgan Russell Psychosocial
10. Depression
11. Obsessionality
12. Tension
13. Eating Disorder Inventory
14. Eating Attitudes Test
15. Rosenberg Self-Esteem Scale
16. Short Mood and Feeling Questionnaire
17. Maudsley Obsessional Compulsive Index

Timing

1. Post

67. Freeman, C., Sinclair, F., Turnbull, J., & Annandale, A. (1985). Psychotherapy for bulimia: A controlled study. *Journal of Psychiatric Research, 19,* 473-478.

Comparisons

1. Cognitive behavioral therapy vs. behavior therapy
2. Group therapy vs. waitlist control
3. Cognitive behavioral therapy vs. group therapy
4. Cognitive behavioral therapy vs. waitlist control
5. Behavior therapy vs. group therapy
6. Behavior therapy vs. waitlist control

Measures

1. Binge Frequency
2. Eating Attitudes Test
3. Montgomery Asberg Depression Scale

Timing

1. post

68. Gowers, S., Norton, K., Halek, C., & Crisp, A. H. Outcome of outpatient psychotherapy in a random allocation treatment study of anorexia nervosa. *International Journal of Eating Disorders, 15,* 165-177.

Comparisons

1. outpatient individual and family vs. no treatment control

Measures

1. weight
2. weight as % MMPW
3. BMI

4. Menstruation
5. Nutrition
6. Mental State
7. Sexual Adjustment
8. Socioeconomic adjustment
9. Global Score
10. sexual adjustment
11. socioeconomic adjustment

Timing

1. One year
2. Two Year

69. Griffiths, R. A., Hadzi-Pavlovic, D., & Channon-Little, L. (1996). The short-term follow-up effects of hypnobehavioral and cognitive behavioral treatment for bulimia nervosa. *European Eating Disorders Review, 4,* 12-31.

Comparisons

1. cognitive behavioral therapy vs. hypnobehavioral
2. Cognitive behavioral therapy vs. control
3. Hypnobehavioral vs. control

Measures

1. shape concern
2. eating concern
3. restraint
4. weight concern
5. overeating
6. eating attitudes test
7. eating disorder inventory drive for thinness
8. eating disorder inventory bulimia
9. eating disorder inventory body dissatisfaction
10. BMI
11. Objective bulimic episodes per month
12. Objective bulimic episodes (days per month)
13. Subjective bulimic episodes per month
14. Subjective bulimic episodes days per month
15. Self-induced vomiting episodes per month
16. Self-induced vomting episodes days per month
17. Laxative abuse episodes per month
18. Laxative abuse episodes days per month
19. General Health Questionnaire
20. Zung Self-rating depression scale
21. Eating Disorder Inventory interoceptive awareness

22. Eating Disorder Inventory maturity fears
23. Eating Disorder Inventory perfectionism
24. Eating Disorder Inventory Ineffectiveness
25. Eating Disorder Inventory Interpersonal distrust
26. Rosenberg self-esteem scale
27. Overall adjustment score from the social adjustment scale
28. Expectancy and suitability scale 1
29. Expectancy and suitability scale 2
30. Expectancy and suitability scale 3
31. Expectancy and suitability scale 4

Timing

1. post
2. 6 month follow-up
3. 9 month follow-up

70. Hall, A., & Crisp, A. H. (1987). Brief psychotherapy in the treatment of anorexia nervosa: Outcome at one year. *British Journal of Psychiatry, 151,* 185-191.

Comparisons

1. combined individual and family psychotherapy vs. dietary advice

Measures

1. body weight
2. global clinical scores
3. CCEI?

