RELAPSE PREVENTION FOR EATING DISORDERS: A RANDOMIZED CONTROLLED TRIAL TARGETING WEIGHT-RELATED SELF-ESTEEM

by

Sarah Mary Royal

Master of Arts, Ryerson University, 2011

Bachelor of Medical Sciences, University of Western Ontario, 2004

A dissertation

presented to Ryerson University

in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

in the Program of

Psychology

Toronto, Ontario, Canada, 2014

AUTHOR'S DECLARATION FOR ELECTRONIC SUBMISSION OF A DISSERTATION

I hereby declare that I am the sole author of this dissertation. This is a true copy of the dissertation, including any required final revisions, as accepted by my examiners.

I authorize Ryerson University to lend this dissertation to other institutions or individuals for the purpose of scholarly research.

I further authorize Ryerson University to reproduce this dissertation by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

I understand that my dissertation may be made electronically available to the public.

Abstract

Relapse Prevention for Eating Disorders: A Randomized Controlled Trial Targeting Weight-Related Self-Esteem

Doctor of Philosophy, 2014

Sarah Mary Royal

Psychology, Ryerson University

A high level of weight-related self-esteem (WRSE) at the end of eating disorder treatment is predictive of relapse. The first goal of this project was to develop a cognitive-behavioural intervention to target WRSE in partially remitted eating disorder clients to prevent relapse (WRSE protocol). The second goal (Study 1) was to conduct a pilot study to assess whether receiving the WRSE protocol leads to improvements in WRSE and related variables. The final goal of this project (Study 2) was to conduct a randomized controlled trial to determine whether the individual-based treatment added to treatment as usual (TAU) provided additional benefits to eating disorder clients, with respect to WRSE, eating disorder symptoms, and relapse. After the treatment manual was developed, 16 clients were recruited and administered the treatment protocol in Study 1. The results indicated that participants had significant improvements in levels of WRSE and related variables following treatment. For Study 2, 47 participants who had achieved behavioural symptom interruption were randomly assigned to either 1) TAU + WRSE protocol or 2) TAU. Results were mainly consistent across Complete Case and Last Observation Carried Forward procedures where participants who received the additional WRSE protocol had greater improvements in WRSE, body checking behaviour, and self-esteem. Groups did not differ with respect to body avoidance, general avoidance, fat talk, and other variables compared

to participants who received TAU only. Multiple imputation procedures, which accounted for missing data, indicated no significant differences for all measured variables. Participants who completed the WRSE protocol had significantly greater adherence to their meal plan (i.e., less dietary restriction) compared to participants who only received TAU. Groups did not differ regarding level of binge eating and/or vomiting after the intervention period, and there were no differences in relapse between groups at 3-month follow-up. Overall, the newly developed treatment provided some benefit to eating disorder clients above and beyond TAU. However, the data appear to have been sensitive to attrition. Future research should include further refinement of the treatment protocol and evaluation across a longer follow-up period to assess its impact on relapse rates.

Acknowledgements

I am grateful for so many people who have supported me throughout the PhD process. Thank you to my academic supervisor, Dr. Michelle Dionne, who approaches her mentorship role with wisdom, kindness, incredible intellect, and humour. I would also like to express my appreciation for Dr. Traci McFarlane, whose enthusiasm and dedication to the field helped to solidify my commitment to a career in the area of eating disorders. I would like to thank my committee members, Dr. Colleen Carney, Dr. Jennine Rawana, and Dr. Corinne Hart for their insightful questions at my dissertation examination. Thank you to the therapists, including my friend Danielle MacDonald who also played a large role in the day-to-day coordination of the project. A special thank you to Dr. Rachel Lyon for her efforts in developing the treatment manual and for being one of my biggest supporters throughout graduate school. I would also like to express my gratitude to Dr. Marion Olmsted and all of the staff at the Toronto General Hospital Eating Disorder Day Hospital Program for supporting the project. Thank you also to the Social Sciences and Humanities Research Council, Academy for Eating Disorders, and Association for Behavioral and Cognitive Therapies for financial support.

I would also like to thank my incredible family and friends – I'm blessed that there are too many of you to list. In particular, thank you to my clinical cohort at Ryerson. I could not have succeeded as well without you and I know that our strong friendships will continue beyond graduate school. Finally, thank you to my parents, Laura and Stu, and my brother Kevin. I don't have the words to express my gratitude for your unwavering support not only throughout my graduate training but my entire life. I know how lucky I am.

This dissertation is dedicated to all the clients with eating disorders I had the honour of working with, and learning from, over the past 6 years in graduate school. Thank you.

Table of Contents

List of Tables

List of Appendices

Relapse Prevention for Eating Disorders: A Randomized Controlled Trial Targeting Weight-Related Self-Esteem

Eating disorders are complex psychological conditions that greatly compromise physical health (Mitchell & Crow, 2006), psychological well being (Gadalla, 2008), and quality of life (Jenkins, Rienecke Hoste, Meyer, & Blissett, 2011; Vallance, Latner, & Gleaves, 2011). Characterized by a preoccupation with weight and/or shape, extreme eating-related practices (e.g., binge eating and compensatory purging), and, for some, risky underweight status, eating disorders can affect up to 9% of the population (Hoek & van Hoeken, 2003). Lifetime prevalence rates for anorexia nervosa and bulimia nervosa are 0.9% and 1.5%, respectively, in women (Hudson, Hiripi, Pope, & Kessler, 2007). Living with an eating disorder can be limiting as individuals diagnosed with these mental health conditions often have difficulty navigating interpersonal relationships (Hartmann, Zeeck, & Barrett, 2010) and maintaining employment (Williams, 2006), which can greatly influence their quality of life and productivity. Furthermore, eating disorders are some of the most significant psychiatric conditions that can have serious physical health complications. For example, patients with eating disorders have high rates of osteoporosis from chronic malnutrition (Zipfel et al., 2001). Other complications can include electrolyte imbalances that put these individuals at risk of cardiac arrhythmias, problems related to the gastrointestinal system, reproductive dysfunction, dermatological effects (dry skin, brittle nails, and/or development of "lanugo" facial hair), and dental problems (Pomeroy & Mitchell, 2002). The mortality rate is also alarming; patients across eating disorder diagnoses die as a result of their psychological disorder, including death by suicide (Arcelus, Mitchell, Wales, & Nielsen, 2011; Crow et al., 2009). Indeed,

anorexia nervosa has the highest mortality rate for any psychological disorder, with an estimated 10% of sufferers dying within 10 years of illness onset (Sullivan, 2002).

To further complicate the clinical picture, psychiatric comorbidity is the norm for patients with eating disorders; for example, Hudson, Hiripi, Pope, and Kessler (2007) found that 56.2 % of patients with AN and 94.5% of patients with BN also had another DSM-IV psychiatric disorder. Eating disorder patients suffer from other current and lifetime psychological conditions including, but not limited to, mood disorders, anxiety disorders, posttraumatic stress disorder, substance use disorders, and personality disorders (e.g., Baker, Mitchell, Neale, & Kendler, 2010; Brewerton, 2007; Chen, Brown, Harned, & Linehan, 2009; Grilo, White, & Masheb, 2009). Comorbidity can complicate recovery from eating disorders. For example, a client with comorbid posttraumatic stress disorder may engage in eating disorder symptoms to cope with re-experiencing symptoms, such as flashbacks or nightmares, or a client may use substances in attempts to suppress weight and subsequently develop difficulties related to substance abuse or dependence. Patients with eating disorders can also be diagnosed with Axis II conditions, such as borderline personality disorder (Godt, 2008). The presence of a personality disorder can impact treatment engagement, development of a therapeutic alliance, and interpersonal functioning. Psychiatric comorbidity increases psychological suffering for patients, and adds complexity for treating clinicians who work with these patients.

Eating disorders are not only costly in terms of their dire consequences for sufferers but also from both financial and public health perspectives. The costs associated with binge eating and purging in BN were an average of $1599.45/year (Crow,

Frisch, Peterson, Croll, Raatz, & Nyman, 2009). Furthermore, in Canada, intensive comprehensive psychological and medical treatment for eating disorders is often difficult to access outside of major cities, and many mental health clinicians do not receive training in the specialized skills that are necessary in working with these individuals. The 'revolving door' nature of eating disorder treatment, expanded upon below in the "Relapse" section, also increases healthcare costs, as clients require additional doses of treatment when they are not successful in achieving or maintaining gains in recovery from their eating disorder.

Diagnostic Criteria for Eating Disorders

The American Psychiatric Association recently released the latest version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) for reference in the diagnosis of psychiatric disorders (APA, 2013). It is important to note, however that the current studies were designed and conducted before the release of the DSM-5; therefore, descriptions of relevant diagnostic criteria for eating disorders reflect the previous edition of the DSM (DSM-TR-IV). The DSM-TR-IV identifies two major classes of eating disorders: Anorexia Nervosa (AN) and Bulimia Nervosa (BN; APA, 2000). Criteria for AN include a refusal to maintain a normal body weight, fear of gaining weight or becoming fat, overvaluation of weight and shape or denial of the seriousness of low weight, and amenorrhea in women (APA, 2000). Patients with AN may or may not engage in binge eating and compensatory behaviours, such as self-induced vomiting, laxative abuse, or excessive exercise. The criteria for BN include recurrent binge eating and purging behaviours (i.e., an average of at least 2 episodes per week in the past 3 months) and presence of weight-related self-evaluation or self-esteem (WRSE; APA,

2000). A third diagnostic category, Eating Disorder Not Otherwise Specified or EDNOS, captures clinically significant eating disorders that do not meet the specific criteria outlined for AN or BN; for example, patients who are bingeing/purging at a frequency less than twice weekly, or someone who meets all diagnostic criteria for AN other than amenorrhea (APA, 2000). Patients who meet criteria for proposed eating disorders found in the DSM-IV-TR Appendix entitled "Criteria Sets and Axes Provided for Further Study," such as binge eating disorder (BED) and purging disorder, would currently fall under the DSM-IV-TR EDNOS diagnostic category.

The recently published latest edition, DSM-5, includes updates in the adult eating disorders section. With respect to AN, the requirement for amenorrhea status has been removed. Research suggested that amenorrhea status might not provide diagnostically relevant information (Roberto, Steinglass, Mayer, Attia, & Walsh, 2008). It is also irrelevant for biological males and post-menopausal females, and, furthermore, many female patients of childbearing age use hormonal birth control that can force a menstrual period, thus obfuscating the ability to assess this criterion. Additionally, the wording for AN's Criterion A (i.e., significantly low body weight for developmental stage) has changed for clarification purposes, and guidance is provided in the DSM-5 text to aid diagnosticians in evaluating this criterion. In addition to endorsement of fear of weight gain, Criterion B for AN in DSM-5 now alternatively includes persistent behaviour that interferes with weight gain. With respect to changes in the BN criteria, frequency for binge/compensatory behaviour has decreased from an average of twice weekly to once weekly, to reflect that this psychopathology is equivalent regardless of average weekly frequency. Finally, BED was removed from the "Criteria Sets and Axes Provided for

Further Study" section and included as an independent diagnosis in DSM-5. BED criteria remain similar to the proposed criteria listed in DSM-IV-TR. One exception to previous BED criteria is a modification to a minimum of once weekly binge eating over the last 3 months, as opposed to the originally proposed twice weekly for 6 months, such that it is consistent with the frequency criterion for BN.

While both DSM-IV-TR and DSM-5 emphasize a distinction between the eating disorder categories, theorists have proposed a transdiagnostic model to underscore their commonalities (Fairburn, Cooper, & Shafran, 2003). Briefly, this model suggests that an undue influence of weight and shape on self-esteem, or WRSE, which has been described as the "core psychopathology" of eating disorders (Vitousek & Hollon, 1990), is pervasive across the eating disorders. Fairburn and colleagues (2003) propose that behavioural symptoms, such as low weight, binge eating, and compensatory behaviours, are reflections of this maladaptive cognitive schema that ties weight and shape to a patient's self-evaluation. Based on this model, a transdiagnostic treatment manual for eating disorders was recently published (Fairburn, 2008).

Treatment and Relapse

According to the National Institute for Clinical Excellence (NICE, 2004) guidelines, the gold standard in psychological treatment for eating disorders, in particular BN and BED, is cognitive behavioural therapy (CBT; see Murphy, Straebler, Cooper, & Fairburn, 2010). The goals of CBT for patients with eating disorders include eliminating dietary restriction by developing a regular eating pattern, eliminating binge eating and purging behaviours (e.g., self-induced vomiting, laxative misuse, excessive exercise, fasting, ipecac misuse, etc.), and weight gain, if indicated. There is an abundance of

research examining the effectiveness of CBT for eating disorders. A recent review of meta-analyses for treatment of BN indicated that CBT is superior to both control conditions and other psychotherapies, including interpersonal therapy and dialectical behaviour therapy (Hoffman, Asnaani, Vonk, Sawyer, & Fang, 2012). The evidence is less clear for AN (Wilson, 2005), and indeed, researchers have identified the lack of sufficient treatment studies for adults with AN (Le Grange & Lock, 2005). With respect to BED, a recent review of randomized controlled trials found that CBT is effective in reducing binge eating but is not associated with significant weight loss for these patients (Brownley, Berkman, Sedway, Lohr, & Bulik, 2007). Building on the transdiagnostic theory for eating disorders, Fairburn (2008) developed an individual-based enhanced CBT treatment protocol that targets all variants of eating disorders (CBT-E). A recent randomized control trial with a 60-week follow-up period found that CBT-E was more effective than waitlist control in symptom reduction and eating disorder psychopathology over the long-term (Fairburn et al., 2009). Their clinical sample was transdiagnostic including patients diagnosed with AN, BN, and EDNOS.

Despite clear evidence for the efficacy of CBT and the promising transdiagnostic treatment protocol developed by Fairburn (2008), relapse is common in eating disorders (e.g., Carter, Blackmore, Sutandar-Pinnock, & Woodside, 2004; McFarlane, Olmsted, & Trottier, 2008; Richard, Bauer, & Kordy, 2005). Indeed, the University Health Network's Day Hospital program in Toronto, Ontario, an internationally recognized treatment facility that provides an intensive group-based CBT program, reported relapse rates for remitted patients of approximately 40% within 12 months (McFarlane, Olmsted, & Trottier, 2008). High rates of relapse can lead to a "revolving door" phenomenon

where patients frequently have multiple admissions to eating disorder treatment programs, which is costly from both personal distress and public health perspectives.

Given the high rates of relapse in eating disorders, researchers recognize the crucial need to identify factors that might influence the risk of relapse for patients. Earlier work found that previous specialized eating disorder treatment, history of suicide attempt, excessive exercise following discharge from treatment, severity of obsessive-compulsive symptoms at admission, and concern about weight and shape at discharge were predictive of relapse at 18 months in patients diagnosed with AN (Carter et al., 2004). For clients with BN, both attitudes towards weight/shape and self-esteem were associated with treatment outcome (Fairburn, Peveler, Jones, Hope, and Doll, 1993). Specifically, participants with intermediate levels of negative weight and shape attitudes did the least well in active treatment. Other important variables include patients' desired weight, duration of illness, Eating Disorder Inventory scores, specialization of clinic, and additional treatment during follow-up (for AN patients) and symptom status before relapse, motivation for treatment, and additional treatment during follow-up (for BN patients; Richard et al., 2005). Qualitative research by Federici and Kaplan (2008) found that patients with AN described motivation to change, viewing recovery as a "work in progress", perceived value of treatment, development of supportive relationships, awareness and tolerance of negative emotions, and self-validation as factors most relevant to relapse and recovery. Halmi and colleagues (2002) examined predictors of relapse following CBT intervention and found that patients who relapsed had greater preoccupation with food and ritualized eating, as well as decreased motivation to change. Most recently, McFarlane and colleagues (2008) found that slower treatment response, a

greater degree of pre-treatment caloric restriction, higher levels of WRSE, and more eating disorder symptoms at discharge were predictive of relapse at 12-month follow-up post-intensive outpatient treatment. Overall, many different factors have been identified that are clearly relevant for enhancing wellness in eating disorder patients over the long term. The literature is less clear, however, on how to specifically address these vulnerability factors.

Interventions are needed that specifically focus on relapse prevention in eating disorders. While relapse prevention is currently addressed in CBT for eating disorders (e.g., Fairburn, 2008), typically only 1-2 sessions are devoted to this important topic. A review of the literature revealed several attempts at more comprehensive relapse prevention focus. Pike, Walsh, Vitousek, Wilson, and Bauer (2003) developed a manual focused on relapse prevention using cognitive-behavioural methods in AN. They randomly assigned participants who had successfully completed inpatient treatment for AN to receive either CBT or nutritional counselling for 1 year. Their results indicated that the CBT group had a longer time-to-relapse and lower rate of relapse as compared to the nutritional counselling group. Mitchell, Agras, Wilson, Halmi, Kraemer, and Crow (2004) randomly assigned treated eating disorder patients to either crisis intervention (i.e., additional follow-up sessions if patients experience a recurrence of symptoms or anticipate a recurrence) or routine follow-up care. The results indicated that none of the patients who relapsed sought out additional support post-treatment; consequently, they concluded that solely informing patients about additional assistance that is available post-treatment is not sufficient to prevent relapse in eating disorders. Walsh and colleagues (2006) completed a two-site randomized controlled trial examining the impact of

fluoxetine, versus placebo, on prolonging time to relapse in weight-restored patients with AN. Participants in both conditions were also receiving CBT and were followed for up to one year. The results indicated that there was no difference between groups in time-to-relapse. Most recently, Carter and colleagues (2009) compared the impact of individual CBT and maintenance treatment as usual (MTAU) for weight-restored patients diagnosed with AN on relapse using a nonrandomized controlled research design. MTAU referred to follow-up by assessment only although participants could seek follow-up care. The results indicated that the CBT group had a smaller percentage of participants relapse and a significantly longer time to relapse compared to the MTAU condition.

In sum, the results of these findings suggest that CBT interventions may be helpful in reducing risk of relapse in patients with eating disorders. Additional studies are gravely needed to reduce risk in order to decrease the psychological burden and high cost of repeated treatment admissions. Due to the number of relapse-related considerations previously described, it remains important to determine the most beneficial manner in which to intervene.

Weight-Related Self-Esteem

Research in other areas of psychopathology provides insight into the desired targets of a CBT-based relapse prevention intervention, particularly given the number of factors linked to relapse in eating disorder patients. Researchers have examined the construct of cognitive vulnerability to psychopathology, in particular in the area of recurrent major depression. For example, Segal, Kennedy, Gemar, Hood, Pedersen, and Buis (2006) conducted a landmark study where patients diagnosed with Major Depressive Disorder (MDD) who had remitted from a major depressive episode

underwent a sad mood induction followed by completion of questionnaires assessing relevant variables, such as dysfunctional attitudes. These participants were subsequently followed for 18 months. The results suggested that patients who reported a higher level of mood-related cognitive reactivity (i.e., endorsement of more dysfunctional attitudes after the sad mood induction) relapsed more quickly than did participants without this specific vulnerability. Recent research also found that dysfunctional attitudes at the end of acute treatment phase was associated with a greater risk of depressive relapse 20 and 35 months later (Jarrett et al., 2012). These findings provide evidence for a cognitive vulnerability to depressive relapse. Research in other areas suggests that individual suffering from different psychological disorders may also possess specific cognitive styles. For example, Ledley and Heimberg (2006) reviewed research studies and suggested that individuals diagnosed with social anxiety disorder display a tendency to appraise social interactions in a negative manner, which can contribute to the maintenance of their problems.

