Examination of a new, shorter cognitive behavioural therapy for non-underweight eating disorders: Effectiveness and predictive role of body image

By

Mia Liane Pellizzer

BPsych(Hons)

Thesis
Submitted to Flinders University
for the degree of

Doctor of Philosophy (Clinical Psychology)

College of Education, Psychology & Social Work

October 2018

TABLE OF CONTENTS

ABSTRACT

Cognitive behavioural therapy for eating disorders (CBT-ED) has the strongest evidence base for non-underweight eating disorders. However, given the length of treatment ($\leq$ 20 sessions) and requirement for experienced therapists, access to CBT-ED is often limited by reduced therapist availability, long waitlists, and high costs. To overcome these systemic barriers, ten-session cognitive behavioural therapy (CBT-T) was developed as a shorter therapy, suitable for delivery by novice therapists under supervision. Findings from an initial pilot study were promising however have not yet been replicated. Thus the first aim of this research was to replicate the initial findings. The second main aim of the research was to better understand the role of body image in eating disorder research, given that the over-evaluation of shape and weight is central to eating disorder psychopathology and a key target of treatment. The role of body image as a predictor and moderator of treatment outcome was examined in the context of a range of other predictors and moderators.

Prior to conducting pilot studies of CBT-T, the first study (N=328) sought to explore the psychometric properties of three measures of body image disturbance pertinent to eating disorder treatment (body image flexibility, avoidance, and checking). Confirmatory factor analysis suggested the original factor structures for the body image flexibility and checking measures were appropriate, while an alternative structure was found for avoidance. Each solution had acceptable reliability and validity and were used in subsequent studies.

CBT-T was examined in two case series ($N = 26$, $N = 52$) using trainee psychologists under supervision. Significant improvements for eating disorder cognitions, behaviours, quality of life, and negative affect were found from baseline to post-treatment for both case series and results were maintained at both a one and three month follow-up. Rates of abstinence, remission, and good outcome were comparable to studies of longer versions of CBT-ED.

Data from the two case series were combined ($N = 78$) to assess predictors of attrition, and predictors and moderators of outcome. Body image flexibility and avoidance emerged as both significant baseline predictors and moderators of outcome while body checking, negative affect, personality beliefs, and self-efficacy were predictors of outcome. No significant predictors of attrition were found. A sub-sample of participants who reported bingeing and/or purging at baseline (N=62) were used to explore the ability of early change variables to predict outcome. Early change in body image flexibility was the most consistent predictor of outcome, followed by body image avoidance. Body checking and the fear of expressing and receiving compassion were significant in several, but not all, analyses.

Results provide support for the effectiveness of CBT-T. Results also demonstrate the importance of considering body image as both a significant predictor and moderator of outcome. Further research is required to assess longer follow-ups and randomised controlled trial designs that compare CBT-T and longer CBT-ED directly. Further research is also required to confirm novel findings and explore the benefit of modifying existing protocols to incorporate a stronger focus on body image and fear of compassion.

DECLARATION

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university; and to the best of my knowledge and belief, does not contain any material previously published or written by another person except where due reference is made in the text.

Mia Pellizzer

BPsych(Hons)

ACKNOWLEDGEMENTS

First and foremost, I want to acknowledge my dream team of supervisors. I feel very privileged to have worked with all of you. Tracey Wade, I cannot express how much you have supported me to develop as a researcher, clinician, and person. My writing and understanding of statistics have substantially improved and I feel well prepared for life beyond the PhD. I will miss the stable very much and hope that I'll continue to work with you in some capacity for a long time. Glenn Waller, you have shown me what truly excellent clinical supervision is and have set the bar high for future supervisors. Your feedback on manuscripts has been invaluable and it has been a true pleasure working with you. I have also appreciated our banter over the years and love that I share my name with one of your dogs! Marika Tiggemann, a conversation with you at the end of my Honours year guided me towards eating disorders and for this I will always be grateful. You have been a terrific supervisor and mentor.

A big thank you to my colleagues who were therapists in my treatment study: Ryan Balzan, Samantha Boots, Emily Matheson, Jamie-Lee Pennesi, Cele Richardson, and Eloisa Steen. Thank you for collecting all of those questionnaires! Thank you also to every person who participated in my research. For those who were in remission I hope you maintain recovery and for those who weren't I hope you work towards recovery and living a full, wonderful life.

To my office mates Em and Jem. Emily, you have been such a wonderful friend and support over the last few years. Thank you for your love and guidance, for picking me up when I'm down, and celebrating with me during the highs. Jeremy, you are very much like a brother to me. I've thoroughly enjoyed our banter and silly song writing (with NSFW content). You have also been a wonderful support emotionally and I always enjoy our chats. Sharing an office with the two of you has been awesome. Mikaela, although we didn't share

an office for the majority of the PhD I have been fortunate to see you most days. Our weekly goals and problem solving emails have been a true asset and I wouldn't have submitted without them! Thank you for all the walks and lunch time chats. Big shout outs to all of the beautiful friends I have made along the way. I'm fortunate to say that there are too many of you to name individually!

To my parents Sandra and Primo, and my brother Marc, you have always encouraged me to pursue my goals and have always given me unconditional love and support. Apologies for all of the stressed out times you endured and thank you for getting me through it all. I'm truly grateful to you all. Thank you to my gorgeous husband JD, who has only ever known me as a student. Since moving in together five years ago you have been our main source of income and I look forward to being a more equal contributor. Like my family, you have endured several stressed out Mia times and you have been a wonderful support through them all. Thank you for being my best friend and for making my life brighter. I look forward to the next chapter of our lives

CHAPTER 1

Overview and Aims of the Research

Background

It is estimated that 10-13% of females will meet criteria for DSM-5 anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED) or other specified feeding and eating disorders (OSFED) by the age of 20 (Fairweather-Schmidt & Wade, 2014; Stice, Marti, & Rohde, 2013). Eating disorders are classified as a mental illness, but significantly impair both psychosocial and physical functioning (Fairburn & Harrison, 2003; Jenkins, Hoste, Meyer, & Blissett, 2011). Individuals with eating disorders utilise health services more than any other form of mental illness (Striegel-Moore et al., 2008). In Australia 913, 000 people were estimated to have an eating disorder in 2012 and the total socioeconomic cost that year was $67.9 billion (Butterfly Foundation, 2012). Therefore, there is a strong argument for developing accessible and cost effective treatments for eating disorders.

Effective Treatments for Non-Underweight Eating Disorders

Cognitive behavioural therapy for eating disorders (CBT-ED) is considered to be the most effective psychological treatment for non-underweight eating disorders (Linardon, Wade, de la Piedad Garcia, & Brennan, 2017). CBT-ED is recommended by the National Institute for Health and Care Excellence (NICE) and the Royal Australian and New Zealand College of Psychiatrists (RANZCP) as a frontline treatment, initially as guided self-help (CBTgsh) and then as individual CBT-ED if CBTgsh is ineffective after 4 weeks or if CBTgsh is not suitable or acceptable to the client (Hay et al., 2014; NICE, 2017). However, typically 20 sessions of CBT-ED are recommended for non-underweight eating disorders and therapists delivering CBT-ED are usually required to have extensive, specialised training in the area of eating disorders (NICE, 2017). Considering rebates are only available for a maximum of 10 sessions per calendar year under the Better Access to Mental Health Care (Australian Government, 2015), CBT-ED can quickly become costly and, due to a limited number of suitably qualified therapists, access to treatment can be difficult and lead to

lengthy waitlists. Thus, there are important systemic barriers impeding access to treatment to be addressed.

Ten-session cognitive behavioural therapy (CBT-T), a transdiagnostic treatment for non-underweight eating disorders, was developed by Waller et al. (2018) to address the systemic barriers inherent to longer versions of CBT-ED. Containing the key components of CBT-ED, CBT-T is a shorter treatment that is suitable for delivery by novice therapists, such as provisional psychologists, under expert supervision (Waller et al., 2018). An initial evaluation found significant reductions for behavioural and cognitive eating disorder symptoms and anxiety and depression symptoms by post-treatment which were maintained at a 3-month follow-up (Waller et al., 2018). Rates of abstinence and remission were considered to be comparable to longer versions of CBT-ED delivered by experienced therapists (Waller et al., 2018). Replication is critical in the development of a new therapies as part of a systematic approach to developing complex interventions (Craig et al., 2008), and thus further evaluation of CBT-T using case series is indicated.

Importance of Body Image in Newer Treatments for Eating Disorders

A key component of more recent therapies for eating disorders, including CBT-T and enhanced CBT (CBT-E; Fairburn, 2008) is body image work, such as reducing body image avoidance behaviours (e.g., avoiding mirrors and scales) and body checking (e.g. pinching body parts, excessive weighing and mirror gazing; Fairburn, 2008; Waller et al., 2007; Waller et al., 2018). Body image avoidance and checking are behavioural manifestations of the over-evaluation of shape and weight that is central to the core psychopathology of eating disorders (Fairburn, Cooper, & Shafran, 2003).

Another aspect of body image relevant to eating disorders is body image flexibility, a positive body image construct that concerns the ability to accept and experience both positive and negative body-related thoughts, feelings, and experiences (Sandoz, Wilson, Merwin, &

Kellum, 2013). Body image flexibility has only recently been considered in eating disorder treatment studies, however results are limited to inpatient or residential care programs which have predominantly used cross-sectional analyses and a combination of therapy modalities (Bluett et al., 2016; Butryn et al., 2013; Lee, Ong, Twohig, Lensegrav-Benson, & Quakenbush-Roberts, 2018). Thus while there is emerging evidence that body image flexibility improves during treatment, it is unclear whether this is possible using CBT-ED in an adult, outpatient setting. These gaps in our knowledge indicate a need to explore the role of body image avoidance, checking, and flexibility in CBT-ED treatments.

Despite the potential importance of body image variables in treatment, these variables have not previously been evaluated as potential predictors of treatment outcomes. Two recent meta-analyses concluded early symptom change was the most robust predictor of outcome (Linardon, de la Piedad Garcia, & Brennan, 2017; Vall & Wade, 2015), but evaluation of simple predictors and moderators of outcome have yielded inconsistent findings across studies (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015). Therefore, further work is required to better understand the factors that predict and influence eating disorder treatment outcomes, particularly in transdiagnostic samples (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015).

Aims of the Current Research

The first aim of the thesis was to replicate the initial evaluation of CBT-T (Waller et al., 2018) with a transdiagnostic, non-underweight (i.e., body mass index [BMI] greater than 17.5) outpatient sample using provisional (trainee) psychologists as therapists. The second main aim was to more closely examine the role of body image and weight concerns in recovery from an eating disorder. This involved a two-step process. The first was to assess the structure and psychometric properties of three different measures of body image related to eating disorder psychopathology (body image flexibility, avoidance, and checking) that were

subsequently used in case series examinations of CBT-T. The second was to investigate the degree to which body image predicts recovery during CBT-T treatment, including its moderating role and whether early change in body image is predictive of outcome. Additional novel and established predictors and moderators of outcome, early change variables, and predictors of attrition are also examined. The studies conducted to address these two overarching aims are presented as individual chapters, summarised below.

Summary of Chapters

A narrative literature review (**Chapter Two**) provides a detailed examination of the issues and themes introduced in this overview. Specifically, evidence based psychological treatment for non-underweight eating disorders, systemic barriers to accessing evidence based treatment, solutions to overcoming systemic barriers, a description of CBT-T and initial findings, the role of body image in eating disorder treatment, and predictors and moderators of treatment outcome are reviewed in more detail.

In order to prevent repetition in this thesis, measures that were used across most or all studies are comprehensively reviewed in **Chapter Three.** A description of each measure is provided, followed by an overview of the factor structure. A summary of the evidence pertaining to reliability and validity is then provided.

Results from the first study are presented in **Chapter Four**, an examination of the factor structure and psychometric properties of three measures: The Body Image Acceptance and Action Questionnaire, a measure of body image flexibility (BI-AAQ; Sandoz et al., 2013), the Body Image Avoidance Questionnaire (BIAQ; Rosen, Srebnik, Saltzberg, & Wendt, 1991) and the Body Checking Questionnaire (BCQ; Reas, Whisenhunt, Netemeyer, & Williamson, 2002). The study sought to confirm the optimal structure of each measure for use in subsequent case series of CBT-T. Participants ($N = 328$) were young (18 – 25) female undergraduate students. Confirmatory factor analysis suggested the original factor structures

for the body image flexibility (BI-AAQ) and checking (BCQ) measures were appropriate, while an alternative structure was found for the body image avoidance measure (BIAQ). The psychometric properties of each solution were explored using correlational, regression, and *t*-test analyses. Each solution had acceptable reliability and validity and were used in subsequent CBT-T case series. Overall, results from the first study inform the reliable and valid measurement of body image disturbance relevant to eating disorder psychopathology. A version of this chapter has been published in *Psychological Assessment* (Pellizzer, Tiggemann, Waller, & Wade, 2018). A copy of the published version is included in **Appendix A**.

The effectiveness of CBT-T was examined in two case series using two samples of non-underweight individuals with eating disorders (**Chapter Five**). In the first case series (*N* = 26) all participants completed a 4-week waitlist control period between the baseline assessment session and starting the first session of CBT-T. Due to an elevated attrition rate (50%) the second case series (*N* = 52) randomly allocated participants to either an immediate start or 4-week waitlist condition following the baseline assessment to examine whether the waitlist increased attrition. In both case series, CBT-T was delivered by provisional psychologists under expert supervision in an outpatient university clinic. Using multi-level modelling and both intent-to-treat (ITT) and completer analyses, statistically and clinically significant improvements for eating disorder cognitions, behaviours, quality of life, and negative affect were found from baseline to post-treatment for both case series and results were maintained at both a one and three month follow-up. Rates of abstinence, remission, and good outcome were comparable to studies of longer versions of CBT-ED. Findings from the first case series have been published in *Clinical Psychologist* (Pellizzer, Waller, & Wade, 2018b).

Data from the two case series were then combined ($N = 78$) to assess predictors of attrition and predictors and moderators of outcome (**Chapter Six**). Measures of body image (flexibility, avoidance, and checking), negative affect, personality, and motivation (readiness to change and self-efficacy) were assessed as potential predictors of global eating disorder psychopathology. No significant predictors of attrition were found when variables were tested in a multivariate logistic regression. Body image flexibility was both the strongest predictor and moderator of global eating disorder psychopathology. Body image avoidance was also both a predictor and moderator while body checking, negative affect, personality beliefs, and self-efficacy were simple predictors. A version of this chapter has been published as a brief report in the *International Journal of Eating Disorders* (Pellizzer, Waller, & Wade, 2018a). A copy of the published version is included in **Appendix B.**

A sub-sample of participants who reported bingeing and/or purging at baseline ($N = 62$) were used to explore novel and established early change variables (**Chapter Seven**). Early change variables (i.e., change in each variable from baseline to mid-treatment) were calculated for novel (body image flexibility, avoidance, and checking, and fear of compassion) and established predictors (behavioural symptoms and therapeutic alliance). Both global eating disorder psychopathology and clinical impairment at post-treatment and 3-month follow-up were considered as outcomes. Using linear regression (for both completer and ITT), and after adjusting for baseline and early behavioural change, early improvement in body image flexibility was found to be the most robust and consistent predictor of good outcome, followed by body image avoidance. Early change in body checking and some of the fear of compassion subscales were also predictors of good outcome in some analyses. Early change in behavioural symptoms and therapeutic alliance were not significant predictors of outcome. A version of the chapter is currently under review with *Behaviour Research and Therapy*.

Chapter Eight concludes the thesis with a general discussion to summarise the key findings across these studies. This includes clinical implications, limitations, and avenues for further research.

Reader Navigation

Chapters Four to **Seven** were originally prepared as manuscripts, three of which are published and one which is currently under review. The versions presented in the thesis chapters are highly similar to the published and submitted versions however the introductions and method sections (particularly measures and design) have been reduced to avoid repetition of background information. At times, further detail has been included for supplementary analyses. However, a large portion of content remains identical to published and under review manuscripts. The literature review presented in **Chapter Two**, while not published in its current form, contains introduction content from published and under review manuscripts. Throughout the thesis the participants in the treatment trials are referred to as clients, in order to be consistent with Australian terminology.

CHAPTER 2

Literature Review[1]

---

[1] The literature review contains content from the introduction sections of three published

papers that appear in *Psychological Assessment* (Pellizzer, Tiggemann, et al., 2018), provided

in **Appendix A**, *Clinical Psychologist* (Pellizzer, Waller, et al., 2018b) provided in **Appendix**

B, and the *International Journal of Eating Disorders* (Pellizzer, Waller, et al., 2018a),

provided in **Appendix C**. Content has also been drawn from the introduction section of one

paper under review in *Behaviour Research and Therapy*.

Evidence Based Psychological Treatments for Non-Underweight Eating Disorders

For non-underweight adults with eating disorders (i.e. individuals with a body mass index [BMI] above 17.5), the 2017 National Institute for Health and Care Excellence (NICE) guidelines recommend that guided self-help using cognitive behaviour therapy (CBTgsh) be offered as frontline treatment, comprising self-help materials for eating disorders supplemented with 4 to 9 supportive sessions of 20 minutes duration over 16 weeks. If after 4 weeks of treatment this appears to be unacceptable, contraindicated or ineffective, then up to 20 sessions of cognitive behavioural therapy for eating disorders (CBT-ED) over 20 weeks is recommended as the next step for individuals with Bulimia Nervosa (BN; NICE, 2017). The four-session review is recommended given a large body of evidence showing that early change in eating disorder symptoms predicts good outcome (Vall & Wade, 2015). For individuals with Binge Eating Disorder (BED), group CBT-ED is recommended as a second step after CBTgsh where it is available. Individual CBT-ED is considered appropriate as a second step if group CBT-ED is unavailable or unacceptable to the individual (NICE, 2017). For individuals with Other Specified Feeding and Eating Disorders (OSFED), it is recommended that the individual is offered treatment for the eating disorder most congruent with symptoms (NICE, 2017).

The Royal Australian and New Zealand College of Psychiatrists (RANZCP) guidelines similarly recommend CBTgsh or CBT-ED as a frontline treatment for BN and BED (Hay et al., 2014). The RANZCP guidelines mention the use of interpersonal psychotherapy (IPT) and dialectical behaviour therapy (DBT) for BN and BED, and mindfulness for BED, however summarise the evidence base for such treatments as small and weak (Hay et al., 2014). Thus, it is recommended such treatments only be offered when a CBT-trained therapist is not available. The NICE and RANZCP guidelines are supported by a

recent review which suggested that CBT-ED outperforms all active psychological treatments for eating disorders including IPT (Linardon, Wade, et al., 2017).

The NICE (2017) guidelines specify that the recommended dose of CBT-ED for adults with BN and BED is up to 20 sessions over 20 weeks. CBT-ED refers to the generic use of cognitive behavioural therapy techniques for eating disorders and thus can be considered an umbrella term, encompassing more specific versions of CBT-ED. For instance, CBT-E (Fairburn, 2008) is a specific, manualised version of CBT-ED. This review will focus on CBT-ED more broadly given there is currently no evidence that CBT-E produces greater effect sizes compared to earlier versions of CBT-ED such as CBT for Bulimia Nervosa (CBT-BN; Linardon, Wade, et al., 2017). Furthermore, CBT-E contains the same key mechanisms as CBT-ED broadly. Treatment is initially focused on engaging the individual, case formulation, providing psychoeducation, and establishing regular eating. Treatment then addresses key areas of eating disorder psychopathology such as the over-evaluation of body shape and weight, emotion regulation, and dietary restraint. Later sessions focus on maintenance of gains achieved during therapy and relapse prevention (Fairburn, 2008; NICE, 2017; Waller et al., 2007).

Therapists delivering CBT-ED are typically clinicians experienced in working with eating disorders who have received extensive, specialised training, and continue to receive expert supervision when conducting the therapy. For instance, in the two major efficacy trials (examining internal validity or whether the treatment works under controlled conditions) of CBT-E, therapists were required to complete six months of training prior to starting the trial (Fairburn et al., 2015; Fairburn et al., 2009), and received weekly supervision with experts, and had all sessions taped which were audited weekly. In contrast, effectiveness studies (examining external validity or whether the treatment works in the real world) of CBT-E have specified less stringent training requirements. Byrne, Fursland, Allen, and Watson (2011)

provided training during each psychologist's first week at the clinic followed by ongoing

weekly team meetings to discuss cases and adherence in addition to weekly individual

supervision. A similar procedure was followed by Signorini, Sheffield, Rhodes, Fleming, and

Ward (2018), where therapists were psychologists or psychiatric registrars. In another

effectiveness study the two lead therapists received training and regular supervision by

Professor Fairburn while other therapists (from a variety of backgrounds) received weekly

supervision and training by the lead therapists (Knott, Woodward, Hoefkens, & Limbert,

2015). Other effectiveness studies specify the use of regular supervision only (Rose &

Waller, 2017; Turner, Marshall, Stopa, & Waller, 2015; Waller et al., 2014).

Systemic Barriers to Accessing Evidence Based Treatments

In the Australian health care system there are significant barriers impeding

progression from guided self-help to CBT-ED. First, rebates are available for only 10

sessions per calendar year under the Better Access to Mental Health Care through the

Medicare Benefits Schedule initiative (Australian Government, 2015). Thus, as CBT-ED for

non-underweight individuals requires up to 20 sessions, completing a full CBT-ED treatment

program can quickly become an expensive endeavour. Second, as few as 8% of individuals in

Australia requiring eating disorder treatment receive it (Hart, Granillo, Jorm, & Paxton,

2011). Generally, people with a mental illness in Australia struggle to access appropriate

health care. This is due in part to insufficient numbers in the workforce with the appropriate

skills and geographical distribution to meet client need (Mental Health Workforce Advisory

Committee, 2011). Ethically, these barriers require attention, given that rapid access to

appropriate treatment impacts on outcome. For example, young people with BN offered

immediate online CBT engaged more and had better outcomes than those who were given the

same program after a three-month wait (Sánchez-Ortiz et al., 2011). Similarly, a

transdiagnostic study of CBT in eating disorders in Western Australia found that being on a

waiting list led to greater treatment drop-out when treatment was finally offered (Carter et al., 2012).