Timing

1. post

71. le Grange, D., Crosby, R. D., Rathouz, P. J., & Leventhal, B. L. (2007). A randomized controlled comparison of family-based treatment and supportive psychotherapy for adolescent bulimia nervosa. *Archives of General Psychiatry*, *64*(9), 1049-1056. doi:10.1001/archpsyc.64.9.1049

Comparisons

1. Family-based therapy for BN vs. Supportive Psychotherapy

Measures

1. Objective binge-eating
2. Subjective-binge eating
3. Vomiting

4. All compensatory behaviors
5. Restraint
6. Weight Concern
7. Shape Concern
8. Eating Concern
9. Global
10. Rosenberg Self-Esteem Scale
11. Beck Depression Inventory

Timing

1. Post
2. Follow-up

72. Ljotsson, B., Lundin, C., Mitsell, K., Carlbring, P., Ramklint, M., & Ghaderi, A. (2007). Remote treatment of bulimia nervosa and binge eating disorder: A randomized trial of internet-assisted cognitive behavioural therapy. *Behaviour Research and Therapy, 45*(4), 649-661. doi:10.1016/j.brat.2006.06.010

Comparisons

1. Internet assisted CBT (self-help) vs. waiting list control

Measures

1. Objective binge eating
2. Purging
3. Restraint
4. Eating concern
5. Shape concern
6. Weight concern
7. Total score
8. Drive for thinness
9. Bulimia
10. Body dissatisfaction
11. Ineffectiveness
12. Perfectionism
13. Interpersonal distrust
14. Interoceptive awareness
15. Body Satisfaction Questionnaire
16. Satisfaction with Life Scale
17. Self-Concept Questionnaire
18. Montgomery Asberg Depression Scale- self assessment

Timing

1. Post

71. Lock, J., Le Grange, D., Agras, W. S., Moye, A., Bryson, S. W., & Jo, B. (2010). Randomized clinical trial comparing family-based treatment with adolescent-focused individual therapy for adolescents with anorexia nervosa. *Archives of General Psychiatry, 67*(10), 1025-1032.doi:10.1001/archgenpsychiatry.2010.128

Comparisons

1. Family-based treatment vs. adolescent-focused individual therapy

Measures

1. Full Remission
2. Partial Remission
3. BMI
4. EDE Score

Timing

1. Post
2. 6 month follow up
3. 12 month follow-up

73. 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*(12), 1347-1354.doi:10.1176/appi.ajp.2009.09030345

Comparisons

1. Therapist led group treatment vs. Therapist assisted group treatment
2. Therapist led group treatment vs. self-help
3. Therapist led group treatment vs. Waiting list control
4. Therapist assisted group treatment vs. self-help
5. Therapist assisted group treatment vs. waiting list control
6. Self-help vs. waiting list control

Measures

1. Objective binge eating days
2. Objective binge eating episodes
3. Restraint subscore
4. Eating concerns subscore
5. Shape concerns subscore
6. Weight Concerns subscore

 7. Global score
 8. BMI
 9. Inventory of Depressive Symptomatology
 10. Restraint Disinhibition
 11. Hunger
 12. Impact of weight on quality of life
 13. Rosenberg self-esteem questionnaire

<u>Timing</u>

 1. Post
 2. 6 month follow-up
 3. 12 month follow-up

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

<u>Comparisons</u>

1. Individual CBT vs. Group CBT

<u>Measures</u>

 1. BMI
 2. Binge episodes per month
 3. Symptom Checklist-90 (SCL-90) Global Score Index
 4. Beck Depression Inventory
 5. State-trait anxiety Inventory
 6. Binge Eating Scale
 7. Emotional Eating Scale total score
 8. Total score
 9. Restraint
 10. Eating concern
 11. Weight Concern
 12. Shape Concern

<u>Timing</u>

 1. Post
 2. 3 year follow-up

75. 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. *Behavior Therapy, 41*(1), 106-120.doi:10.1016/j.beth.2009.01.006