Similarly, patients with eating disorders possess a cognitive vulnerability to psychopathology, namely WRSE. This construct, recognized in the DSM-IV-TR and DSM-5 criteria for AN and BN, is conceptualized as a strong connection of weight and shape to one's self-esteem or self-evaluation (APA, 2000). Also known as "weight-related self-evaluation", "undue influence of weight and shape", and "overvaluation of weight and shape", WRSE has been referred to as the "core psychopathology" of the eating disorders (Vitousek & Hollon, 1990). Indeed, although WRSE is not formally recognized as a DSM criterion for BED, recently researchers have argued for its inclusion as a diagnostic specifier for this diagnosis (Grilo, White, Gueorguieva, Wilson, &

Masheb, 2013). WRSE is a maladaptive cognitive schema that typically is not the first target of CBT treatment. That is, patients with eating disorders first address their behavioural symptoms, such as restricting food intake, binge eating, and purging behaviour, prior to commencing cognitive work. Addressing WRSE is critical because patients who achieve behavioural symptom control but continue to report high levels of WRSE at the end of psychological treatment are at a greater risk of relapse (McFarlane et al. 2008). Indeed, recent research described a 'pseudo-recovery state' where patients are symptom-free but continue to endorse disordered eating cognitions and beliefs (Keski-Rahkonen & Tozzi, 2005). While there is no clear consensus among researchers on classifying recovery from an eating disorder (e.g., Walsh, 2008), recent studies have proposed a definition of recovery that encompasses physical, behavioural, and psychological (including cognitive) domains, such that remitted patients are indistinguishable from non-eating disorder individuals on all of these factors (Bardone-Cone et al., 2010).

How does WRSE present in patient's daily lives? The most recognizable manner is through eating disorder symptoms themselves; however, the core psychopathology of eating disorders can also manifest behaviourally in other ways. Indeed, in addition to engaging in eating disorder symptoms such as binge eating, purging, and restricting, patients also engage in body checking and body avoidance behaviours, which are viewed as expression of WRSE (Shafran et al., 2004). Furthermore, individuals with eating disorder psychopathology also engage in experiential avoidance (Rawal, Park, & Williams, 2010) that can lead them to disengage from other important areas of life, including their emotional experience. Eating disorder patients also often misperceive

bodily physical sensations and their emotions as "feeling fat" (Cooper, Deepak, Grocutt, & Bailey, 2007), and ruminate about their bodies, food, and eating (Cowdrey & Park, 2011). These characteristics common in patients with eating disorders can also be viewed as behavioural expressions of WRSE.

WRSE is distinguished from body dissatisfaction. Patients with eating disorders generally endorse body-related concerns and express dissatisfaction with their bodies (Cash and Deagle, 1997) although it is not a specific diagnostic criterion for all of the eating disorder categories. Body dissatisfaction is also not uncommon in women without eating disorders in modern society, a phenomenon that has been termed "normative discontent" (Rodin, Silberstein, & Striegel-Moore, 1984). Individuals can be dissatisfied with the state of their bodies but not necessarily engage in extreme practices to lose or maintain weight. These individuals can also report body dissatisfaction but not endorse a strong connection of their self-evaluation to weight and shape, per se. Patients with eating disorders can be distinguished from normative samples by endorsement of an undue influence of weight and shape on their self-perception, often to the exclusion or minimization of other contributors.

Summary and Goals

The burden and disappointment of relapse in eating disorders has impacted patients, clinicians, and family members alike. Indeed, the empirical evidence is clear that relapse is a significant concern in this population and worthy of future research in the area of eating disorder treatment. It is important to note that not all relapse-relevant variables highlighted in the literature are modifiable through treatment (e.g., length of illness, history of suicide attempt, etc.). Certainly, treatment focused on reducing relapse

must address one or more risk factors that can be specifically targeted by clinicians and modified in patients such that observable change can occur. Research in relapse prevention in MDD provides convincing support for the use of mindfulness-based cognitive-behavioural interventions to decrease cognitive vulnerability in these patients. Similarly, for patients with eating disorders, WRSE is a cognitive schema that increases an individual's relapse risk (McFarlane et al., 2008) and, as such, represents a logical choice for intervention.

The goals of this dissertation project are threefold: 1) To develop a relapse prevention treatment manual targeting WRSE in partially remitted eating disorder patients; 2) To examine the treatment manual's effect on WRSE and related variables in a pilot study, and; 3) To conduct a small randomized controlled study using the newly developed WRSE treatment manual as an adjunct to treatment as usual to determine if it provides any additional therapeutic benefits in preventing relapse in eating disorder patients.

Development of the Preliminary Protocol

Given that patients who remit following eating disorder treatment with high levels of WRSE are at greater risk of relapse (Carter et al., 2004; Fairburn et al., 1993; McFarlane et al., 2008), an intervention specifically targeting WRSE may be useful. Researchers at Toronto General Hospital's Eating Disorder Day Hospital Program (Dr. Traci McFarlane, Dr. Rachel Strimas, and Ms. Sarah Royal) developed an 8-week cognitive-behavioural relapse prevention treatment manual that specifically addresses WRSE and its behavioural components. The manual was developed with the intention that it can be used following intensive eating disorder treatment completion; that is, once

patients have achieved behavioural symptom interruption with respect to dietary restriction, binge eating, and compensatory behaviours. The following sections provide detailed information on the relevant targets of treatment that were addressed in the manual. Target areas were selected based on review of the literature and clinical experience with respect to treatment of eating disorders.

Components

Mindfulness, Rumination, and Experiential Avoidance. Mindfulness refers to present-focused awareness and non-judgmental acceptance of thoughts, emotions, and sensations that arise in one's attention (Kabat-Zinn, 1990; Segal, Williams, & Teasdale., 2002). It is a process of relating to one's own experience without attempting to actively alter it (Philippot & Segal 2009). Mindfulness has been incorporated in several dominant psychological treatment interventions including Mindfulness-based Stress Reduction (Kabat-Zinn, 1990), Mindfulness-based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002), Dialectical Behaviour Therapy (Linehan, 1993), and Acceptance and Commitment Therapy (Hayes, Strosahl, & Wilson, 1999). Mindfulness is included in these therapeutic approaches to increase patients' awareness of the connection between cognitive reactivity and emotional distress, and to decrease their vulnerability to thoughts, emotions, and sensations such that emotional health is improved (Linehan, 1994; Teasdale, 1999). Patients can learn to sit with their experience (not avoiding it) and not necessarily act upon their thoughts or emotions in a maladaptive manner. Indeed, experiential avoidance has been shown to mediate the relationship between both intensity of negative affect and childhood trauma and endorsement of problematic behaviours, including alcohol and recreational drug use, binge eating, and aggression (Kingston,

Clarke, & Remington, 2010). Mindfulness is an important adjunct to cognitive approaches, such as CBT, that emphasize the examination and active alteration of unbalanced or unhelpful thought processes (Beck, Rush, Shaw, & Emery, 1979).

Several mechanisms of change for mindfulness have been suggested. Baer (2003) proposes that mindfulness allows for exposure to painful emotions, sensations, and thoughts that might otherwise be actively avoided, a task that can help to de-catastrophize them. Baer (2003) also suggests that attitudes towards these experiences can be altered such that thoughts are recognized as not facts, and that mindfulness promotes acceptance within the individual. Other researchers have proposed that mindfulness has its influence through impacting emotion regulation abilities. Philippot and Segal (2009) reported that mindfulness could improve training in attentional control, awareness of experience, and inhibition of immediate responses, which are skills relevant in regulating emotional experiences.

Segal and colleagues (2002) developed MBCT to reduce the risk of depressive relapse in patients diagnosed with recurrent MDD. Briefly, MBCT is a group-based relapse prevention program for patients who have remitted from a major depressive episode. The treatment specifically addresses cognitive reactivity by teaching clients to use mindfulness skills that increase their self-compassion with respect to distressing thoughts, emotions, and sensations, in addition to learning standard cognitive-behavioural skills (Kuyken et al., 2010). By learning mindfulness, patients are able to notice their current experience, including ruminative thoughts, and recognize warning signs that they might be at risk of relapsing in their depression. Several randomized controlled trials have found that MBCT is superior to primary care monitoring in maintaining wellness

with respect to depressive symptoms (e.g., Ma & Teasdale, 2004; Teasdale et al., 2000). Kuyken and colleagues (2010) examined MBCT's mechanisms of change and found that they included increases in mindfulness and self-compassion through treatment. Furthermore, using formal, as opposed to informal, mindfulness practice was associated with decreased ruminative thinking in remitted depressed patients (Hawley et al., 2014).

Relatedly, patients diagnosed with eating disorders frequently engage in ruminative-type thinking, such as distressing body-related and eating-related cognitions. Rumination refers to the mental rehearsal of events viewed as stressful (Zoccola & Dickerson, 2012). Several studies have shown that ruminative thinking related to eating, shape, and weight is associated with eating disorder symptoms (Cowdrey & Park, 2012; Rawal, Park, & Williams, 2010). Mindfulness skills may be helpful for eating disorder patients to cope with their maladaptive ruminative thinking. There is also a literature related to mindful eating in the context of eating disorders, although that is beyond the scope of the current project. Furthermore, in addition to ruminative thinking, patients with eating disorders also engage in experiential avoidance of distressing thoughts and emotions (i.e., deliberate attempts to avoid experiencing these events), which has been linked to eating disorder psychopathology (Rawal, Park, & Williams, 2010); mindfulness may also be helpful for eating disorder patients in decreasing this behaviour.

Based on a review of the current literature, inclusion of a mindfulness component in a relapse prevention treatment protocol for eating disorders is warranted. Mindfulness may be helpful in teaching patients a complementary skill, not included in traditional CBT for eating disorders, to manage their distressing body-related thoughts, thus, further interrupting unhelpful thought patterns that may increase urges for eating disorder

symptoms. It is important to note that mindfulness was utilized in the current studies as one of many taught skills and not as a formal mindfulness practice as recommended in the prevention of depressive relapse (Segel et al., 2002).

Body Checking. Body checking refers to behaviours that permit the monitoring and evaluation of appearance-related characteristics (Fairburn, 2008). Recent research indicates that patients diagnosed with eating disorders examine their bodies in idiosyncratic patterns (Shafran, Fairburn, Robinson, & Lask, 2004). Common checking behaviours can include frequent weight checking, pinching or touching body parts to determine amount of fat, measuring the size of body parts, comparing their bodies to others, high levels of mirror use, and trying on clothing to determine if they fit (Rosen, 1997). Women with eating disorders are also more likely to experience body-checking related cognitions and beliefs as compared to non-clinical women, such as believing that body checking can reassure them or help to control their weight (Mountford, Haase, & Waller, 2006). Patients are also not always aware of the extent to which they engage in body checking behaviours (Fairburn, 2008). Body checking behaviour also occurs in non-clinical populations (White & Warren, 2013) but patients with eating disorders report more unhealthy levels of frequent body checking behaviour (Amin, Strauss, & Waller, 2012). Men also engage in body checking (Walker, Anderson, & Hildebrandt, 2009), although the topography of specific behaviours differs based on gender (Alfano, Hildebrandt, Bannon, Walker, & Walton, 2011).

The consequences of body checking are significant. For example, frequency of body checking behaviour predicted difficulties in mental health-related quality of life in a community sample (Latner, Mond, Vallance, Gleaves, & Buckett, 2012). Also using a

non-clinical sample of women, Shafran, Lee, Payne, and Fairburn (2007) examined the relationship between body checking and body dissatisfaction in an experimental design by randomly assigning participants to engage in a high or low level of body checking behaviour. Participants in the high body checking condition experienced a temporary increase in levels of body dissatisfaction, feelings of fatness, and endorsed more self-critical body-related thoughts compared to participants in the low body checking condition. Body checking has also been linked to body dissatisfaction in the eating disorders (Reas, Whisenhunt, Netemeyer, & Williamson, 2002). Lavender and colleagues (2013) examined the relationship between body checking behaviour and restrictive eating practices in patients with full or partial AN using ecological momentary assessment. The results suggested that body checking frequency was associated with restrictive eating practices, including no food intake for 8 waking hours and consumption of less than 1200 calories, for the particular day measured in addition to the following day. Body checking may serve to maintain dietary restriction and the authors suggested targeting body checking in treatment to aid in eliminating dietary restriction practices. To examine differences based on diagnostic category, Mountford, Haase, and Waller (2007) studied a transdiagnostic sample and found that patients with AN and BED have lower levels of body checking behaviour compared to patients diagnosed with BN and other forms of EDNOS. Their findings also indicated that endorsement of a belief that body checking provides accurate information about weight was related to binge eating and vomiting behaviour, and not related to diagnosis per se. In non-clinical women, the relationship between body-related thoughts and body checking behaviour is mediated by

social physique anxiety, namely, the anxious affect experienced when one's body is or may be observed by others (Haase, Mountford, & Waller, 2007).

Research suggests that body checking may serve to maintain patients' preoccupation with weight and shape (Shafran et al., 2004). As such, psychoeducation and strategies related to body checking were included in the WRSE manual. While addressing body checking is not directly targeting WRSE per se, addressing one of its "symptoms" can serve to draw attention away from their bodies such that they can engage with, and build self-esteem to connect to, other valued areas of life.

Body Avoidance. Body avoidance refers to attempts to avoid seeing one's own body or body parts or knowing relevant body-related information (e.g., weight) or having one's body or body parts visible to others. Body avoidance can occur in women without eating disorders (White & Warren, 2013) and in male populations (Meyer, McPartlan, Rawlinson, Bunting, & Waller, 2011). It is not uncommon for patients diagnosed with eating disorders to engage in behaviours opposite to body checking, i.e. body avoidance (Shafran et al., 2004). Indeed, patients with eating disorders report higher levels of body avoidance compared to non-clinical samples (Amin, Strauss, & Waller, 2012). Body avoidance behaviours can include, but are not limited to, avoiding knowing one's weight, wearing loose or baggy clothing, always wearing makeup, avoidance of certain clothing (e.g., tight or revealing clothing items, bathing suits), avoiding mirrors or looking at oneself while naked, avoiding social situations, difficulty accepting compliments, avoidance of sexual intimacy, and avoiding interactions with thinner women. Further, patients may simultaneously endorse both body checking and body avoidance behaviours. There are numerous consequences of body avoidance. In a community

sample, frequency of body avoidance predicted physical health-related quality of life impairments (Latner et al., 2012). Body avoidance has also been linked to body dissatisfaction in patients with eating disorders (Shafran et al., 2004). It follows that body avoidance can also limit the types of experiences that an individual has, such as decreased social contact outside of the home and avoidance of sexual intimacy.

Similar to body checking, body avoidance is also proposed to be a behavioural manifestation of WRSE (Shafran et al., 2004). Body avoidance can function as a safety behaviour, maintaining a patient's preoccupation with weight and shape in a manner similar to avoidance in the anxiety disorders. Research demonstrates that individuals who avoid anxiety-provoking stimuli do not get the opportunity to habituate to the emotion, to learn that they can tolerate the emotion, and to learn that catastrophic outcomes generally do not come true (see Abramowitz, Deacon, & Whiteside, 2011). The psychological treatment of choice for anxiety is exposure, which can serve to decrease anxiety and avoidance behaviours over time. Several studies have shown that body image exposure in the context of eating disorders (i.e., systematic exposure to observing oneself in a full-length mirror) can decrease body image distress (Delinsky & Wilson, 2010; Hildebrandt, Loeb, Troupe, & Delinsky, 2012). There is evidence that negative affect decreases during the course of body exposure (Trottier, Carter, MacDonald, McFarlane, & Olmsted, under review; Vocks, Legenbauer, Wachter, Wucherer, & Kosfelder, 2007). Given this evidence, exposures to address body avoidance were included as part of the WRSE treatment manual.

Feeling Fat. For patients with eating disorders, "feeling fat" is often likened to "being fat" (Fairburn, 2008). The empirical literature on feeling fat is sparse, which is

surprising given its high occurrence in eating disorder populations. In an early study using an undergraduate sample, Striegel-Moore, McAvay, and Rodin (1986) found that feeling fat was related to perfectionism, perceived social pressure to be thin, weight-related social comparison, and degree to which experiences of failure affect body-related feelings. Furthermore, feeling fat was also associated with perceived lack of control over eating, dieting, and binge eating behaviours in this sample. More recent qualitative work found that feeling fat was present in female non-dieters, dieters, and patients with AN alike but that clinical patients felt fatter, had more distress, and experienced more negative emotions related to feeling fat (Cooper et al., 2007).

Scholars in the eating disorder field have suggested that "feeling fat" may be a misperception of either aversive physical sensations or an emotion as a subjective feeling that one is fat (Fairburn, 2008). Such an assertion is reminiscent of body displacement theory. Body displacement refers to the displacement of negative emotions onto one's body (Bruch, 1978). By displacing these emotions onto the body, individuals experience a heightened sense of control over their distress (Jasper, 1993), given that patients with eating disorder believe that they can control weight and shape through extreme dietary restriction and exercise. McFarlane, Urbszat, and Olmsted (2011) used an experimental paradigm to induce feelings of ineffectiveness in both eating disordered and non-eating disordered individuals. Eating disordered participants who underwent the ineffectiveness induction, as compared to a control condition, reported higher levels of implicit body concerns, which was not observable in non-eating disordered participants. These results provide experimental support for the validity of body displacement in eating disorder populations.

Feeling fat is also observed to fluctuate throughout the day (Fairburn, 2008), which suggests that this phenomenon reflects something other than body-related changes, as it is not possible to observe significant weight or shape-related changes in the course of a day. Addressing feeling fat may an important avenue for relapse prevention. Scholars have suggested that body displacement may be important in the maintenance of eating disorder behaviour and psychopathology (McFarlane et al., 2011) and that "feeling fat" is a manifestation of WRSE (Fairburn, 2008). The WRSE protocol includes psychoeducation about feeling fat (i.e., that fat is not a feeling) and strategies to re-label feelings of fatness.

Increasing Self-Esteem in Other Areas of Life. When individuals overvalue weight and shape in their self-evaluation, a corollary is that other areas of life, such as relationships, career, hobbies, and personality, become less important or less dominant in their lives. Furthermore, a patient's entire life may revolve around the eating disorder to the detriment of other pursuits. Indeed, research indicates that patients with eating disorders have deficits in their social lives and employment pursuits (Hartmann, Zeeck, & Barrett, 2010; Williams, 2006). In order to adequately decrease WRSE, another important target of relapse prevention is to build self-esteem in other areas of life, such that a setback or distress related to weight and shape will not have such a powerful impact on how the patient evaluates himself or herself. Therefore, identifying areas of life important to the patient and setting behavioural goals to target these areas were included in the preliminary relapse prevention protocol.