A recent comprehensive review of barriers and facilitators to initial treatment seeking highlighted similar issues (Regan, Cachelin, & Minnick, 2017), with two system barriers identified, namely waitlist time and insurance coverage, across the quantitative studies included. Of these, waitlist time significantly predicted treatment engagement in two of four studies while insurance coverage was not found to be a significant correlate in the two studies that assessed it (Regan et al., 2017). Eleven descriptive (qualitative) studies were also included in the review, and 9 studies found financial considerations (cost, insurance coverage) to be common barriers (Regan et al., 2017). In addition waitlist length was a common barrier in one of the qualitative studies while availability was reported as a barrier in two qualitative studies (Regan et al., 2017). A recent systematic review, which included eight qualitative, three quantitative, and two mixed-method studies, used thematic analysis to identify the frequency of reported barriers and facilitators to treatment seeking (Ali et al., 2017). Practical barriers, including cost and time, were mentioned frequently (62%), particularly by women from ethnically diverse backgrounds (Ali et al., 2017). Similar barriers were raised in a review of critical gaps in treating eating disorders (Kazdin, Fitzsimmons-Craft, & Wilfley, 2017). Numerous other barriers to eating disorder treatment seeking have been endorsed e.g., perceptions and beliefs of eating disorders, eating disorder specific variables such as type and duration (Ali et al., 2017; Kazdin et al., 2017; Regan et al., 2017).

In summary, systemic barriers to accessing evidence-based eating disorder treatment in Australia include cost of treatment and limited or delayed access to appropriate health care. Therefore, in response to limited funding for psychological treatment, there is increasing pressure for shorter, cost-effective psychological therapies

that are also efficacious. Given lengthy waitlists are also in part due to accessibility of experienced clinicians, the use of novice or trainee therapists under expert supervision offers a viable way of increasing access to evidence-based treatments and thus decreasing waitlist times.

Overcoming Systemic Barriers: Novice Therapists and Shorter Treatment Protocols Evidence from CBT-ED Studies

Thus far, there is some emerging evidence for the use of shortened treatment protocols and novice therapists in CBT-ED. Prior effectiveness studies of individual CBT-ED have predominantly used experienced therapists (e.g. Byrne et al., 2011; Knott et al., 2015; Signorini et al., 2018; Waller et al., 2014). An effectiveness study of a group program, however, found comparable outcomes to individual treatment when it was conducted by postgraduate psychology students in conjunction with therapists who had experience treating eating disorders (Wade, Byrne, & Allen, 2017). In addition, a recent effectiveness study of individual CBT-ED found outcomes comparable to experienced therapists when using a sample of non-experienced therapists from varied disciplines (Rose & Waller, 2017), as did another effectiveness study using a combination of experienced and non-experienced therapists from varied disciplines (Turner, Marshall, et al., 2015).

While the use of a shorter treatment protocol has been less explored, one study evaluated eight sessions of CBT-ED with a BN sample before randomising participants to either one of two exposure conditions (exposure to either pre-binge or pre-purge cues) or to a relaxation training control (Bulik, Sullivan, Carter, McIntosh, & Joyce, 1998). At the end of the eight CBT-ED sessions (using intent to treat [ITT] analyses), significant changes were observed for binges and purges per fortnight, and ratings of depression and global functioning. In addition, 28% were abstinent from bingeing and purging in the

fortnight preceding the end of CBT-ED assessment and approximately half of participants scored at least one quartile lower (quartiles: absent, mild, moderate, severe) on food restriction and body dissatisfaction using clinician ratings (Bulik et al., 1998). Hence there is some evidence that a briefer version of CBT-ED is effective for BN.

There is also emerging evidence that there is limited benefit of longer treatments. Bell, Waller, Shafran, and Delgadillo (2017) examined outcomes after adjusting for rapid response ($\geq$ 1.13 change score on the Eating Disorder Examination Questionnaire [EDE-Q] and at least 70% reduction in bingeing or purging) observed by session eight of treatment. Across a range of treatment modalities (including CBT-ED), participants completed an average of 16 sessions. Treatment duration was not found to significantly predict any post-treatment outcome except for an improvement in purging, however this lost significance after adjusting for rapid response (Bell et al., 2017). Similarly, a recent study examined women with BN who received inpatient treatment for 9 weeks followed by a median of 45 outpatient treatment sessions (Beintner & Jacobi, In press). Like the previous study, a variety of treatment modalities were included (mostly CBT-ED and psychodynamic therapy). Neither the duration of inpatient stays nor number of outpatient treatment sessions were related to outcomes at discharge or at a 18-month follow-up assessment (Beintner & Jacobi, In press). While results are not specific to CBT-ED, findings provide further support for the use of shorter protocols.

Evidence from CBTgsh Studies

By definition CBTgsh uses novice therapists and shorter treatment duration, and studies of CBTgsh provide the most evidence for the use of novice therapists and shorter treatment protocols in eating disorder treatment. A review concluded that CBTgsh is a brief, cost-effective therapy that has often delivered outcomes commensurate to longer versions of CBT-ED delivered by experienced therapists (Wilson & Zandberg, 2012). While therapist-led

CBT-ED is considered to be more effective than CBTgsh, a recent meta-analysis

demonstrated that CBTgsh is an efficacious treatment for reducing behavioural and cognitive

symptoms of BN and BED, supporting the NICE (2017) recommendations of offering

CBTgsh as a first line treatment as per a stepped-care approach (Linardon, Wade, et al.,

2017).

      With BN, BED and OSFED samples, the majority of CBTgsh studies have evaluated

CBTgsh over 6 to 10 sessions (see Wilson & Zandberg, 2012). Furthermore, a large number

of studies have also used novice or non-therapists such as undergraduate psychology students

(Ghaderi, 2006; Ghaderi & Scott, 2003), postgraduate psychology students (Cachelin et al.,

2014; Cassin, von Ranson, Heng, Brar, & Wojtowicz, 2008; Dunn, Neighbors, & Larimer,

2006; Ljotsson et al., 2007; Loeb, Wilson, Gilbert, & Labouvie, 2000; Steele & Wade, 2008;

Wilson, Wilfley, Agras, & Bryson, 2010; Zandberg & Wilson, 2013), general practitioners

(Banasiak, Paxton, & Hay, 2005; Durand & King, 2003), nurses with (Palmer, Birchall,

McGrain, & Sullivan, 2002) and without eating disorder specialisation (Walsh, Fairburn,

Mickley, Sysko, & Parides, 2004), non-specialist therapists with no formal qualifications and

limited clinical experience (Carter & Fairburn, 1998), and contact with past clients who were

recovered or improved following group therapy for BN (Huon, 1985). In summary, studies

of CBTgsh demonstrate that CBT for eating disorders can successfully be delivered using

shorter protocols and novice therapists. Given eating disorders have been described as

difficult to treat (Fairburn & Harrison, 2003), evaluating the outcomes produced by trainee

psychologists under expert supervision is an important empirical question.

Evidence Supporting Use of Novice Therapists and Shorter Protocols from Other

Areas

      The use of novice therapists and shorter treatment protocols has also been evaluated

for a range of other disorders. For example, briefer treatments for depression and anxiety that

focused on the key active elements demonstrated comparable effectiveness to longer versions (Jacobson et al., 1996; Öst & Ollendick, 2017). An initial evaluation of the Improving Access to Psychological Therapies (IAPT) initiative in the United Kingdom (which like Australia, emphasises the need for shorter, time-limited therapies) showed that an average of 4.9 sessions was received by clients with depression and anxiety (Clark et al., 2009), with optimal recovery rates between four and six sessions, and with a reduction in the dose-response effect after six sessions (Delgadillo et al., 2013). Novice therapists (usually trainee psychologists) have successfully delivered Acceptance and Commitment Therapy and CBT for depression, anxiety, pain, and wellbeing (Henriksson, Anclair, & Hiltunen, 2016; Kohtala, Lappalainen, Savonen, Timo, & Tolvanen, 2015; Lappalainen et al., 2014; Öst, Karlstedt, & Widén, 2012; Räsänen, Lappalainen, Muotka, Tolvanen, & Lappalainen, 2016; Stark & Hiltunen, 2016; van der Veek, Derkx, Benninga, Boer, & de Haan, 2013), demonstrating that, with specialist supervision, novice therapists are able to deliver outcomes commensurate to experienced therapists in clinical trials (e.g. Öst et al., 2012; Zandberg & Wilson, 2013). Given the phenomenon of therapist drift away from evidence-based practice in experienced therapists (Cowdrey & Waller, 2015; Waller & Turner, 2016), associated with decreasing effectiveness over time (Goldberg et al., 2016), the use of trainee psychologists is both viable and cost-effective.

In summary, studies of CBTgsh and several studies of CBT-ED provide support for the use of shorter treatment protocols and novice therapists as solutions to systemic barriers to accessing evidence-based eating disorder treatments. Furthermore, there is emerging evidence that there is a decrease in the dose-response effect in longer treatments for eating disorders (Beintner & Jacobi, In press; Bell et al., 2017) as well as for anxiety and depression (Delgadillo et al., 2013). The use of shorter treatments and novice therapists has shown to be both viable and efficacious from eating disorder, depression, and anxiety research and is

better suited to governmental mental health support in both Australia and the United Kingdom.

Introducing Ten-Session Cognitive Behavioural Therapy (CBT-T)

In an effort to counteract systemic barriers to treatment and address IAPT requirements in the United Kingdom, Waller et al. (2018) recently developed a 10-session version of CBT for eating disorders (CBT-T), a transdiagnostic outpatient treatment for non-underweight clients. While CBT-T is based on the same psychological underpinnings as CBT-ED, the clear session protocol of CBT-T allows trainee or novice therapists, such as provisional psychologists currently undertaking their postgraduate qualifications, to learn and deliver the therapy (Waller et al., 2018). In addition, the 10-session format is better suited to Australia's Medicare requirements making the treatment more affordable for individuals. Hence CBT-T has the capacity to meet Australia's need for more cost effective, accessible treatment.

CBT-T is a manualized treatment that adopts some of the key elements of CBT-ED (Fairburn, 2008; NICE, 2017; Waller et al., 2007), such as in-session weighing, exposure, nutrition, cognitive restructuring, body image work, and relapse prevention. The structure of CBT-ED and CBT-T are comparable, in that psychoeducation and changes to eating are addressed earlier in treatment, while body image concerns are addressed in the latter half of treatment and relapse prevention is addressed during final sessions (Fairburn, 2008; NICE, 2017; Waller et al., 2018). However, given the shorter duration of treatment, CBT-T places greater emphasis on early behavioural change, requiring fast adoption of regular eating and increased carbohydrate intake (Waller et al., 2018). While body image work is tailored to the individual client, the use of classic behavioural experiments, surveys, and mirror exposure are explicitly encouraged as core methods in the protocol (Waller et al., 2018). Notably, only four sessions are offered initially, with an extension to ten (inclusive of earlier sessions)

being contingent upon active engagement and progress with therapy tasks (Waller et al., 2018). This protocol recognizes that early change in outpatient therapies is one of the strongest predictors of good outcome (Vall & Wade, 2015), and encourages clients not actively engaging in CBT-T to return to treatment when they are ready to engage (Waller et al., 2018). Thus an increase in attrition may be expected given some clients will engage in collaborative discussions with their therapist about leaving treatment.

An initial evaluation of CBT-T with 106 non-underweight clients treated by clinical assistants (Bachelors level psychology students) under expert supervision showed that, by the end of treatment and at 3-month follow-up, statistically and clinically significant reductions were observed for both behavioural and cognitive measures of eating disorder symptoms (Waller et al., 2018). Effect sizes for all behaviours and cognitions were very large. Symptom reduction, abstinence (being free from all bulimic behaviours) and remission (abstinence plus EDE-Q global score ≤ 1 SD above the community norm) were found to be comparable to longer versions of CBT-ED (Byrne et al., 2011; Fairburn et al., 2009; Knott et al., 2015; Turner, Marshall, et al., 2015; Waller et al., 2014) and mean EDE-Q global scores at post treatment and follow-up fell below the clinical cut-off (≤ 1 SD above the community norm), an indicator of clinically significant change (Kraemer et al., 2003) that has previously been adopted in efficacy trials (Fairburn et al., 2015; Fairburn et al., 2009). There were also improvements in secondary outcomes, such as depression and anxiety symptoms, where large or very large significant reductions were observed at both mid- and post-treatment (Waller et al., 2018).

CBT-T is the first therapy of its kind as it has been designed purposefully as a briefer, focused version of CBT-ED to be delivered by novice therapists, overcoming current systemic barriers to accessing traditional CBT-ED. A key step in developing new therapies is establishing replicability (Open Science Collaboration, 2015), and therefore replicating

findings from the initial evaluation of CBT-T is critical. This approach conforms to the

Medical Research Council (MRC) guidance on developing and evaluating complex

interventions (Craig et al., 2008) which specifies that complex interventions should be

developed in a systematic manner (including the use of several pilot studies) prior to

conducting randomised controlled trials (Craig et al., 2008). Thus, replicating the initial CBT-

T study by Waller et al. (2018) is an important priority. This is the first major aim of the

current thesis.

The Role of Body Image in Eating Disorder Treatment

The second major aim of the thesis is to better understand the role of body image in

therapeutic outcomes. Body image is a multifaceted construct that encompasses both a

perceptual and attitudinal component (Cash, 2004). Thus, aspects of body image include

body size and shape estimation, global (dis)satisfaction, affective distress, cognitions, and

behavioural aspects (Cash & Smolak, 2011). One of the main modifications to CBT-E, which

originated from CBT for BN (Fairburn, 1981), was the added focus on weight and shape

concern and body image concerns. These concerns were considered an important maintaining

factor of the eating disorder behaviours in the model of eating disorders that informs CBT-E

(Fairburn et al., 2003), but this hypothesis has rarely been tested. One supporting cross-

sectional study has shown that low self-esteem was associated with greater over-evaluation of

weight and shape, which, in turn, was associated with increased dietary restraint (Lampard,

Byrne, McLean, & Fursland, 2011).

Specifically, the over-evaluation of shape and weight and their control is considered

to be central to core psychopathology while other features such as dieting restraint, bingeing

and purging are considered secondary (Fairburn, 2008). Therefore, body image cognitions

and behaviours are a main focus of CBT-E treatment (and of CBT-ED more broadly).The

over-evaluation of shape and weight and underlying behaviours and cognitions, e.g. "feeling

fat", are addressed and challenged in CBT-ED using cognitive behavioural strategies (Fairburn, 2008; Waller et al., 2007). CBT-T has the same focus on body image concerns as CBT-ED. In CBT-T, body image work is the focus of sessions six to nine and includes a historical review of body image concerns, behavioural experiments, cognitive restructuring, mirror exposure, and surveys (Waller et al., 2018).

Body Image Avoidance and Body Checking

CBT-ED (and CBT-T) targets two behavioural manifestations of body image disturbance, body image avoidance and body checking. Body image avoidance includes behaviours such as avoiding mirrors and weighing, preferring to wear baggy clothing to hide body shape, and withdrawing from social situations that involve body image or eating. In contrast, body checking involves obsessive weighing and shape checking, such as pinching, touching, or measuring body parts, and looking at mirrors and reflective surfaces (Fairburn, 2008; Menzel, Krawczyk, & Thompson, 2011; Waller et al., 2007). Both body image avoidance and checking are elevated in clinical eating disorder samples and thus are considered to be both risk and maintenance factors for eating disorders (e.g. Amin, Strauss, & Waller, 2012; Calugi, Dalle Grave, Ghisi, & Sanavio, 2006; Campana, Swami, Onodera, da Silva, & Tavares, 2013; Grilo et al., 2005; Menzel et al., 2011; Reas, Grilo, Masheb, & Wilson, 2005; Reas et al., 2002; Rosen et al., 1991; Shafran, Fairburn, Robinson, & Lask, 2003).

Two recent meta-analyses support the importance of assessing body image avoidance and body checking in eating disorder research. Walker, White, and Srinivasan (2018) found strong correlations with eating disorder pathology and body image dissatisfaction and moderate correlations with measures of mood and affect. Nikodijevic, Buck, Fuller-Tyszkiewicz, de Paoli, and Krug (2018) examined clinical and non-clinical populations separately. Body image avoidance and body checking were significantly higher in clinical

samples with large effects and in nonclinical samples both behaviours were correlated with eating disorder pathology (Nikodijevic et al., 2018). Correlations between constructs of interest tended to be stronger in female samples (Walker et al., 2018). Despite this, to our knowledge no study has evaluated whether either influences treatment outcomes (Vall & Wade, 2015).

Body Image Flexibility

Eating disorder research and treatment, like the field of body image more broadly, has typically focused on negative body image and neglected consideration of positive body image (Tylka & Wood-Barcalow, 2015). Considered distinct from negative body image, positive body image itself is multifaceted and consists of aspects such as appreciation, acceptance and love of one's body, focusing on one's body's assets rather than imperfections, and interpreting body-related information in a protective way (Webb, Wood-Barcalow, & Tylka, 2015). Positive body image has started to gain some attention in eating disorder treatment and research, particularly the construct of body image flexibility. Body image flexibility is an aspect of positive body image that is considered to be a protective factor for physical and psychological wellbeing (Tylka & Wood-Barcalow, 2015; Webb et al., 2015). Sandoz et al. (2013) define body image flexibility as the ability to accept and experience both positive and negative thoughts, beliefs, perceptions, and feelings about one's body.

In non-clinical samples using cross-sectional designs, body image flexibility was found to be protective for various forms of disordered eating. Sandoz et al. (2013) found that high body image flexibility buffered the effect of body image dissatisfaction on disordered eating. In addition, body image flexibility scores were more predictive of individuals at risk of developing an eating disorder than body image dissatisfaction (Sandoz et al., 2013). Ferreira, Pinto-Gouveia, and Duarte (2011) found body image flexibility to be a significant moderator of the association between body image

dissatisfaction and drive for thinness, a significant predictor of eating pathology, and an accurate discriminate between clinical and non-clinical samples. Similarly, Moore, Masuda, Hill, and Goodnight (2014) found body image flexibility to be negatively related to disordered eating and a significant moderator between disordered eating cognitions and behaviours. Body mass index (BMI) moderates the relationship between body image flexibility and disordered eating, such that higher flexibility is associated with less disordered eating for participants with lower BMI (Hill, Masuda, & Latzman, 2013). Body image flexibility also partially mediates the relationship between disordered eating cognitions and behaviours (Timko, Juarascio, Martin, Faherty, & Kalodner, 2014; Wendell, Masuda, & Le, 2012).

Body image flexibility has recently become an outcome of interest in treatment studies of clinical populations. Butryn et al. (2013) found greater improvement in flexibility is associated with greater reduction in eating disorder symptoms. Similarly, Lee et al. (2018) found changes in flexibility were associated with positive outcomes in eating disorder risk, quality of life, and general mental health, even after adjusting for general psychological flexibility. However, both studies assessed change simultaneously, not allowing for causal interpretations. Only one study, in an adolescent sample, used a prospective design, showing that pre-treatment flexibility predicted post-treatment quality of life and eating disorder risk when controlling for baseline levels of these variables (Bluett et al., 2016). Hence, while there is early evidence for body image flexibility as an important predictor of treatment outcomes, its role in adults remains to be tested.

Measuring Body Image Avoidance, Checking, and Flexibility

The Body Image Avoidance Questionnaire (BIAQ; Rosen et al., 1991) and the Body Checking Questionnaire (BCQ; Reas et al., 2002) are commonly used measures that were developed to assess body image avoidance and body checking respectively. Relative

to measures that assess the affective and cognitive components of body image, measures of the behavioural component of body image have received the least amount of attention (Cash & Smolak, 2011). While both the BIAQ and BCQ have been psychometrically evaluated, factor structure and reliability have been inconsistent across studies. Despite this, validity for both measures has been promising, with studies supporting the view that both behaviours are risk and maintenance factors for eating disorders.

The Body Image Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013) assesses body image flexibility. In contrast to the BIAQ and BCQ, it has demonstrated strong psychometric properties (see **Chapter Three**). As research on body image flexibility in eating disorder treatment remains limited, further investigation is required to confirm the applicability of the BI-AAQ to clinical populations. When considering all three measures together, previous studies have reported significant, moderate to strong correlations between the three measures using female samples, $r = .58$ - .78 (Campana et al., 2013; Cvetanovski, 2014; Latner, Mond, Vallance, Gleaves, & Buckett, 2012; Reas et al., 2002; Swami et al., 2012; Timko et al., 2014). However, to our knowledge the psychometrics of each measure have not been investigated simultaneously and thus it is unknown whether the BI-AAQ will remain a significant predictor of global eating disorder psychopathology when it is evaluated simultaneously with the BIAQ and BCQ.

Given body image avoidance and checking are maintenance factors, their accurate assessment will be important in eating disorder treatment studies to ascertain the effect of therapy on each behaviour. Thus a further aim of the current thesis was to examine validity and reliability of these three body image measures, which are reviewed in greater detail in **Chapter Three**. Furthermore, while body image flexibility is not routinely targeted in CBT-ED, its measurement will provide an opportunity to evaluate whether treatment can

succeed in improving an aspect of positive body image, in addition to decreasing aspects of negative body image.

Predictors and Moderators of Eating Disorder Treatment Outcomes

The evaluation of simple predictors and moderators of eating disorder treatment outcomes, early change variables, and predictors of attrition, is an important target of research in order to inform those mechanisms which may be most influential in determining treatment outcome. Throughout the thesis, simple predictors are considered to be variables measured at baseline which directly predict change in the outcome variable of interest over time (Vall & Wade, 2015). Moderators are variables that specify under what conditions a target variable is related to an outcome variables (Kraemer, Kiernan, Essex, & Kupfer, 2008). Specifically, in **Chapter Six**, a variable was considered to be a significant moderator if the size, sign, or strength of the effect of time (target variable) on the changing scores of the outcome variable (EDE-Q global score) was dependent on the predictor (Kelly, Carter, Zuroff, & Borairi, 2013). Early change variables are considered to be a change in a predictor that occurs in early in treatment (e.g. between baseline and mid-treatment) that subsequently predicts change in the outcome variable of interest over time (Kelly, Carter, & Borairi, 2014; MacDonald, Trottier, & Olmsted, 2017). Predictors of attrition, like simple predictors, are typically variables measured at baseline that predict whether or not an individual is likely to dropout from treatment (Vall & Wade, 2015)

Evaluating predictors and moderators of eating disorder treatment outcomes is particularly important given short and long-term remission rates only range from 37 to 69% across trials using evidence based CBT-ED (Linardon, de la Piedad Garcia, et al., 2017). Thus, there is a strong need to identify the characteristics that identify whether or not an individual will benefit from CBT-ED. In this way, current treatments may be able to be modified to make them more effective for more people (i.e. by focusing more on identified

variables that are likely to result in poorer outcomes) or enable clinicians to match individuals to the best treatment depending on the individual's characteristics. Furthermore, understanding those variables which predict poorer outcomes improves understanding of the disorders and aids in early diagnosis (Kraemer et al., 2008). The NICE (2017) guidelines also suggest focusing on such factors in order to address treatment barriers and promote positive factors. A greater understanding of predictors paves the way for more flexible, individualised treatment. Thus, a key aim of the thesis is to explore predictors and moderators of outcome in the context of CBT, particularlu for the body image variables discussed above given their central role in the development and maintenance of eating disorders. Specifically, the thesis will aim to assess both established and novel simple baseline predictors, early change variables, and moderators of outcome.