Comparisons

1. Dialectical behavior therapy for BED (group) vs. active comparison group therapy (ACGT)

Measures

1. Restraint
2. Weight Concerns
3. Shape Concerns
4. Eating Concerns
5. Beck Depression Inventory
6. Rosenberg Self-Esteem Scale
7. Negative Mood Regulation Scale
8. Anger (Emotional Eating Scale)
9. Anxiety (Emotional Eating Scale)
10. Depression (Emotional Eating Scale)
11. Disorders of Emotion Regulation
12. Positive (Positive and Negative Affect Scale)
13. Negative (Positive and Negative Affect Scale)
14. Weight (pounds)
15. BMI

Timing

1. Post
2. 12 month follow-up

76. Wilson, G. T., Wilfley, D. E., Agras, W. S., & Bryson, S. W. (2010). Psychological treatments of binge eating disorder. *Archives of General Psychiatry, 67*(1), 94-101.doi:10.1001/archgenpsychiatry.2009.170

Comparisons

1. Interpersonal Psychotherapy vs. Behavioral Weight Loss Treatment
2. Interpersonal Psychotherapy vs. Cognitive Behavioral Therapy (guided self-help)
3. Cognitive Behavioral Therapy (guided self-help) vs. Behavioral Weight Loss Treatment

Measures

1. Number of binge days
2. Body Mass Index
3. Weight

4. Global Eating Disorder Examination Score

Timing

1. Post treatment
2. 1 year follow-up
3. 2 year follow-up

77. Fairburn, C. G., Cooper, Z., Doll, H. A., O'Connor, M. E., Bohn, K., Hawker, D. M., Wales, J. A., Palmer, R. L. (2009). Transdiagnostic cognitive behavioral therapy for patients with eating disorders: A two-site trial with 60-week follow-up. *American Journal of Psychiatry, 166,* 311-319.

Comparisons

1. Cognitive Behavioral Therapy for Eating Disorders Broad Form vs. Waiting List Control
2. Cognitive Behavioral Therapy for Eating Disorders Focused Form vs. Waiting List Control
3. Cognitive Behavioral Therapy for Eating Disorders Broad Form vs. Cognitive Behavioral Therapy for Eating Disorders Focused Form

Measures

1. Overall Severity
2. Dietary Restraint
3. Eating Concern
4. Shape Concern
5. Weight Concern
6. General Psychiatric Features
7. Body Mass Index

Timing

1. Post treatment
2. 60 week follow-up

Appendix B

Coding Manual

General Instructions

1. Note that each code below is numbered. When coding, please highlight empirical evidence in support of the code in the study report, and mark it with the coding reference number.
2. You should guess a code when a plausible guess is possible. However, if insufficient evidence exists in the study report to make a plausible guess, then fill in the coding blanks with "-99" to indicate unknown.

Code #	Code Description	Code
STUDY LEVEL CODES		
1	**Study Identification Number**	
2	**Comparison Number**	
3	**Measure Number**	
4	**Year of Study**	
5	**Disorder Type.** 1. Anorexia Nervosa 2. Bulimia Nervosa 3. Binge-eating Disorder 4. Eating Disorder NOS	
6	**Criteria used for Diagnosis.** If specific criteria were used to diagnose the patients in the study then code here. The study must be specific regarding the criteria they used. 1. DSM-IV Criteria 2. ICD-10 Criteria 3. Author created their own criteria (i.e., so as to include a range of severity, etc) 4. Other (Other diagnostic criteria was used that has been created and standardized for use with the diagnostic population)	
COMPARISON LEVEL CODES		
7	**Level of Severity of the Patient in the Treatment Condition.** Code the EDE global score when provided. *Note:* Be sure to code the global scale and not one of the subscales. Some studies have provided subscale information and not global scale information.	
8	**Level of Severity of the Patient in the Comparison Condition.** Code the EDE global score when provided. *Note:* Be sure to code the global scale and not one of the subscales. Some studies have provided subscale information and not global scale information.	
9	**Number of subjects assigned to the treatment condition**. *Note:*	