Core Beliefs. Core beliefs refer to rigidly held beliefs related to the self, others/the world, and/or the future that can be positive or negative in valence. Negative,

or maladaptive, core beliefs have been linked to psychopathology in general. Individuals with current eating disorders endorsed more rigidly held negative core beliefs compared to participants who had recovered from an eating disorder as well as individuals without an eating disorder (Jones, Harris, & Leung, 2005). Frequency of compensatory behaviours, including vomiting, laxative misuse, and fasting, is associated with more severe dysfunctional core beliefs (Dingemans, Spinhoven, & van Furth, 2006). Research has highlighted that negative beliefs held by eating disorder patients may extend beyond thoughts related to food, weight and shape and, as such, should be addressed in CBT (Jones, Leung, & Harris, 2007). Core beliefs are not consistently addressed in the Toronto General Hospital Day Hospital Program[1] (DHP) where the current study took place. These rigid and emotionally laden beliefs (e.g. I am helpless; I am unlovable) appear to be an important area to target in the recovery from eating disorders, and their content are frequently indicative of low self-esteem; thus, they have been included in the WRSE manual.

Protocol

An 8-week individual-based protocol was developed specifically targeting WRSE for patients with eating disorders, with the goal of reducing risk of relapse. Duration of eight weeks was chosen such that the intervention could be brief but also allowed for

[1] Briefly, the Toronto General Hospital Day Hospital Program is group-based and treats patients with primary eating disorders, including AN, BN, and EDNOS (excluding BED). Patients attend 5 days per week, up to 8 hours daily. The program is primarily cognitive-behavioural in focus but also includes aspects of interpersonal therapy. The focus of treatment includes behavioural symptoms, such as binge eating and purging, and weight restoration, if indicated. Clients attend weekly groups that focus on treatment goals, check-in on symptoms, meal planning, body image, relationships, and nutrition education. The program also includes supervised meals and meal/snack outings. As part of the program, patients have access to psychologists, psychiatrists, dietitians, occupational therapists, and nurses who provide comprehensive clinical care.

sufficient time to address the relevant WRSE topics. The manual was based on cognitive-behavioural principles due to the amount of research support for the efficacy of CBT for eating disorders. Each individual treatment session is 50-60 minutes in length.

Each treatment session included a review of any eating disorder symptoms and the client's adherence to the meal plan in the past week. If clients engaged in binge eating, purging, or significant restriction in the past week, then up to 20 minutes of the session was devoted to addressing this issue, given that symptom interruption remains a priority. Strategies utilized to address symptoms include brief behavioural analysis to determine the important antecedents and reinforcers of eating disorder symptoms, and solution analysis to generate strategies that might be helpful to prevent symptoms in the future. Clients who expressed distress related to engaging in eating disorder symptoms received validation and were provided with education about lapses versus relapses, and framing the 'slip' as an opportunity to learn how to prevent the "slippery slope" of eating disorder relapse. With respect to weight, clients were not necessarily weighed in session. For example, most clients who received the protocol as part of the current project were already being weighed as part of the DHP's transitional program and, if not, they were weighed in session based on clinical judgment and consultation with the supervising psychologist. If clients had been restricting or were less than adherent to their meal plan and experiencing ambivalence about getting back on track, motivational strategies, such as decisional balance, were employed. Often, clients (most of who were participating in the Transitional Program) had already analyzed their symptoms and were back on track with respect to symptoms by the time they attended their individual WRSE treatment session. If this was the case, the individual therapist spent less time on symptoms and

focus on the WRSE protocol. It is important to note that the strategies described above are not exhaustive and therapists used their clinical judgement to determine an intervention to target eating disorder symptoms.

With the exception of Session 1, clinicians reviewed homework with clients. Homework review was always completed to emphasize the importance of skill practice outside of treatment sessions and to generalize the skills to their daily lives. When clients did not complete their homework, attempts were made to determine barriers that interfered with its implementation. If practical, missed homework was completed in session and/or assigned as homework for the upcoming week.

Sessions typically involved psychoeducation on a new topic or skill. Topics included information about relapse in eating disorders and WRSE, mindfulness, introduction to behavioural goals outside weight and shape, body checking and body avoidance, core beliefs, feeling fat, and relapse prevention. Following psychoeducation on mindfulness, clients also completed a 3-minute breathing space exercise in session each week. The clinician debriefed the exercise with the client and elicited her reactions to, and experience with, the mindfulness exercise. The sessions always ended with assigning homework for the coming week based on the new topic/skill learned in session. Homework could also include continuing to work on previously learned skills. For example, a client with high levels of body avoidance would continue to complete body exposures on a weekly basis. The amount of homework each week was at the clinician's discretion based on clinical judgment and the client's reaction to the particular topic/skill. At the end of each session, therapists sought verbal feedback from clients regarding their

reactions to the material and the session. Therapists attempted to incorporate any feedback into future sessions.

Study 1: Pilot

To examine the preliminary outcomes of the 8-week individual-based WRSE treatment manual, a pilot study was conducted with an eating-disordered sample. As a first step, we were interested in the feasibility of implementing the treatment protocol within the DHP setting. Specifically, we sought to examine dropout rate and clients' acceptance of the protocol as suggested by Leon, Davis, and Kraemer (2011). Additionally, we were interested in examining the impact of the treatment protocol on levels of WRSE and related variables, including eating disorder psychopathology, body checking, body avoidance, general self-esteem, ruminative thinking, and general avoidance behaviour in clients who had achieved behavioural symptom interruption of their eating disorder (i.e., elimination of binge/purge behaviour and/or weight gain).

Hypotheses. It was predicted that participants would show significant decreases in their levels of eating disorder psychopathology, WRSE, body checking, body avoidance, general avoidance, and ruminative thinking from pre- to post-intervention. It was also predicted that there would be a significant increase in general self-esteem from pre- to post-intervention.

Method

Participants

The sample (N = 16) was female and transdiagnostic, including the following diagnoses: AN restrictive subtype (n = 2), AN binge-purge subtype (n= 1), BN purging subtype (n = 9), and EDNOS (n = 4). With respect to ethnicity, 14 participants identified as Caucasian, 1 participant identified as Asian, and 1 participant identified as mixed ethnicity (Latin/Caucasian).

Eligibility for Participation. Partial remission was required for eligibility to participate in the study. Partial remission was defined as weight restoration to a minimum body mass index (BMI) of 19, no more than one binge and/or vomit episode in their last two weeks of DHP, and no less than an average of 90% of a normal meal plan in the two weeks prior to the relapse prevention treatment. Clients were recruited near the end of their hospital stay in the DHP if they achieved partial remission following CBT intervention for their eating disorder.

Procedure

The newly developed 8-week WRSE protocol was pilot tested between July 2008 and September 2011 (Royal, McFarlane, Strimas, Trottier, & Olmsted, 2011). Participants were recruited from the Toronto General Hospital DHP. A staff member approached potential participants regarding their interest in participating in the study. If interested, clients were put in contact with study personnel and an appointment was scheduled for the informed consent process. Eight graduate-level clinical psychology students completing placements at the Toronto General Hospital DHP served as therapists for the 16 pilot clients. The principal investigator (Sarah Royal) was one of the therapists for the pilot study. Participants were typically also involved in the DHP's Transitional Program[2] during their participation in the current study. One participant was

[2] Briefly, the Transitional Program is optional for patients who complete the intensive DHP. On a weekly basis, the DHP's transitional Program involves two "core" required program days and optional therapy groups on three additional days. The focus of the Transitional Program is maintenance of behavioural symptom control through weekly weight monitoring, symptom tracking, supervised meals, and weekly goal setting. The DHP's Transitional Program also involved weekly groups addressing topics such as body image, review of weekly goals, and topics selected by patients, such as relationships. Patients also have individual access to a dietitian and occupational therapist to discuss changes to their meal plan and occupation-related consultation, respectively.

eligible and recruited following individual CBT for bulimia nervosa and had not received treatment through the DHP. A registered clinical psychologist employed at the DHP and familiar with the protocol provided weekly supervision to all therapists who were treating clients as part of the study. The Institutional Research Ethics Board at the University Health Network (Toronto General Hospital site) in Toronto, Ontario, Canada approved this study prior to its commencement.

Measures

Participants completed a battery of study-related questionnaires prior to commencing individual treatment and again 8 weeks later following their final treatment session. Participants in the study had the option of completing the battery of questionnaires on their own time and returning the package within the week to research personnel.

Eating Disorder Psychopathology. To assess eating disorder psychopathology and related personality traits, the first version of the Eating Disorder Inventory was administered to participants (EDI-1; Garner & Olmsted, 1984; Garner, Olmsted, & Polivy, 1983). This scale is a 64-item self-report measure with items rated from 'Never' to 'Always'. The EDI has 8 subscales: Drive for Thinness, Bulimia, Body Dissatisfaction, Perfectionism, Interpersonal Distrust, Maturity Fears, Ineffectiveness, and Interoceptive Awareness. Higher scores on each of the subscales reflect greater degree of eating disorder psychopathology, including the Interoceptive Awareness subscale whose name may be misleading. A sample item from the EDI-1 Bulimia subscale is "I have gone on eating binges where I have felt that I could not stop". The EDI-1 is used widely in eating

disorder research. Schaefer, MacLennan, Yaholnitsky-Smith, and Stover (1998) found that the EDI-1 subscales displayed internal consistencies ranging from 0.82-0.92.

Weight-Related Self-Esteem (WRSE). WRSE was assessed using two self-report measures. The first was the Shape and Weight Based Self-Esteem Inventory (SAWBS; Geller, Johnston & Madsen, 1997), which examines the importance of weight and shape in the context of other valued areas of life. Respondents select personally-relevant attributes from a provided list (e.g., "Your friendships"; "Your body shape and weight") that have influenced how they viewed themselves during the last four weeks and rank order them with respect to their importance. They also have the option of including attributes that are not listed on the inventory. Respondents then divide a circle into sections for each selected attribute where the size of the section corresponds to its relative importance in influencing their self-evaluation. Researchers then measure the angle created by the weight and shape section of the circle, which is the resulting score on the SAWBS. Greater angle degrees indicate higher levels of WRSE. The SAWBS has good test-retest reliability (r = .81; Geller et al., 1997) and has demonstrated validity in an eating disorder population (Geller, Johnston, Madsen, Goldner, Remick, and Birmingham, 1998).

The second measure used to assess levels of WRSE in participants was the Weight Influence on Self-Esteem Questionnaire (WISE-Q; Trottier, McFarlane, Olmsted, & McCabe, 2013). This 23-item self-report instrument asks respondents to rate the negative impact of a 5-pound weight gain on different aspect of their lives, including domains both related to appearance (e.g., how physically attractive you feel) and unrelated to appearance (e.g., the quality of your work). Items are rated on a 5-point

scale from "Not at all" to "Extremely" and scores are summed to give a total score where higher score reflect greater levels of WRSE. Trottier and colleagues (2013) found that the WISE-Q demonstrated good psychometric properties in a sample of eating disorder participants, including concurrent validity with related constructs, internal consistency (α = .96), and test-retest reliability (*r* = .88). Cronbach's alpha for Time 1 for the WISE-Q was .94.

Self-Esteem. To examine general self-esteem, the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1979) was administered to participants as part of Study 1. This 10-item questionnaire has items with scores ranging from 1 (strongly disagree) and 6 (strongly disagree). Several items are reverse scored before items are summed to give a total score, where higher scores reflect greater general self-esteem levels. A sample item is "I feel that I'm a person of worth, at least on an equal plane with others". Robins, Hendin, and Trzesniewski (2001) found that the RSES had strong internal consistency across several assessments (α = .88-.90).

Body Checking. To measure the degree of body checking behavior, participants completed the Body Checking Questionnaire (BCQ; Reas, Whisenhunt, Netemeyer, & Williamson, 2002). This 23-item self-report questionnaire examines respondents' endorsement of a range of current body checking behaviours on a scale ranging from 1 (Never) to 5 (Very Often). A sample item is "I check the diameter of my legs to make sure they're the same size as before". Higher scores reflect greater endorsement of body checking behaviour in respondents. The BCQ can reliably distinguish between eating disordered respondents and healthy controls (Calugi, Grave, Ghisi, & Sanavio, 2006).

The BCQ has strong test-retest and internal consistency reliability (Reas et al., 2002). In the current study, internal consistency at Time 1 was strong (α = .89).

Body Avoidance. To examine participants' level of body avoidance, the Body Image Avoidance Questionnaire (BIAQ; Rosen, Srebnik, Saltzberg, & Wendt, 1991) was administered. This self-report scale measures behavioural avoidance of situations that could trigger body-focused psychological distress. Items are scored from 0 (Never) to 5 (Always) and summed, where higher scores are indicative of a greater degree of body avoidance. A revised version of the BIAQ was utilized for the current study. Given that participants were simultaneously participating in the DHP's Transitional Program, four items were not included due to rules and norms that are part of the DHP Transitional Program (e.g, "I fast for a day or longer"; "I only eat fruits, vegetables and other low calorie foods") and, thus, would not be endorsed by participants. The original BIAQ has demonstrated good internal consistency (α = .89), test-retest reliability (r = .87), and concurrent validity with related constructs (r = .22 - .78; Rosen et al., 1991). At Time 1, Cronbach's alpha for the revised BIAQ was .77.

General Avoidance. To measure participants' level of experiential avoidance of difficult thoughts, emotions, and/or activities, the Cognitive-Behavioral Avoidance Scale (CBAS; Ottenbreit & Dobson, 2004) was administered. The total CBAS score has displayed excellent test-retest reliability (r = .92) and internal consistency (α = .91) in its original psychometric study. Respondents read 31 statements and indicate their personal relevance from 1 (Not at all true for me) to 5 (Extremely true for me). Scores are summed for a total score where higher scores reflect greater degree of general avoidance behaviour. A sample item is "While I know I should make decisions about my personal

relationships, I just let things go on as they are". In the current study, the CBAS demonstrated excellent internal consistency at Time 1 ($\alpha = .91$).

Rumination. To examine participants' level of ruminative thinking, the Ruminative Responses Scale (RRS), a subscale of the Response Styles Questionnaire, was administered to participants (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). This scale was originally developed to examine rumination in depressed patients but has also been used in eating research (e.g., Gordon, Holm-Denoma, Troop-Gordon, & Sand, 2012). Respondents indicate the extent to which they engage in various rumination-related behaviours, such as "Think about how alone you feel" through 22 items. Scores are summed to give a total score where higher scores reflect a higher level of rumination. Internal consistency at Time 1 in the current study was $\alpha = .78$.

Demographics. Demographic information, including gender, ethnicity, and eating disorder diagnosis was obtained from patient information collected when they were admitted to the DHP.

Client Feedback. Participants were also administered a Client Feedback Form, created for the purposes of this study, that contained 9 questions examining how helpful they found different aspects of the treatment, including homework, behavioural goals to increase self-esteem, body avoidance exposures, mindfulness, identifying and shifting core beliefs, attention to the meal plan, relationship with the therapist, overall benefit of treatment to their recovery, and confidence that they can continue with recovery. Participants rated each treatment aspect from 1 (Not at all beneficial) to 5 (Very beneficial). Mean scores were calculated for each item and higher scores indicated more helpful treatment components.

Results

See Table 1 for descriptives. Data were visually scanned for univariate outliers using frequency distribution tables and none were present. A missing values analysis was conducted and indicated that 7.05% of the data was missing, due to attrition (n = 1) and missing items within otherwise complete questionnaire data. Given the small amount of overall missing data, techniques to address this issue would likely yield similar results (Tabachnick & Fidell, 2013; R. D. Crosby, personal communication, July 9, 2013), thus, a complete case analysis was conducted. Proration was employed to handle missing item data where the respondent completed at least 75% of scale or subscale items (Tabachnick & Fidell, 2013). The assumption of normality for paired samples *t* test was examined for all variables

using the Shapiro-Wilk test. Violations of the test of normality were found for a number of difference score variables (See Table 2). As such, paired samples *t* tests were conducted for variables where both pre- and post-scores contained a normal distribution and Wilcoxon sign-rank (*Z*) tests for variable scores with a non-normal distribution.

Weight-Related Self-Esteem and Related Variables

See Table 2 for means, standard deviations, normality test results, and statistical test results. The results indicated that clients who completed the 8-week relapse prevention protocol reported significant decreases from baseline in WRSE based on both the SAWBS and WISE-Q, the BCQ, the revised version of the BIAQ, the CBAS, and the RRS. Participants also displayed significant decreases in their EDI Drive for Thinness, Body Dissatisfaction, Ineffectiveness, Interoceptive Awareness, and Maturity Fears subscale scores. There were no observed significant changes from baseline in the EDI

Bulimia, Perfectionism, and Interpersonal Trust subscale scores. There was also a significant increase from baseline in general self-esteem as assessed by the RSES.

Feasibility

Regarding feasibility, only one participant dropped out of the study indicating a strong retention rate. Mean scores for each item on the Client Feedback Form were calculated and scores could range from 1 to 5. Participants rated all aspects of treatment highly with respect to how helpful they were including: Homework (M = 4.33; SD = 1.05), Behavioural Goals (M = 4.33; SD = 1.18); Body Avoidance Exposures (M = 3.80; SD = 1.32), Mindfulness (M = 3.80; SD = 1.32), Identifying and Shifting Core Beliefs (M = 4.40; SD = 1.06), Attention to the Meal Plan (M = 3.93; SD = 1.03); Relationship with the Therapist (M = 4.73; SD = .59); Overall Treatment to their Recovery (M = 4.60; SD = .74); and their Confidence to Continue (M = 4.61; SD = .63).

Discussion

The preliminary results of the impact of the 8-week treatment protocol on WRSE and related variables are very promising. Participants who completed the study had significant improvements in their level of WRSE as assessed using two self-report measures. This finding provides some preliminary evidence that this cognitive schema may be modifiable when targeted in treatment. Participants also reported improvements in cognitive and behavioural constructs that are specifically targeted in the protocol, including body checking, body avoidance, general avoidance, general self-esteem, and ruminative thinking, suggesting that focused therapeutic attention on these constructs can be fruitful. With respect to eating disorder psychopathology, participants also reported significant improvements in areas that are intuitive. Although the protocol is not

designed to specifically target body image distress and drive for thinness, it is possible that setting and completing behavioural goals in other valued areas of life draws attention away from a focus on the body. Furthermore, there is empirical evidence that body exposures are helpful in reducing body image distress (Delinsky & Wilson, 2010; Hildebrandt, Loeb, Troupe, & Delinsky, 2012). Participants may also have displayed improvements in feelings of ineffectiveness because they gained mastery over certain behaviours (e.g., body checking, body avoidance, general avoidance) and have expanded the types of activities in which they engage, perhaps leading to feeling more effective in their lives. The significant improvements in interoceptive awareness may possibly be explained by improvements in mindfulness, allowing participants to become more experientially aware; however, changes in mindfulness were not specifically measured and, as such, this remains a hypothesis to be examined in future research. Participants also displayed decreases in their levels of maturity fears, (i.e., fears of engaging in the demands of adult life), perhaps because they gained experiences of mastery through setting and following through with behavioural goals outside of weight and shape.