Simple Predictors of Outcome

Vall and Wade (2015) conducted a comprehensive meta-analysis and systematic review of predictors of treatment outcomes. The review was not specific to CBT-ED but instead included all studies of specialist eating disorder treatments published in peer-reviewed journals. Simple predictors were defined as baseline variables that predicted change in the outcome of interest over time (Vall & Wade, 2015). Their review highlighted several significant simple predictors of outcome. Specifically, predictors that significantly predicted improved outcome at both post-treatment and follow-up included fewer bulimic behaviours (bingeing, purging, driven exercise), greater motivation to recover, higher self-efficacy, higher BMI, lower depression, lower weight and shape concerns, older age of onset or shorter illness duration, better interpersonal functioning, and fewer familial problems (Vall & Wade, 2015). Lower eating disorder pathology and lower comorbid psychopathology were significant predictors of post-treatment outcome only while higher self-esteem was a significant predictor at follow-up but not post-treatment (Vall & Wade, 2015).

A recent systematic review examined predictors of outcome specifically in studies of CBT-ED (Linardon, de la Piedad Garcia, et al., 2017). Overall, the review concluded that of the 37 studies examining simple predictors findings were inconsistent (Linardon, de la Piedad Garcia, et al., 2017). Specifically, some studies found improved treatment outcomes were associated with greater motivation to change, earlier age of onset and shorter illness duration, lower shape concern, lower frequency of bulimic behaviours, higher BMI, lower weight suppression, lower depression, and lower comorbid psychopathology (Linardon, de la Piedad Garcia, et al., 2017). However, although the above summary appears consistent with the Vall and Wade (2015) review, none of the simple predictors reviewed were consistently replicated across all studies (Linardon, de la Piedad Garcia, et al., 2017). Thus it remains unclear whether there are robust simple predictors of treatment outcomes when using CBT-ED. In the initial evaluation of CBT-T, EDE-Q subscales, BMI, frequency of bulimic behaviours, personality beliefs, working alliance, anxiety and depression were assessed as simple predictors however none were found to significantly predict outcome (Waller et al., 2018).

Moderators of Outcome

Vall and Wade (2015) found no moderator variables that were examined in a minimum of three studies and therefore provided a narrative review of moderation findings. As the majority of studies reviewed used adolescent and/or AN samples, findings are not described here. Linardon, de la Piedad Garcia, et al. (2017) found 11 CBT-ED studies that assessed moderation however the majority of studies were with BED samples. Two studies using BN samples tested EDE subscales however no subscale was found to significantly moderate behavioural or cognitive outcomes (Linardon, de la Piedad Garcia, et al., 2017). BED studies found inconsistent results. For the majority of variables tested (age, gender, ethnicity, education, EDE global score, dietary subtype, depression, personality disorder, self-esteem), no study found a significant moderation (Linardon, de la Piedad Garcia, et al.,

2017). One study found participants categorised as having clinical over-evaluation of weight and shape concerns to have greater reductions in EDE global scores but a subsequent study did not replicate the finding. Furthermore, two studies found objective binge eating frequency to moderate EDE global scores however in opposite directions (see Linardon, de la Piedad Garcia, et al., 2017). Thus our current knowledge of moderators of treatment outcome is limited by a small number of studies and inconsistent findings.

A novel area of interest in eating disorder treatment research is self-compassion and the fear of self-compassion. Using a transdiagnostic inpatient and day program sample Kelly et al. (2013) found both self-compassion and the fear of self-compassion to be simple baseline predictors and moderators of post-treatment eating disorder symptoms. Participants with higher fear of self-compassion, and low self-compassion, had higher levels of eating disorder psychopathology at the end of treatment. Kelly et al. (2013) assessed the fear of self-compassion using a subscale from the fears of compassion scales developed by Gilbert, McEwan, Matos, and Rivis (2011) following clinical observation that some experience difficulty in expressing and receiving compassion to the self and others. While the treatment modality used was primarily CBT-ED, due to the inclusion of a variety of other treatment modalities the Kelly et al. (2013) study was not included in the Linardon, de la Piedad Garcia, et al. (2017) review. To our knowledge, this is the only study to have assessed self-compassion and the fear of self-compassion as moderators of eating disorder treatment outcome and thus further research is required in CBT-ED treatment studies to replicate the finding. A recent, non-clinical longitudinal study found self-compassion significantly moderated the relationship between weight/shape concerns and eating pathology in a sample of undergraduate students during the first three years of college (Stutts & Blomquist, 2018). Specifically, the relationship between weight/shape concerns and eating pathology was stronger for those with low self-compassion and weaker for those with higher self-

compassion (Stutts & Blomquist, 2018). Thus there is emerging evidence that self-compassion and the fear of self-compassion are moderators of eating disorder outcomes.

Early Change Variables

In both recent reviews, early symptom change was found to be the most robust and consistent predictor of outcome across all eating disorders (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015). Specifically, early reductions in eating disorder symptoms such as binge eating, purging, dietary restraint, and global eating disorder psychopathology typically lead to greater improvements in outcome related to eating disorder psychopathology, bulimic behaviours, and general psychopathology, at both end of treatment and follow-up. Thus, a focus on early change in eating disorder treatment has been encouraged, particularly through the use of behavioural techniques such as the use of homework tasks and self-monitoring, as in cognitive behavioural therapy (Linardon, Brennan, & de la Piedad Garcia, 2016).

Early change in therapeutic alliance has also been evaluated as a predictor of outcome in eating disorder treatment, however results have been mixed (Linardon, de la Piedad Garcia, et al., 2017). A recent meta-analysis of 20 studies spanning multiple therapy types and eating disorder diagnoses found a small but significant effect for early or mid-treatment alliance predicting outcome (Graves et al., 2017). However, the relationship between early symptom change predicting subsequent alliance was stronger, with a small to moderate effects, and early symptom change was found to partially account for the relationship between early alliance and outcome (Graves et al., 2017).

Beyond early change in symptoms and therapeutic alliance, exploration of additional early change predictors has been limited. Three potential avenues have been suggested. The first is variables related to body image. In a mixed diagnosis inpatient sample, changes to the Body Attitude Test (Probst, Vandereycken, Van Coppenolle, &

Vanderlinden, 1995) during treatment accounted for a large proportion of change in eating disorder psychopathology at end of treatment (Danielsen & Rø, 2012). Other studies found early change in body image related subscales of the Eating Disorder Examination interview or questionnaire (EDE/EDE-Q) and the Changes in Eating Disorder Symptoms Scale (CHEDS) to significantly predict outcome (Cavallini & Spangler, 2013; Spangler, Baldwin, & Agras, 2004; Turner, Bryant-Waugh, & Marshall, 2015), while one study did not (Wilson, Fairburn, Agras, Walsh, & Kraemer, 2002). Two residential treatment studies found early improvements in body image flexibility to be associated with greater reductions in eating disorder symptoms, quality of life, and general mental health (Butryn et al., 2013; Lee et al., 2018). However, it is unknown whether this result generalises to outpatient treatment. Second, greater decreases in shame and increases in self-compassion were found to significantly predict eating disorder symptoms for outcomes in hospital treatment (Kelly, Carter, et al., 2014). Third, emotion regulation is also of interest, with studies showing early change in emotion regulation to significantly predict global eating disorder psychopathology (Peterson et al., 2017) and abstinence from bingeing and purging (MacDonald, Trottier, et al., 2017). Hence there is emerging evidence for additional early change variables that significantly predict eating disorder outcomes, however available studies are limited and at least half did not control for early symptom change.

Predictors of Attrition

Attrition varies between 10.3% to 50% in effectiveness studies of CBT-ED (Byrne et al., 2011; Knott et al., 2015; Rose & Waller, 2017; Signorini et al., 2018; Turner, Marshall, et al., 2015; Waller et al., 2014). Hence assessing predictors of attrition is important to identify those most at risk for dropping out of treatment and to inform treatment engagement strategies. Vall and Wade (2015) found two significant predictors of

dropout, more frequent bingeing and purging at baseline and lower motivation at baseline.

Waitlist length has also been found to be a significant predictor of dropout (Carter et al.,

2012), reinforcing the need to overcome systemic barriers to accessing treatment. A recent

meta-analysis of randomised controlled trials (RCTs) of CBT with eating disorder samples

found dropout was highest in internet-based CBT and lowest in manualised versions of

CBT-ED such as CBT-E and CBT-BN (Linardon, Hindle, & Brennan, 2018). While there

was limited evidence that lower dropout was associated with longer treatment, all other

factors were not found to significantly predict drop out (Linardon et al., 2018). Given the

need to improve outcomes in eating disorder treatment, it is important that predictors of

attrition are further examined that can inform future revisions of treatment protocols.

Methodological Limitations

Across the literature reviewed in this chapter, there are several key limitations

apparent in current methodology and treatments. For instance, while CBT-ED is

considered to be the most effective psychological treatment for eating disorders (Linardon,

Wade, et al., 2017), as many as 60% of individuals do not meet criteria for remission at the

end of treatment (Linardon, Wade, et al., 2017). Similarly, a recent meta-analysis of BN

RCTs found more than 60% of individuals did not abstain from core BN symptoms at

post-treatment and follow-up (Linardon & Wade, 2018). Thus, substantial work is required

to improve current treatments. Body image is reviewed as an important area for future

treatment to target and assess, particularly given the importance of body image concerns in

the model of eating disorders that informs CBT-E (Fairburn et al., 2003). Thus far, work in

the area of body image avoidance and checking has been predominately cross-sectional

and with non-clinical samples, and using samples comprised mostly of Caucasian women

(e.g. Nikodijevic et al., 2018; Walker et al., 2018). Furthermore, no study has yet

evaluated whether either influences treatment outcomes (Vall & Wade, 2015). Similar

limitations are consistent in body image flexibility however some researchers have utilised

more diverse samples (Kurz, Flynn, & Bordieri, 2016) and several studies have assessed

body image flexibility in residential treatment studies (Bluett et al., 2016; Butryn et al.,

2013; Lee et al., 2018). However, of these clinical studies, only Bluett et al. (2016) used a

prospective design. The majority of work assessing simple predictors, moderators, and

early change variables has overlooked body image and while several key findings were

reviewed, findings have often not been replicated across all studies (Linardon, de la Piedad

Garcia, et al., 2017; Vall & Wade, 2015).

Conclusions

This review has concluded that CBT-ED is the best evidence-based treatment for non-

underweight disorders (Hay et al., 2014; Linardon, Wade, et al., 2017; NICE, 2017).

However, due to the length of the treatment and requirement for experienced clinicians, high

treatment costs and limited access to treatment create systemic barriers to treatment that need

to be addressed. CBT-T (Waller et al., 2018) was described as a newer, shorter treatment for

non-underweight eating disorders that is suitable for delivery by novice therapists and thus

offers a solution to the current systemic barriers to accessing treatment in Australia,

particularly given the current Better Access to Mental Health Care initiative. The use of

shorter treatment protocols and novice therapists have been demonstrated successfully in

several studies of CBTgsh (e.g. Wilson & Zandberg, 2012) in addition to some studies of

CBT-ED. The initial evaluation of CBT-T found outcomes comparable to longer versions of

CBT-ED (Waller et al., 2018). Replication of findings is an important next step in the

development of CBT-T and thus is a key aim of this thesis. Second, while body image

variables such as body image avoidance, checking, and flexibility are considered to be

important risk and maintenance factors in eating disorders, they have seldom been evaluated

in treatment studies. Rather, variables related to the over-evaluation of shape and weight

more broadly have been evaluated. Thus, a second key aim of the thesis is to better understand the role of body image in eating disorder treatment by evaluating whether body image avoidance, checking, and flexibility are simple predictors of outcome, moderators of outcome, and whether early change in body image is predictive of outcome. Additional predictors and moderators of outcome, early change variables, and predictors of attrition identified in prior research will also be examined to compare the role of body image to both established and novel predictors of outcome.

CHAPTER 3

Measures[2]

Measures that appear regularly across the studies described in the thesis are summarised in depth below. Thus, unless a measure is unique to that study and therefore has not been summarised in the present chapter, the measures appearing below will be described briefly in forthcoming chapters to avoid repetition. Generally all measures were chosen because they were considered robust indicators of the construct of interest. Where this was not the case, as for the body image variables, examinations of structure were conducted and appear in **Chapter 4**.

Global Eating Disorder Psychopathology

Description

The Eating Disorder Examination Questionnaire version 6.0 (EDE-Q; Fairburn & Beglin, 1994, 2008) is a 28-item measure of eating disorder psychopathology over the previous 28 days. Items (*N*=22) assess behavioural and cognitive aspects of eating disorders (e.g., "Have you had a definite desire to have a totally flat stomach"), using scales with a 7-point Likert scale either related to frequency (0 = *No days*, 6 = *Every day*) or intensity (0 = *Not at all*, 6 = *Markedly*). Six further items assess behavioural diagnostic symptoms (e.g., "Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight?") that are rated using frequencies. Four subscales are comprised from the 22 cognitive items and include Restraint, Eating Concern, Shape Concern, and Weight Concern. A global score is calculated by summing and averaging the four subscales (Fairburn & Beglin, 1994). Higher scores indicate greater eating disorder psychopathology.

Factor Structure

The EDE-Q was developed by directly modifying items from the Eating Disorder Examination (Fairburn, Cooper, & O'Connor, 2008), a semi-structured interview of global eating disorder psychopathology. The initial development of the EDE-Q did not complete a

factor analysis to confirm the four subscales and global score (Fairburn & Beglin, 1994). An exploratory factor analysis (EFA), specifying four factors for extraction, was first performed by Peterson et al. (2007) using a sample of participants with bulimic symptoms. At that time, the EDE-Q consisted of 36 items. Variance accounted for by each factor was not reported. Factor loadings ranged from .272 to 1.032 and factor correlations ranged from .077 to .498 (Peterson et al., 2007). However, the items loading on to each factor differed from the original proposed structure. A post-hoc analysis extracting three factors found that the Restraint and Eating Concern factors were largely similar while the Shape and Weight Concern factors were combined as one factor (Peterson et al., 2007). A second EFA of a 32-item version was completed by Hrabosky et al. (2008) using a sample of obese bariatric surgery candidates. The EFA included the 23 cognitive items and three of the behavioural items. Behavioural items were recoded to be consistent with the scoring for cognitive items. Items were retained if they loaded on one factor with a loading of .50 or higher while factors were retained if they had an eigenvalue of 1.00 or higher and accounted for at least 5% of total variance (Hrabosky et al., 2008). A four-factor solution was identified which accounted for a total of 52.9% variance. The resulting factors were comparable to the solution reported by Peterson et al. (2007) and thus the original solution was not replicated (Hrabosky et al., 2008). A subsequent confirmatory factor analysis (CFA) was performed and fit indices were considered to be adequate for this solution (Hrabosky et al., 2008). Although the original factor structure has not been replicated, scoring for the EDE-Q is consistent with the originally proposed subscales, rather than subsequent factor analytic findings. Given the uncertainty about factor structure, and that numerous treatment studies use the global EDE or EDE-Q score as a main indicator of outcome across eating disorders and age groups (e.g. Byrne et al., 2011; Fairburn et al., 2009; le Grange, Crosby, Rathouz, & Leventhal, 2007;

Lock et al., 2010; Turner, Marshall, et al., 2015; Wade, Treasure, & Schmidt, 2011) the

global EDE-Q score is reported only throughout the thesis.

Reliability and Validity

Internal consistency (Cronbach's α = .70 - .93), test-retest reliability (short-term, over

1-14 days, r = .66 - 94), and temporal stability (long term test-retest reliability, over 5-15

months, r = .57 - 82) for the four (original) subscales are considered adequate (Berg,

Peterson, Frazier, & Crow, 2012). However, limited psychometric data is available for

several of the behavioural items (Berg et al., 2012). The EDE-Q Restraint subscale is

correlated with other measures of restraint and bulimic symptoms, and food records, and all

subscales are strongly correlated with the interview version of the EDE (Berg et al., 2012;

Fairburn & Beglin, 1994). Additionally, the EDE-Q has been found to successfully

differentiate between those with and without an eating disorder (Berg et al., 2012). The EDE-

Q is routinely used in most evaluations of treatment to assess the over-evaluation of weight

and shape.

Clinical Impairment

Description

The Clinical Impairment Assessment (CIA; Bohn et al., 2008; Bohn & Fairburn,

2008) is a 16-item measure of psychosocial impairment caused by eating disorder

psychopathology. Items (e.g., "Over the past 28 days, to what extent have your eating habits,

exercising or feelings about your eating, shape or weight made it difficult to concentrate?")

are rated on a 4-point Likert scale (0 = *not at all*, 3 = *a lot*) and are summed to calculate a

global CIA impairment score (Bohn et al., 2008; Bohn & Fairburn, 2008). Higher scores

indicate greater psychosocial impairment and a total score of 16 is considered to be indicative

of an eating disorder (Bohn et al., 2008). The CIA was developed to compliment the EDE-Q

and has been designed to be administered directly after the EDE-Q (Bohn et al., 2008).

Factor Structure

The authors examined an initial pool of 22 items using Item Response Theory (IRT) which concluded that the questionnaire was not significantly unidimensional, contrary to the authors' aim (Bohn et al., 2008). Five items were deemed as having a floor effect, as significantly misfitting or inconsistent with the underlying construct were omitted. Principal components factor anaysis of the remaining 17 items found two items that did not load clearly onto a domain. One item was retained due to clinical relevance. Principal components factor analysis of the remaining 16 items initially found items loaded on to two factors explaining 71% of the variance. As one factor had low loadings, a three factor solution was specified which accounted for 77% of the total variance, with loadings ranging between 0.45 to 0.86 (Bohn et al., 2008). The three factors were considered as three specific domains of impairment: personal, social, and cognitive (Bohn et al., 2008). Subsequent IRT analysis found both the overall measure and specific domains to be significantly unidimensional. With the exception of Jenkins (2013), several subsequent studies have confirmed the original factor structure (Calugi et al., 2018; Martín et al., 2015; Reas, Rø, Kapstad, & Lask, 2010).

Reliability and Validity

Internal consistency (Cronbach's α = .97) and test-retest reliability (r = .86, after a three day interval) are adequate and the cut-off score of 16 was found to have 76% sensitivity and 86% specificity (Bohn et al., 2008). The CIA correlates well with the global EDE-Q score and clinician ratings of impairment, and discriminated between those with and without an eating disorder (Bohn et al., 2008). In addition, the CIA was recently found to correlate well with a measure of general psychopathology (Calugi et al., 2018). The strong psychometric properties of the CIA have been confirmed by several investigations (Calugi et al., 2018; Jenkins, 2013; Vannucci et al., 2012).

Negative Affect

Description

The Depression Anxiety and Stress Scales short form (DASS21; Lovibond & Lovibond, 1995), a 21 item measure of general psychopathology and negative affect. Items (e.g. "I felt down-hearted and blue") are rated on a 4-point Likert scale (0 = *did not apply to me at all*, 3 = *applied to me very much, or most of the time*) and Depression, Anxiety, and Stress subscales are summed to calculate a total score where higher scores indicate greater psychopathology (Lovibond & Lovibond, 1995). Subscale scores can be categorised as normal, mild, moderate, severe, or extremely severe.

Factor Structure

Lovibond and Lovibond (1995) presented a factor analysis only for the full 42-item version of the DASS and suggested 21 items (7 from each factor) to be used for the short version (i.e. a factor analysis of the 21 items was not conducted). Using a clinical sample, Antony, Bieling, Cox, Enns, and Swinson (1998) performed an EFA with principal components which supported a three-factor solution (i.e., depression, anxiety, and stress subscales), accounting for 67% of the total variance. The factor structure was considered to be similar to the full 42-item version of the DASS, however the authors summarised that the DASS-21 solution had a cleaner factor structure with smaller inter-factor correlations (Antony et al., 1998). Factor loadings for the DASS21 were typically quite high, ranging from .48 to .91 (Antony et al., 1998). The factor structure of the DASS21 was subsequently examined with a CFA by Clara, Cox, and Enns (2001) using a psychiatric sample. Two models were examined, the 21-item model proposed by Lovibond and Lovibond (1995) and a second 21-item model comprised of the remaining items from the 42-item DASS (Clara et al., 2001). The original 21-item model (Lovibond & Lovibond, 1995) was found to be a better fit

than the alternative model (Clara et al., 2001). Correlations between factors ranged from .50 to .75 (Clara et al., 2001).

A second CFA was completed by Henry and Crawford (2005) using a general population sample. Using the same model proposed by Lovibond and Lovibond (1995) and later evaluated by Clara et al. (2001), poor fit indices were initially found, although improvements were observed after permitting correlated error (Henry & Crawford, 2005). Several alternative models were subsequently tested and the best fit indices were found for a quadripartite model (that included an additional general distress factor) when correlated error was permitted (Henry & Crawford, 2005). All items were found to load on to the general distress factor, with factor loadings all ≥ .36 (Henry & Crawford, 2005). Several subsequent studies have continued to examine the DASS21 using both EFA and CFA (see Osman et al., 2012). In a recent evaluation of factor structure, Osman et al. (2012) found stronger support for the DASS21 total score as opposed to computing subscales or dimensions. The DASS21 total score is thus used in the thesis.

Reliability and Validity

The DASS21 has good internal consistency (α = .81 - .94 across subscales, .93 total scale), is correlated with other measures of depression, anxiety, negative affect, and mixed depression and anxiety, and discriminates well between clinical and non-clinical samples (Antony et al., 1998; Henry & Crawford, 2005; Osman et al., 2012).