	Count all those subjects assigned to the treatment condition even if they were later dropped, unless the dropped subject was later found to not meet inclusion criteria.	
10	**Number of subjects assigned to the comparison condition**. *Note*: Count all those subjects assigned to the treatment condition even if they were later dropped, unless the dropped subject was later found to not meet inclusion criteria.	
11	**Treatment Type.** *Note:* This label will be operationalized by the studies, not the raters. Code the specific theory-base of the treatment in this section. 1. Cognitive Behavioral Therapy 2. Interpersonal Psychotherapy 3. Psychodynamic Therapy 4. Experiential Therapies 5. Motivational or Supportive Therapy 6. Education/support (Self-help books, psychoeducation, etc) that does not have a clear allegiance to one of the specific theories listed 7. Nutrition or Dietary Advice 8. Exercise Related 9. Combination of the theories/therapies listed	
12	**Comparison Type.** The comparison condition in this meta-analysis is defined as the condition to which either CBT, IPT, experiential or education/support treatments are compared. 1. No Treatment or Wait-List (Client is not receiving any type of treatment, education or support) 2. Usual Care, Usual Services, or Treatment-as-Usual (treatment is genuine therapy but not under the control or direction of researcher) 3. An alternative therapy (CBT, IPT, Experiential, Motivational, Supportive) 4. Education/support 5. Nutrition or Dietary Advice 6. Exercise Related 7. Combination of the theories/therapies listed	
13	**Format of Treatment in treatment condition.** 1. Individual (Client is seen in a one-on-one situation with a therapist) 2. Group (Client is seen in a group setting where there is more than one client per therapist) 3. Self-help; bibliotherapy; (If patient has weekly or frequent meetings with a therapist then code as individual treatment) 4. Family Therapy 5. Internet-guided	

	6. Nutrition or Dietary Advice 7. Exercise Related 8. Combination of Treatments 9. No treatment/control group	

14	**Format of Treatment in the Comparison Condition.**
	  1. Individual (Client is seen in a one-on-one situation with a therapist)
	  2. Group (Client is seen in a group setting where there is more than one client per therapist)
	  3. Self-help; bibliotherapy; (If patient has weekly or frequent meetings with a therapist then code as individual treatment)
	  4. Family Therapy
	  5. Internet-guided
	  6. Nutrition or Dietary Advice
	  7. Exercise Related
	  8. Combination of Treatments
	  9. No treatment/control group	

15	**Duration of Treatment in Number of Sessions in Treatment Condition** *Note*: Record the length of each treatment, in sessions. If the length of each treatment was variable, record the average length of each treatment.	
16	**Duration of Treatment in Number of Sessions in Comparison Condition** *Note*: Record the length of each treatment, in sessions. If the length of each treatment was variable, record the average length of each treatment. Enter a -99 if there is no treatment.	
17	**Length of Sessions in the Treatment Condition.** *Note:* Record the length of each session, in minutes. If the length of the sessions was variable, record the average length of each session.	
18	**Length of Sessions in the Comparison Condition.** *Note:* Record the length of each session, in minutes. If the length of the sessions was variable, record the average length of each session. Enter a -99 if there is no treatment.	

19	**Number of sessions in the Treatment Condition.**
	  1. Fixed (There is a set number of sessions and this is followed for each participant involved)
	  2. Variable (Session number may vary by participant or may vary around an average number of sessions that has been pre-set before the study)	

20	**Number of sessions in the Comparison Condition.**
	  1. Fixed (There is a set number of sessions and this is followed for each participant involved)
	  2. Variable (Session number may vary by participant or may vary around an average number of sessions that has been	