There were no observed changes in participants' EDI bulimia scores, which is not surprising since the sample was transdiagnostic (i.e., not all participants engaged in bulimic behaviours to begin with) and because clients entered the study as asymptomatic and maintenance of abstinence from symptoms was specifically addressed with participants as part of the treatment intervention. There were also no observed improvements in the EDI perfectionism and interpersonal distrust scores, two subscales assessing personality trait symptoms common in patients with eating disorders. Indeed, perfectionism is difficult to modify and was not specifically targeted in the protocol.

Furthermore, interpersonal functioning was also not specifically targeted in the protocol although, anecdotally, many participants set behavioural goals related to interpersonal relationships.

While the current results are promising, there are several important limitations. First, eating disorder symptoms were not directly measured using standardized clinical interviews at post-intervention and at a follow-up time point as part of the pilot study, which focused on questionnaire changes from pre- to post-intervention. Future studies should include measurement of behavioural symptom level (i.e., binge eating, vomiting) to determine the impact of the current intervention.

Additionally, most participants receiving the WRSE intervention were also participating in the DHP's Transitional Program for at least part of their involvement in the study. Therefore, it is possible that these changes were due to involvement in this additional treatment and/or the passage of time. It is possible that the measured variables would have changed over time without the WRSE intervention. Future studies would need to include a control group that does not receive the WRSE protocol in order to more stringently evaluate its impact on participants' wellbeing.

Following the final pilot session, clients also completed the Client Feedback Form that solicited their feedback on their treatment experience and the specific components of the protocol. Feedback was sought in order to refine the treatment protocol prior to its use in future research. Clients reported that they were generally satisfied with their experience in treatment. Mean scores for every treatment component was rated 3.8/5 or higher. In particular, clients rated benefit from core belief work highly (4.4/5), a topic that is not addressed to a notable degree in the DHP. Informal verbal feedback on the

protocol was also solicited from the therapists who provided the treatment in Study 1. The therapists suggested that incorporating additional treatment sessions to adequately address WRSE with clients would be beneficial. Furthermore, they indicated that it was occasionally difficult to complete mindfulness in the treatment sessions given time constraints.

Revision of the WRSE Manual

Based on the feedback from both participants and therapists, the manual was revised by the three authors to emphasize mindfulness and core beliefs, and the full protocol was extended from 8 to 10 sessions. Mindfulness practice was included near the beginning of the treatment sessions such that its importance is emphasized. Furthermore, an additional topic entitled "fat talk" was added to the protocol. Fat talk refers to negative body-related conversations that take place among women (Nichter, 2000). Fat talk conversations are common in western society and takes place within friendships (Royal, MacDonald, & Dionne, 2013) and families. The authors recognized that participants who are actively working toward decreasing the importance of weight and shape in their lives by engaging in other types of activities would likely be in new and different interpersonal situations where they might encounter fat talk behaviour. While not formally researched yet with an eating disorder population, it is possible that patients participate in fat talk conversations or, alternatively, that they are triggered by these discussions. In the spirit of targeting behaviours that maintain WRSE, the authors recognized that addressing fat talk as a specific problematic behaviour and/or environmental trigger would likely further benefit eating disorder patients.

Study 2: Randomized Controlled Trial

Rationale for a Randomized Controlled Trial.

Pilot testing of the relapse prevention protocol targeting WRSE demonstrated that clients showed significant decreases in WRSE, body checking, body avoidance, general avoidance, drive for thinness, body dissatisfaction, maturity fears and ruminative thinking, as well as significant increases in global self-esteem and interoceptive awareness. These results, while promising, do not reveal whether the therapeutic effects were simply due to passage of time and/or due to the concurrent transitional relapse prevention component of the DHP's Transitional Program. A study that includes a control condition is required to address these methodological limitations. Furthermore, a larger scale study would also have the capacity to include the measurement of eating disorder symptoms to assess the impact of the protocol on relapse status. Finally, the DHP has a longstanding and effective Transitional Program to treat eating disorder patients. A study is required to determine whether or not the WRSE protocol would provide any additional benefit to the treatment already provided through the DHP programming.

Several changes were made to the questionnaire package based on the findings in Study 1 and subsequent updates to the manual. Several additional questionnaires were included to more fully assess the constructs targeted in the WRSE protocol, such as mindfulness and fat talk. Furthermore, there is indication that eating disorder patients are frequently not fully aware of the extent of their body checking behaviour and, as such, a measure of cognitions connected to body checking was also included. Additionally, the literature was further consulted to determine if there were any more appropriate measures

assessing all constructs of interest. Due to this process, a different measure was selected to examine ruminative thinking that is broader than depressive rumination.

Therefore, the aims of the current study were to: 1) Compare the addition of a revised 10-week relapse prevention protocol to treatment as usual (TAU) to TAU itself; 2) Investigate changes in WRSE and related variables across both conditions from Time 1 (prior to intervention) to Time 2 (post-treatment or 10 weeks later), and 3) Examine behavioural outcome at post-intervention (end of treatment) and 3-month follow-up. A number of hypotheses can be formulated.

Hypothesis 1. Participants in the experimental condition (WRSE protocol + TAU) will have significantly greater decreases from baseline in levels of WRSE, body checking and related cognitions, body avoidance behaviours, general avoidance, ruminative thinking, fat talk behaviour, and eating disorder psychopathology (in particular, drive for thinness, body dissatisfaction, ineffectiveness, and maturity fears) compared to participants in the control condition (TAU).

Hypothesis 2. Participants in the experimental condition (WRSE protocol + TAU) will report significantly greater increases from baseline to end of intervention period in interoceptive awareness, general self-esteem, and mindfulness, as compared to the control condition (TAU).

Hypothesis 3. Participants in the experimental condition (WRSE protocol + TAU) will adhere to their prescribed meal plan to a significantly greater degree during the study period as compared to participants in the control condition (TAU).

Hypothesis 4. Amongst participants who presented to the DHP with binge eating or vomiting behaviour (threshold of greater than or equal to an average of 4 or more binge

eating and/or vomit episodes per month for 3 months), participants in the experimental condition (WRSE protocol + TAU) will be more likely to be abstinent, and have less binge eating and vomit episodes, in the last month of the intervention period as compared to participants in the control condition (TAU).

Hypothesis 5. Participants in the experimental condition (WRSE protocol + TAU) will be less likely to have relapsed (see definition in Data Analysis section below) at the 3 months post-intervention period as compared to participants in the control condition (TAU).

Method

Participants

Forty-seven participants were initially recruited for Study 2 from the Toronto General Hospital DHP. Data from two participants were removed from analyses. The first participant revealed that she was pregnant during the course of individual treatment, a circumstance that had not been disclosed to study personnel or DHP staff at the time of recruitment. Her data were not included because pregnancy was an a priori exclusion criterion for study participation. The second participant whose data were removed was a male who withdrew from the study after completing the questionnaires at Time 1 prior to beginning the intervention period due to changes in his weekly schedule. This participant was the only male recruited for the current study. Initial plans for recruitment included both females and males but, given that we were only able to recruit one male and that men may have unique WRSE concerns, we did not include his data in the final analyses.

Therefore, the final sample included 45 female participants with a mean age of 28.7 (10.1) years and a mean BMI of 22.1 (4.12) at the time of recruitment. The majority

of the participants were Caucasian (68.9%), with other predominant ethnicities including Asian (11.1%), Black (4.4%), and Latin American (2.2%). Approximately 48.9% of the sample reported taking a psychiatric medication during the study period. The sample was transdiagnostic with respect to eating disorder diagnosis including: AN-R (*n* = 12; 26.7%), AN-BP (*n*= 9; 20.0%), BN-P (*n* = 16; 35.6%), BN-NP (*n* = 1; 2.2%), and EDNOS (*n* = 7; 15.6%).

Procedure

Forty-seven consecutive patients who received treatment for an eating disorder in the Toronto General Hospital DHP were recruited to participate in the current study. To be eligible, participants must have completed a full stay (i.e. five or more weeks) of intensive eating disorder-focused treatment in the DHP prior to discharge. Additionally, they met DSM-IV diagnostic criteria for an eating disorder prior to admission to the DHP based on the Eating Disorder Examination Interview (EDE-I; Fairburn, 2008). The DHP admits individuals who meet criteria for AN, BN, and EDNOS with the exception of BED. Patients diagnosed with BED are referred to other treatment services in the Greater Toronto Area. Participants must also have achieved behavioural symptom interruption during their intensive day hospital stay, defined in the current study as weight restoration to a minimum BMI of 19, adherence to the meal plan (i.e. 90% or greater adherence in the last two weeks of treatment), and no more than one binge and/or purge episodes in their last two weeks of DHP in order to be eligible.

The exclusion criteria for the current study included pregnancy, current psychosis, acute suicidality, and participation in another individual-based eating disorder relapse prevention program. There were no restrictions regarding age, gender, or psychiatric

comorbidity. The institutional Research Ethics Boards at the University Health Network (Toronto General Hospital) and Ryerson University, both located in Toronto, Ontario, Canada, approved this study.

A staff psychologist employed by the DHP identified eligible participants for recruitment during their final week in the program prior to discharge, based on reported symptoms in the DHP. A DHP staff member already acquainted with potential participants, typically a psychological assistant or staff psychologist, then approached these individuals and provided them with an information sheet detailing the study (see Appendix A). Individuals who expressed interest in the study signed the information sheet, which gave study personnel permission to contact them to provide further study details and arrange a meeting for the informed consent process. Potential participants could also choose to keep a copy of the information sheet and return it to administrative or clinical staff at the DHP should they later decide that they were interested in being contacted for the study. After study personnel received a signed information sheet, potential participants were contacted to discuss the study in further detail and a meeting was scheduled at a mutually convenient time to undergo the informed consent process. In the meeting, participants were provided with a copy of the consent form to review (Appendix B) and the study was verbally described to them, including the limits to confidentiality as stipulated by the College of Psychologists of Ontario, the voluntary and anonymous nature of research participation, the risks and benefits of participating in a treatment study, and their rights to withdraw their participation at any time throughout the study. Prospective participants were also informed that their decision to participate or not participate would not affect their current or future quality of care within UHN.

Additionally, prospective participants were informed that their participation would not affect any current or future affiliation with Ryerson University. Furthermore, all individuals were provided with contact information for the research ethics board at UHN. Prospective participants were provided the opportunity to ask questions prior to signing the consent form.

After informed consent was obtained, participants completed a battery of pre-intervention questionnaires (described below). Next, they were informed of their random assignment to either the experimental or control condition (Time 1). Randomization tables were generated using an online random number generator. Individuals in the experimental condition were assigned to a study therapist who contacted them to arrange their first treatment session at a mutually convenient time. Study therapists included one clinical psychologist and three graduate students in clinical psychology with prior clinical training in the treatment of eating disorders and CBT. The principal investigator for the trial (Sarah Royal) was one of the therapists. A registered clinical psychologist provided all graduate students therapists with weekly individual supervision. Participants in the experimental condition completed 10 weekly treatment sessions (described below) with a study therapist and completed the battery of questionnaires again following their final session (Time 2). Participants who were randomly assigned to the control condition were contacted approximately 10 weeks after recruitment to arrange a meeting to complete the same battery of questionnaires (Time 2). Both groups also completed a semi-structured interview assessing eating disorder symptoms at Time 2 (described below). Finally, DHP staff contacted participants again approximately 6 months after discharge from the

intensive DHP program (roughly equivalent to 3 months post-Time 2) and invited participants to complete a diagnostic eating disorder interview.

During the 10-week period, both groups completed treatment as usual (TAU) which typically included the DHP Transitional Program for eating disorders. TAU could also include additional psychotherapy (not focused on relapse prevention), psychiatric medication, and/or dietician support in the community. The rationale for this degree of reduced control in experimental research design was because eating disorder-specific services are difficult for clients to access in the Greater Toronto Area and we did not want to limit their access so we were flexible in this regard.

Intervention (Experimental Condition)

For the current study, the experimental condition consisted of the newly revised individual-based WRSE protocol (described in detail below) and TAU. Participants who were randomly assigned to the experimental condition received 10 weekly individual treatment sessions based on the WRSE relapse prevention protocol conducted by a study therapist. Each session was approximately 50-60 minutes in length. Briefly, the protocol is based on cognitive-behavioural principles and, as such, is structured, goal-oriented, present-focused, collaborative, and places an important emphasis on homework completed between sessions (Beck et al., 1979). Similar to the earlier 8-week version, the general outline for most sessions includes a brief symptom check-in on the previous week (eating disorder symptoms, meal plan, weight, etc.), completion of in-session mindfulness practice, homework review, introduction to a new topic, assignment of homework, and feedback on the session. The first session of the protocol focuses on developing therapeutic rapport with the study participant. Additionally, psychoeducation

is provided on relapse in eating disorders and WRSE. The second session involves an introduction to mindfulness and in-session practice. The third session involves a decisional balance exercise (pros/cons) regarding the separation of weight and shape from self-esteem and also introduces the concept of setting behavioural goals outside of weight and shape. In the fourth session, clients are introduced to the topics of body checking and body avoidance. In the fifth session, the topic of core beliefs is introduced and the sixth session involves introducing a technique to begin to shift core beliefs. In the seventh and eighth session, clients are introduced to "Feeling Fat" and "Fat Talk", respectively. The ninth and tenth sessions involve preparation for the end of therapy, discussion of relapse prevention, and reinforcement of skills learned as part of the protocol.[3]

Measures

Study participants in both conditions completed the following self-report measures at Time 1 and Time 2.

Eating Disorder Psychopathology. A revised version of the Eating Disorder Examination Interview (EDE-I; Fairburn, 2008) was used to assess eating disorder symptoms. The EDE-I is a semi-structured clinical interview that assesses the range of eating disorder psychopathology and assists clinicians in diagnosis of an eating disorder. The original EDE-I has demonstrated high inter-rater reliability (r = .69 – 1.0) and distinguishes between eating disorder patients and healthy control participants (Cooper & Fairburn, 1987). The revised EDE-I was used pre-DHP, at follow-up (Time 2), and at 3-month follow-up to determine eating disorder symptom level in both conditions.

[3] Please contact the author to request the manual.

The Eating Disorder Inventory-1 (EDI-1; Garner & Olmsted, 1984; Garner, Olmsted, & Polivy, 1983) was again used to measure eating disorder symptoms and personality characteristics relevant to patients diagnosed with eating disorders. Please see Measures section in Study 1.

Weight-Related Self-Esteem (WRSE). The Shape and Weight Based Self-Esteem Inventory (SAWBS; Geller, Johnston & Madsen, 1997) was again used to assess the importance of weight and shape to self-worth (i.e., WRSE), while accounting for other variables that might contribute to respondents' view of themselves. Please see Measures section in Study 1.

WRSE was also measured using the Weight Influence on Self-Esteem Questionnaire (WISE-Q; Trottier, McFarlane, Olmsted, & McCabe, 2013), similar to Study 1 (see Measures section in Study 1). Cronbach's alpha for the WISE-Q at Time 1 in the current study was $\alpha = .95$.

For the current study, WRSE was also measured using the Eating Disorder Examination Questionnaire (EDEQ) Weight Concern subscale and Shape Concern subscale (Fairburn & Beglin, 1994. The EDEQ Weight Concern subscale consists of 5 items, such as "Has your weight influenced how you think about (judge) yourself as a person?" The EDEQ Shape Concern subscale has 8 items. A sample item is "Has your shape influenced how you think about (judge) yourself as a person?" For each subscale, items are summed to give a total where higher scores indicated greater levels of Shape or Weight Concern. A systematic review of literature found that the EDEQ can distinguish between eating disorder cases and non-cases, and that there is support for good test-retest reliability (Weight Concern: $r = .71$-$.92$; Shape Concern: $r = .66$-$.94$) and internal

consistency (Weight Concern: α = .72-.89; Shape Concern: α = .83-.93 (Berg, Peterson, Frazier, & Crow, 2012). At Time 1, internal consistency was α = .90 for the EDEQ Shape Concern subscale and α = .88 for the EDEQ Weight Concern subscale.

In the current study, total scores on both the SAWBS, WISE-Q, EDEQ Weight Concern subscale, and EDEQ Shape Concern subscale were utilized as continuous measures of WRSE.

Self-Esteem. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1979) was again used to assess global self-esteem in participants. See Measures section in Study 1. Cronbach's alpha, reflecting internal consistency, at Time 1 in the current study was strong (α = .89).

Body Checking. The Body Checking Questionnaire (BCQ; Reas, Whisenhunt, Netemeyer, & Williamson, 2002) was again used to evaluate the extent to which individuals engage in various body checking rituals (See Measures section in Study 1). The BCQ was found to have excellent internal consistency at Time 1 in the current study (α = .95).

The Body Checking Cognitions Scale (BCCS; Mountford, Haase, & Waller, 2006) is a 19-item self-report measure examining the cognitions that underlie body checking behaviours. A sample item is "I think body checking will reassure me about my size". Anecdotally, patients are not always aware of body checking and, thus, a self-report measure may not fully capture the degree to which they engage in these behaviours. Therefore, the BCCS was also administered to study participants to assess the thoughts and beliefs they hold regarding body checking, which may be more salient to them. The BCCS is clinically valid, that is, eating disorder patients were more likely

to have beliefs about body checking than non-clinical controls (Mountford et al., 2006). The BCCS demonstrated excellent internal consistency at Time 1 (α = .94).

In the current study, the BCQ and BCCS were used as continuous measures of body checking-related behaviours and cognitions, respectively.

Body Avoidance. A revised version of the Body Image Avoidance Questionnaire (BIAQ; Rosen, Srebnik, Saltzberg, & Wendt, 1991), used previously in Study 1, examined behavioural avoidance of situations that trigger body-related distress. See scale description in Measures section of Study 1. Total scores on the revised version of the BIAQ were utilized as a continuous measure of body avoidance. The revised version of the BIAQ demonstrated strong internal consistency at Time 1 in the current study (α = .83).

Fat Talk. The Fat Talk Questionnaire (FTQ; Royal, MacDonald, & Dionne, 2013) is a newly developed 14-item self-report scale that examines the degree to which women participate in discussions involving negative comments or criticisms about their own bodies in friendships. A sample item is "When I'm with one or several close female friend(s), I complain that I am fat". Participants indicate the degree to which they engage in the fat talk behaviour described in each item, with responses varying from 1 (Never) to 5 (Always). The FTQ has demonstrated excellent internal consistency (α = .93) in past research, was shown to be associated with theoretically related variables, such as body shape concerns and restrained eating in female university students, and displayed good test-retest reliability (Royal, MacDonald, & Dionne, 2013). In the current study, the total score on the FTQ was utilized as a continuous measure of individual fat talk behaviour. The FTQ is currently being validated with an eating disorder population. No fat talk

measures are currently available that have been previously validated with eating disorder patients. In the current study, the FTQ demonstrated excellent internal consistency at Time 1 ($\alpha = .94$).

General Avoidance. The Cognitive-Behavioral Avoidance Scale (CBAS; Ottenbreit & Dobson, 2004) measures level of general behavioural avoidance from a multi-dimensional perspective. See Measures section of Study 1 for scale description. Scores were used continuously in analyses the current study. The CBAS demonstrated excellent internal consistency at Time 1 ($\alpha = .94$).