<div align="center">

Body Image Flexibility

</div>

Description

The Body Image Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013) is a 12-item unidimensional affective measure of body image designed to measure body image flexibility, the ability to accept and experience thoughts, beliefs, perceptions, and feelings about one's body. Sandoz et al. (2013) developed the BI-AAQ by adapting three

versions of the Acceptance and Action Questionnaire, a measure of psychological flexibility (Bond & Bunce, 2003; Bond et al., 2011; Hayes et al., 2004). Items (e.g., "To control my life, I need to control my weight") are rated on a 7-point Likert scale (1 = *never true*, 7 = *always true*) and are reverse scored and summed such that higher scores indicate greater body image flexibility.

Factor Structure

Sandoz et al. (2013) initially tested a total of 46 items. Item-total correlations were examined and items with negative correlations or correlations less than .30 were removed, leaving a total of 29 items. Resulting items were assessed using several indices and were considered appropriate for principal factor analysis. Using all 29 items, two factors were initially found with the first factor accounting for 34.6% of the variance and the second factor contributing an additional 7.4% variance (Sandoz et al., 2013). However, all items were found to load on to one factor (above 0.30) with some loading on to both factors. Given items loaded on to the second factor appeared to do so due to a difference in wording direction, factor analysis was repeated by specifying one factor for extraction. This single factor accounted for 34.4% variance. The final 12 items were selected as each had a factor loading of greater than .60 (Sandoz et al., 2013). This 12-item one-factor model was found to have good reliability and validity (reported below) and several subsequent studies using factor analysis have since confirmed the structure and psychometrics of the model (Ferreira et al., 2011; Kurz et al., 2016; Timko et al., 2014).

Reliability and Validity

The BI-AAQ has good internal consistency (Cronbach's α = .91 - .95), item-total reliability (*r* = .50 – 82), and test-retest reliability (*r* = .80 - .82 after a three to four week interval) (Ferreira et al., 2011; Kurz et al., 2016; Sandoz et al., 2013; Timko et al., 2014). It is correlated with measures of eating disorder psychopathology, general psychopathology, self-

compassion, self-esteem, social comparison, body dissatisfaction, body appreciation, BMI, intuitive eating, distress tolerance, internalisation of the thin ideal, psychological flexibility, body checking and body image avoidance (Ferreira et al., 2011; Hill et al., 2013; Kelly, Vimalakanthan, & Miller, 2014; Sandoz et al., 2013; Schoenefeld & Webb, 2013; Timko et al., 2014; Wendell et al., 2012). Eating disorder and dieting samples, in addition to those classified 'at risk' for eating disorders, have significantly lower BI-AAQ scores compared to controls (Ferreira et al., 2011; Masuda, Hill, Tully, & Garcia, 2015; Sandoz et al., 2013; Timko et al., 2014) and improvements have been demonstrated following inpatient eating disorder treatment (Bluett et al., 2016; Butryn et al., 2013; Lee et al., 2018).

Body Image Avoidance

Description

The Body Image Avoidance Questionnaire (BIAQ; Rosen et al., 1991) is a 19-item behavioural measure of body image that assesses the avoidance of body image related situations. Items (e.g., "I avoid going clothes shopping") were originally rated on a 6-point Likert scale (0 = *never*, 5 = *always*). However, the response format has been changed throughout the thesis to match that of the BI-AAQ, enabling factor analysis for **Chapter Four**. Scores are summed such that higher scores indicated greater body image avoidance.

Factor Structure

The BIAQ was developed following interviews with body dissatisfied young (18-20), university women (Rosen et al., 1991). Answers that were given by 3 or more participants were retained as items (i.e. 19 items). Principal-components factor analysis using varimax rotation and a minimum eigenvalue of 1 found a four factor model that explained 60.3% of variance (Rosen et al., 1991). All inter-item and factor correlations were above .30. The four factors were labelled as Clothing, Social Activities, Eating Restraint, and Grooming and Weighing, which explained 36.4%, 9.7%, 7.3%, and 6.9% of the variance respectively

(Rosen et al., 1991). A second factor analysis was completed with a second sample and the structure was reported to closely replicate the initial factor analysis. The agreement between the first and second analyses ranged from .93 - .98 across the four factors and thus cross-validity was concluded (Rosen et al., 1991).

The original factor structure was replicated by Maïano, Morin, Monthuy-Blanc, and Garbarino (2009). However, other studies have found three factor models (Campana, Tavares, da Silva, & Diogo, 2009; Legenbauer, Vocks, & Schütt-Strömel, 2007; Riva & Molinari, 1998) or a two factor model (Lydecker, Cotter, & Mazzeo, 2014). Solutions have also differed in the number of total items. For instance 11 items (Legenbauer et al., 2007), 13 items (Campana et al., 2009; Riva & Molinari, 1998), and 14 items (Lydecker et al., 2014). Thus, there is considerable variability in current factor analytic and psychometric studies. For the thesis it was important to evaluate which solution would be most appropriate for use in subsequent CBT-T case series.

Reliability and Validity

Internal consistency reliability (Cronbach's α = .64 - .89) and test-retest reliability (r = .64 – 87 after a two week interval) vary across studies (Legenbauer et al., 2007; Lydecker et al., 2014; Maïano et al., 2009; Riva & Molinari, 1998; Rosen et al., 1991). The BIAQ is correlated with measures of eating disorder psychopathology, body shape and size, body image flexibility, body checking, social physique anxiety, and self-esteem (Maïano et al., 2009; Reas et al., 2002; Rosen et al., 1991; Timko et al., 2014). Participants with BN were found to have greater scores compared to controls (Rosen et al., 1991). Similarly, BIAQ scores were found to differentiate between low-weight participants with AN, weight-restored participants with AN, and healthy weight controls (Bamford, Attoe, Mountford, Morgan, & Sly, 2014). Rosen et al. (1991) also found BIAQ scores to decrease following cognitive behavioural therapy for body image.

Body Checking

Description

The Body Checking Questionnaire (BCQ; Reas et al., 2002) is a 23-item behavioural measure of body image that assesses body checking behaviours. Items (e.g., "I check to see if my thighs spread when I'm sitting down") were originally rated on a 5-point Likert scale (1 = *never*, 5 = *very often*). However, the response format has been changed throughout the thesis to match that of the BI-AAQ, enabling factor analysis for **Chapter Four.** Scores are summed such that higher scores indicate greater body checking.

Factor Structure

Possible items for the BCQ were generated after reviewing the literature on eating disorder habits and after consultation with eating disorder clients, clinical psychology graduate students, and a panel of experts in the field (Reas et al., 2002). EFA using principal components analysis and oblique rotation was performed on an initial item pool of 38 items. Three factors (labelled Overall Appearance, Specific Body Parts, and Idiosyncratic Checking) with eigenvalues above 1 were found to explain 50% of the total variance (Reas et al., 2002). After assessing loadings on to factors, 10 items were omitted due to loadings of less than .50. A second EFA was performed which found 13 items loading on to the Overall Appearance factor (20.6% variance explained), 9 items loading on the Specific Body Parts factor (15.5% variance) and 6 items loading on to the Idiosyncratic Checking factor (15.2%; Reas et al., 2002). Correlations between factors ranged from .56 to .85 (Reas et al., 2002). This solution was further examined using a CFA with maximum likelihood in a second sample which initially found marginal indices which were later improved after 5 items were omitted (Reas et al., 2002). Item loadings for the resulting 23-item higher-order solution ranged from .58 to .85 while factor loadings on to a higher-order factor ranged from .79 to .93 (Reas et al., 2002). Cross-validation confirmed the solution.

The original factor structure was subsequently replicated (Calugi et al., 2006; Campana et al., 2013; Reas, von Soest, & Lask, 2009; Reas, White, & Grilo, 2006). However, other studies have found a one (Vocks, Moswald, & Legenbauer, 2008), two (White, Claudat, Jones, Barchard, & Warren, 2015), or three factor model with subscales varying from the original model (Lydecker et al., 2014). Thus, like the BIAQ, further evaluation was required to confirm the most appropriate solution for use in subsequent case series of CBT-T.

Reliability and Validity

Internal consistency reliability (Cronbach's α = .66 - .95) and test-retest reliability (*r* = .83 – 94 across one and two week intervals) vary across studies (Calugi et al., 2006; Campana et al., 2013; Lydecker et al., 2014; Reas et al., 2009; Reas et al., 2002; Reas et al., 2006; White et al., 2015). Scores are correlated with measures of body dissatisfaction, body image avoidance, eating disorder psychopathology, BMI, depression, self-esteem, social anxiety, exercise intensity, and body surveillance, and scores are higher in clinical and dieting samples (Calugi et al., 2006; Campana et al., 2013; Reas et al., 2009; Reas et al., 2002; Reas et al., 2006; White et al., 2015).

CHAPTER 4

Measures of body image: Confirmatory Factor Analysis and Association with

Disordered Eating[3]

---

[3] A version of this chapter has been published in *Psychological Assessment* (Pellizzer,

Tiggemann, et al., 2018), provided in **Appendix A**.

Abstract

The current study aimed to examine the factor structure, reliability, and validity of three measures of body image disturbance (body image flexibility, body avoidance, and body checking) considered to be relevant to eating disorder psychopathology, with the aim of determining the optimal structure of each for use in treatment planning and outcome monitoring. Additionally, the study aimed to identify which factors had the strongest association with disordered eating. Participants were 328 female undergraduate university students aged 17-25 years. Confirmatory factor analyses were conducted followed by correlational, regression, and *t*-test analyses. The original proposed models were retained for the body image flexibility and body checking measures, while an alternative model was supported for the body image avoidance measure. All three solutions were found to have acceptable validity and reliability. Scores on each measure differed significantly between normal and disordered eaters. The body image flexibility measure and selected subscales of the body image avoidance and checking measures had unique associations with eating disorder psychopathology and psychosocial impairment. Results of this study indicate how the assessment of body image can be achieved in treatment of eating disorders in such a way as to reduce participant burden while adequately assessing the body image disturbance that is characteristic of eating disorders.

Introduction

The two main behavioural manifestations of body image disturbance targeted in treatment are body image avoidance and body checking. While not routinely targeted in treatment, interest has turned more recently to the role of body image flexibility. However, valid measurement of these three elements requires further improvement. While early investigations of the Body Image Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013) find the measure to be psychometrically sound, to date the BI-AAQ has not been widely used in eating disorders and remains novel. Furthermore, it is unclear whether body image flexibility is a unique predictor of eating disorder psychopathology when considered alongside other relevant body image measures. The Body Image Avoidance Questionnaire (BIAQ; Rosen et al., 1991) and the Body Checking Questionnaire (BCQ; Reas et al., 2002) have been subject to more psychometric evaluation, however studies have found inconsistent factor structure and reliability. However, both measures have demonstrated convergent and concurrent validity with respect to eating disorder samples, suggesting their potential value in assessment of relevant targets in eating disorder intervention (see **Chapter Three**).

The primary aim of the current study is to examine the factor structure of each of the three measures of body image by testing models supported by prior research, with a view to determining the optimal structure to inform treatment planning and monitor outcomes related to body image disturbances observed in disordered eating and its associated psychological impairment. We achieve this using a female university sample who reported a full range of disordered eating. A second aim is to determine which factors have the strongest association with disordered eating, as well as with issues commonly associated with disordered eating, including perfectionism, depression, anxiety, and body dissatisfaction. Negative affect (i.e., depression and anxiety) and body dissatisfaction were classified as two of the most potent risk factors for developing disordered eating in a large longitudinal study focused on

university-age women (Jacobi & Fittig, 2010). Additionally, clinical perfectionism has been considered as a risk and maintenance factor for eating disorders in addition to depression and anxiety disorders (Egan, Wade, & Shafran, 2011). Given the problems with assessment burden in a clinical population who are undergoing treatment, the findings will allow clinicians to select the most relevant subscales, rather than using each measure in its entirety.

Method

Participants

A total of 346 female university students from Flinders University, South Australia, were recruited from two separate studies. The majority of participants ($N = 234$) were recruited to address the aims outlined in this paper and completed an online questionnaire entitled "Body image and eating behaviours". A subgroup ($N = 112$, 34%) participated in a separate study entitled "Thinking styles in young women" where the primary aims focused on attention bias related to body dissatisfaction. Data from this second study were amalgamated with the first to increase power and allow for a greater variety of variables to be considered in validity analyses. All participants received either course credit or payment for their participation. Participants who did not meet inclusion criteria for either study (aged 17 to 25 years and female) were excluded from the analyses ($N = 18$). Therefore, the final number of participants included in analyses was 328. The mean age was 19.74 years ($SD = 2.13$) and the majority identified as being Caucasian (74.7 %). Participants also identified as being Aboriginal or Torres Strait Islander (0.3%), Asian (17.1%), African (0.6%), or of other descent (7.3%). The mean body mass index (BMI) was 23.00 ($SD = 4.77$), with a range of 14.69 to 59.99.

Measures

Participants completed the following measures:

Body image flexibility. The BIAAQ (Sandoz et al., 2013) was used as a measure of body image flexibility. The BI-AAQ has strong psychometric properties (see **Chapter Three**).

Body image avoidance. The BIAQ (Rosen et al., 1991) measures body image avoidance. To date, varying factor structures and psychometric properties have been reported (see **Chapter Three**). The response format was changed from a 6-point to a 7-point Likert scale to enable factor analysis.

Body checking. The BCQ (Reas et al., 2002) assesses body checking behaviours. Like the BIAQ, varying factor structures and psychometric properties have been reported (see **Chapter Three**). The response format was also changed from a 5-point to a 7-point Likert scale, enabling factor analysis.

Global eating disorder psychopathology. The Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) was used as a measure of global eating disorder psychopathology over the previous 28 days. The EDE-Q global score has good psychometric properties (see **Chapter Three**).

Clinical impairment. The Clinical Impairment Assessment (CIA; Bohn et al., 2008; Bohn & Fairburn, 2008) measures psychosocial impairment due to eating disorder psychopathology. Strong psychometric properties have been reported (see **Chapter Three**).

Depression and anxiety. The Depression and Anxiety subscales from the Depression Anxiety and Stress Scales short form (DASS21; Lovibond & Lovibond, 1995) were administered to participants in the second study (N=112). Good reliability and validity have been reported, although factor structure has varied across studies (see **Chapter Three**).

Perfectionism.

Description. The 7-item Personal Standards (PS) subscale and 9-item Concern over Mistakes (CM) subscale from the Multidimensional Perfectionism Scale (MPS; Frost,

Marten, Lahart, & Rosenblate, 1990) were administered to participants in the second study (*N*=112) to assess clinical perfectionism. Both the PS and CM subscales were listed in a paper defining clinical perfectionism and appropriate measurement (Shafran, Cooper, & Fairburn, 2002), hence their inclusion here. Items (e.g., "I set higher goals than most people") are rated on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*) and are summed and averaged such that higher scores indicate greater perfectionism (Frost et al., 1990). Given the two subscales are correlated (r = .47; Frost et al., 1990), the two were combined to create a total perfectionism score.

Factor structure. The MPS was developed by creating an item pool from previous measures of perfectionism and additional items to assess five hypothesised dimensions of perfectionism: Personal Standards, Concern over Mistakes, Parental Expectations, Doubting of Actions, and Organisation (Frost et al., 1990). From an initial pool of 67 items, 20 were omitted after using reliability analyses, leaving 47 items to be explored with a sample of female undergraduate students using factor analysis with a principal-factor solution (Frost et al., 1990). Initially a 10-factor solution was found but this reduced to 6 factors after removing 4 factors that contributed the least amount of variance. The 36-item 6-factor solution explained a total of 54% variance (Frost et al., 1990). The Concern over Mistakes factor explained the largest amount of variance (22.5%), followed by Organisation (12.5%), Personal Standards (6.6%), Parental Expectations and Parental Criticism (5.4% and 3.8% respectively, initially considered as one Parental Expectations dimension), and Doubts about Action (2.8%; Frost et al., 1990). However, the Organisation scale was found to have a weak pattern of inter-correlations with other subscales and while it was retained as a separate factor in the measure, it was omitted from calculation of overall perfectionism (Frost et al., 1990). In a second cross-validation sample, the 6-factor solution was replicated and accounted for 64.5% of variance (Frost et al., 1990). Some items were found to load higher on different

factors and thus changes were made to the factor structure where appropriate (Frost et al., 1990). Variance explained by each factor was similar to the initial solution and the same conclusion was reached regarding the Organisation scale. Subsequent studies using factor analysis have found differing solutions (see Burgess, Frost, & Marten DiBartolo, 2016).

Reliability and validity. The PS and CM subscales have good internal consistency (α = .83 PS and α = .88 CM) and are correlated with other measures of perfectionism, self-evaluation, general psychopathology, procrastination, and compulsivity (Frost et al., 1990).

Body dissatisfaction.

Description. The 9-item body dissatisfaction subscale of the Eating Disorder Inventory (EDI-3; Garner, 2004) was administered to participants in the second study (*N*=112). Items (e.g., "I think my stomach is too large") are rated on a 6-point Likert scale (1 = *always*, 6 = *never*). Items 3, 5, 6, 7, and 9 are reverse scored and all items are summed and averaged, with lower scores indicating a greater level of body dissatisfaction.

Factor structure. The original EDI was developed in 1983 to assess symptom clusters of clinical relevance to individuals with eating disorders (Nyman-Carlsson & Garner, 2016). The most recent version, the EDI-3 (Garner, 2004), consists of 91 items comprising 12 subscales (3 eating disorder risk subscales and 9 'psychological' subscales) in addition to six composite scores and three response style indicators . EFAs were conducted separately on eating disorder risk items and psychological items due to earlier findings that the two areas are broad, distinct constructs (Garner, 2004). For eating disorder risk items, EFAs using principal axis extraction and promax rotation confirmed a three-factor model which accounted for 63% of total variance in a US adult clinical sample, 60.8% in an international adult clinical sample, and 65.6% in a US adolescent clinical sample (Garner, 2004). For psychological items, EFAs found an 8 (rather than 9) factor model to be the best solution, explaining 52.3%, 57.4%, and 46.6% of total variance for the samples previously described

(Garner, 2004). However, 9 factors were subsequently decided on after considering content and inconsistent item-total correlations across the three samples (Garner, 2004). The first independent evaluation of the EDI factor structure was completed by Clausen, Rosenvinge, Friborg, and Rokkedal (2011) using both a clinical and non-clinical Danish sample. Several models were tested using CFA and the best fitting model was the 12-factor model specified in the EDI-3 manual (Clausen et al., 2011; Garner, 2004).

Reliability and validity. The EDI-3 has good internal consistency (majority of subscales and composites above .80) for adolescent and US samples (Nyman-Carlsson & Garner, 2016). However, international samples have found lower reliability for some subscales (Nyman-Carlsson & Garner, 2016). The Body Dissatisfaction subscale in particular has demonstrated good internal consistency ($\alpha = .88 - .96$) across the three tested samples (Garner, 2004). Short-term test-retest reliability is considered excellent ($r = .91 - .98$ all subscales, $r = .95$ Body Dissatisfaction subscale) and the EDI-3 successfully discriminates between eating disorder and control samples with high sensitivity and specificity (Clausen et al., 2011; Cumella, 2006; Garner, 2004; Nyman-Carlsson, Engström, Norring, & Nevonen, 2014; Nyman-Carlsson & Garner, 2016). The EDI-3 is correlated with measures of eating disorder symptoms, personality, and psychopathology (Garner, 2004)

Procedure

Following approval by the Institutional Research Ethics Committee, participants were recruited online via the psychology registration system. All participants completed the three body image measures and the measures of eating disorder psychopathology and psychosocial impairment related to eating (EDE-Q and CIA). In addition, the subgroup completed measures of depression and anxiety, body dissatisfaction, and perfectionism. Height and weight were self-reported.

Statistical Analyses

Confirmatory factor analysis (CFA), the best analysis to test models suggested by prior research, was conducted using Mplus7.1 (Muthén & Muthén, 1998-2017) separately for each body image measure. For the BI-AAQ, the original and well-replicated Sandoz et al. (2013) model was examined. For the BIAQ, the original Rosen et al. (1991) model was examined in addition to the Campana et al. (2009) and Lydecker et al. (2014) solutions. For the BCQ the original Reas et al. (2002) model was examined, in addition to the White et al. (2015) and Lydecker et al. (2014) solutions. In order to examine how these three measures related to each other, a CFA were performed using the best solution for each of the three body image measures. Weighted least squares with mean and variance adjustment (WLSMV) was used for all analyses as per recommendations for categorical data (Brown, 2006).

Prior to running each CFA, missing values were replaced using the expectation maximisation method. The overall model of fit for each CFA performed was judged using the following fit indices: Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and the Tucker Lewis Index. As per previous recommendations, a good fit is indicated by RMSEA < 0.05, CFI and TLI ≥ 0.9, while an excellent fit is indicated by RMSEA < .01, CFI and TLI ≥ 0.95 (Bentler, 1990; Bentler & Bonett, 1980; Dehon, Weems, Stickle, Costa, & Berman, 2005; MacCallum, Browne, & Sugawara, 1996; Schreiber, Nora, Stage, Barlow, & King, 2006; Williams, Dalgleish, Karl, & Kuyken, 2014). However, it is noted that RMSEA can be artificially large in models with small degrees of freedom and sample size (Kenny & McCoach, 2003). Composite reliability was assessed for the BI-AAQ, BIAQ, and BCQ using standardised loadings and error variances obtained from Mplus (Raykov, 1997). A composite reliability of 0.8 indicates good internal consistency (Cicchetti, 1994). The internal consistency of all other scales was assessed by Cronbach's alpha.

All other analyses were conducted with IBM Statistical Package for the Social Sciences, Version 22 (IBM Corp, 2013). Pearson correlations were performed to evaluate the

relationship between the subscales of each body image measure, eating disorder psychopathology, psychosocial impairment related to eating, depression and anxiety, perfectionism and body dissatisfaction. Hierarchical multiple regressions were conducted to assess the unique contribution of each body image measure with respect to eating disorder psychopathology and psychosocial impairment after controlling for BMI.

Results

Preliminary Analyses

After combining data from the two groups of participants, data were first checked for normality to ensure the suitability of parametric tests. As recommended by Tabachnick and Fidell (2012) visual inspection of distributions and formal inference tests were carried out. Several variables were not normally distributed, including the BIAQ, BCQ, EDE-Q, CIA, DASS depression and anxiety, and BMI. To aid interpretation, transformations were not performed given the majority of variables correspond to meaningful values (Tabachnick & Fidell, 2012). Furthermore, WLSMV makes no distributional assumptions and thus factor analysis was unaffected. Little's missing completely at random test was non-significant $\chi^2(11) = 5.328, p = .914$), indicating that data were missing at random.