	pre-set before the study)	
21	**Attrition In the Treatment Condition.** Code the number of individuals who dropped out of treatment in the treatment condition.	
22	**Attrition In the Comparison Condition.** Code the number of individuals who dropped out of treatment in the comparison condition.	
MEASURE LEVEL CODES		
23	**Timing of Assessment.** (Was the assessment a pretreatment condition, post treatment or follow-up?) 　1. Pretreatment (Assessment immediately before treatment takes place) 　2. Post Treatment (Assessment immediately after the finish of therapy; i.e. within one month of treatment) 　3. Follow-up (Assessment takes place after an amount of time since treatment has passed; i.e. 6 months) 　4. Other (Assessment takes place during treatment)	
24	**Timing of Follow-up.** *Note:* If the timing of the assessment is pre or post then code as -.99. Otherwise, indicate the follow-up timing as the number of months from the point of beginning treatment.	
25	**Type of Outcome Measure.** *Note:* When noted, code whether the outcome measure is considered a primary or secondary outcome measure in the statistical analyses by the authors of the study. This distinction should be made by the study authors and not by the raters. 　1. Primary Outcome Measure 　2. Secondary Outcome Measure	
26	**Outcome Measure.** See attached sheet	

Appendix C

Measure-level Codes

1. Distress (Mood, Depression, Anxiety, Hostility, etc)

1. Mean Beck Depression Inventory (BDI)
- Brief Symptom Inventory (BSI)
- Hamilton depression rating scale (HAMD)
- SCL-90 Global
- Hamilton anxiety rating scale
- STAI-1
- STAI-2
- SCl-53
- SCL 90 obsessive compulsive
- SCL 90 anxiety
- SCL 90 anger-hostility
- SCL 90 phobic anxiety
- SCL 90 paranoid ideation
- SL 90 psychosis

2. Binge eating related

- Binges per week 16 weeks
- Binges per week 24 weeks
- Binges per week 32 weeks
- Binge days per week
- Binge episodes per week
- Mean Binge Eating Scale (BES) scales
- EDE- binges per month
- EDI bulimic symptoms
- urge to binge last week
- Binge attacks last week
- Objective binges
- Subjective binges
- EDE binge days/ month
- EDE binge episodes/ month
- Binge eating daily self-monitoring method
- Binge eating EDE-Q method
- Inventory to Diagnose Depression
- EDI Bulimia
- EDE overeating

3. Purging Related

- Purges per week 16 weeks
- Purges per week 24 weeks
- Purges per week 32 weeks

- Vomit episodes
- EDE episodes of laxative use
- EDEQ days of laxative use
- EDE abstinence from compensation
- Extreme Weight loss behaviors

4. Eating/Hunger related—uncontrolled eating

- Hunger/disinhibition 16 weeks (TFEQ)
- Hunger/disinhibition 24 weeks (TFEQ)
- Dietary preoccupation 16 weeks (TFEQ)
- Dietary preoccupation 24 weeks (TFEQ)
- Dietary restraint
- EDE dietary restraint
- EDE eating concerns
- EDEQ dietary restraint
- EDEQ eating concerns
- TFEQ hunger
- TFEQ disinhibition
- EDI Interoceptive awareness
- TFEQ restrained eating
- Dutch Eating Behavior Questionnaire
- Self-Control Scale

5. Weight/BMI

- Weight
- BMI
- Weight Loss
- Percentage Weight loss

6. Body related

- Body Shape Questionnaire (BSQ)
- EDE shape concern
- EDE weight concern
- EDEQ weight concern
- EDEQ shape concern
- Eating disorder inventory- Drive for thinness
- EDI Body dissatisfaction
- EDI Perfectionism
- EDE Excessive Exercise
- Body Image Avoidance Questionnaire

7. Self-esteem

- Rosenberg Self Esteem Scale
- Self-esteem
- EDI Ineffectiveness
- FSKN Total Score

8. Interpersonal/Social

- Inventory of Interpersonal Problems- IIP
- EDI Interpersonal distrust
- EDI Maturity fears
- SCL-90 Interpersonal Sensitivity

9. Cognitive Restraint

- TFEQ Restraint (if cognitive related…if eating related it would go in eating/hunger)
- TFEQ Cognitive control

10. Global ED symptom scores

- EDE global score
- EDEQ global score
- Eating Attitude Test Total Score
- TFEQ Rigid control
- TFEQ Flexible control
- Global severity
- Global improvement
- EDI total score
- Bulimia Test