Mindfulness. The Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman et al, 2007) is a brief 12-item questionnaire that assesses the degree to which a respondent is mindful. A sample item is "I am able to pay close attention to one thing for a long period of time". Respondents select between item choices ranging from "Rarely/Not at all" to "Almost Always". The CAMS-R has demonstrated adequate internal consistency ($\alpha = .74$) and validated using related constructs in past research (Feldman et al., 2007). In the current study, the CAMS-R was utilized as a continuous measure of mindfulness and demonstrated strong internal consistency ($\alpha = .82$).

Rumination. The Ruminative Thought Style Questionnaire (RTSQ; Brinker & Dozois, 2009) is a 20-item scale that measures ruminative thoughts (positive, negative, and neutral) that are both past- and future-oriented. A sample item is "Even if I think about a problem for hours, I still have a hard time coming to a clear understanding". Items are summed to give a total score where higher scores indicate a greater degree of ruminative thinking. The RTSQ has demonstrated excellent internal consistency ($\alpha = .92$) and test-retest ($r = .80$) reliability and was correlated with related constructs in its

development research (Brinker & Dozois, 2009). The RTSQ was used in this study as a continuous measure of the tendency to engage in ruminative thought patterns. In the current study, the RTSQ demonstrated excellent internal consistency at Time 1 ($\alpha = .95$).

Demographics. Demographic information, including age, gender, ethnicity, height, weight, eating disorder diagnosis, psychiatric comorbidity, was obtained from patient information collected when they were admitted to the DHP.

Client Feedback. Participants were administered the same Client Feedback Form from Study 1 that contained 9 questions examining how helpful they found different aspects of the treatment and their confidence in maintaining recovery (See Measures section in Study 1). Participants rated the how beneficial each treatment component was and their confidence ratings from 1 (Not at all) to 5 (Very). Mean scores were calculated for each item and higher scores indicated more helpful treatment components.

Symptoms at Time 2 and 3-month Follow-up. Objective binge eating episodes, vomiting episodes, and adherence to the meal plan were collected as part of the DHP on a weekly basis. Additionally, participants were administered the EDE-I (as described above) at Time 2 and 3-month follow-up.

Data Analysis

Analyses (Hypotheses) 1 and 2

Sensitivity analyses were performed on Time 1 and Time 2 questionnaire data to compare results across various statistical procedures. Analytic approaches included complete case analysis, imputation using last observation carried forward (LOCF), and multiple imputation procedures. Briefly, complete case analysis refers to exclusive inclusion of participants for which data is available at all measured time points (i.e., both

Time 1 and Time 2; Tabachnick & Fidell, 2013). Participants who are lost due to attrition are not included in the analyses. LOCF is an intent-to-treat procedure that involves single imputation of any missing data that is unavailable at Time 2 due to attrition. The last available data value (i.e., data from Time 1) is used to impute similar scores at Time 2, such that there is no difference/change in scores for participants who were lost to attrition. The third procedure, multiple imputation, is also an intent-to-treat procedure that involves the creation of multiple datasets with plausible values that represent the missing values. Subsequent statistical analyses are conducted using the multiple datasets and the results are averaged. Multiple imputation procedures are considered the optimal approach for handling large amounts of missing data (Tabachnick & Fidell, 2013).

The results were compared with and without missing data (Tabachnick & Fidell, 2013), and the use of more than one method for addressing missing data has been utilized in eating disorder research (e.g., Paxton, McLean, Gollings, Faulkner, & Wertheim, 2007; R. D. Crosby, personal communication, July 9, 2013). For each set of procedures, difference scores were calculated for each participant's questionnaires by subtracting the Time 1 score from the Time 2 score. Researchers have supported the use of difference scores in research (e.g., Chiou & Spreng, 1996; Thomas & Zumbo, 2012). This procedure was selected for several reasons. Firstly, all recruited participants had achieved behavioural symptom interruption with respect to their eating disorder through the DHP. As such, the primary outcomes of interest were questionnaire scores (WRSE and other targeted variables) and eating disorder symptoms at *Time 2*. Indeed, it was predicted that both groups would improve over time (since both are receiving active

treatment) but that the experimental group would change to a greater degree than the control group on relevant variables; thus, differences at Time 2 are of critical importance. Secondly, in order to accurately compare results using sensitivity analysis with three data analytic approaches, it is preferred to use similar statistical tests for each approach. Difference scores allow for the use of independent samples *t* tests with normal data or, alternatively, the Mann-Whitney *U* test with non-normal data. A similarly robust non-parametric statistical test equivalent to the repeated measures analysis of variance (ANOVA) is not available, thus providing additional rationale for the use of difference scores. Furthermore, during multiple imputation procedures, the independent samples *t* test provides pooled results across the various imputed datasets in SPSS, a feature that is not provided with many other statistical tests, thus, using the independent samples *t* test allows us to overcome this limitation in the software. Finally, the literature suggests that repeated-measures analysis of variance (ANOVA) is vulnerable to the effects of missing values (Gueorguieva & Krystal, 2004). Using difference scores can overcome the necessity of using repeated-measures ANOVA.

Data were first scanned visually for outliers by inspecting frequency distribution tables. Next, difference scores were calculated for each participant for each of the three datasets (complete case analysis, LOCF, and multiple imputation). Normality was assessed on difference scores within each group using the Shapiro-Wilk test. For normal data, the independent samples *t* test was performed. For non-normal data, the Mann-Whitney *U* test was performed.

Analysis (Hypothesis) 3

To examine differences in groups on adherence to the prescribed meal plan across time, a linear mixed-effects model procedure was conducted on weekly percentage of meal plan adherence. All participants were included in this analysis.

Analysis (Hypothesis) 4

A subset of participants who presented to the DHP with clinically significant binge eating and/or vomiting across conditions was identified. Clinically significant symptoms were defined as an average of at least once weekly binge eating and/or vomiting for 3 months prior to treatment.

Hypothesis 4a. Self-report of either binge and/or vomiting in these participants was assessed at Time 2 (EDE-I) and as part of the DHP's Transitional Program on a weekly basis. Participants were subsequently categorized as abstinent or not abstinent during the past month. Groups were compared on symptoms using Fisher's exact test (FET) because some expected cell frequencies were less than 5.

Hypothesis 4b. Self-reported binge eating and vomiting symptoms for the last month of the intervention period were also examined as continuous variables. The assumption of normality was tested for independent samples *t* tests for binge eating episodes and vomits episodes using the Shapiro-Wilk test and were found to be non-normal ($p < .05$). As such, the non-parametric Mann-Whitney *U* test was used.

Analysis (Hypothesis) 5

To compare relapse at approximately 3 months follow-up (Time 3), participants were categorized as either "relapsed" or "not relapsed" based on self-reported symptoms.

Relapse Definition. Symptom frequency for BN was binge/vomiting an average of at least twice weekly for the past 3 months. The weight criterion for AN was reaching

a BMI below 17.5 kg/m^2 during the 3 month follow-up period. For clients who had been diagnosed with EDNOS at the start of the DHP, symptom level was compared to their pre-DHP symptoms to determine if they had relapsed to baseline symptom severity. A dichotomous outcome variable ("relapsed"/"not relapsed") was selected due to the small sample at 3 months follow-up due to attrition (N = 21). Groups were compared on relapse status using FET because several expected cell frequencies were less than 5.

Results

Outliers and Statistical Assumptions

The data were visually scanned for univariate outliers using frequency distribution tables and none were present. The assumption of normality for independent samples *t* tests was tested on all relevant variables using the Shapiro-Wilk test. Violations of the test of normality were found for a number of difference score variables (described below). Subsequent analyses used independent samples *t* tests for scores with a normal distribution and Mann-Whitney *U* tests for scores with a non-normal distribution. For categorical data, the chi square test statistic was utilized or, alternatively, FET when expected cell frequencies were found to be less than 5.

Missing Data

To evaluate the pattern of missing data in the study, a missing values analysis was conducted. Approximately 44.2% of questionnaire data was missing. Most of the missing data was accounted for by attrition (described in the next section). Little's Missing Completely At Random (MCAR; Little, 1988) test was conducted to determine if data was appropriate for imputation methods, which are described below. The results were not statistically significant (χ^2 (15946) = 95.02, p = 1.00) indicating that data is

MCAR, an assumption that must be met prior to the use of imputation procedures. When data are found to be MCAR, then both complete cases analysis and multiple imputation procedure provide unbiased estimates. The remaining missing data were addressed using mean substitution when at least 75% of items on a scale or subscale were available (Tabachnick & Fidell, 2013).

Attrition

The majority of missing data was due to attrition after baseline assessment. Six participants from the experimental condition dropped out of the study (30%). Reasons for dropout in the experimental condition included extended illness (n = 2), missing 4 sessions or more in a row (n = 2), moving (n = 1) and unknown (n = 1). Participants in the experimental condition did not necessarily drop out of the DHP's Transitional Program. Seven participants from the control condition (28%) dropped out of the study. It was not possible to ascertain the reasons for study dropout in the control condition because all of these participants were no longer participating in the DHP's Transitional Program (i.e., they were no longer regularly attending Toronto General Hospital) and/or were unable to be contacted based on the contact information that they originally provided. There was no difference between groups with respect to dropout, χ^2 (1) = .022, p = .883. Study completers and non-completers were compared on baseline (Time 1) questionnaire scores, including the SAWBS, WISE-Q, EDEQ Shape Concern and Weight Concern subscales, EDI, BCQ, BIAQ-R, BCCS, RSES, FTQ, CBAS, CAMS-R, and the RTSQ. No significant differences were found (p = .062 - .915). There were also no significant differences between completers and non-completers with respect to age (U = 171, p =

.359), BMI (U = 164, p = .271), ethnicity (p = .399; FET), psychiatric co-morbidity (p = .136; FET), or psychiatric medication use (p = .267; FET).

Randomization

The experimental and control groups were compared on baseline demographic characteristics. The experimental condition (M = 30.00, SD = 11.78) did not differ from the control condition (M = 27.64, SD = 8.65) with respect to age (t (43) = .78, p = .44). With respect to BMI at Time 1, the experimental condition (M = 22.51, SD = 5.40) and control condition (M = 21.76, SD = 2.78) did not differ significantly (t (43) = .61, p = .55). Additionally, there were no differences in ethnicity (p = .127, FET), number of co-morbid psychiatric diagnoses upon admission to the DHP (χ^2 (1) = .38, p = .536), and use of psychiatric medication (χ^2 (1) = .87, p = .350) between groups at baseline.

All participants chose to participate in the DHP's transitional program while they were completing this study. The experimental group (M = 7.35; SD = 2.85) and control group (M = 7.84; SD = 2.39) did not differ with respect to weeks spent in the DHP's Transitional Program during the 10-week intervention period (t (43) = -.63, p = .53). The experimental group (M = 9.40; SD = 5.20) and control group (M = 9.44; SD = 4.37) also did not differ with respect to overall total weeks in the DHP's Transitional Program out of a possible 16 weeks (t (43) = -.03, p = .98).

Hypotheses 1 and 2

To examine both Hypothesis 1 and 2, a sensitivity analysis was conducted by using both intent-to-treat to account for missing data in order to examine differences in groups with respect to questionnaire data: Complete Case Analysis, LOCF, and Multiple Imputation.

Complete Case Analysis

Difference scores were calculated for each questionnaire by subtracting Time 1 scores from Time 2 scores for all participants for which there were complete data at both Time 1 and Time 2. Difference scores were screened for violations of the normality assumption using the Shapiro-Wilk test. Non-normality was found for the BCQ difference score and three of the EDI subscale difference scores (Bulimia; Interpersonal Trust; Interoceptive Awareness) and, thus, the non-parametric Mann-Whitney *U* test was conducted for these variables. Independent samples *t* tests were conducted for all remaining difference scores. The difference scores for participants in the experimental condition were significantly greater than the control condition on the WISE-Q, EDEQ Shape Concern subscale, EDEQ Weight Concern Subscale, BCQ, and EDI body dissatisfaction subscale and reflected decreases in scores for these variables ($p < .05$). The difference score for the RSES was significantly greater in the experimental condition compared to the control condition and reflected a greater increase in scores. All other group comparisons were non-significant. See Table 3 for means, standard deviations, mean ranks, Shapiro-Wilk test results, and analysis results (Independent Samples *t* test or Mann-Whitney *U* test).

Last Observation Carried Forward (LOCF)

The LOCF intent-to-treat analysis involves using participants' last available scores to fill in missing data at later time points. Difference scores were calculated for each questionnaire by subtracting Time 1 scores from Time 2 scores for all participants for which there were complete data at both Time 1 and Time 2. Missing data, due to attrition, on questionnaire total scores at Time 2 was imputed using the data at Time 1 by

assigning a difference score of 0 to these participants. All difference scores were screened for violations of the normality assumption using the Shapiro-Wilk test. Non-normal distributions were obtained for all variables with the exception of the RTSQ difference score. The independent samples *t* test was employed to compare groups on the RTSQ difference score and the Mann-Whitney U test was used for all other comparison analyses. Similar to the complete case analyses, significant differences were obtained between groups on the WISE-Q, EDEQ Shape Concern subscale, EDEQ Weight Concern subscale, BCQ, and RSES ($p < .05$). The difference scores for the experimental group on the WISE-Q, EDEQ Shape Concern subscale, EDEQ Weight Concern subscale, and BCQ were greater than the control group and reflected a decrease in scores in these variables. The difference score for the RSES was significantly greater in the experimental group compared to the control group and reflected a greater increase in scores at Time 2. For all aforementioned results, experimental participants showed a significantly greater change in the expected direction compared to the control participants. Unlike the complete case analysis, there was no significant difference between groups on the EDI body dissatisfaction subscale ($U = 178.5$, $p = .096$). Similar to the complete case analysis, remaining group comparisons were found to be non-significant. See Table 4 for means, standard deviations, Shapiro-Wilk test results, and analysis results (Independent Samples *t* test or Mann-Whitney *U* test).

Multiple Imputation

Multiple imputation procedures were also employed to account for missing data. Difference scores were calculated for each questionnaire by subtracting Time 2 scores from Time 1 scores for all participants following multiple imputation procedures.

Attempts were made to use the Shapiro-Wilk test to screen data for the assumption of normality; however, the results across datasets derived using multiple imputation are not pooled for this test statistic. Furthermore, results are also not pooled across datasets for the Mann-Whitney U test, which would be the non-parametric test required for use with non-normal data. Accordingly, data were all subjected to independent samples *t* test due to the availability of pooled results. Given this limitation, results are interpreted with caution. Using multiple imputation procedures, the experimental and control conditions did not differ on any questionnaire difference scores. See Table 5 for means and analysis results (Independent Samples *t* tests). Please note that standard deviations associated with pooled means are not reported by SPSS.

Dropouts By Condition

Given the non-significant results in questionnaire data obtained when using multiple imputation procedures, as compared to both complete case analysis and LOCF, it was hypothesized that there may be differential explanations for dropout by condition. For example, it is possible that participants who dropped out of the experimental condition had lower scores on the WISE-Q, EDEQ subscales, BCQ, EDI body dissatisfaction subscale and higher on the RSES at Time 2, or, alternatively, that participants who dropped out of the control condition were higher on the WISE-Q, EDEQ subscales, BCQ, EDI body dissatisfaction subscale, and lower on the RSES. Either of these scenarios could provide a potential explanation for the "loss" of significant findings once missing data is imputed. To examine these hypotheses, dropouts by group were compared on the aforementioned variables using the independent samples *t* test or,

alternatively when non-normal distributions were identified, the Mann-Whitney *U* test. All differences between groups were not significant ($p > .05$).

Hypothesis 3. Participants in the experimental condition will be significantly more adherent to the meal plan than participants in the control condition.

A linear mixed-effects model analysis was conducted to investigate differences in percentage adherence to the meal plan between experimental and control groups for the 10-week study period. The results revealed a significant effect of condition ($t(246.8) = 2.94$; $p < .005$). Participants in the experimental condition had significantly greater percentage adherence to the prescribed meal plan from baseline to 10 weeks ($M = 97.3$, $SE = .51$) compared to participants in the control condition ($M = 95.3$, $SE = .45$).

Hypothesis 4: Experimental participants will be significantly less likely to have binged and/or vomited in the last month of the intervention period as compared to Control participants.

Analysis 1. Using the subset of recruited participants in both groups who presented with clinically significant binge eating and/or vomiting upon admission to the DHP, participants were categorized as either "abstinent" or "not abstinent" from binge and vomit symptoms for the last month of the intervention period based on self-reported EDE-I results at Time 2 ($n = 19$). Missing data was supplemented by values obtained from the DHP's Transitional Program, if available. There were a total of 7 experimental participants and 12 control participants who were included in this analysis. FET was conducted to examine differences in treatment groups with respect to binge and/or vomiting symptoms because some expected cell frequencies were less than 5. The results revealed that 42.9% ($n = 3$) of experimental participants and 50% ($n = 6$) of control

participants were abstinent, although this difference was not statistically significant (p = .57; FET).

Analysis 2. This analysis also utilized the subset of recruited participants in both groups who presented with clinically significant binge eating and/or vomiting upon admission to the DHP. Groups were initially compared for pre-DHP binge eating and vomit levels for the 3 months prior to DHP admission. With respect to total binge eating episodes for the 3 months prior to DHP admission, the experimental group (M = 131.17, SD = 155.73) and control group (M = 108.13, SD = 98.67) did not differ significantly ($t(20)$ = .42, p = .68). Levene's test was significant for total vomit episodes for the 3 months prior to DHP admission (F = 8.65, p < .01), indicating non-equal variances. With respect to total vomit episodes for the 3 months prior to DHP admission, the experimental condition (M = 231.67, SD = 239.38) and control condition (M = 150.88, SD = 135.75) did not differ significantly ($t(6.25)$ = 1.01, p = .46). Total number of binge eating episodes and vomit episodes over the last month of the intervention period were calculated. The Shapiro-Wilk test for normality was significant (p < .05) indicating non-normal data for both binge eating episodes and vomit episodes. Median binge eating episodes over the last 4 weeks of the intervention period were 1.00 and 0.50 for the experimental and control conditions, respectively. Median vomit episodes were 4.0 and 0 for the experimental and control conditions, respectively. The Mann-Whitney U test was conducted to examine differences between the experimental and control groups on these two variables. The differences between groups were not significant on binge eating episodes (U = 40.0, p = .86) and vomit episodes (U = 28.5, p = .19).

Hypothesis 5. Experimental participants will be significantly less likely to have relapsed compared to Control participants at 3 months follow-up.

Participants who completed the 3-month follow-up assessment interview were characterized as either "not relapsed" (n = 16) or "relapsed" (n = 5) based on the last 3 months. The experimental and control groups were compared using FET for categorical data because some cells had less than the expected frequency of 5. The results indicated that 18.2% (n = 2) of experimental participants had relapsed compared to 30% (n = 3) of the control participants, although this difference was not statistically significant (p = .635; FET).

Client Feedback on Protocol.