Confirmatory Factor Analysis of Each Measure

Indices for all models are presented in **Table 1**. A CFA of the unidimensional 12-item BI-AAQ (Sandoz et al., 2013) produced CFI and TLI indices that indicated that the model is an excellent fit. The items, standardised factor loadings, and variance explained for the BI-AAQ are summarised in **Table 2**.

The three CFAs of the BIAQ (Rosen et al., 1991), summarised in **Table 1**, show that the 2-factor Lydecker et al. (2014) solution was considered an excellent fit by CFI and TLI indices, while the 4-factor model (Rosen et al., 1991) was considered only to be a good fit by CFI and TLI and the Campana et al. (2009) 3-factor solution was considered a poor fit by all

Table 1

Confirmatory Factor Analyses Model Fit Statistics (N=212) for the BI-AAQ, BIAQ, and BCQ (Best Fitting Model is Shaded)

	RMSEA [90% CI]	CFI	TLI	χ2 test of model fit (*df*)
BI-AAQ 1-factor, 12-item (Original; Sandoz et al., 2013)	0.115 [0.102, 0.128]	0.982	0.977	288.169 (54)
BIAQ 4-factor, 19-item (Original; Rosen et al., 1991)	0.088 [0.080, 0.096]	0.922	0.909	515.965 (146)
BIAQ 3-factor, 13-item (Campana et al., 2009)	0.121 [0.109, 0.133]	0.879	0.848	358.803 (62)
BIAQ 2-factor, 14-item (Lydecker et al., 2014)[a]	0.060 [0.047, 0.072]	0.979	0.975	165.326 (76)
BCQ 3-factor, 23-item (Original; Reas et al., 2002)	0.096 [0.089, 0.102]	0.925	0.916	910.376 (227)
BCQ 2-factor, 23-item (White et al., 2015)	0.090 [0.083, 0.097]	0.933	0.926	837.214 (229)
BCQ 3-factor, 23-item (Lydecker et al., 2014)	0.092 [0.085, 0.098]	0.931	0.932	852.681 (227)
6 factors (BI-AAQ, BIAQ 2 subscales, & BCQ 3 subscales)	0.055 [0.052, 0.058]	0.953	0.951	2211.836 (1112)
6 factors (BI-AAQ, BIAQ 2 subscales, & BCQ 3 subscales) loading onto one higher order factor	0.066 [0.063, 0.069]	0.933	0.929	2711.262 (1121)

Note. BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking Questionnaire; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker Lewis Index
[a]The CFA was run again after omitting item 13 (R^2 = .04, loading = .20). RMSEA [90% CI] = 0.067 [0.054, 0.080], CFI = 0.977, TLI = 0.972, χ2 test of model fit (*df*) = 157.698 (64)

Table 2.

Items, Standardised CFA Squared Multiple Correlations and Factor Loadings on the 12 Item One Factor Body Image Acceptance and Action Questionnaire

Item	R^2	Loading
1. Worrying about my weight makes it difficult for me to live a life that I value	0.69	0.83
2. I care too much about my weight and body shape	0.64	0.80
3. I shut down when I feel bad about my body shape or weight	0.65	0.80
4. My thoughts and feelings about my body weight and shape must change before I can take important steps in my life	0.78	0.89
5. Worrying about my body takes up too much of my time	0.73	0.86
6. If I start to feel fat, I try to think about something else	0.19	0.43
7. Before I can make any serious plans, I have to feel better about my body	0.74	0.86
8. I will have better control over my life if I can control my negative thoughts about my body	0.66	0.81
9. To control my life, I need to control my weight	0.64	0.80
10. Feeling fat causes problems in my life	0.79	0.89
11. When I start thinking about the size and shape of my body, it's hard to do anything else	0.79	0.89
12. My relationships would be better if my body weight and/or shape did not bother me	0.70	0.84

three indices. Thus, the Lydecker et al. (2014) model was selected as the most appropriate solution. Item 13 of the Lydecker et al. (2014) solution was found to have a lower factor loading (0.20) and R^2 (0.04), and thus the CFA was run a second time after omitting the item. As seen in the footnote of **Table 1** omitting the item did not improve the fit indices. **Table 3** summarises the items, standardised factor loadings, and variance explained.

For the BCQ, all three models were similar across all three indices (**see Table 1**). Specifically, the CFI and TLI for each model indicated all were a good fit. Given the similarity across models, the original model (Reas et al., 2002) was selected as the most appropriate. **Table 4** summarises the items, standardised factor loadings, and variance explained.

Confirmatory Factor Analysis of all Measures Together

A CFA was performed to examine the six factor model using the items from the best fitting models (Campana et al., 2009; Lydecker et al., 2014; Rosen et al., 1991; White et al., 2015). The three chosen models (6 subscales) were then combined into a six-factor CFA. The six-factor solution was indicated by the CFI and TLI to be an excellent fit (see **Table 1**), demonstrating that each subscale represents a unique factor. While a hierarchical CFA including a higher order factor showed a good fit to excellent fit (see **Table 1**), the comparison of the two models ($\chi2 = 499.426$, $df = 9$, $p < .001$) suggests that the structure is best described as six-factor model without a higher order factor. Therefore, the six subscales were considered as separate dimensions in the analyses reported below. It is noted that across all analyses the RMSEA fit index was considered neither good nor excellent. An Exploratory Factor Analysis (EFA) was conducted as a supplementary analysis to examine the replicability of the 6-factor CFA solution. Geomin oblique rotation was applied in Mplus to allow for correlated factors. Model comparisons showed the 6-factor solution to

Table 3.

Items, Standardised CFA Squared Multiple Correlations and Factor Loadings on the 14 Item Two Factor Body Image Avoidance Questionnaire

Factor	Item	R^2	Loading
1. Exposure Discomfort	1. I wear baggy clothes	0.32	0.57
	2. I wear clothes I do not like	0.44	0.67
	3. I wear darker colour clothing	0.24	0.49
	4. I wear a special set of clothing e.g. my "fat clothes"	0.55	0.74
	13. I am inactive	0.04	0.20
	15. I avoid physical intimacy	0.44	0.66
	16. I wear clothes that will divert attention from my weight	0.61	0.78
	17. I avoid going clothes shopping	0.61	0.78
	18. I don't wear "revealing" clothes (e.g. bathing suits, tank tops, or shorts)	0.50	0.71
2. Social Discomfort	7. I fast for a day or longer	0.51	0.71
	8. I do not go out socially if I will be "checked out"	0.70	0.84
	9. I do not go out socially if the people I am with will discuss weight	0.74	0.86
	10. I do not go out socially if the people I am with are thinner than me	0.74	0.86
	11. I do not go out socially if it involves eating	0.63	0.79

Note. Composite Reliability (CR) for the 14-item two factor Body Image Avoidance Questionnaire is 0.920. After omitting item 13 CR = 0.926.

Table 4.

Items, Standardised CFA Squared Multiple Correlations and Factor Loadings on the 23 Item Three Factor Body Checking Questionnaire

Factor	Item	R^2	Loading
1. Overall Appearance	3. I have special clothes which I try on to make sure they still fit	0.45	0.67
	5. I check my reflection in glass doors or car windows to see how I look	0.29	0.54
	8. I look at others to see how my body size compares to their body size	0.59	0.77
	11. I ask others about their weight or clothing size so I can compare my own weight/size	0.50	0.71
	12. I check to see how my bottom looks in the mirror	0.42	0.65
	13. I practice sitting and standing in various positions to see how I would look in each position	0.40	0.64
	15. I try to elicit comments from others about how fat I am	0.46	0.68
	17. I suck in my gut to see what it is like when my stomach is completely flat	0.60	0.77
	21. I pull my clothes as tightly as possible around myself to see how I look	0.35	0.59
	22. I compare myself to models on TV or in magazines	0.29	0.54
2. Specific Body Parts	1. I check to see if my thighs spread when I'm sitting down	0.63	0.80
	2. I pinch my stomach to measure fatness	0.73	0.85
	6. I pinch my upper arms to measure fatness	0.68	0.83
	9. I rub (or touch) my thigs while sitting to check for fatness	0.79	0.89
	10. I check the diameter of my legs to make sure they're the same size as before	0.69	0.83
	14. I check to see if my thighs rub together	0.66	0.81
	16. I check to see if my fat jiggles	0.69	0.83
	19. I look to see if I have cellulite on my thighs when I'm sitting	0.51	0.71
3. Idiosyncratic Checking	4. I check the diameter of my wrist to make sure it's the same size as before	0.54	0.73
	7. I touch underneath my chin to make sure I don't have a "double chin"	0.65	0.80
	18. I check to make sure my rings fit the same way as before	0.28	0.53
	20. I lie down on the floor to see if I can feel my bones touch the floor	0.32	0.56
	23. I pinch my cheeks to measure fatness	0.30	0.54

be the best fitting model, with a good RMSEA, and excellent CFI and TLI; the factor structure demonstrated variable replicability (see **Table 5 and 6**).

Descriptives and Internal Consistency

Table 7 presents the means, standard deviations, minima, and maxima for all variables, and the internal consistency (as measured by composite reliability) for the body acceptance (BI-AAQ) scale, body avoidance (BIAQ) total and subscales, and the body checking (BCQ) total and subscales. Good internal consistency was observed across all total scores and subscales.

Convergent Validity

Table 8 presents the Pearson correlations between the six body image subscales and their cumulative total, eating disorder psychopathology, and psychosocial impairment related to eating i.e., depression and anxiety, perfectionism and body dissatisfaction. Overall, adequate convergent validity is demonstrated across all measures. The two body avoidance subscales were strongly inter-correlated, as were the three body checking subscales. There were significant, strong positive relationships between eating disorder psychopathology and the body avoidance and checking total scores and subscales. For body acceptance there was a significant, strong negative relationship with eating disorder psychopathology. BMI had significant moderate positive relationships with the body avoidance total and subscales, significant weak positive relationships with the body checking total and subscales, and a significant, moderate negative relationship with the body acceptance measure.

Multicollinearity

Given that there were 3 correlations > 0.80 between body image measure subscales, the presence of multicollinearity was examined. Multicollinearity was examined in the context of the hierarchical multiple regressions testing concurrent validity, with eating disorder psychopathology (EDE-Q) and psychosocial impairment (CIA) as the dependent

Table 5

Exploratory Factor Analyses – Summary of Model Fit Information

	Number of parameters	χ2	*df*	RMSEA [90% CI]	CFI	TLI	Models compared	χ2[a]	*df*
1-factor	49	1788.351**	1127	0.080 [0.073, 0.087]	0.916	0.913			
2-factor	97	1445.432**	1079	0.061 [0.052, 0.069]	0.954	0.949	1-factor against 2-factor	281.617**	48
3-factor	144	1288.627**	1032	0.052 [0.042, 0.061]	0.968	0.963	2-factor against 3-factor	149.944**	47
4-factor	190	1182.183**	986	0.047 [0.035, 0.056]	0.975	0.970	3-factor against 4-factor	110.828**	46
5-factor	235	1074.390*	941	0.039 [0.0.026, 0.050]	0.983	0.979	4-factor against 5-factor	126.993**	45
6-factor	279	1009.712*	897	0.037 [0.022, 0.049]	0.986	0.981	5-factor against 6-factor	74.812*	44

Note. RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker Lewis Index

** $p < .001$ * $p < .0$

Table 6

Exploratory Factor Analysis – Factor Loadings on the 6 Factor Model ≥ .4

Item	F1	F2	F3	F4	F5	F6	POVE
BI-AAQ 1	**0.82**						0.75
BI-AAQ 2	**0.69**						0.75
BI-AAQ 3	**0.65**						0.68
BI-AAQ 4	**0.97**		-0.54				0.87
BI-AAQ 5	**0.83**						0.78
BI-AAQ 6							0.30
BI-AAQ 7	**1.03**						0.85
BI-AAQ 8	**0.88**						0.77
BI-AAQ 9	**0.63**						0.71
BI-AAQ 10	**0.66**						0.79
BI-AAQ 11	**0.85**						0.86
BI-AAQ 12	**0.67**						0.77
BIAQ 1		**0.68**					0.58
BIAQ 2						0.40	0.47
BIAQ 3		**0.63**					0.53
BIAQ 4						0.45	0.57
BIAQ 7			0.40	**-0.51**			0.70
BIAQ 8				**-0.71**			0.57
BIAQ 9							0.60
BIAQ 10						**0.68**	0.70
BIAQ 11	**0.56**					0.42	0.83
BIAQ 13	**0.40**					**0.40**	0.73
BIAQ 15						**0.51**	0.65
BIAQ 16							0.14
BIAQ 17				**0.51**	0.44		0.46
BIAQ 18			0.41	**0.53**			0.48
BCQ 1		**0.53**					0.64
BCQ 2	**0.40**						0.67
BCQ 3		**0.59**					0.71
BCQ 4		**0.56**					0.61
BCQ 5		**-0.61**					0.46
BCQ 6			**0.50**				0.60
BCQ 7			**0.78**				0.81
BCQ 8							0.60
BCQ 9					**0.68**		0.65
BCQ 10			**0.51**	0.44			0.36
BCQ 11			0.44		**0.46**		0.79
BCQ 12			**0.47**		0.42		0.73
BCQ 13			**0.56**				0.67
BCQ 14			**0.59**				0.82
BCQ 15					**0.57**		0.71
BCQ 16					**0.76**		0.62
BCQ 17			**0.65**				0.41
BCQ 18			**0.48**	0.44			0.50
BCQ 19			**0.53**				0.80
BCQ 20					**0.73**		0.70
BCQ 21			**0.50**				0.77
BCQ 22			**0.67**				0.73
BCQ 23					**0.78**		0.75

Note. All factor loadings significant $p < .05$

POVE = Proportion of variance explained

Table 7

Minima, Maxima, Means, Standard Deviations, and Internal Consistency (Composite Reliability) for all Variables

	N	Range	Min	Max	*M*	*SD*	CR	Cronbach's Alpha
BI-AAQ	328	12 - 84	12	84	53.61	16.92	0.959	-
Two Factor 14 Item BIAQ Total	328	14 - 98	14	86	37.79	13.52	0.920	-
Two Factor 14 Item BIAQ Exposure Discomfort Subscale	328	9 - 63	9	60	28.62	9.55	0.857	-
Two Factor 14 Item BIAQ Social Discomfort Subscale	328	5 - 35	5	34	9.17	5.22	0.907	-
Three Factor 23 Item BCQ Total	328	23 - 161	24	156	74.09	28.46	0.957	-
Three Factor 23 Item BCQ Overall Appearance Subscale	328	10 - 70	11	68	34.50	11.73	0.883	-
Three Factor 23 Item BCQ Specific Body Parts Subscale	328	8 - 56	8	56	26.10	12.21	0.942	-
Three Factor 23 Item BCQ Idiosyncratic Checking Subscale	328	5 - 35	5	35	15.29	6.52	0.775	-
EDE-Q Total	216	0 - 6	0	5.80	2.02	1.45	-	0.76-0.92
CIA Total	217	0 - 48	0	42	12.08	10.53	-	0.95
DASS21 Depression Subscale	111	0 – 21	0	21	4.75	4.63	-	0.92
DASS21 Anxiety Subscale	111	0 – 21	0	21	4.39	4.18	-	0.85
MPS PS and CM Subscales	111	1 – 5	1.50	5	3.06	0.69	-	0.77 (PS), 0.88 (CM)
EDI Body Dissatisfaction Subscale	111	1 – 6	1.00	5.44	3.17	0.92	-	0.84
BMI	328		14.69	59.99	23.00	4.77	-	-

Note: BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking Questionnaire; EDE-Q = Eating Disorder Examination Questionnaire; CIA = Clinical Impairment Assessment; DASS21 = Depression Anxiety and Stress Scales 21 item version; MPS = Multidimensional Perfectionism Scale; PS = Personal Standards; CM = Concern over Mistakes; EDI = Eating Disorder Inventory; BMI = Body Mass Index; CR=Composite Reliability Cronbach's alpha provided as a range across the 4 subscales for the EDE-Q.

Table 8

Pearson Correlations between the BI-AAQ, Two Factor BIAQ Subscales and Total Scores, Three Factor BCQ Subscales and Total Scores, EDE-Q Global Scores, CIA, BMI, DASS, MPS, and EDI-BD

	BIAQT (*N*=328)	BIAQED (*N*=328)	BIAQSD (*N*=328)	BCQT (*N*=328)	BCQO (*N*=328)	BCQS (*N*=328)	BCQI (*N*=328)	EDE-Q (*N*=216)	CIA (*N*=217)	BMI (*N*=328)	DASS-D (*N*=111)	DASS-A (*N*=111)	MPS (*N*=111)	EDI-BD (*N*=111)
BI-AAQ	-.66	-.60	-.63	-.73	-.70	-.68	-.69	-.81	-.81	-.34	-.45	-.40	-.33	.50
BIAQT	-	.96	.84	.60	.55	.54	.60	.63	.72	.42	.42	.40	.26	-.53
BIAQED	-	-	.64	.54	.49	.49	.54	.56	.64	.42	.37	.34	.27	-.53
BIAQSD	-	-	-	.57	.52	.52	.56	.63	.71	.32	.39	.40	.17 [a]	-.41
BCQT	-	-	-	-	.95	.96	.90	.78	.72	.18	.33	.28	.42	-.61
BCQO	-	-	-	-	-	.87	.80	.73	.68	.16	.28	.24	.40	-.58
BCQS	-	-	-	-	-	-	.81	.74	.68	.16	.33	.29	.41	-.61
BCQI	-	-	-	-	-	-	-	.74	.69	.18	.36	.31	.38	-.54

Note. BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking Questionnaire; BIAQT = BIAQ Total; BIAQED = BIAQ Exposure Discomfort; BIAQSD = BIAQ Social Discomfort; BCQT = BCQ Total; BCQO = BCQ Overall Appearance; BCQS = BCQ Specific Body Parts; BCQI = BCQ Idiosyncratic checking; DASS21 = Depression Anxiety and Stress Scales 21 item version; DASS-D = DASS21 depression subscale; DASS-A = DASS21 anxiety subscale; MPS = Multidimensional Perfectionism Scale; EDI-BD = Eating Disorder Inventory body dissatisfaction subscale.

All correlations are significant (*p* < .001) unless denoted by [a]

variables respectively (**Table 9**). BMI was included as a covariate given its significant associations with the body image measures. We examined the Condition Index (CI) and Variance Proportions (VP) described by Tabachnick and Fidell (2012). It is recommended that a CI> 30 in addition to a VP> 0.50 for at least two different variables is indicative of multicollinearity (Tabachnick & Fidell, 2012). In both regression analyses there was one CI> 30 (36.89 and 36.97 respectively), but in both cases no more than one VP> 0.50. Thus, multicollinearity is not indicated.

Concurrent Validity

As shown in **Table 9**, BMI explained 10.1% of the variance of eating disorder psychopathology, and the body image measures explained an additional 63.4% of the variance. Significant independent predictors were the body acceptance measure, the social discomfort subscale of the body avoidance measure, and the specific body parts and idiosyncratic subscales of the body checking measure. With respect to psychosocial impairment, BMI explained 12.2% of the variance, with the body image measures explaining an additional 61.9% of the variance. The significant independent predictors were the body acceptance measure and the social discomfort subscale of the body avoidance measure.

A series of t-tests were performed to compare participants who had high levels of disordered eating, defined as an EDE-Q global score more than one standard deviation above the community mean (≥ 2.77) using Australian norms (Mond, Hay, Rodgers, & Owen, 2006), with those who did not on each body image measure. The disordered eating group and healthy group were comparable in age however the disordered eating group had a significantly higher BMI (see **Table 10**). All tests demonstrated significant differences between groups on each body image measure (see **Table 10**). The disordered eating group had a significantly lower BI-AAQ score and higher BIAQ and BCQ scores than the healthy comparison group. This difference was also present for each of the BIAQ and BCQ

Table 9

Summary of Regression Analyses with the Six Body Image Subscales, Controlling for BMI, with Global EDE-Q and CIA Scores as the Dependent Variables (Significant Subscales Bolded)

		Global EDE-Q ($N = 216$[a])				CIA ($N = 217$)				
Step	Predictors & Order of Entry	B	SE	β	p	Predictors & Order of Entry	B	SE	β	p
1	BMI	0.09	0.02	0.32	< .001	BMI	0.75	0.14	0.35	< .001
	$R^2 = .101, F(1, 214) = 24.057, p < .001$					$R^2 = .122, F(1, 215) = 30.008, p < .001$				
2	**BI-AAQ**	-0.04	0.01	-0.45	< .001	**BI-AAQ**	-0.28	0.04	-0.46	< .001
	BIAQ Exposure Discomfort	0.00	0.01	-0.02	.724	BIAQ Exposure Discomfort	0.11	0.06	0.10	.051
	BIAQ Social Discomfort	0.03	0.02	0.12	.032	**BIAQ Social Discomfort**	0.47	0.11	0.23	< .001
	BCQ Overall Appearance	0.01	0.01	0.05	.564	BCQ Overall Appearance	0.03	0.07	0.03	.681
	BCQ Specific Body Parts	0.02	0.01	0.20	.009	BCQ Specific Body Parts	0.08	0.06	0.10	.212
	BCQ Idiosyncratic Checking	0.03	0.02	0.16	.033	BCQ Idiosyncratic Checking	0.11	0.11	0.07	.325
	R^2change = 0.634, Fchange(6, 208) = 82.830, $p < .001$					R^2change = .619, Fchange(6, 209) = 83.297, $p < .001$				

Note. BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking Questionnaire; EDE-Q = Eating Disorder Examination Questionnaire; CIA = Clinical Impairment Assessment; BMI = Body Mass Index; SE = Standard Error

[a] 1 participant did not complete enough items to derive a global EDE-Q score

Table 10

Summary of Independent Samples t-tests Comparing Disordered Eating and Healthy Groups on the Best Fitting BI-AAQ, BIAQ, and BCQ

Measure	Disordered Eating Group $N = 69$ M(SD)	Healthy Group $N = 147$ M(SD)	t	df	p	Cohen's d
Age	19.69 (2.18)	19.49 (1.89)	0.68	211	.50	0.10
BMI	25.10 (5.17)	21.97 (4.54)	4.52	214	<.001	0.66
BI-AAQ	38.07 (12.38)	61.14 (14.18)	12.18	150.91	<.001	1.69
BIAQ Total	48.99 (13.80)	32.25 (9.83)	9.06	101.57	<.001	1.49
BIAQ Exposure Discomfort	35.78 (9.52)	25.25 (7.97)	8.49	214	<.001	1.24
BIAQ Social Discomfort	13.21 (6.08)	7.00 (2.87)	8.08	85.53	<.001	1.49
BCQ Total	101.48 (27.43)	62.77 (20.73)	10.41	105.79	<.001	1.68
BCQ Overall Appearance	45.62 (10.75)	31.04 (9.15)	10.32	214	<.001	1.51
BCQ Specific Body Parts	38.44 (11.72)	22.20 (9.66)	10.74	214	<.001	1.57
BCQ Idiosyncratic Checking	20.39 (6.61)	12.07 (4.62)	9.42	100.23	<.001	1.56

Note. BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking

subscales. All differences were associated with large between group effect sizes.

Discussion

Cognitions and behaviours related to body image disturbance are considered to be central to core eating disorder psychopathology and important targets for intervention (Fairburn, 2008). Promotion of positive body image is increasingly considered to be a desirable outcome in the treatment of eating disorders (Sandoz et al., 2013), and body avoidance and body checking are specific behaviours that are a key focus of treatment (Fairburn, 2008; Waller et al., 2007). Thus their reliable and valid measurement is important in informing treatment planning and monitoring outcome. Therefore, this study sought to investigate the factor structure, reliability, and validity of measures of body image flexibility, body image avoidance, and body checking in order to inform their parsimonious use in eating disorder research and treatment.

The first aim of this study was to determine the optimal structure of each body image questionnaire by examining models supported by prior research. The unidimensional 12-item structure for the body image flexibility measure was found to be a good to excellent fit to the data, consistent with the original model and subsequent replications (Ferreira et al., 2011; Sandoz et al., 2013; Timko et al., 2014). The 2-factor 14-item structure for the body image avoidance measure reported by Lydecker et al. (2014) was considered an excellent fit, with one factor representing social discomfort and the other representing exposure discomfort. Lydecker et al. (2014) postulated that affective discomfort is a key driver of body image avoidance behaviours, but the present study showed the social discomfort rather than the exposure discomfort scale to be a significant predictor of eating disorder psychopathology. This is perhaps indicative of the high comorbidity of social anxiety and eating disorders and highlights the importance of assessing body image concerns in a social context (Hinrichsen, Wright, Waller, & Meyer, 2003). As all three solutions investigated for the body checking

questionnaire were found to be a good fit (Lydecker et al., 2014; White et al., 2015), the original 3-factor model (Reas et al., 2002) was retained. All measures evidenced good internal consistency, and convergent validity was demonstrated with moderate to strong negative relationships with eating disorder psychopathology, BMI, depression and anxiety, perfectionism, and body dissatisfaction. However, for all solutions, the RMSEA fit index was neither good nor excellent. This may have been due to the smaller sample size and degrees of freedom (Kenny & McCoach, 2003). Regardless, the optimal structure for each measure requires further exploration.

The second aim was to determine the factors that have the strongest association with disordered eating. The results suggest that the 12-item body image flexibility questionnaire and the 5-item social discomfort subscale of the body avoidance questionnaire are the most pertinent when considering outcomes related to both disordered eating psychopathology and quality of life related to disordered eating. If assessment of body checking is also required, then the specific body parts and idiosyncratic subscales of the body checking questionnaire are also indicated, given that they predict unique variance in disordered eating psychopathology. Use of this subset of body image measures involves a total of 30 items (as opposed to the original 54 items), providing a more manageable burden on respondents.

The strongest predictor of both disordered eating and quality of life was the body image flexibility measure. This is consistent with the idea that the measure assesses a broader aspect of positive body image. It was noted in a recent review by Webb et al. (2015) that positive body image assessment has largely been neglected in eating disorder prevention and intervention work. Notably, positive body image is defined as distinct from negative body image, and attaining positive body image is a desirable outcome, rather than simply the absence of negative body image (Tylka & Wood-Barcalow, 2015). Given that positive body

image is conceptualised as a protective factor, ongoing assessment in eating disorder treatment is of particular relevance.

However, current outcome monitoring in eating disorder treatment focuses on the assessment of negative body image only, typically through the use of measures such as the EDE-Q. This is an important indicator of outcome, with one study identifying that changes to negative body image during inpatient eating disorder treatment were the strongest predictor of eating pathology outcome in a transdiagnostic sample (Danielsen & Rø, 2012). In the absence of the assessment of positive body image, it is unknown whether treatment decreases negative body image alone or additionally encourages improved positive body image. Given the consistent findings across eating disorder treatment studies that early decrease in symptoms (including binge/purge symptoms and disordered eating) is one of the most robust predictors of good outcome (Vall & Wade, 2015), it would be of interest to further examine the predictive outcome of early changes to positive body image.

This study has several limitations. The cross-sectional design does not enable causal conclusions regarding the contribution of body image disturbance to disordered eating. Future research investigating the measures over multiple time points is warranted, as is examination of test-retest reliability and responsiveness of these questionnaires to change. Further, this study did not utilise a clinical eating disorder sample. Rather, all participants were female undergraduate university students, which might limit the generalisation of results, although it should be noted that the rate of disordered eating is typically high in such samples. Nonetheless, all results should be interpreted cautiously when applying the results to males. The sample size, while sufficient to run the confirmatory factor analyses presented, is not sufficient to assess cross-validation with confirmatory or exploratory factor analysis to ensure the stability and precision of the solution. Thus further research may seek to replicate the findings of this study using a different and independent sample. The individual measures

investigated have their own set of limitations. Specifically, while the psychometric properties of the body image flexibility measure have been consistently replicated across studies, it has been noted that, because of the use of negatively worded items, conceptually the measure may also be assessing the experiential avoidance of body image (Timko et al., 2014; Webb et al., 2015). Additionally, the measure may be more relevant to body image concerns of women than those of men (Sandoz et al., 2013; Webb et al., 2015). While the BI-AQQ was studied in an exclusively male sample which supported prior findings with women, psychometric properties including factor structure and validity were not conducted (Masuda et al., 2015). Thus, further research might investigate the use of more positively worded items and modifying the scale for use with men. Further research is also needed to establish whether items such as mirror gazing and weighing, which were omitted from the Lydecker et al. (2014) solution for body image avoidance, can be included in the valid assessment of body-related maintenance behaviours, given the focus of interventions for eating disorders on these behaviours (Fairburn, 2008; Waller et al., 2007). Finally, the response format of the BIAQ and BCQ measures were modified in the present study to match the BI-AAQ to aid in factor analysis. Therefore, results for both measures must be interpreted with this is mind.

In summary, the structure of the original body image flexibility and body checking measures were replicated and deemed to be reliable and valid measures. The Lydecker et al. (2014) solution for the body image avoidance measure was considered to be the best fitting model and adequate reliability and validity were demonstrated. The significant predictors of eating disorder psychopathology and psychosocial impairment included the body image flexibility measure and select subscales from the body image avoidance and body checking measures. It is suggested that researchers and clinicians focus on the subscales identified, in order to reduce participant burden while adequately assessing body image disturbance as related to eating disorders.

CHAPTER 5

Ten-session Cognitive Behavioural Therapy (CBT-T) for Non-Underweight Eating

Disorders: Outcomes from Two Case Series[4]

---

[4] The first case series has been published in *Clinical Psychologist* (Pellizzer, Waller, et al.,

2018b), provided in Appendix B.

Abstract

Objective: The development of a ten-session Cognitive Behavioural Therapy (CBT-T) for non-underweight eating disorders targets barriers to treatment inherent in longer CBT, including cost, therapist expertise, and lengthy wait lists. We investigate the effectiveness of CBT-T with two samples of non-underweight clients, delivered by trainee psychologists in a student training clinic.

Method: In the first case series (*N*=26) all participants completed a 4-week wait-list control condition between baseline assessment and starting CBT-T. In the second case series (*N*=52) participants were randomly allocated to either a no-wait-list or 4-week wait-list condition. CBT-T was delivered by seven different trainee psychologists under supervision. Measures included eating disorder cognitions and behaviours, quality of life, and general psychopathology. The majority of completer and intention-to-treat analyses used multi-level modelling while last-observation-carried-forward was applied for abstinence, remission, and good outcome analyses to aid comparison with prior studies.

Results: Both case series found significant improvements for eating disorder cognitions, behaviours, quality of life, and negative affect from baseline to post-treatment and at one- and three-month follow-ups. Effect sizes were typically medium to large. Abstinence, remission, and good outcome rates were comparable and often exceeded rates from efficacy and effectiveness studies of longer forms of CBT and CBT guided self-help studies.

Conclusions: Results provide evidence for the effectiveness of CBT-T performed by trainee psychologists for non-underweight eating disorder clients. Results were comparable to longer versions of CBT for eating disorders. Longer follow-up, randomised controlled trial designs, and moderator analyses are required in order to provide robust evidence about who does best with a shorter versus a longer therapy delivered by trainees.

Introduction

Ten-session cognitive behavioural therapy (CBT-T), a therapy suitable for delivery by novice therapists, was developed to address the need for shorter, cost-effective psychological therapies that are also efficacious (Waller et al., 2018). An initial evaluation using clinical assistants (Bachelors level psychology students) under supervision, found statistically and clinically significant reductions in behavioural and cognitive eating disorder symptoms at post-treatment and 3-month follow-up (Waller et al., 2018). Symptom reduction, abstinence, and remission were comparable to longer versions of evidence-based CBT for eating disorders (CBT-ED; Byrne et al., 2011; Fairburn et al., 2009; Knott et al., 2015; Turner, Marshall, et al., 2015; Waller et al., 2014). Novice therapists have successfully delivered CBT to both eating disorder (Banasiak et al., 2005; Cachelin et al., 2014; Carter & Fairburn, 1998; Rose & Waller, 2017; Turner, Bryant-Waugh, et al., 2015; Wade et al., 2017; Wilson et al., 2010; Zandberg & Wilson, 2013) and non-eating disorder clinical samples (Henriksson et al., 2016; Kohtala et al., 2015; Lappalainen et al., 2014; Öst et al., 2012; Räsänen et al., 2016; Stark & Hiltunen, 2016; van der Veek et al., 2013), demonstrating that, with specialist supervision, novice therapists are able to deliver outcomes commensurate to experienced therapists in clinical trials (e.g. Öst et al., 2012; Zandberg & Wilson, 2013).

The overall aim of the current study is to explore the effectiveness of outpatient CBT-T delivered by trainee psychologists using two Australian samples of non-underweight clients. This approach conforms to the Medical Research Council (MRC) guidance on developing and evaluating complex interventions (Craig et al., 2008) that complex interventions should be developed in a systematic manner (including use of pilot studies) prior to conducting randomised controlled trials (Craig et al., 2008). A key step in developing new therapies is establishing replicability (Open Science Collaboration, 2015),

and therefore replicating the Waller et al. (2018) findings is an important first aim. The second aim is to extend knowledge of the effectiveness of CBT-ED in an outpatient clinic with trainee psychologists. Prior effectiveness studies of individual CBT have predominantly used experienced therapists (Byrne et al., 2011; Knott et al., 2015; Signorini et al., 2018; Waller et al., 2014) with fewer using clinical assistants and inexperienced therapists from varying fields (Rose & Waller, 2017; Turner, Marshall, et al., 2015; Waller et al., 2018).

To our knowledge, this is the first effectiveness study to examine a therapist sample comprised solely of trainee psychologists treating eating disorders. It was hypothesised that significant reductions in behavioural and cognitive eating disorder symptoms would be found, with effect sizes, abstinence and remission rates comparable to longer versions of CBT-ED and trials with experienced therapists. Given eating disorders have been described as difficult to treat (Fairburn & Harrison, 2003), evaluating whether trainee psychologists are able to produce commensurate outcomes is an important empirical question. It was further hypothesised that attrition would be comparable to experienced therapists, which has varied between 10.3% to 50% in effectiveness studies (Byrne et al., 2011; Knott et al., 2015; Rose & Waller, 2017; Signorini et al., 2018; Turner, Marshall, et al., 2015; Waller et al., 2014).

Method

Participants

First case series. Thirty five participants (aged ≥ 15 years and body mass index [BMI] > 17.5) were assessed for suitability for outpatient CBT-T treatment. Adolescents with BN were considered appropriate to include in the sample given the efficacy of CBT for adolescents with BN and its equivalence with Family Based Therapy (NICE, 2017; Schmidt et al., 2007). Participants were excluded if they had a severe physical or psychiatric condition

that would interfere with treatment engagement (e.g., high suicidality, psychosis), if they were already receiving psychotherapy for an eating disorder, or if they had difficulty speaking or understanding English. Thirty-three were offered CBT-T (two were already receiving psychotherapy for an eating disorder and thus were ineligible) and a total of 26 (79%) started CBT-T (see **Figure 1**). In this latter group, the mean age was 28.73 years ($SD = 9.57$; range 16.41 – 51.49), and the mean BMI was 27.76 ($SD = 7.96$; range 19.80-52.40). The majority were female (96.2%) and all participants identified as being Caucasian. Diagnosis, using DSM-5 criteria (American Psychiatric Association, 2013), was assessed at baseline using a standardised outline of the issues to be covered (Wade & Pellizzer, 2018) i.e. information regarding pertinent diagnostic features such as current eating, compensatory behaviours, and body image disturbance. Self-report measures, such as the Eating Disorder Examination Questionnaire (Fairburn & Beglin, 2008) and Clinical Impairment Assessment (Bohn et al., 2008; Bohn & Fairburn, 2008) supplemented information collected via clinical interviewing. Diagnosis was discussed and confirmed in supervision. Diagnoses for each case series are presented in **Figure 1**. In the first case series, the most common diagnosis was BN ($N = 24$, 92.3%), followed by OSFED ($N = 1$, 3.8%) and Unspecified Feeding and Eating Disorder ($N = 1$, UFED; 3.8%).

The initial assessment additionally included a thorough risk assessment to ensure participants with high suicidality were not included and comorbid issues were explored in an unstructured way. Comorbidities were assessed in more depth using the MINI International Neuropsychiatric Interview 6.0 (Sheehan et al., 1997) at the end of treatment session 1 (rather than at assessment to reduce burden). While comorbidities were common, no participants were excluded for having a severe psychiatric condition. The five most common comorbidities at pre-treatment were Generalized Anxiety Disorder (60%), Social Anxiety Disorder (52%), Major Depressive Disorder (28%), Panic Disorder with Agoraphobia (24%),
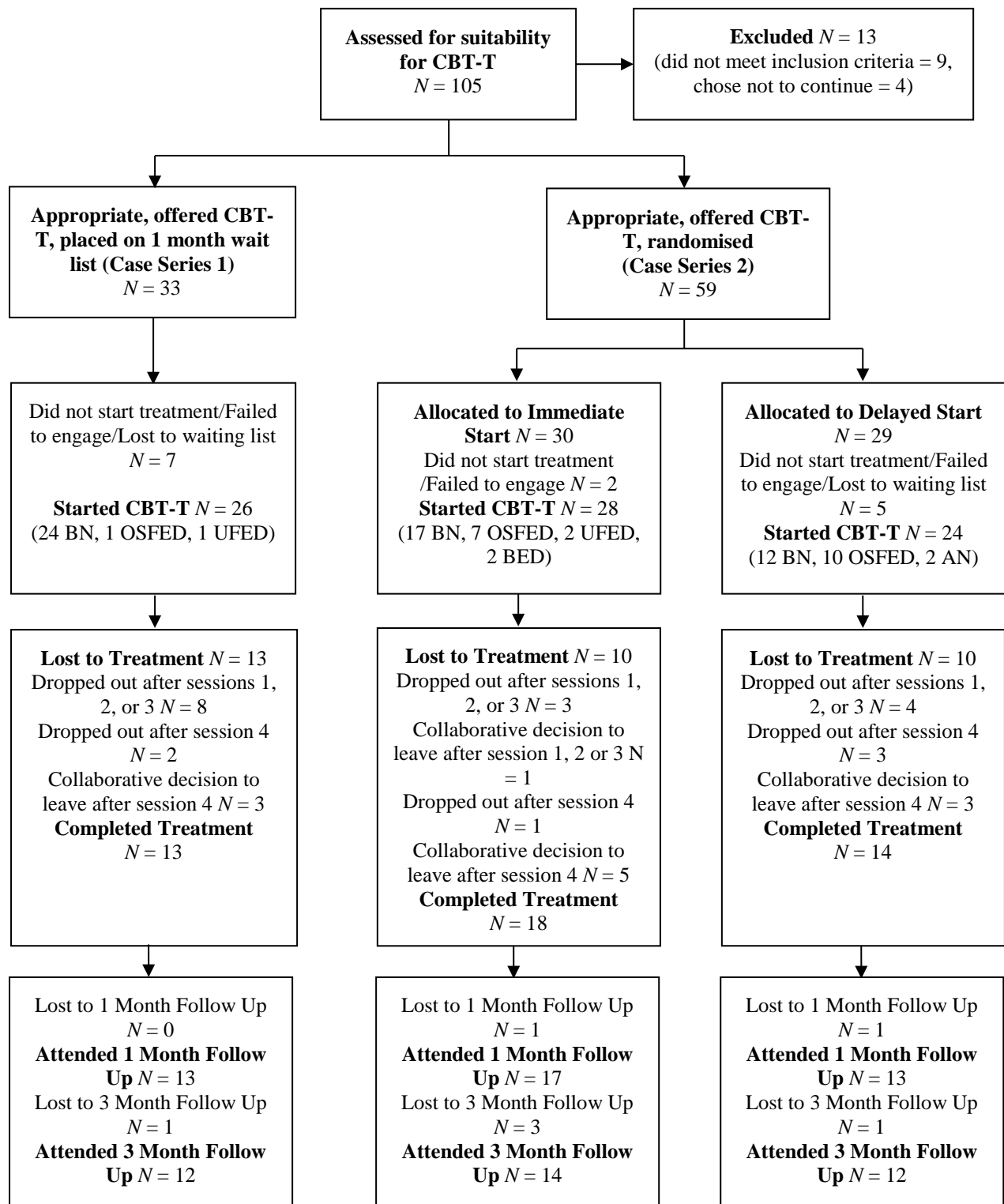
Figure 1. CONSORT diagram.

BN = Bulimia Nervosa, OSFED = Other Specified Feeding and Eating Disorder, UFED = Unspecified Feeding

and Eating Disorder, BED = Binge Eating Disorder, AN = Anorexia Nervosa.

OSFED diagnoses: 13 BN Low Frequency/Limited Duration, 5 Atypical AN.

and Agoraphobia (without Panic Disorder; 20%). In addition, over half of the sample (57.5%) were taking psychiatric medication (mostly antidepressants) and were asked to keep medication stable during the course of treatment.

Second case series. Seventy participants were assessed for suitability with inclusion and exclusion criteria identical to the pilot study: Seven participants were ineligible, four chose not to continue past the assessment, and 59 were offered CBT-T and randomized. Of those 59, 52 (88%) started CBT-T (see **Figure 1**), with a mean age of 26.42 (SD = 9.62; range 15.69 – 68.97), and a mean BMI of 26.29 (SD = 7.81; range 18.2 – 52.4). The majority were female (90.4%) and Caucasian (82.7%). Diagnosis assessed as described in the first case series. Similar to the first case series, BN was most common (N = 29, 55.8%), OSFED (N = 17, 32.7%), UFED (N = 2, 3.8%), BED (N = 2, 3.8%), and AN (N = 2, 3.8%). Almost half of the sample were purging at baseline (46.2%). DSM-5 diagnoses are presented in **Figure 1**. Like the first sample, almost half of the sample were purging at baseline (48.08%). Risk and comorbidities were assessed as per the first case series. The five most common comorbidities at pre-treatment, as per the MINI (Sheehan et al., 1997), were Generalized Anxiety Disorder (39.2%), Social Anxiety Disorder (21.6%), Agoraphobia (without Panic Disorder; 19.6%), Alcohol Dependence
 (13.7%), and Obsessive Compulsive Disorder (11.8%). Approximately a third of the sample (36.5%) were taking psychiatric medication. Like the first case series, participants were asked to keep medication stable during the course of treatment.

Design

First case series. Participants completed measures at baseline (assessment session) and then again after a four-week waitlist period. The latter was designated the pre-treatment assessment (session 1). Further assessments took place at mid-treatment (session 4), post-treatment (session 10), and after one- and three-month follow-up.

Second case series. This was a randomised controlled trial (RCT), with participants randomised to a four-week waitlist period or immediate start after completing measures at baseline (assessment session/pre-treatment). Further assessments occurred at mid-treatment (session 4), post-treatment, and after one- and three-month follow-ups. There was no questionnaire assessment at session one for the waitlist group in order to reduce participant burden. The measures were identical for both case series.

Measures

Height, weight and frequency of disordered eating. Height was measured at baseline and weight was measured (and shared with participants) at each session as part of the therapy. Frequency of objective bingeing, vomiting, and laxative abuse were calculated for each week (obtained from daily food intake diaries), and clinician judgement was used to classify objective and subjective binges. Given the low occurrence of laxative use in both samples, laxatives and vomiting were combined to create a 'purging' variable.

Global eating disorder psychopathology. The Eating Disorder Examination – Questionnaire (EDE-Q; Fairburn & Beglin, 2008) was used to assess global eating disorder psychopathology over the previous 28 days. The EDE-Q global score has good psychometric properties (see **Chapter Three**). Internal consistency in the current study was .78 and.90 for the first and second case series respectively.

Clinical impairment. The Clinical Impairment Assessment (CIA; Bohn et al., 2008; Bohn & Fairburn, 2008) assessed psychosocial impairment caused by eating disorder psychopathology. Psychometric properties are strong (see **Chapter Three**). In the current study internal consistency was .94 and .89 for the first and second case series respectively.

Negative affect. The Depression Anxiety and Stress Scales 21 (DASS21; Lovibond & Lovibond, 1995), a measure of general psychopathology, has good psychometric properties

(see **Chapter Three**). Internal consistency in the present study was.90 and .94 for the first and second case series respectively.

Eating disorder symptoms.

*Description***.** The 15-item Eating Disorder Measure (ED15; Tatham et al., 2015) assesses core diagnostic eating disorder behaviour and attitudes over the previous week. Ten cognitive items (e.g., "Over the past week, how often have I worried about losing control over my eating") are rated on a 6-point Likert scale (0 = *Not at all*, 6 = *All of the time*), while 5 behavioural items assess bingeing and compensatory behaviours using frequencies. Two subscales (Weight and Shape Concerns and Eating Concerns) are derived from the 10 cognitive items and are averaged to calculate an Overall Attitudinal score. Higher scores indicate greater eating disorder psychopathology. The ED15 was administered weekly during therapy and at all assessment points.