With respect to the Client Feedback Form, participants again rated all treatment components highly regarding helpfulness: Homework (M = 4.40; SD = .55), Behavioural Goals (M = 4.00; SD = 1.00); Body Avoidance Exposures (M = 3.40; SD = 1.14), Mindfulness (M = 4.40; SD = .55), Identifying and Shifting Core Beliefs (M = 3.60; SD = 1.14), Attention to the Meal Plan (M = 3.40; SD = 1.14); Relationship with the Therapist (M = 4.60; SD = .55); Overall Treatment to their Recovery (M = 4.40; SD = .55); and their Confidence to Continue (M = 4.40; SD = .89).

Discussion

The randomized controlled trial (Study 2) involved 47 consecutive participants recruited from the DHP who were assigned to either the experimental condition (WRSE protocol + TAU) or the control condition (TAU). Overall, the results indicated that the WRSE protocol provides some additional benefit above and beyond TAU to patients diagnosed with eating disorders. When examining the data using complete case

analysis and LOCF, participants in the experimental condition had significantly greater decreases in WRSE (as assessed by the WISE-Q and both the Shape Concern and Weight Concern subscales of the EDEQ), body checking, and body dissatisfaction, and significantly greater increases in general self-esteem, as compared to participants in the control condition. Body dissatisfaction appeared to be sensitive to missing data, as the group difference was no longer significant following the LOCF analysis. For both sets of analyses, although there were mean differences between groups on the SAWBS, and measures of body avoidance, general avoidance, fat talk, rumination, and mindfulness in the expected direction, these differences were not statistically significant. The results are not entirely surprising since both groups are receiving active psychological treatment. While the DHP's Transitional Program did not specifically address WRSE and related behaviours such as body avoidance, providing therapeutic support to patients through the Transitional Program nonetheless helps patients to develop skills to maintain behavioural symptom control and helps them to transition out of the hospital into their independent lives, which may have indirectly impacted some of these variables.

A potential explanation for the lack of significant difference between groups on ruminative thinking is that the RTSQ does not specifically address ruminative thoughts related to eating, weight, and shape. It is surprising that there were no changes in levels of mindfulness in the experimental condition, as this topic is not routinely taught in the DHP's Transitional Program. Possibly, the amount of mindfulness focus and/or practice was not potent enough to observe any significant changes. Finally, the lack of significant difference in levels of fat talk behaviour may be related to the fact that the FTQ has not

yet been validated in an eating disorder population. While anecdotally clinicians and researchers are cognizant of the impact of fat talk on eating disorder patients, it has not yet been formally studied. It is also possible that small sample size led to insufficient power to detect differences between the experimental and control groups on the SAWBS, or measures of body avoidance, general avoidance, fat talk, rumination, or mindfulness.

Unexpectedly, the multiple imputation procedures used to address missing data revealed no significant differences between groups for all measured questionnaire variables. This result was surprising and suggested that data were sensitive to attrition and participants who were progressing remained in the study. When further examined, however, there were no differences between completers and non-completers within each condition on measured variables. As such, due to non-significant findings when using multiple imputation procedures, the significant findings from the complete case analysis and LOCF were interpreted with caution.

With respect to meal plan, participants in the experimental condition were statistically significantly more adherent than participants in the control condition. This provides some evidence that increased contact with the individual therapist as part of the WRSE treatment protocol played a role in avoiding dietary restriction. It should be noted, however, that mean adherence percentages were very high in both groups (greater than 95%) likely due to the fact that participants across conditions receive attention to their meal plan as part of the DHP's Transitional Program. Finally, groups were compared with respect to symptom level and abstinence status at Time 2, and also relapse status at 3-months follow-up, and no significant differences were found, probably due to the low rate of relapse at both time periods. Future research could further examine the

impact of the WRSE protocol on maintenance of symptom control over a longer time period.

General Discussion

This paper reports on two studies detailing the development and preliminary evaluation of a new relapse prevention protocol targeting WRSE in patients diagnosed with eating disorders. The devastation that eating disorders can inflict on patients and their loved ones is significant and the chronicity of these conditions exacerbates the suffering of all involved. The high rates of relapse in eating disorders are particularly difficult. It is essential that clinicians and researchers take notice of this important topic and devote sufficient attention to it. Clients experience frustration with their recurrent struggles and hopelessness can develop when they relapse and are required to recommit to psychological treatment. The current series of studies attempted to address these clinical concerns in a preliminary capacity. The final treatment protocol and treatment studies are the result of hours of dedicated commitment to its development and evaluation by many clinicians and researchers affiliated with the Toronto General Hospital DHP.

The literature provides evidence that effective treatments are available to address the psychological needs of many patients with eating disorders who are in the active phase of their illness. Our current psychological interventions addressing the behavioural symptoms of dietary restriction, binge eating, and compensatory behaviours do require refinement and adaptation for patients who do not achieve significant behavioural treatment gains. Such work is beyond the scope of this paper. The current studies focus on what happens when patients *do* achieve significant gains in changing their eating disorder behaviour but are at risk of relapsing in part due to a maladaptive cognitive schema that ties weight and shape to their self-worth as an individual. Indeed, it is difficult to imagine a situation where weight and shape are highly critical to an

individual's sense of self and that the individual is not at risk of sliding down the slippery slope into previous eating disorder behaviours. It is opined that WRSE should be addressed in some capacity to maintain long-term abstinence and recovery from an eating disorder.

In recognizing the importance of addressing WRSE to decrease the risk of relapse in patients with eating disorders, the extant literature on relapse in other psychological disorders was consulted. The literature on mindfulness-based interventions (i.e., MBCT) provided valuable guidance on psychological interventions that are effective in targeting cognitive vulnerability to psychopathology and relapse. Furthermore, classic behavioural symptoms of eating disorders (restricting, binge eating, and compensatory behaviours) are not the only behaviours that these patients engage in that maintain their preoccupation with weight and shape. Indeed, behaviours such as repetitive body checking, body avoidance, and general avoidance also required attention. Furthermore, developing skills to manage negative body talk that is common in western society and identifying the true source of "fat" feelings were also deemed to be important. Finally, underlying negative core beliefs that are rigidly held by eating disorder patients were also addressed in the current protocol, such that new and more adaptive cognitive schemas might develop.

The initial development of the WRSE manual involved 8 sessions of CBT-based psychological intervention provided on an individual basis to eating disorder patients. Generally, the material was well received by participants who received the pilot intervention in Study 1. The results of Study 1 were very promising as participants reported significant decreases in WRSE, body checking, body avoidance, ruminative

thinking, general avoidance, and significant increases in general self-esteem after receiving the intervention. This may be because the intervention specifically targeted these variables. However, it was recognized that these changes might very well be due to the passage of time and/or participation in concurrent eating disorder treatment through the DHP's Transitional Program. Thus, a randomized controlled study was planned that could address these methodological concerns and determine whether or not the addition of the individual-based protocol to TAU would provide any additional benefits to patients who are recovering from an eating disorder. First, however, several important developments were incorporated into the manual itself based on feedback from both clients and therapists in Study 1, including expanding the total number of sessions to 10, expanding the focus on core belief work, and including an additional module related to fat talk.

Strengths

The current studies have several important methodological strengths that should be highlighted. The overarching goal of this project was to examine the impact of a newly developed treatment protocol on eating disorder symptoms and relevant psychological variables as compared to TAU. The treatment manual was developed and revised based on theoretically relevant literature in the areas of relapse prevention, mindfulness, and eating disorder intervention. A pilot study was first conducted to determine whether or not to proceed with the larger scale randomized controlled study, which is a rigorous methodological approach. Based on promising pilot study results, a larger scale study using a randomized controlled trial (RCT) approach was conducted in the context of the current relapse prevention treatment programming available at the

DHP. By employing a randomized methodology, the likelihood increases that baseline differences are equal between groups such that the effect of the intervention can be accurately evaluated. An additional strength is that the study had few exclusion criteria. Eating disorder samples are often complicated by psychiatric comorbidity, and patients are often prescribed psychiatric medication and involved in additional current psychotherapy while in treatment at the DHP. As such, the findings can be generalized more easily to eating disorder populations at large. The current study also has a statistical strength. Given the large proportion of missing data due to attrition, sensitivity analyses were conducted by using three data analytic methods, including complete case analysis and two intent-to-treat methods (LOCF and multiple imputation). This is considered a strength because results were compared both with and without missing data, and also using the 'gold standard' technique (i.e., multiple imputation) for handling data lost to attrition.

Limitations

There are several important limitations to the current studies. Firstly, both Study 1 and Study 2 used relatively small samples sizes (N = 16 and N = 47, respectively). In particular with Study 2, this may had led to inadequate power to detect differences between groups on measured variables. Due to time constraints and structural changes in the DHP that eliminated the Transitional Program, it was not feasible to recruit additional patients for the Study 2.

Therapists, assessors, and researchers were not blind to study hypotheses or participant condition, which is an additional limitation of the study. The lead researcher and research assistant most heavily involved in the study were also main therapists and

assessors, which was wholly unavoidable due to financial constraints and availability of trained research and clinical personnel. Assessors attempted to ensure that assessment of eating disorder psychopathology using the EDE-I was standardized although it is possible that experimenter's bias toward a favourable result could have been introduced due to non-blindness. Additionally, although treatment sessions were taped for supervision purposes, no formal measures to ensure adherence to the manual were used due to time and resource constraints. This is another important limitation of the study.

A significant methodological limitation is that both groups were also receiving TAU, which mainly consisted of the DHP's Transitional Program. This program, by nature, only has two weekly mandatory attendance days while also offering eating disorder programming on three additional days per week. Therefore, participants' attendance can be highly variable and uncontrolled and participants are not necessarily receiving an equal dose of treatment within or between conditions due to the nature of the DHP's Transitional Program. Furthermore, TAU could also include meeting with a psychotherapist or dietitian in the community and/or psychiatric medication. Given that Study 2 was evaluating a treatment that did not yet have sufficient clinical and empirical validity, it was decided that ethically we could not require patients to not receive standard treatment, which all patients are offered as part of standard care in the DHP. Unfortunately, this removes a layer of control within the study methodology. In determining the nature of the experimental and control conditions for the current study, various options were considered. One possibility was requiring that all participants *not* complete the DHP's Transitional Program such that the current research study could compare the WRSE treatment protocol to, for example, a wait-list control group. The

vast majority of patients who complete the DHP also complete the Transitional Program. Study personnel weighed the risks and benefits with respect to patient care and research methodology. As mentioned above, it was determined that it was not ethical to preclude participation in standard care (DHP's Transitional Program) in order to participate in a treatment protocol that has not yet been sufficiently validated. Practically, it was also expected that a majority of prospective participants would decline participation in the current study if they could no longer access DHP support through the Transitional Program. Another option considered was comparing the WRSE protocol to either another individual-based non-CBT (i.e., 'attention control') treatment while allowing both groups access to the DHP's Transitional Program. The existing literature was consulted and no adequate comparison treatment was identified. Thus, the most ethical course of action was to allow both the experimental and control groups to access to the DHP's Transitional Program during the course of their participation in the study. As such, the current study is best described as an effectiveness study that examined the incorporation of the individual-based WRSE treatment to TAU, and assessing any added therapeutic benefits above and beyond the TAU that is offered to patients upon discharge from the DHP.

Another limitation of the project is that mood was not specifically assessed at the various time points. Mood may be importantly linked to the WRSE schema and also, separately, to repetitive, ruminative thinking styles and self-esteem. It will be important for future research on the protocol to parse out the independent influence of mood on rumination and other measured variables.

The purpose of the WRSE protocol is to decrease the rates of relapse in patients with eating disorders. The results indicated that there were no differences between groups at 3-month follow-up, although the sample at that time point was relatively small. An important limitation is that, due to time constraints, we were unable to follow participants over a longer timeframe to determine whether participants in the experimental condition continued to see improvements in WRSE, body checking, self-esteem and body dissatisfaction, which has been observed in participants following CBT intervention, or to have reduced rates of relapse that might be more evident across a longer follow-up period.

Finally, this study had a high rate of attrition typical of eating disorder treatment follow-up. It was not possible to determine the causes for attrition in all cases, although no participants in the treatment condition specifically reported that they could not tolerate the treatment itself. Furthermore, groups did not differ with respect to their rates of attrition. The high number of dropouts, however, was a significant concern for data analysis and subsequent interpretation. While statistical techniques are available to account for missing data, they are obviously not as robust as having the actual data from participants themselves. Future research should include procedures to minimize attrition in studies evaluating the efficacy of the WRSE protocol.

Research and Practice

The previously described limitations provide exciting opportunities to develop future research studies in the area of WRSE in eating disorder patients. Given the limitation with respect to lack of adequate control in study design, future research could examine the efficacy of the individual-based WRSE protocol on its own, outside of the

DHP's Transitional Program. In fact, the DHP implemented structural changes to their program that resulted in the elimination of it altogether, which limited the number of participants who were recruited for Study 2. However, these structural changes in the DHP also provide an opportunity for future research where participants could be recruited and receive the WRSE treatment intervention or are assigned to a control group where they could receive CBT without the emphasis on targeting WRSE.

With respect to attrition, various attempts to contact patients for follow-up were used, such as connecting with them while they were attending the DHP's Transitional Program and/or attempting to contact them repeatedly through their provided contact information. One method that was not employed, however, was using an incentive to decrease dropouts. Future researchers could consider using an incentive to increase the number of participants who complete follow-up data. Incentives were not possible in the current RCT due to financial constraints.

Future research could also further refine the individual treatment manual. Although not formally analyzed, informal feedback was obtained from therapists in Study 2 regarding their experiences with the protocol. It was highlighted that several sessions contained content that was difficult to review with patients in the allotted 50-60 minute treatment session. Furthermore, it was also highlighted that there was occasionally a high level of homework for participants, particularly if they were targeting several behaviours for many weeks throughout the treatment, such as both body checking and body avoidance. Therapists were encouraged to tailor the homework (and follow-up on specific topics) based on the unique needs of the client. It would be helpful to include these therapist instructions in the manual itself such that it is clear to anyone using the

protocol in the future, and also to make adaptations to the manual to reduce the burden of sessions that are heavy in content.

Another potential avenue for refinement of the treatment manual is to vary the types of mindfulness exercises taught to patients. In the current protocol, only the 3-minute breathing space was taught and practiced in session and for homework. It is possible that varying the types of mindfulness exercises or incorporating more intensive formal practice might lead to positive changes in reported levels of mindfulness. Relatedly, patients were only taught one strategy to begin to shift core beliefs, which are notoriously difficult to change. Providing patients with additional tools (e.g., positive data logs) might be helpful. Additionally, future research should further examine the connection between WRSE and its theoretical manifestations, such as body checking and body avoidance, as well as less studied constructs like 'feeling fat' and fat talk behaviour. Finally, it will be important that future research on the WRSE manual expands the longitudinal aspect of the current study such that the impact of the protocol on eating disorder symptoms and relapse rates can be more fully examined.

With respect to practical implications, future research is needed to determine the most cost-effective approach to feasibly incorporate the protocol, or specific components, into existing relapse prevention efforts. Independent aspects of the protocol (e.g., setting behavioural goals, mindfulness, etc.) may possibly provide additional benefits to current programs. Future research could also examine whether or not the protocol can be effectively provided in a group format to increase cost-effectiveness.

Conclusions

Based on the current body of research, including its limitations, we would recommend that future research is needed prior to the implementation of the WRSE protocol in standard clinical practice for the treatment of eating disorders. In particular, more research is needed on the impact of the WRSE protocol on relapse rates in the long term as well as its therapeutic benefits independent of a concurrent transitional treatment program for eating disorder recovery. Ideally, this future research would include a larger sample to increase power to detect differences.

Clinicians and researchers in the eating disorder field have long recognized the crucial need to address both WRSE and relapse in order to adequately treat these patients and maintain wellness in the long term. The current studies add to the literature by reporting on the preliminary scientific investigation of the first treatment manual to address this important topic in a transdiagnostic sample of clients with eating disorders. The results indicate that the newly developed WRSE manual is effective in helping patients with eating disorders make changes in WRSE and related behaviours, including body checking, self-esteem, and body dissatisfaction. Participants who received the treatment intervention were also more adherent to their meal plan, which is important in maintaining wellness. In Study 2, the results were sensitive to the missing data and it was unclear what unobserved characteristics may have differentially contributed to attrition in the groups. Future research should include refinement of the protocol and conduct of a more rigorously controlled RCT, including longer follow-up, to examine the efficacy of the WRSE treatment manual. Overall, the WRSE protocol is a promising relapse

prevention-focused mindfulness-informed CBT intervention for transdiagnostic eating disorders.

Appendix A: Information Sheet

University Health Network

Information about a Research Study

STUDY TITLE: Relapse Prevention for Eating Disorders: Targeting weight-related self-esteem

INVESTIGATOR: Dr. Traci McFarlane

Background and Purpose:
You are being invited to participate in this study because you have been diagnosed with an eating disorder. Relapse after intensive treatment is a major concern in the eating disorder field. One area that predicts relapse is when people continue to evaluate themselves based on their weight and shape. This study targets this method of self-evaluation and teaches other methods of evaluating the self, and how to disconnect weight and shape from self-worth. This study also teaches strategies to avoid engaging eating disordered thoughts. Methods used are cognitive and behavioural strategies similar to the ones you learned to use in the day hospital, and mindfulness meditation. Mindfulness meditation is learning how to observe thoughts without reacting to them by allowing them to enter and leave awareness. The purpose of this intervention is to reduce the risk of eating disordered relapse after intensive treatment.

Procedures

- This study involves being randomly assigned (like flipping a coin) to either an experimental group or a control group. The experimental group involves 10 individual study treatment sessions that are in addition to Track One and any other treatment that you may have arranged in the community. The control group involves attending the optional group treatment offered to you by the program and any other treatment that you may have arranged with the community.
- For participants assigned to the experimental group, the 10 individual study treatment sessions will be scheduled over a 10-week period. Each treatment session will last 50-minutes and will involve cognitive-behavioural strategies and mindfulness practice. All sessions are aimed at targeting weight-related self-evaluation and reducing your risk of relapse.
- As part of this study you will be asked to complete assessment interviews and questionnaire packages at the time of being discharged from the day hospital, after the 10-week intervention period, and at 6-month follow-up. The post-day hospital and follow-up assessments are part of the standard assessment routine of the program. The only additional assessment required for this study is the assessment at the end of the intervention period (ten weeks after discharge from the day hospital program). The time commitment will be approximately 1 to

1.5 hours for each interview and completing the questionnaires.

- Participants assigned to the control group will review their treatment plan during the study with the study doctor.

Risks and Benefits:
As with all therapy, a risk is that you may discuss distressing issues with your therapist. However, therapists will be trained how to work with issues therapeutically and will be supervised by a registered clinical psychologist (Dr. Traci McFarlane). Another risk is that you may receive a treatment that is not helpful for you. A benefit of this study is that you will get additional support after your intensive treatment (10 sessions that are in addition to Track 1 and any other treatment you have organized), and the information learned from this study may benefit other individuals with eating disorders in the future.

Voluntary and Confidential:
Your participation in this study is voluntary. You can choose not to participate or you may decide to leave the study at any time without affecting your care.

If you agree to join this study, the study doctor/team will look at your personal health information and collect only the information needed for this study. The information that is collected will be kept confidential.