Factor structure. Initially, 11 cognitive items were developed based on clinical observations by four of the authors (Tatham et al., 2015). Exploratory factor analysis found two factors that accounted for 62% and 10.3% of the total variance, with factor loadings of greater than .50, except for 1 item which was excluded (Tatham et al., 2015). To our knowledge, the factor structure and psychometrics of the ED15 have not yet been examined by others given the recent publication of the measure.

Reliability and validity. Internal consistency (Cronbach's α = .94 Weight and Shape Concerns, α = .80 Eating Concerns), split-half reliability (Spearman-Brown coefficient =.93 Overall), and test-retest reliability (r = . 91 non-clinical, r = .79 clinical Overall, two to three week retest interval) are adequate (Tatham et al., 2015). The ED15 and EDE-Q were strongly correlated for attitudinal scales (r = .90), while concordance between behavioural items varied (r = .61 - .97). In the present study the correlation between attitudinal items was slightly lower (r = .76) while behavioural items were slightly higher (r = .78 - .96). The ED15

correlates with measures of depression and anxiety, and clinical samples have higher ED15 scores than non-clinical participants (Tatham et al., 2015). Internal consistency was α =.85 in the second case series.

Comorbidities.

Description. The MINI International Neuropsychiatric Interview 6.0 (Sheehan et al., 1997) is a semi-structured interview that assesses 17 DSM-IV Axis 1 disorders. Each diagnosis is separated into modules where screening questions are first asked followed by questions for each diagnostic criteria that are rated and scored using both the interview template and clinical judgement. For each case series, the MINI was administered at session 1 (pre-treatment) and session 10 (post-treatment). The number of current diagnoses (omitting eating disorders) was calculated at each time point to assess changes in current comorbidities across treatment.

Reliability and validity. The MINI has adequate test-retest reliability ($r = .73 - .93$, after a 1-2 day retest interval) and inter-rater reliability ($K = .99 – 1.0$) and correlates well with the Structured Clinical Interview for DSM-III-R Patient Version (Sheehan et al., 1997). A later evaluation found specificity to range from .72 to .97 and sensitivity to range from .46 to .94 across all diagnoses in the MINI (Lecrubier et al., 1997). Reliability was similar to Sheehan et al. (1997), with inter-rater reliability ranging from 0.88 to 1.0 and test-retest reliability ranging .76 to .93 (using kappa coefficients; Lecrubier et al., 1997). The MINI was also found to have good concordance with the Composite International Diagnostic Interview (Lecrubier et al., 1997).

Perceived confidence and suitability of treatment. Participants were asked to rate, on a 100-point visual analogue scale, answers to the following questions: "How confident are you in this approach", "How suitable is this approach to you?" These were included in order to examine face validity of the therapy to participants.

Procedure

Following review and approval by the Institutional Research Ethics Committee, participants were recruited from consecutive referrals to the Flinders University Services for Eating Disorders (FUSED) outpatient clinic after giving informed consent, including to be treated by trainee psychologists. At assessment, all participants were provided with psychoeducation from a self-help book (Waller et al., 2010, p. 19 - 43), and an appointment was made for their first treatment. In the first case series, the first treatment session was scheduled four weeks after the assessment. In the second case series, participants were randomised to complete their first treatment session either one or four weeks from assessment. Each participant received one session per week of CBT-T for 10 weeks and follow-up sessions at one and three months post-treatment (Waller et al., 2018). Seven trainee psychologists (postgraduate clinical psychology students) administered the treatment under the supervision of Glenn Waller and Tracey Wade. Supervision occurred bi-weekly for the majority of therapists except for the first author who received supervision weekly.

As per the CBT-T protocol, treatment was ceased with slow responders at session 4, with a collaborative decision to seek alternative support until more active change could be tackled early in therapy. A review of progress (such as homework completion, food monitoring, and regular eating) informed this decision and the context of individual situations was discussed in supervision to determine whether sufficient progress had been made prior to collaboratively making the decision to leave treatment with participants. Participants for whom this occurred typically reported low motivation, had insight regarding their minimal improvement, and were relieved by the prospect of leaving treatment.

Statistical Analyses

All analyses were conducted with IBM Statistical Package for the Social Sciences, Version 22 (IBM Corp, 2013). Attrition was categorised as either collaboratively deciding to

end treatment or dropping out (e.g. moving away, not attending sessions etc.). Potential pre-treatment predictors of attrition were assessed using multinomial logistic regression using three groups (completers, drop out, and collaborative decision to leave). Between-group baseline comparisons for the second case series were assessed using binomial logistic regression. For the second case series the initial four-week period was compared between the two groups to determine whether there were differences in eating disorder symptoms after the four-week waitlist (i.e., between baseline and start of treatment) versus the first four weeks of CBT-T (immediate start condition). The ED15 was used, as the EDE-Q was not administered at session one (in the second case series). EDE-Q global scores were substituted if ED15 scores were missing, given the high correlation between the two total scores ($r = .76$). This substitution was performed for 16/52 cases (30.77%). We used multi-level modelling (MLM), enabling inclusion of cases with missing data via maximum likelihood estimation. Calculation of an effect size for between-group comparisons using Cohen's d used the mean of the final observation minus the mean of the initial observation divided by the pooled SD. Bonferroni correction was applied for multiple comparisons.

MLM assessed outcome using completer and intent to treat (ITT) analyses. For completer analyses, all drop-outs were omitted by using the 'select cases' function and within-group effect sizes were calculated (Cohen's d). Bonferroni correction was applied for multiple comparisons. For the second case series, we first examined group as a moderator and baseline was included as a covariate to compare group outcomes. No significant differences were observed between the groups and there was no interaction between condition and time (i.e., there was no impact of waitlist). Therefore, further analyses collapsed the groups to assess the data as a complete group (i.e., as case series design). Baseline was not included as a covariate to allow the calculation of effect sizes from baseline. Paired samples t-tests were

performed to assess the change in the number of comorbidities from pre-treatment to post-treatment.

Abstinence and remission rates were calculated at three time points - post-treatment (session 10, EOT), one-month follow-up (FU1), and at the three-month follow-up (FU3). Abstinence was defined as being free of all bulimic behaviours (objective binges, purging) over the past month using the EDE-Q. As per Waller et al. (2018) remission was defined as abstinence in addition to having an EDE-Q Global score no greater than one SD above the mean score for non-clinical females (≤ 2.77) using Australian norms (Mond et al., 2006). The Fairburn et al. trials in 2009 and 2015 defined 'good outcome' at post-treatment as a score on the EDE < 1 SD above the UK community norm. This measure of 'good outcome' was considered an indicator of clinically significant change (Fairburn et al., 2015; Fairburn et al., 2009; Kraemer et al., 2003). Like the present study, effectiveness studies typically use the EDE-Q (e.g. Byrne et al., 2011; Knott et al., 2015; Signorini et al., 2018). Thus, to enable comparisons, 'good outcome' in the present study is considered as having a post-treatment score on the EDE-Q of ≤ 2.77 (within 1 SD of Australia norms; Mond et al., 2006). The Fairburn et al. trial (2015) and subsequent effectiveness studies applied last observation carried forward for ITT analyses (Byrne et al., 2011; Knott et al., 2015; Signorini et al., 2018; Turner, Marshall, et al., 2015; Waller et al., 2014). Therefore, for comparability purposes, last observation carried forward was applied for abstinence, remission, and good outcome analyses only. To compare changes in eating disorder psychopathology across studies, effect sizes and confidence intervals were calculated for EDE or EDE-Q between baseline and post-treatment using reported means and standard deviations for both ITT and completer samples where available.

Results

Preliminary Analyses

Data were first checked for normality to ensure the suitability of parametric tests, using visual inspection of distributions and formal inference tests (Tabachnick & Fidell, 2012). Several variables were not normally distributed, including bingeing, purging, BMI, and age in both case series. In the second case series CIA and EDE-Q at follow-up, DASS at post-treatment and follow-up, treatment suitability, and MINI at post-treatment were also not normally distributed. To aid interpretation, transformations were not performed given all variables correspond to meaningful values (Tabachnick & Fidell, 2012).

Participant Flow

We defined 'unacceptability' as actively declining the therapy after it was described in detail or passively opting out by not attending the first treatment session. Seven of the 33 participants (21.21%) in the first case series and 7 of the 59 participants (11.86%) in the second case series demonstrated unacceptability. For those who attended the first treatment session, confidence ($M = 72.63$, $SD = 14.57$ first case series; $M = 77.88$, $SD = 14.11$ second case series) and suitability ($M = 78.46$, $SD = 15.30$ first case series; $M = 76.86$, $SD = 18.13$, second case series) were rated highly. This was highly similar to ratings of perceived treatment expectancy ($M = 68.1$, $SD = 20.5$) and suitability ($M = 78.2$, $SD = 24.4$) reported in the Fairburn et al. (2015) efficacy trial using experienced therapists.

We defined 'attrition' as starting treatment but not completing it. Overall, this occurred for 13 of the 26 participants (50%) in the first case series and 20 of the 52 participants (38.46%) in the second case series. Attrition was categorised into two groups: those where a collaborative decision was made with the therapist to leave treatment due to lack of engagement with therapy tasks ($N = 3$, 11.54% first case series, $N = 9$, 17.31% second case series), and those who ceased therapy prematurely without discussion with the therapist i.e., dropped out ($N = 10$, 38.46% first case series, $N = 11$, 21.15% second case series). See **Figure 1** for reasons for attrition. The only significant predictor of attrition

was purging in the second case series (see **Table 1**), where those who collaboratively decided to leave treatment engaged in significantly greater purging at baseline compared to completers. There was insufficient power in the first case series (collaborative decision to leave $N = 3$) to calculate an Odds Ratio (OR) between completers and those who collaboratively decided to leave. However, completers were purging at baseline ($M = 2.00$, $SD = 3.51$) while those who collaboratively decided to leave were not ($M = 0$, $SD = 0$). In the second case series, assigned condition was not a significant predictor of attrition, OR = 0.64 (95% CI: 0.14 – 3.04, completers vs. collaborative decision to leave) and OR = 2.25 (95% CI: 0.55 – 9.25, completers vs. dropouts).

Symptom Change across the Four-Week Wait-List Period (First Case Series)

For both ITT and completers, no significant differences were observed between baseline and pre-treatment for all variables and the majority of effect sizes were small (see **Table 2**).

First Four Sessions of CBT-T versus Waitlist (Second Case Series)

There was a significant interaction between condition and time, $F(1, 46.41) = 5.81$, $p = .02$ for eating disorder symptoms, indicating that participants in the immediate start condition had a significantly greater decrease over the first four-week period (i.e., while in therapy) than the waitlist group (while not receiving therapy). On the ED15, the immediate start group moved from $M = 3.92$ $SE = .24$ to $M = 2.91$ $SE = .25$, while the waitlist group moved from $M = 3.58$ $SE = .26$ to $M = 3.29$ $SE = .26$. The within-group effect size decrease for the immediate start condition was large and significant ($d = 0.80$, 95% CI: 0.25 – 1.33), but was small and non-significant for the waitlist condition ($d = 0.23$, 95% CI: -0.34 – 0.79). Therefore, the first four weeks of CBT-T was more effective in reducing eating disorder symptoms compared to the four-week waitlist period.

Symptom Change across the Course of Treatment

Table 1: Multinomial Logistic Regression Analyses to Assess Predictors of Attrition

	First Case Series					Second Case Series				
Variable	Completers *N* = 13 *M (SD)*	CD *N* = 3 *M (SD)*	Drop Out *N* = 10 *M (SD)*	OR (95% CI) C vs. CD	OR (95% CI) C vs. D	Completers *N* = 32 *M (SD)*	CD *N* = 9 *M (SD)*	Drop Out *N* = 11 *M (SD)*	OR (95% CI) C vs. CD	OR (95% CI) C vs. D
Age	30.40 (9.82)	29.48 (18.11)	26.32 (6.51)	0.99 (0.87 – 1.13)	0.95 (0.86 – 1.05)	26.63 (10.16)	27.39 (9.89)	25.01 (8.38)	1.01 (0.94 – 1.08)	0.98 (0.90 – 1.07)
Global EDE-Q	4.41 (0.74)	4.70 (0.86)	4.35 (0.86)	1.87 (0.27 – 13.03)	0.89 (0.27 – 2.94)	3.79 (1.09)	4.32 (0.99)	3.43 (1.29)	1.71 (0.74 – 3.99)	0.76 (0.42 – 1.38)
CIA	35.62 (7.67)	40.69 (2.15)	35.44 (7.55)	1.13 (0.91 – 1.42)	1.00 (0.88 – 1.13)	27.12 (9.40)	30.94 (8.76)	28.77 (11.85)	1.04 (0.96 – 1.13)	1.02 (0.95 – 1.09)
Objective binges	2.92 (3.72)	0.67 (0.58)	7.70 (8.87)	0.60 (0.21 – 1.71)	1.14 (0.96 – 1.35)	3.59 (3.68)	4.11 (5.23)	3.36 (6.31)	1.02 (0.88 – 1.20)	0.99 (0.84 – 1.16)
Purging	2.00 (3.51)	0 (0)	6.70 (9.39)	a	1.13 (0.96 – 1.32)	2.25 (3.44)	6.56 (6.69)	3.36 (7.13)	**1.15 (1.00 – 1.32)**	1.06 (0.91 – 1.23)
BMI	26.55 (7.14)	27.76 (5.65)	29.34 (9.81)	1.02 (0.87 – 1.21)	1.05 (0.94 – 1.17)	27.71 (8.57)	26.11 (7.87)	22.34 (3.12)	0.97 (0.88 – 1.08)	0.84 (0.71 – 1.01)
DASS total	33 (13.48)	39.67 (5.51)	35.78 (10.05)	1.06 (0.93 – 1.22)	1.02 (0.95 – 1.11)	23.39 (12.87)	33.88 (12.71)	30.18 (19.38)	1.05 (0.99 – 1.12)	1.03 (0.98 – 1.09)
Confidence	73.46 (14.05)	73.33 (20.21)	74 (13.92)	1.00 (0.91 – 1.09)	1.00 (0.94 – 1.07)	80.56 (14.33)	72.22 (12.02)	74.00 (14.07)	0.96 (0.90 – 1.01)	0.97 (0.91 – 1.02)
Suitability	82.69 (12.35)	76.67 (25.17)	75.43 (13.95)	0.97 (0.89 – 1.06)	0.96 (0.90 – 1.03)	77.91 (18.24)	67.78 (18.56)	82.22 (15.86)	0.97 (0.94 – 1.01)	1.02 (0.97 – 1.07)

Note. EDE-Q = Eating Disorder Examination Questionnaire; CIA = Clinical Impairment Assessment; DASS = Depression Anxiety and Stress Scales; BMI = Body Mass Index; OR = Odds Ratio; CD = Collaborative decision to leave; C = Completers; D = Dropout.

a = Insufficient power to compute OR

Table 2

Eating Pathology over the Course of Treatment, using Completer and Intention-To-Treat Analyses (First Case Series)

	Baseline (Assessment)		Pre-Treatment (session 1)			Mid-Treatment (Session 4)			Post-Treatment (Session 10)			1-Month Follow-Up			3-Month Follow-Up				
Completer (N = 13)	*M*	*SE*	*M*	*SE*	*d*	*M*	*SE*	*d*	*M*	*SE*	*d*	*M*	*SE*	*d*	*M*	*SE*	*d*	*F*	Post hoc comparisons
EDE-Q Global	4.41	0.29	4.19	0.29	0.22	3.24	0.29	1.16	2.03	0.29	2.37	2.02	0.29	2.38	1.81	0.29	2.59	18.85*	B, S1 > S4 > S10, F1, F3
CIA	35.62	2.77	31.71	2.77	0.41	23.80	2.77	1.23	14.83	2.77	2.17	15.66	2.77	2.08	13.53	2.82	2.30	11.53*	B, S1 > S4 > S10; B, S1 > F1, F3
Objective binges/week	2.92	0.61	2.08	0.61	0.40	0.15	0.61	1.31	0.00	0.61	1.38	0.12	0.61	1.33	0.23	0.64	1.24	3.89*	
Purging/week	2.00	0.49	0.77	0.49	0.72	0.23	0.49	1.04	0.08	0.49	1.13	0.14	0.49	1.10	0.23	0.51	1.02	2.28	
DASS	33.59	4.33	29.92	4.29	0.25	26.19	4.29	0.50	18.12	4.29	1.04	17.54	4.29	1.08	18.46	4.33	1.01	4.50*	B, S1, S4 > S10; B > F1
ITT (N = 26)																			
EDE-Q Global	4.42	0.19	3.96	0.20	0.47	3.11	0.22	1.27	1.94	0.24	2.29	1.95	0.25	2.22	1.76	0.26	2.34	23.84*	B, S1 > S4 > S10, F1, F3
CIA	36.16	1.86	31.46	1.92	0.50	23.50	2.08	1.28	14.55	2.28	2.08	15.46	2.42	1.92	13.39	2.55	2.04	18.00*	B, S1 > S4 > S10, F3; B, S1 > F1
Objective binges/week	4.50	0.82	2.73	0.82	0.43	0.51	0.93	0.91	0.20	1.09	0.89	0.23	1.13	0.87	0.29	1.18	0.83	3.59*	B > S4
Purging/week	3.58	0.94	1.96	0.94	0.34	0.85	0.99	0.57	0.60	1.10	0.58	0.58	1.16	0.57	0.60	1.23	0.54	3.00	
DASS	35.11	2.80	31.29	2.84	0.27	28.67	3.01	0.44	19.37	3.24	1.04	18.59	3.43	1.06	19.39	3.62	0.97	6.37*	B, S1, S4 > S10, F1; B > F3

Note. *Bonferroni adjusted comparisons for eating related variables $p < .01$; d = within-time effect size, Cohen's d from baseline*; df* varies from 34.55 – 57.10 for completers and 63.74 – 74.51 for ITT; ITT = Intention-to-treat; EDE-Q = Eating Disorder Examination Questionnaire; CIA = Clinical Impairment Assessment; DASS = Depression Anxiety and Stress Scales.

Body mass index. In the first case series, there was no change observed in BMI (F[76.10] = 0.96, p = .45). In contrast, a small significant increase in BMI was found in over the course of therapy for completer (F[58.00] = 0.81, p = .55) or ITT analyses the second case series. Completer analyses (F[110.04] = 3.08, p = .02) showed increases in BMI between baseline (M = 27.71, SE = 1.49) and post-treatment (M = 28.41, SE = 1.50), d = -.08. ITT analyses (F[123.32] = 4.63, p = .002) showed increases from baseline (M =26.29, SE = 1.07) to mid-treatment (M = 26.67, SE = 1.08), d = -.05, post-treatment (M = 27.08, SE = 1.08), d = -.10, and one-month follow-up (M = 27.03, SE = 1.08), d = -0.10.

Attitudinal and behavioural change.

First case series. Results from the first case series are presented in **Table 2**. Completers had statistically significant reductions with large effect sizes in eating psychopathology and impairment from baseline and pre-treatment to mid- and post-treatment. The mean EDE-Q global and CIA scores began in the clinical range and fell below the clinical cut-off (EDE-Q 2.77; CIA 16) at post-treatment. While there was no significant difference for bingeing or purging, effects were large from baseline to mid- and post-treatment. Negative affect significantly reduced from baseline, pre- and mid-treatment to post-treatment, with a large effect (from baseline). The pattern of results was almost identical for ITT analyses, except the difference between objective bingeing from baseline to mid-treatment became significant. There was a significant decrease in the number of current comorbidities from pre-treatment (M = 2.46, SD = 1.81) to post-treatment (M = 0.85, SD = 1.07), t(12) = 4.40, p < .001, d = 1.08.

Second case series. Completers demonstrated a similar pattern of results (see **Table 3**). In contrast to the first case series, both objective binges and purging showed a statistically significant reduction, with large effect sizes between baseline and mid- and post-treatment. Negative affect demonstrated statistically significant reductions from

Table 3

Eating Pathology over the Course of Treatment, using Completer and Intention-To-Treat Analyses (Second Case Series)

	Baseline (Assessment)		Mid-Treatment (Session 4)			Post-Treatment (Session 10)			1-month follow-up			3-month follow-up				
Completer (N = 32)	M	SE	M	SE	d	M	SE	d	M	SE	d	M	SE	d	F	Post hoc comparisons
EDE-Q Global	3.79	0.18	2.32	0.18	1.47	1.35	0.19	2.37	1.23	0.19	2.48	1.26	0.20	2.39	60.86*	B > S4 > S10, F1, F3
CIA	27.12	1.60	16.24	1.60	1.22	9.45	1.62	1.97	8.15	1.68	2.08	8.47	1.73	2.01	36.14*	B > S4 > S10, F1, F3
Objective binges/week	3.59	0.32	0.25	0.32	1.87	0.08	0.35	1.88	0.21	0.33	1.87	0.23	0.36	1.77	22.79*	B > S4, S10, F1, F3
Purging/week	2.25	0.32	0.16	0.32	1.17	0.08	0.34	1.18	0.34	0.33	1.06	0.16	0.35	1.12	10.22*	B > S4, S10, F1, F3
DASS	23.39	2.41	17.33	2.41	0.45	13.77	2.44	0.71	11.63	2.54	0.85	12.10	2.61	0.81	5.08*	B > S10, F1, F3
ITT (N = 52)																
EDE-Q Global	3.81	0.15	2.49	0.16	1.19	1.49	0.18	1.96	1.38	0.19	1.99	1.38	0.20	1.92	61.83*	B > S4 > S10, F1, F3
CIA	28.13	1.36	18.27	1.45	0.98	11.12	1.58	1.62	9.77	1.70	1.67	9.70	1.80	1.62	39.21*	B > S4 > S10, F1, F3
Objective binges/week	3.64	0.41	0.42	0.43	1.06	0.26	0.51	1.02	0.39	0.52	0.97	0.34	0.56	0.94	20.37*	B > S4, S10, F1, F3
Purging/week	3.23	0.55	0.96	0.57	0.57	0.91	0.63	0.55	1.14	0.65	0.49	0.93	0.69	0.52	10.70*	B > S4, S10, F1
DASS	26.50	2.08	21.79	2.22	0.31	17.03	2.42	0.59	14. 07	2.59	0.74	13.95	2.75	0.72	5.94*	B > S10, F1, F3

Note. * Bonferroni adjusted comparisons for eating related variables $p < .01$; d = within-time effect size, Cohen's d from baseline; df varies from 62.44 – 106.38 for completers and 84.12 – 119.71 for ITT; ITT = Intention-to-treat; EDE-Q = Eating Disorder Examination Questionnaire; CIA = Clinical Impairment Assessment; DASS = Depression Anxiety and Stress Scales.

baseline to post-treatment with a medium effect size. Current comorbidities also significantly decreased from pre-treatment ($M = 1.31$, $SD = 1.31$) to post-treatment ($M = 0.72$, $SD = 1.22$), $t(31) = 2.60$, $p = .01$, $d = 0.47$. Similar results were found for ITT analyses except effect sizes for purging were medium rather than large. For eating disorder cognitions, the effect sizes found in the both case series between baseline and post-treatment were higher than those reported in prior effectiveness and efficacy studies of CBT-ED and CBTgsh studies with trainee psychologists or inexperienced therapists (see **Table 4**).