***Questions*:**
If you have any questions about the study, please call the person in charge of this study, Dr. Traci McFarlane at (416) 340-3720. If you are interested in participating in this study, please sign this form and return it to the day hospital staff.

I am interested in participating in this research study and agree to having the study personnel contact me to discuss my potential participation further.

_____	_____ _____
Name (please print)	Signature Date

Appendix B: Consent Form

University Health Network

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

STUDY TITLE: Relapse Prevention for Eating Disorders: Targeting Weight-related Self-Esteem.

INVESTIGATOR: Dr. Traci McFarlane (416-340-3720); Sarah Royal, PhD Student in Clinical Psychology

You are being asked to take part in a research study. Before agreeing to participate in this study, it is important that you read and understand the following explanation of the study procedures. The following information describes the purpose, procedures, benefits, discomforts, risks and precautions associated with this study. It also describes your right to refuse to participate or withdraw from the study at any time. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is known as the informed consent process. Please ask the study staff to explain any words you don't understand before signing this consent form. Make sure all of your questions have been answered to your satisfaction before signing this document.

Background and Purpose

You are being invited to participate in this study because you have been diagnosed with an eating disorder. Relapse after intensive treatment is a major concern in the eating disorder field. One area that predicts relapse is when people continue to evaluate themselves based on their weight and shape. This study targets this method of self-evaluation and teaches other methods of evaluating the self, and how to disconnect weight and shape from self-worth. This study also teaches strategies to avoid engaging eating disordered thoughts. Methods used are cognitive and behavioural strategies similar to the ones you learned to use in the hospital, and mindfulness meditation. Mindfulness meditation is learning how to observe thoughts without reacting to them by allowing them to enter and leave awareness. The purpose of this intervention is to reduce the risk of eating disordered relapse after intensive treatment.

Procedures

Participants who choose to participate will be randomly assigned (that is assigned by

chance) to either an experimental group or a control group. The experimental group involves 10 individual study treatment sessions that are in addition to the optional group follow-up treatment offered to you by the program, and any other treatment that you may have arranged in the community**.** The control group involves attending the optional group treatment offered to you by the program if you so choose, and any other treatment that you may have arranged in the community.

For participants assigned to the experimental group, each study treatment session will last 50-minutes and will involve active strategies to change behaviours and challenge thoughts, and strategies aimed at raising awareness of your thoughts. All sessions are aimed at improving self-esteem and preventing relapse.

As part of this study, you will be asked to complete questionnaire packages at the time of being discharged from the hospital and after the 10-week period. The time commitment will be approximately 1 to 1.5 hours to complete the questionnaires. You will be notified by telephone regarding the scheduling of appointment times.

It is important for participants to attend all 10 therapy sessions in order to ensure that you receive the maximum benefits of the treatments. In addition, it is important to attend all of the assessment appointments, so that we can accurately evaluate the effectiveness of the treatment.

Participants assigned to the control group will review their treatment plan during the study with the study doctor.

Audiotaping

For participants in the experimental group, an audiotape will be made of each treatment session that you attend. These tapes are made for the purpose of monitoring the therapist's techniques. These tapes will be destroyed at the end of the study. You may request at any time that tapes of your therapy sessions be erased.

Risks and Benefits

As with all therapy, a risk is that you may discuss distressing issues with your therapist. However, therapists will be trained how to address issues therapeutically and will be supervised by a registered clinical psychologist (Dr. Traci McFarlane). Another risk is that you may receive a treatment that is not helpful for you.

A benefit of this study is that you may get additional support after your intensive treatment, and the information learned from this study may benefit other individuals with eating disorders in the future.

Alternative Treatments

Other forms of individual and group psychotherapy for eating disorders are available in the community. Please contact the study investigator if you are interested in these options.

Confidentiality

If you agree to join this study, the study doctor and his/her study team will look at your personal health information and collect only the information they need for the study. Personal health information is any information that could be used to identify you and includes your name, address, date of birth, new or existing medical records, that includes types, dates and results of medical tests or procedures.

All information obtained during the study will be held in strict confidence. Your research records will be identified only by a code number and your initials. All records will be kept in locked files at the Toronto General Hospital for 25 years and only members of the research team will be allowed access to these files. No names or identifying information will be used in any publication or presentations.

Please note that the law says that clinical psychologists must report: 1) child abuse or neglect, 2) sexual abuse by a healthcare professional and 3) risk of harm to self or another person.

Patient records may also have to be released if ordered by a court of law. Also, employees of the University Health Network Research Ethics Board may look at the study records and at information that can identify you. These people may need to see this information to make sure the study is being done properly, and done according to laws and guidelines.

Your participation in this study also may be recorded in your medical record at this hospital.

Any information about you that is sent out of the hospital will have a code and will not show your name or address, or any information that directly identifies you.

If you decide to withdraw from the study, the information about you that was collected before you leave the study will still be used in order to answer the research question. No new information will be collected without your permission.

Participation

Your participation in this study is voluntary. You can choose not to participate or you may decide to leave the study at any time without affecting your care**.** However, if you do decide to leave the study, the investigators will still use the study data that was collected before you left the study. You may refuse to answer any question you do not want to answer, or not answer an interview question by saying "pass". We will give you new information that is learned during the study that might affect your decision to stay in the study.

In case you are harmed

In no way does signing this consent form waive your legal rights nor does it relieve the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You do not give up any of your legal rights by signing this consent form.

Questions

If you have any questions, concerns or would like to speak to the study team for any reason, please call: Dr. Traci McFarlane at 416-340-3720.

If you have any questions about your rights as a research participant or have concerns about this study, call the Chair of the University Health Network Research Ethics Board (REB) or the Research Ethics office number at 416-581-7849. The REB is a group of people who oversee the ethical conduct of research studies. These people are not part of the study team. Everything that you discuss will be kept confidential. If you have any general questions about the study, please call the person in charge of this study, Dr. Traci McFarlane at (416) 340-3120.

Consent

I have had the opportunity to discuss this study and my questions have been answered to my satisfaction. I consent to take part in the study. I may withdraw at any time without affecting my care. I have received a signed copy of this consent form. I voluntarily consent to participate in this study.

_____	_____	_____
Study Subject's Name (Please Print)	Study Subject's Signature	Date

I confirm that I have explained the nature and purpose of the study to the person named above. I have answered all questions.

_____	_____	_____
Name of Person Obtaining Consent	Signature	Date

Table 1

Pilot Study: Descriptive data including Means (M), Standard Deviation (SD), Minimum score (Min), and Maximum score (Max) for Pre- and Post-Intervention time points

Scale	Pre-Intervention		Post-Intervention	
	M (SD)	*Min/Max*	*M (SD)*	*Min/Max*
SAWBS	92.19 (52.56)	29.0/210.00	52.07 (29.68)	0/114.00
WISE-Q	2.95 (.62)	1.41/3.82	2.15 (.93)	.36/4.00
RRS	64.92 (9.13)	45.00/77.00	52.58 (15.15)	30.00/77.00
RSES	23.07 (4.62)	16.00/29.00	26.81 (5.01)	18.00/35.00
BCQ	62.93 (15.12)	39.00/82.00	49.00 (16.02)	32.00/85.00
BIAQ – R	45.44 (7.43)	31.00/58.00	40.07 (6.15)	30.00/49.00
CBAS	91.13 (21.29)	54.00/116.0	67.64 (20.13)	48.00/106.00
EDI				
Drive for Thinness	12.56 (5.10)	3.00/21.00	8.73 (5.19)	0/16.00
Bulimia	3.13 (3.44)	0/9.00	1.20 (1.70)	0/5.00
Body Dissatisfaction	18.00 (8.09)	0/26.00	13.87 (7.65)	1.00/27.00
Ineffectiveness	11.19 (5.71)	2.00/25.00	6.40 (5.36)	0/19.00
Perfectionism	11.63 (3.12)	5.00/17.00	10.07 (4.35)	3.00/18.00
Interpersonal Distrust	4.38 (3.72)	0/14.00	2.40 (2.80)	0/8.00
Interoceptive Awareness	8.94 (5.81)	1.00/20.00	3.87 (5.26)	0/21.00
Maturity Fears	4.81 (2.93)	0/11.00	2.53 (1.85)	0/7.00

SAWBS = Shape and Weight Based Self-Esteem Inventory; WISE-Q = Weight Influenced Self-Esteem Questionnaire; RRS = Ruminative Responses Style Questionnaire; RSES = Rosenberg Self-Esteem Questionnaire; BCQ = Body Checking Questionnaire; BIAQ-R = Revised version of the Body Image Avoidance Questionnaire; CBAS = Cognitive Behavioral Avoidance Scale; EDI-I = First version of the Eating Disorder Inventory

Table 2

Pilot Study: Mean (M) and Standard Deviation (SD), and test statistic (Paired Samples t test (t) or Wilcoxon sign-rank test (Z) for pre-post variable pairs)

Scale	Pre-Intervention	Post-Intervention	Test Statistic
	M (SD)	*M (SD)*	*t(DF)* or *Z*
SAWBS	92.19 (52.56)	52.07 (29.67)	-2.54*[a]
WISE-Q	2.95 (.62)	2.15 (.93)	4.08 (14)**
RSES	23.07 (4.62)	26.81 (5.01)	-2.64 (12)*
BCQ	62.93 (15.12)	49.00 (16.02)	3.81 (13)**
BIAQ – R	45.44 (7.43)	40.07 (6.15)	3.29 (14)**
CBAS	91.13 (21.29)	67.64 (20.13)	-2.86**[a]
RRS	64.92 (9.13)	52.58 (15.15)	3.16 (11)**
EDI-I			
Drive for Thinness	12.56 (5.10)	8.73 (5.19)	2.38 (14)*
Bulimia	3.13 (3.44)	1.20 (1.70)	-1.86[a]
Body Dissatisfaction	18.00 (8.09)	13.87 (7.65)	2.44 (14)*
Ineffectiveness	11.19 (5.71)	6.40 (5.36)	3.82 (14)**
Perfectionism	11.62 (3.12)	10.07 (4.35)	1.46 (14)
Interpersonal Distrust	4.38 (3.72)	2.40 (2.80)	-1.54[a]
Interoceptive Awareness	8.94 (5.81)	3.87 (5.26)	-2.58*[a]
Maturity Fears	4.81 (2.93)	2.53 (1.85)	2.51(14)*

** = $p < .05$*
*** = $p < .01$*
a = Analyzed using the Wilcoxon sign-rank test due to non-normality for the pre- and/or post-variable; Z test statistic reported

SAWBS = Shape and Weight Based Self-Esteem Inventory; WISE-Q = Weight Influenced Self-Esteem Questionnaire; RSES = Rosenberg Self-Esteem Questionnaire; BCQ = Body Checking Questionnaire; BIAQ-R = Revised version of the Body Image Avoidance Questionnaire; CBAS = Cognitive Behavioral Avoidance Scale; RRS = Ruminative Responses Style Questionnaire; EDI-I = First version of the Eating Disorder Inventory

Table 3

Complete Case Analysis: Mean (M) and Standard Deviation (SD) or Median (Md) and Interquartile Range (IQ) for Difference Scores (Time 2 – Time 1), and test statistic (Independent Samples t test or Mann-Whitney U test) comparing the experimental and control groups

Difference scores	Experimental *M (SD) or Md (IQ)* (n = 14)	Control *M (SD) or Md (IQ)* (n = 16)	Test Statistic ($t(DF)$ or U)
SAWBS	-16.57 (42.01)	15.44 (61.27)	-1.64 (28)
WISE-Q	-.57 (.67)	-.01 (.71)	-2.20 (28)*
EDEQ – Shape Concern	-1.29 (1.06)	-.13 (1.66)	-2.26 (28)*
EDEQ – Weight Concern	-.81 (.94)	.29 (1.41)	-2.48 (28)*
RSES	3.79 (5.45)	-.81 (4.58)	2.51 (28)*
BCQ	-7.50 (23.25)	-1.00 (16.75)	59.5*[a]
BIAQ – R	-2.57 (7.69)	-3.14 (5.87)	.22 (26)
CBAS	-1.23 (19.42)	-3.93 (17.09)	.38 (25)
BCCS	-.35 (.61)	0.0 (.60)	-1.57 (28)
RTSQ	-8.64 (26.11)	-5.88 (13.89)	-.37 (28)
CAMSR	.27 (.41)	.17 (.39)	.69 (28)
FTQ	-8.50 (6.41)	-5.53 (10.32)	-.92 (27)
EDI			
Drive for Thinness	-1.64 (5.14)	-.13 (5.11)	-.81 (28)
Bulimia	0.0 (3.25)	0.0 (1.50)	86[a]
Body Dissatisfaction	-5.71 (6.29)	-.13 (7.84)	-2.13 (28)*
Ineffectiveness	-.14 (5.53)	.69 (3.82)	-.48 (28)

Perfectionism	-.79 (4.73)	-.63 (3.38)	-.11 (28)
Interpersonal Distrust	.50 (1.00)	0.0 (2.75)	90.5[a]
Interoceptive Awareness	0.0 (4.25)	-.50 (5.50)	109.5[a]
Maturity Fears	-.29 (2.20)	-.63 (3.90)	.29 (28)

* = $p < .05$
a = Analyzed using the Mann-Whitney U test due to non-normality for the pre- and/or post-variable

SAWBS = Shape and Weight Based Self-Esteem Inventory; WISE-Q = Weight Influenced Self-Esteem Questionnaire; EDEQ = Eating Disorder Examination Questionnaire; RSES = Rosenberg Self-Esteem Questionnaire; BCQ = Body Checking Questionnaire; BIAQ-R = Revised version of the Body Image Avoidance Questionnaire; CBAS = Cognitive Behavioral Avoidance Scale; BCCS = Body Checking Cognitions Scale; RTSQ = Ruminative Thoughts Style Questionnaire; CAMSR = Cognitive and Affective Mindfulness Scale – Revised; FTQ = Fat Talk Questionnaire; EDI-I = First version of the Eating Disorder Inventory

Table 4

Last Observation Carried Forward Analysis: Mean (M) and Standard Deviation (SD) or Median (Md) and Interquartile Range (IQ) for Difference Scores (Time 2 – Time 1), and test statistic (t test or Mann-Whitney U test) comparing the experimental and control groups

Difference scores	Experimental *M (SD) or Md (IQ)* (n = 20)	Control *M (SD) or Md (IQ)* (n = 25)	Test Statistic (t *(DF)* or U)
SAWBS	-3.5 (22.75)	0.0 (46.50)	183.5[a]
WISE-Q	-.05 (.80)	0.0 (.23)	154*[a]
EDEQ – Shape Concern	-.56 (1.44)	0.0 (1.19)	146*[a]
EDEQ – Weight Concern	-.30 (1.15)	0.0 (.70)	162*[a]
RSES	0.50 (4.75)	0.0 (1.50)	154.5*[a]
BCQ	-1.50 (15.75)	0.0 (6.00)	163*[a]
BIAQ – R	0.0 (4.50)	0.0 (4.00)	245.5[a]
CBAS	0.0 (4.00)	0.0 (9.50)	230.5[a]
BCCS	0.0 (.64)	0.0 (.18)	182.5[a]
RTSQ	-6.05 (21.97)	-3.76 (11.35)	-.423 (27)
CAMSR	.04 (.42)	0.0 (.33)	206.5[a]
FTQ	-4.00 (9.75)	0.0 (8.00)	173.5[a]
EDI			
Thin	0.0 (2.75)	0.0 (2.00)	228.5[a]
Bulimia	0.0 (0.0)	0.0 (0.0)	210.5[a]
Body Dissatisfaction	-2.00 (10.00)	0.0 (3.50)	178.5[a]
Ineffectiveness	0.0 (1.75)	0.0 (2.00)	249.5[a]

Perfectionism	0.0 (3.75)	0.0 (2.00)	246.5[a]
Interpersonal Distrust	0.0 (1.00)	0.0 (.50)	209[a]
Interoceptive Awareness	0.0 (.75)	0.0 (1.50)	249[a]
Maturity Fears	0.0 (9.00)	0.0 (2.50)	242[a]

** = $p < .05$*
a = Analyzed using the Mann-Whitney U test due to non-normality for the pre- and/or post-variable

SAWBS = Shape and Weight Based Self-Esteem Inventory; WISE-Q = Weight Influenced Self-Esteem Questionnaire; EDEQ = Eating Disorder Examination Questionnaire; RSES = Rosenberg Self-Esteem Questionnaire; BCQ = Body Checking Questionnaire; BIAQ-R = Revised version of the Body Image Avoidance Questionnaire; CBAS = Cognitive Behavioral Avoidance Scale; BCCS = Body Checking Cognitions Scale; RTSQ = Ruminative Thoughts Style Questionnaire; CAMSR = Cognitive and Affective Mindfulness Scale – Revised; FTQ = Fat Talk Questionnaire; EDI-I = First version of the Eating Disorder Inventory

Table 5

Multiple Imputation Data: Pooled Means and pooled test statistic (Independent Samples t test) for each difference score by condition

Difference Scores	Experimental *Pooled Mean*	Control *Pooled Mean*	Test Statistic [*t*(DF)]
SAWBS	-16.37	8.71	-1.38 (154)
WISE-Q	-.53	-.18	-1.44 (175)
EDEQ – Shape Concern	-1.02	-.49	-1.07 (82)
EDEQ – Weight Concern	-.66	-.11	-1.19 (57)
RSES	3.03	.82	1.16 (112)
BCQ	-6.95	-.01	-1.40 (220)
BIAQ – R	-2.99	-2.57	-.16 (60)
CBAS	-2.10	-.37	-.26 (79)
BCCS	-.31	.00	-1.44 (45)
RTSQ	-7.42	-4.82	-.35 (92)
CAMSR	.26	.22	.26 (31)
FTQ	-7.28	-5.99	-.36 (68)
EDI			
Drive for Thinness	-1.82	-.86	-.55 (492)
Bulimia	-1.02	.26	-1.17 (638)
Body Dissatisfaction	-6.03	-1.55	-1.81 (77)
Ineffectiveness	-.46	-.67	.13 (1044)
Perfectionism	-1.02	-1.03	.01 (59)

Interpersonal Distrust	.69	-.01	.91 (172)
Interoceptive Awareness	-.24	-.54	.19 (64)
Maturity Fears	.13	-1.40	1.26 (158)

All statistical tests were non-signficant. Standard deviations are not reported in pooled results.

SAWBS = Shape and Weight Based Self-Esteem Inventory; WISE-Q = Weight Influenced Self-Esteem Questionnaire; EDEQ = Eating Disorder Examination Questionnaire; RSES = Rosenberg Self-Esteem Questionnaire; BCQ = Body Checking Questionnaire; BIAQ-R = Revised version of the Body Image Avoidance Questionnaire; CBAS = Cognitive Behavioral Avoidance Scale; BCCS = Body Checking Cognitions Scale; RTSQ = Ruminative Thoughts Style Questionnaire; CAMSR = Cognitive and Affective Mindfulness Scale – Revised; FTQ = Fat Talk Questionnaire; EDI-I = First version of the Eating Disorder Inventory

References

Abramowitz, J. S., Deacon, B. J., & Whiteside, S. P. (2011). *Exposure therapy for anxiety: Principles and practice*. New York: Guilford Press.

Alfano, L., Hildebrandt, T., Bannon, K., Walker, C., & Walton, K. E. (2011). The impact of gender on the assessment of body checking behavior. *Body Image, 8,* 20-25.

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

Amin, R., Strauss, C., & Waller, G. (2012). Body-related behaviours and cognitions in the eating disorders. *Behavioural and Cognitive Psychotherapy, 42,* 65-73.

Arcelus, J., Mitchell, A. J., Wales, J., & Nielsen, S. (2011). Mortality rates in patients with anorexia nervosa and other eating disorders: A meta-analysis of 36 studies. *Archives of General Psychiatry, 68,* 724-731.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10,* 125-143.

Baker, J. H., Mitchell, K. S., Neale, M. C., & Kendler, K. S. (2010). Eating disorder symptomatology and substance use disorders: Prevalence and shared risk in a population based twin sample. *International Journal of Eating Disorders, 43,* 648-658.

Bardone-Cone, A. M., Harney, M. B., Maldonado, C. R., Lawson, M. A., Robinson, D. P., Smith, R., & Tosh, A. (2010). Defining recovery from an eating disorder: Conceptualization, validation, and examination of psychosocial functioning and psychiatric comorbidity. *Behaviour Research and Therapy, 48,* 194-202.

Beck, A. T., Rush, J., Shaw, B., & Emery, G. (1979). *Cognitive therapy of depression.* New York: Guilford Press.

Berg, K. C., Peterson, C. B., Frazier, P., & Crow, S. J. (2012). Psychometric evaluation of the Eating Disorder Examination and Eating Disorder Examination-Questionnaire: A systematic review of the literature. *International Journal of Eating Disorders, 45,* 428-438.

Brewerton, T. D. (2007). Eating disorders, trauma, and comorbidity: Focus on PTSD. *Eating Disorders: The Journal of Treatment and Prevention, 15,* 285-304.

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.

Bruch, H. (1978). *The golden cage: The enigma of anorexia nervosa.* Cambridge, MA: Harvard.

Calugi, S., Grave, R.D., Ghisi, M., & Sanavio, E. (2006). Validation of the Body Checking Questionnaire (BCQ) in an eating disorders population. *Behavioural and Cognitive Psychotherapy, 34,* 233-242.

Carter, J. C., Blackmore, E., Sutandar-Pinnock, K., & Woodside, D. B. (2004). Relapse in anorexia nervosa: A survival analysis. *Psychological Medicine, 34,* 671-679.

Cash, T. F., & Deagle III, E. A. (1997). The nature and extent of body-image disturbances in anorexia nervosa and bulimia nervosa: A meta-analysis. *International Journal of Eating Disorders, 22,* 107-126.

Chen, E. Y., Brown, M. Z., Harned, M. S., & Linehan, M. M. (2009). A comparison of borderline personality disorder with and without eating disorders. *Psychiatry Research, 170,* 86-90.

Cowdrey, F. A., & Park, R. J. (2011). Assessing rumination in eating disorders: Principal component analysis of a minimally modified ruminative response scale. *Eating Behaviors, 12,* 321-324.

Crow, S. J., Frisch, M. J., Peterson, C. B., Croll, J., Raatz, S. K., & Nyman, J. A. (2009). Monetary costs associated with bulimia. *International Journal of Eating Disorders, 42,* 81-83.

Crow, S. J., Peterson, C. B., Swanson, S. A., Raymond, N. C., Specker, S., Eckert, E. D., & Mitchell, J. E (2009; check APA). Increased mortality in bulimia nervosa and other eating disorders. *The American Journal of Psychiatry, 166,* 1342-1346.

Delinsky, S. S. & Wilson, G. T. (2010). Cognitive behavior therapy with body image exposure for bulimia nervosa: A case example. *Cognitive and Behavioral Practice, 17,* 270-277.

Dingemans, A. E., Spinhoven, Ph., & van Furth, E. F. (2006). Maladaptive core beliefs and eating disorder symptoms. *Eating Behaviors, 7,* 258-265.

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

Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16,* 363-370.

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.

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.

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,* 696-698.

Federici, A., & Kaplan, A. S. (2008). The patient's account of relapse and recovery in anorexia nervosa: A qualitative study. *European Eating Disorders Review, 16,* 1-10.

Gadalla, T. M. (2008). Psychiatric comorbidity in eating disorders: A comparison of men and women. *Journal of Men's Health, 5,* 209-217.

Geller, J., Johnston, C., & Madsen, K. (1997). The role of shape and weight in self-concept: The Shape and Weight Based Self-Esteem Inventory. *Cognitive Therapy and Research, 21,* 5-24.

Geller, J., Johnston, C., Madsen, K., Goldner, E. M., Remick, R. A., Birmingham, C. L. (1998). Shape- and Weight-based Self-esteem and the eating disorders. *International Journal of Eating Disorders, 24,* 285-298.

Godt, K. (2008) Personality disorders in 545 patients with eating disorders. *European Eating Disorders Review, 16,* 94-99.

Gordon, K. H., Holm-Denoma, J.M., Troop-Gordon, W., & Sand, E. (2012). Rumination and body dissatisfaction interact to predict concurrent binge eating. *Body Image, 9,* 352-357.

Grilo, C. M., White, M. A., Gueorguieva, R., Wilson, G. T., & Masheb, R. M. (2013). Predictive significance of the overvaluation of shape/weight in obese patients with binge eating disorder: Findings from a randomized controlled trial with 12-month follow-up. *Psychological Medicine, 43,* 1335-1344.

Grilo, C. M., White, M. A., & Masheb, R. M. (2009). DSM-IV psychiatric disorder comorbidity and its correlates in binge eating disorder. *International Journal of Eating Disorders, 42,* 228-234.

Gueorguieva, R., & Krystal, J. H. (2004). Move over ANOVA: Progress in analyzing repeated-measures data and its reflection in papers published in the *Archives of General Psychiatry*, *Archives of General Psychiatry, 61,* 310-317.

Haase, A. M., Mountford, V., & Waller, G. (2007). Understanding the link between body checking cognitions and behaviors: The role of social physique anxiety. *International Journal of Eating Disorders, 40,* 241-246.

Halmi, K. A., Agras, S., Mitchell, J., Wilson, G. T., Crow, S., Bryson, S, W., & Kraemer, H. (2002). Relapse predictors of patients with bulimia nervosa who achieved abstinence through cognitive behavioral therapy. *Archives of General Psychiatry, 59,* 1105-1109.

Hartmann, A., Zeeck, A., & Barrett, M. S. (2010). Interpersonal problems in eating disorders. *International Journal of Eating Disorders, 43,* 619-627.

Hawley, L. L., Schwartz, D., Bieling, P. J., Irving, J., Corcoran, K., Farb, N. A. S., Anderson, A. K., & Segal, Z. V. (2014). Mindfulness practice, rumination and clinical outcome in mindfulness-based treatment. *Cognitive Therapy and Research, 38,* 1-9.

Hildebrandt, T., Loeb, K., Troupe, S., & Delinsky, S. (2012). Adjunctive mirror exposure for eating disorders: A randomized controlled pilot study. *Behaviour Research and Therapy, 50,* 797-804.

Hoek, H. W., & van Hoeken, D. (2003). Review of the prevalence and incidence of eating disorder. *International Journal of Eating Disorders, 34,* 383-396.

Hoffman, S. G., Asnaani, A., Vonk, I. J. J., Sawyer, A. T., & Fang, A. (2012). The efficacy of cognitive behavioral therapy: A review of meta-analyses. *Cognitive Therapy and Research, 36,* 427-440.

Hudson, J. I., Hiripi, E., Pope, H. G. & Kessler, R. C. (2007). The Prevalence and Correlates of Eating Disorders in the National Comorbidity Survey Replication. *Biological Psychiatry*, 61(3), 348-358.

Jarrett, R. B., Minhajuddin, A., Borman, P. D., Dunlap, L., Segal, Z. V., Kidner, C. L., Friedman, E. S., & Thase, M. E. (2012). Cognitive reactivity, dysfunctional attitudes, and depressive relapse and recurrence in cognitive therapy responders. *Behaviour Research and Therapy, 50,* 280-286.

Jasper, K. (1993). Out from under body-image disparagement. In C. Brown, & K. Jasper (Eds.), *Consuming passions* (pp. 195-218). Toronto ON: Second Story Press.

Jenkins, P. E., Rienecke Hoste, R., Meyer, C., & Blissett, J. M. (2011). Eating disorders and quality of life: A review of the literature. *Clinical Psychology Review, 31,* 113-121.

Jones, C., Harris, G., & Leung, N. (2005). Core beliefs and eating disorder recovery. *European Eating Disorders Review, 13,* 237-244.

Jones, C., Leung, N., & Harris, G. (2007). Dysfunctional core beliefs in eating disorders: A review. *Journal of Cognitive Psychotherapy, 21,* 156-171.

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness.* New York: Dell Publishing.

Kingston, J, Clarke, S., & Remington, B. (2010). Experiential avoidance and problem behaviour: A meditational analysis. *Behavior Modification, 34,* 145-163.

Kuyken, W., Watkins, E., Holden, E., White, K., Taylor, R. S., Byford, S., Evans, A., Radford, S., Teasdale, J. D., & Dalgleish, T. (2010). How does mindfulness-based cognitive therapy work? *Behaviour Research and Therapy 48,* 1105-1112.

Latner, J. D., Mond, J. M., Vallance, J. K., Gleaves, D. H., & Buckett, G. (2012). Body checking and avoidance in women: Associations with mental and physical health-related quality of life. *Eating Behaviors, 13,* 386-389.

Lavendar, J. M., Wonderlich, S. A., Crosby, R. D., Engel, S. G., Mitchell, J. E. Crow, S., Peterson, C. B., & Le Grange, D. A naturalistic examination of body checking and dietary restriction in women with anorexia nervosa. *Behaviour Research and Therapy, 51,* 507-511.

Ledley, D. R. & Heimberg, R. G. (2006). Cognitive vulnerability to social anxiety. *Journal of Social and Clinical Psychology, 25,* 755-778.

Le Grange, D., & Lock, J. (2005). The dearth of psychological treatment studies for Anorexia Nervosa. *International Journal of Eating Disorders, 37,* 79-91.

Leon, A. C., Davis, L. L., & Kraemer, H. C. (2011). The role and interpretation of pilot studies in clinical research. *Journal of Psychiatric Research, 45,* 626-629.

Little, R.J.A. (1988) A Test of Missing Completely at Random for Multivariate Data with Missing Values. *Journal of the American Statistical Association, 83,* 1198-1202.

McFarlane, T., Olmsted, M. P., & Trottier, K. (2008). Timing and prediction of relapse in a transdiagnostic eating disorder sample. *International Journal of Eating Disorders, 41,* 587-593.

McFarlane, T., Urbszat, D., Olmsted, M. P. (2011). "I feel fat": An experimental induction of body displacement in disordered eating. *Behaviour Research and Therapy, 49,* 289-293.

Meyer, C., McPartlan, L., Rawlinson, A., Bunting, J., & Waller, G. (2011). Body-related behaviours and cognitions: Relationship to eating psychopathology in non-clinical women and men. *Behavioural and Cognitive Psychotherapy, 39,* 591-600.

Mitchell, J. E., Agras, W. S., Wilson, G. T., Halmi, K., Kraemer, H., & Crow, S. (2004). A trial of a relapse prevention strategy in women with bulimia nervosa who respond to cognitive-behavior therapy. *International Journal of Eating Disorders, 35,* 549-555.

Mitchell, J. E., & Crow, S. (2006). Medical complications of anorexia nervosa and bulimia nervosa. *Current Opinion in Psychiatry, 19,* 438-443.

Mountford, V., Haase, A., & Waller, G. (2006). Body checking in the eating disorders: Associations between cognitions and behaviors. *International Journal of Eating Disorders, 39,* 708-715.

Mountford, V., Haase, A. M., & Waller, G. (2007). Is body checking in the eating disorders more closely related to diagnosis or to symptom presentation? *Behaviour Research and Therapy, 45,* 2704-2711.

Murphy, R., Straebler, S., Cooper, Z., & Fairburn, C. G. (2010). Cognitive behavioral therapy for eating disorders. *Psychiatric Clinics of North America, 33,* 611-627.

National Institute for Clinical Excellence (2004). *Eating disorders: Core interventions in the treatment and management of anorexia nervosa, bulimia nervosa, and related eating disorders* (Guideline 9). London: Author.

Paxton, S. J., McLean, S. A., Gollings, E. K., Faulkner, C., & Wertheim, E. H. (2007). Comparison of face-to-face and internet interventions for body image and eating problems in adult women: A RCT. *International Journal of Eating Disorders, 40,* 692-704.

Philippot, P., & Segal, Z. (2009). Mindfulness based psychological interventions: Developing emotional awareness for better being. *Journal of Consciousness Studies, 16,* 285-306.

Pomeroy, C., & Mitchell, J. E. (2002). Medical Complications of Anorexia Nervosa and Bulimia Nervosa. In C. G. Fairburn & K. D. Brownell (Eds.), *Eating Disorders and Obesity* (pp. 278-285). New York: The Guilford Press.

Rawal, A., Park, R. J., & Williams, J. M. G. (2010). Rumination, experiential avoidance, and dysfunctional thinking in eating disorders. *Behaviour Research and Therapy, 48,* 851-859.

Reas, D.L., Whisenhunt, B.L., Netemeyer, R., & Williamson, D.A. (2002). Development of the Body Checking Questionnaire: A self-report measure of body checking behaviours. *International Journal of Eating Disorders, 31,* 324-333.

Richard, M., Bauer, S., & Kordy, H. (2005). Relapse in anorexia and bulimia nervosa - A 2.5-year follow-up study. *European Eating Disorders Review, 13,* 180-190.

Roberto, C. A., Steinglass, J., Mayer, L. E. S., Attia, E., Walsh, B. T. (2008). The clinical significance of amenorrhea as a diagnostic criterion for anorexia nervosa. *International Journal of Eating Disorders, 41,* 559-563.

Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Constuct validation of a single-item measure and the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin, 27,* 151-161.

Rodin, J., Silberstein, L., & Striegel-Moore, R. (1984). Women and weight: A normative discontent. *Nebraska Symposium on Motivation, 32,* 267-307.

Rosen, J.C., Srebnik, D., Saltzberg, E., & Wendt, S. (1991). Development of a body image avoidance questionnaire. *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 3,* 32-37.

Royal, S., MacDonald, D.E., & Dionne, M.M. (2013). Development and validation of the Fat Talk Questionnaire. *Body Image, 10,* 62-69.

Royal, S., McFarlane, T., Strimas, R., Trottier, K., & Olmsted, M. P. (September, 2011). *Targeting Weight-Related Self-Esteem to Prevent Relapse in Eating Disorders:*

Results from a Pilot Study. Poster presented at the 17th Annual Meeting of the Eating Disorder Research Society, Edinburgh, Scotland.

Segal, Z. V., Kennedy, S., Gemar, M., Hood, K., Pedersen, R., & Buis, T. (2006). Cognitive reactivity to sad mood provocation and the prediction of depressive relapse. *Archives of General Psychiatry, 63,* 749-755.

Segal, Z., Teasdale, J., Williams, M. (2002). *Mindfulness-Based Cognitive Therapy for Depression*. New York: Guilford Press.

Schaefer, W. K., MacLennan, R. N., Yaholnitsky-Smith, S. A., & Stover, E. D. (1998). Psychometric evaluation of the Eating Disorder Inventory (EDI) in a clinical group. *Psychology and Health, 13,* 873-881.

Shafran, R., Fairburn, C. G., Robinson, P., & Lask, B. Body checking and its avoidance in eating disorders. *International Journal of Eating Disorders, 35,* 93-101.

Shafran, R., Lee, M., Payne, E., & Fairburn, C. G. An experimental analysis of body checking. *Behavioural Research and Therapy, 45,* 113-121.

Sullivan, P. (2002). Course and outcome of anorexia nervosa and bulimia nervosa. In Fairburn, C. G. & Brownell, K. D. (Eds.). *Eating Disorders and Obesity* (pp. 226-232). New York, New York: Guilford.

Tabachnick, B. G., and Fidell, L. S. (2013). *Using Multivariate Statistics, 6th ed.* Boston : Allyn and Bacon.

Thomas, D. R., & Zumbo, B. D. (2012). Difference scores from the point of view of reliability and repeated-measures ANOVA: In defense of difference scores for data analysis. *Educational and Psychological Measurement, 72,* 37-43.

Treynor, W., Gonzalez, R., Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research, 27,* 247-259.

Trottier, K., Carter, J. C., MacDonald, D. E., McFarlane, T., & Olmsted, M. P. (under review). Adjunctive Graded Body Image Exposure for Eating Disorders: A randomized controlled initial trial in clinical practice. *International Journal of Eating Disorders.*

Trottier, K., McFarlane, T., Olmsted, M. P., & McCabe, R. E. (2013). The Weight Influenced Self-Esteem Questionnaire (WISE-Q): Factor structure and psychometric properties. *Body Image, 10,* 112-120.

Vallance, J. K., Latner, J. D., & Gleaves, D. H. (2011). The relationship between eating disorder psychopathology and health-related quality of life within a community sample. *Quality of Life Research, 20,* 675-682.

Vocks, S., Legenbauer, T., Wachter, A., Wucherer, M., & Kosfelder, J. (2007). What happens in the course of body exposure? Emotional, cognitive, and physiological reactions to mirror confrontation in eating disorders. *Journal of Psychosomatic Research, 62,* 231-239.

Vitousek, K. B., & Hollon, S. D. (1990). The investigation of schematic content and processing in eating disorders. *International Journal of Eating Disorders, 14,* 191-214.

Walker, D. C., Anderson, D. A., & Hildebrandt, T. (2009). Body checking behaviors in men. *Body Image, 6,* 164-170.

Walsh, T. B. (2008). Recovery from eating disorders. *Australian and New Zealand Journal of Psychiatry, 42,* 95-96.

Walsh, T. B., Kaplan, A. S., Attia, E., Olmsted, M., Parides, M., Carter, J. C.,...Rockert, W. (2006). Fluoxetine after weight restoration in Anorexia Nervosa: A randomized controlled trial. *Journal of the American Medical Association, 295*, 2605-2612.

White, E. K., & Warren, C. S. (2013). Body checking and avoidance in ethnically diverse female college students. *Body Image, 10,* 583-590.

Williams, M. (2006). Employment counseling with clients who have eating disorders. *Journal of Employment Counseling, 43,*179-191.

Wilson, G. T. (2005). Psychological treatment of eating disorders. *Annual Review of Clinical Psychology, 1,* 439-465.

Zipfel, S., Seibel, M. J., Lowe, B., Beumont, P. J., Kasperk, C., & Herzog, W. (2001). Osteoporosis in eating disorders: A follow-up study of patients with anorexia and bulimia nervosa. *The Journal of Clinical Endocrinology & Metabolism. 86,* 5227-5233.

Zoccola, P. M., & Dickerson, S. S. (2012). Assessing the relationship between rumination and cortisol: A review. *Journal of Psychosomatic Research, 73,* 1-9.