Symptom Change during Follow-Up

Follow-up data are presented in **Table 2 and 3** for completer and ITT analyses. For completer and ITT analyses in both case series, both the one- and three-month follow-up scores were not statistically different from post-treatment scores for eating cognitions. EDE-Q global and CIA scores remained under the clinical cut-off, with very large effect size decreases from baseline. In the first case series, reductions in objective bingeing and purging from baseline to both follow-ups were not significant, however effect sizes were large for completers and medium to large for ITT. In the second case series, reductions in bingeing and purging were significant with large effects for completers. The pattern was similar for ITT however the difference between baseline and three-month follow-up was no longer significant for purging and effect sizes for purging at both follow-ups from baseline were medium (rather than large). In both case series, medium to large reductions in negative affect at one- and three-month follow-up were observed. Differences were significant from baseline except at the one-month follow-up in the first case series.

Abstinence and remission rates

We calculated abstinence, remission, and good outcome at three time points (end of treatment, 1-month and 3-month follow-up), using completer and intention-to-treat

Table 4

Cohen's d (95% Confidence Intervals) between Baseline and Post-Treatment for Disordered Eating Psychopathology

Sample	Present Study	Fairburn et al. trials	Effectiveness studies	CBTgsh Studies
Completer	First case series 2.37 (1.37 – 3.37) Second case series 2.37 (1.73-3.01)		Byrne et al. (2011): 1.50 (1.11 – 1.88) Knott et al. (2014): 2.25 (1.95 – 2.56) restraint, 2.12 (1.82 – 2.42) eating concern, 1.74 (1.46 – 2.02) shape concern, 1.87 (1.59 – 2.16) weight concern Signorini et al. (2017): 1.41 (0.99 – 1.83) Turner et al. (2015): 1.61 (1.26 – 1.97) Waller et al. (2014): 1.07 (0.72 – 1.42) Waller et al. (2018): 1.58 (1.19 – 1.98)	Banasiak et al. (2005): 1.48 (1.01 – 1.96)
ITT	First case series 2.29 (1.59 – 2.99) Second case series 1.96 (1.49-2.43)	Fairburn et al. (2009): 1.32 (0.97 – 1.67; CBT-Ef), 1.28 (0.92 – 1.64; CBT-Eb) Fairburn et al. (2015): 1.79 (1.37 – 2.21)	Byrne et al. (2011): 0.62 (0.37 – 0.88) Knott et al. (2014): Restraint 0.79 (0.61 – 0.98), Eating Concern 0.87 (0.69 – 1.06), Shape Concern 0.75 (0.57 – 0.93), Weight Concern 0.79 (0.61 – 0.97) Rose & Waller (2017): 0.39 (-0.02 – 0.80) Signorini et al. (2017): 0.61 (0.34 – 0.88) Turner et al. (2015): 0.83 (0.57 – 1.10) Waller et al. (2014): 0.61 (0.29 – 0.93) Waller et al. (2018): 1.22 (0.90 – 1.53)	Banasiak et al. (2005): 1.10 (0.70 – 1.51) Cachelin et al. (2014): Restraint 0.09 (-0.41 – 0.59), Eating Concern 0.33 (-0.17 – 0.83), Shape Concern 0.42 (-0.08 – 0.92), Weight Concern 0.43 (-0.07 – 0.93) Carter & Fairburn (1998): 1.47 (0.94 – 2.01) Wilson et al. (2010): 1.10 (0.74 – 1.47) Zandberg & Wilson (2013): Dietary Restraint 0.76 (0.30 – 1.23), Shape and Weight Concerns 0.64 (0.18 – 1.01)

Note. Byrne et al. (2011), Rose & Waller (2017), Signorini et al. (2017) and Turner et al. (2015) samples included participants with BMI < 17.5.

Measures: EDE (Banasiak et al., 2005; Cachelin et al., 2014; Carter & Fairburn, 1998; Fairburn et al., 2009; Fairburn et al., 2015); EDE-Q (present study; Byrne et al., 2011; Knott et al., 2014; Rose & Waller, 2017; Signorini et al., 2017; Turner et al., 2015; Waller et al., 2018), Eating Disorders Inventory (EDI; Waller et al., 2014), and a modified version of the EDE-Q (EDE-Q-SF; Zandberg & Wilson, 2013).

EDE-Q/EDE/EDE-Q-SF global scores not provided in Cachelin et al. (2014), Knott et al. (2014), and Zandberg and Wilson (2013), subscale effect sizes are presented.

Cohen's *d* presented may differ from those presented in some studies. To enable comparison, Cohen's *d* was calculated using means, standard deviations, and sample sizes.

analyses. For comparability purposes to previous studies, last observation carried forward was applied for ITT and where completer follow-up data were not returned. **Table 5** presents the abstinence, remission, and good outcome rates compared to those in relevant studies. Abstinence and remission rates at end of treatment were comparable to or slightly lower than those found by Waller et al. (2018), longer versions of CBT-ED, and CBTgsh performed by inexperienced therapists (see **Table 5**). However, at the three-month follow-up, abstinence and remission rates for the second case series were higher than those studies with data available at the same time point. Results for the first case series remained comparable. Good outcome was found to be similar or higher than all comparable studies listed. The pattern of results was similar for both completer and ITT analyses.

Discussion

The primary aim of this study was to replicate Waller et al.'s (2018) case series in an Australian context. Results partially supported predictions, as significant reductions were observed for all variables in both case series, except for bingeing and purging in the first case series where results did not reach significance. Effect sizes were typically medium and large, suggesting non-significant findings may be due to reduced power. Notably, we observed significant improvements in most variables by mid–treatment, and post-treatment results were largely maintained at both follow-up points. In the first case series, we observed little change for the majority of variables between baseline and pre-treatment, suggesting that improvements over the course of CBT-T are a result of the treatment rather than passage of time. Similarly, in the second case series, little change was found for eating disorder symptoms between baseline and session one of CBT-T for the four-week waitlist condition while the immediate start condition demonstrated a large decrease in symptoms after four weeks of treatment. Abstinence, remission, and good outcome rates for both case series were comparable to Waller et al.'s (2018) pilot study of CBT-T, CBTgsh studies with trainee

Table 5

End of Treatment and Follow-Up Abstinence and Remission Rates Compared with Previous Studies

Sample	Analysis		First sample	Second sample	Fairburn et al. trials	Effectiveness Studies	CBTgsh Studies
Completer	Abstinence	EOT	76.9%	46.9%	43.8% (Fairburn et al., 2015).	57.6% (Byrne et al., 2011); 56% (Waller et al., 2014)[b]; 67.2% (Waller et al., 2018)[a].	39% (Banasiak et al., 2005).
		1-FU	61.5%	56.3%			
		3-FU	61.5%	62.5%		42.8% (Waller et al., 2018)[a].	
	Remission	EOT	53.8%	46.9%		34.4% (Rose & Waller, 2017)[c]; 31% (Turner, Marshall, et al., 2015)[d]; 52.9% (Waller et al., 2014)[b]; 50.0% (Waller et al., 2018)[a].	
		1-FU	38.5%	50%			
		3-FU	46.2%	62.5%		37.1% (Waller et al., 2018)[a].	
	Good Outcome	EOT	76.9%	87.5%	66.4% (Fairburn et al., 2009); 75% (Fairburn et al., 2015).	66% (Byrne et al., 2011); 78.3% (Knott et al., 2015); 69.1% (Signorini et al., 2018)[e].	
		1-FU	76.9%	90.6%			
		3-FU	84.6%	90.6%			
Intent-to-treat	Abstinence	EOT	44%	38.5%	42.3% (Fairburn et al., 2009); 44.8% (Fairburn et al., 2015).	42.5% (Byrne et al., 2011); 59.1% (Waller et al., 2018)[a].	28% (Banasiak et al., 2005); 35.5% (Cachelin et al., 2014); 50% (Carter & Fairburn, 1998); 39.5% (Zandberg & Wilson, 2013).
		1-FU	36%	44.2%			42.1% (Zandberg & Wilson, 2013).
		3-FU	36%	48.1%		41.9% (Waller et al., 2018)[a].	41% (Carter & Fairburn, 1998).
	Remission	EOT	28%	32.5%		23.4% (Rose & Waller, 2017)[c]; 19.6% (Turner, Marshall, et al., 2015)[d]; 47.4% (Waller et al., 2014)[b]; 40.2% (Waller et al., 2018)[a].	38.7% (Cachelin et al., 2014)[f]; 52 % and 62% (high and low negative affect; Wilson et al., 2010)[g]; 62.3% (Zandberg & Wilson, 2013)[h].
		1-FU	20%	34.6%			68.4% (Zandberg & Wilson, 2013)[h].
		3-FU	24%	42.3%		36.6% (Waller et al., 2018)[a].	
	Good Outcome	EOT	52%	63.5%	53% (Fairburn et al., 2009); 65.5% (Fairburn et al., 2015).	41.2% (Byrne et al., 2011); 39.7% (Knott et al., 2015); 42.2% (Signorini et al., 2018)[e].	69% (Carter & Fairburn, 1998).
		1-FU	52%	65.4%			
		3-FU	56%	65.4%			

Note. [a] Waller et al. (2018) assessed abstinence and remission over the last week at post-treatment and over the last two months at the 3-month follow-up. [b] Waller et al. (2014) considered remission to include abstinence and a loss of diagnosis. [c] Rose and Waller (2017) additionally included BMI > 18.5 in their definition of remission. [d] Turner et al. (2015) additionally included BMI > 18.5 in their definition of remission. [e] Signorini et al. (2017) included participants with a BMI > 16. [f] Cachelin et al. (2017) remission = diagnostic remission (fewer than 1 binge/purge episode per week for 3 months). [g] Wilson et al. (2010) definition of remission unclear. [h] Zandberg & Wilson (2013) remission = diagnostic remission (bingeing and purging less than twice per week). EOT = End of treatment; 1-FU = 1-month follow-up; 3-FU = three-month follow-up

psychologists and inexperienced therapists (Banasiak et al., 2005; Cachelin et al., 2014; Carter & Fairburn, 1998; Wilson et al., 2010; Zandberg & Wilson, 2013), and efficacy (Fairburn et al., 2015; Fairburn et al., 2009), and effectiveness studies (Byrne et al., 2011; Knott et al., 2015; Rose & Waller, 2017; Signorini et al., 2018; Turner, Marshall, et al., 2015; Waller et al., 2014) of longer versions of CBT-ED. Similarly, effect sizes between baseline and post-treatment for eating disorder cognitions in both case series outperformed comparable studies. Mean EDE-Q global scores for both case series fell from above the clinical cut-off at baseline to below at both post-treatment and both follow-ups, demonstrating clinically significant change.

Results support the hypothesis that trainee psychologists are able to achieve outcomes commensurate to those found by experienced therapists while receiving expert supervision (cf. Öst et al., 2012). This is particularly encouraging given eating disorders are described as difficult to treat (Fairburn & Harrison, 2003), and longer versions (e.g. CBT-E) are often described as requiring specific training and practice, and not being easy to learn (Agras, Fitzsimmons-Craft, & Wilfley, 2017). Results also suggest that 10 sessions are sufficient to produce good outcomes in eating disorders, as has been demonstrated in evaluations of CBTgsh (Wilson & Zandberg, 2012). Thus, results provide support for CBT-T as an efficacious, time efficient, and cost effective treatment for eating disorders suitable for delivery by trainee psychologists.

At one- and three-month follow-up, abstinence, remission, and good outcome rates typically increased further from post-treatment (however in the first case series some rates decreased). Several studies of CBTgsh have demonstrated similar findings (Wilson & Zandberg, 2012), while CBT-ED studies tend not to show this effect. This may indicate that shorter treatments build self-efficacy and encourage clients to continue working and improving. Alternatively, it is possible that the longer therapies stop having substantial

impact well before the end of therapy (e.g., Rose & Waller, 2017), whereas the shorter ones allow for further gain during follow-up. The follow-up appointments also offered the chance to problem-solve any slippage that had occurred. Thus, the favourable three-month follow-up results are likely due to a combination of continued self-directed therapy and strategies discussed at the one-month follow-up session.

It was hypothesised that attrition would be similar to rates achieved by experienced therapists in longer evaluations of CBT-ED. This hypothesis was largely supported. The overall attrition rate was 50% in the first case series and 38.5% in the second case series. While both rates are higher than the 31.2% attrition rate reported by Waller et al. (2018), both are within the range of those reported by comparable studies evaluating longer versions of CBT for eating disorders with predominantly experienced therapists, ranging from 10.3% to 50% (Byrne et al., 2011; Fairburn et al., 2015; Fairburn et al., 2009; Knott et al., 2015; Rose & Waller, 2017; Signorini et al., 2018; Turner, Marshall, et al., 2015; Waller et al., 2014). Therefore, data provide support for the hypothesis that trainee psychologists would yield similar attrition rates to experienced therapists.

Attrition was categorised into two groups, those who collaboratively decided to leave (had a discussion with their therapist) and dropout. In the first case series 23% of the total attrition collaboratively decided to leave compared to 77% who were classified as dropouts. For the second case series 45% collaboratively decided to leave while 55% were dropouts. Thus, the review session and demand for quick behavioural change contributed to higher attrition. The only significant predictor of attrition found was purging. Those who collaboratively decided to leave treatment were purging significantly more at baseline compared to completers in the second case series. While there appeared to be a difference in purging between those who collaboratively decided to leave and completers in the first case series, there was insufficient power to test this difference. No other significant

predictors of attrition were found in either case series.

After the first case series was conducted, while no significant predictors of attrition were found, design and therapist skill were suspected of playing a role. The design of the first case series included a one month wait-list period following assessment to provide a within-subjects control group, and increased wait times for eating disorder treatment were previously found to be a significant predictor of attrition (Carter et al., 2012). The design of the second case series was adjusted to address this issue by randomly allocating participants to start immediately following assessment or after the one-month wait list. While the rates of attrition varied slightly between the immediate start and delayed start conditions (35.71% immediate, 41.67% delayed overall), group allocation was not found to be a significant predictor of attrition. This indicates that a four-week wait list is not detrimental to engagement in CBT-T. While Carter et al. (2012) found time spent on a waitlist to be a significant predictor of attrition, the participants in their study spent an average of 6 months on a waitlist prior to attending an assessment. In the present study participants in both case series were assessed and provided with psychoeducational materials designed to increase motivation, which may have increased engagement. Instead, therapist inexperience may have contributed to attrition in the first case series. When the first case series commenced the first author had not yet completed clinical placements and the other two therapists involved had only completed their first. It may be helpful for novice therapists new to the therapy to "shadow" more experienced novice therapists until they can better manage engagement, or that some intensive training should be offered before new therapists take on clients.

Unacceptability (21.21% first case series; 11.86% second case series) was higher compared to Waller et al.'s (2018; 8.8%) initial evaluation of CBT-T. Comparisons to other studies are limited as specific attrition prior to starting treatment is often not reported

however the number of participants declining treatment is often higher than found in the present study (Byrne et al., 2011; Fairburn et al., 2015; Fairburn et al., 2009; Knott et al., 2015). Despite being slightly higher than Waller et al. (2018), , acceptability of the treatment was considered to be relatively high overall. In addition, perceived confidence and suitability of CBT-T were rated highly at pre-treatment, and were comparable to expectancy and credibility ratings reported in an efficacy trial with experienced therapists (Fairburn et al., 2015), suggesting that clients' treatment expectations are unchanged when treatment is delivered by trainee psychologists.

In addition to eating disorder psychopathology, negative affect reduced from baseline to post-treatment and both follow-ups, with moderate to large effects. Most reductions were statistically significant. Results are comparable to Waller et al. (2018), where alternative measures of depression and anxiety were used. Significant reductions were also found in the number of current comorbid disorders between pre- and post-treatment for completers. Hence, shorter therapies can also improve comorbidities, even though not targeting them specifically. Reductions in negative affect are also comparable to those reported in longer versions of CBT-ED using alternative measures (Byrne et al., 2011; Knott et al., 2015; Turner, Marshall, et al., 2015; Waller et al., 2014). Thus, these results provide further support for the conclusion that CBT-ED is effective for comorbid problems (Linardon, Wade, et al., 2017; Turner, Marshall, Wood, Stopa, & Waller, 2016), even at this shorter dose.

Further research is needed to address limitations and to continue development of CBT-T as an effective therapy (Craig et al., 2008). First, the attrition rate in the first case series study is higher than the majority of comparable studies, which may limit conclusions. However, the overall attrition rate decreases when considering drop outs only. Having a collaborative discussion with participants about leaving treatment is a

specific feature of CBT-T, such that participants are encouraged to return to treatment at any time in the future when they become more confident that they can actively engage in therapy. While attrition was high, for the majority of analyses attrition was dealt with appropriately using multilevel modelling with maximum likelihood estimation to enable inclusion of cases with missing data. Furthermore, despite high attrition the pattern of results for the majority of analyses between ITT and completer analyses were not substantially different and thus attrition does not appear to have biased results. However, readers are advised to interpret results for abstinence, remission, and good outcome with caution due to the use of last observation carried forward (LOCF). This strategy was chosen to enable comparisons with the majority of prior efficacy and effectiveness studies which also used LOCF (Byrne et al., 2011; Fairburn et al., 2015; Knott et al., 2015; Signorini et al., 2018; Turner, Marshall, et al., 2015; Waller et al., 2014). However, LOCF (particularly at follow-up) can inflate results and thus future research should consider alternative methods such as multiple imputation (MacDonald, McFarlane, Dionne, David, & Olmstead, 2017).

In addition to attrition, other limitations require consideration for future research. Second, a longer-term follow-up period is required to assess the durability of outcomes over time. Third, while a within-subjects control was included in the first case series, and participants in the second case series were randomised to either an immediate or delayed start, there was not an independent control group or a second comparison treatment. Therefore, future investigations should adopt a randomised controlled trial design that incorporates a longer-term follow-up period to evaluate the effectiveness of CBT-T over time compared to other therapies, such as Fairburn's (2008) enhanced CBT-E. Fourth, we cannot extrapolate findings to clients with a BMI under 17.5. There are also small sample sizes for some diagnostic categories (AN, BED, and UFED) which may limit

generalisations to these groups. Fifth, the effects of a four-week waitlist may have been

confounded by the completion of an assessment and the provision of psychoeducation.

Thus, future research exploring the effects of waitlist may evaluate whether such variables

effect engagement. Sixth, while all therapists were supervised weekly or bi-weekly,

fidelity was not formally evaluated.

In summary, the results from both case series provide support for CBT-T as an

effective, shorter treatment for non-underweight eating disorder clients. Outcomes and

attrition data support the use of expert-supervised trainee provisional psychologists in the

delivery of CBT-ED, supporting the use of trainee psychologists as an effective strategy

for overcoming research-practice and treatment gaps in eating disorder treatment. The

present study addresses the need to provide shorter, cost-effective psychotherapy to this

clinical group, and suggests that CBT-T has the capacity for widespread dissemination by

overcoming barriers of cost and accessibility.

CHAPTER 6

Body image flexibility: A Predictor and Moderator of Outcome in Transdiagnostic

Outpatient Eating Disorder Treatment[5]

---

[5] A version of this chapter has been published as a brief report in the *International Journal of Eating Disorders* (Pellizzer, Waller, et al., 2018a), provided in **Appendix C**.

Abstract

Objective: Predictors of attrition and predictors and moderators of outcome were explored in a transdiagnostic sample of clients who received ten-session Cognitive Behavioural Therapy (CBT-T) for non-underweight eating disorders. Body image flexibility, a protective positive body image construct, was hypothesised to be a significant moderator.

Method: Data from two case series were combined to form a sample of 78 participants who received CBT-T. Baseline measures of body image, negative affect, personality, and motivation (readiness to change and self-efficacy) were included as potential predictors. Global eating disorder psychopathology at each assessment point (baseline, mid- and post-treatment, 1- and 3-month follow-up) was the outcome variable. Predictors of attrition were assessed using logistic regression, and multi-level modelling was applied for predictors and moderators of outcome.

Results: No variables were significant predictors of attrition when tested using multivariate analyses. Baseline body image flexibility was the strongest predictor and moderator of improvements in global eating disorder psychopathology, followed by body image avoidance. Baseline body checking, negative affect, personality beliefs and self-efficacy were significant predictors of improvements in global eating disorder psychopathology.

Discussion: Higher body image flexibility predicted lower global eating disorder psychopathology at every assessment point. Further research is required to replicate findings and explore the benefit of focusing on positive body image in treatment.

Introduction

Improvements in body image flexibility are associated with positive outcomes in eating disorder symptoms, quality of life, and general mental health in treatment studies that assessed change simultaneously (Butryn et al., 2013; Lee et al., 2018). However only one study (adolescent sample) shows prospectively that pre-treatment flexibility predicts post-treatment quality of life and eating disorder risk, when adjusting for baseline levels of these variables (Bluett et al., 2016). The role of body image flexibility in predicting treatment outcomes still needs to be tested in adults with eating disorders. While cognitive behaviour therapy for eating disorders (CBT-ED) does not explicitly target body image flexibility, it does address two key behavioural manifestations of image disturbance - body avoidance and checking (Amin et al., 2012). While both behaviours are considered to be risk and maintenance factors for eating disorders (Amin et al., 2012), no study has evaluated whether either influences treatment outcomes.

The aim of this study is to explore these three aspects of body image (flexibility, avoidance, and checking) as potential predictors and moderators of outcome in an adult outpatient transdiagnostic case series (body mass index [BMI] > 17.5), using ten-session CBT for eating disorders (CBT-T; Waller et al., 2018). Results will be compared to established predictors of treatment outcomes and attrition, namely comorbidity (as indicted by negative affect and personality disorder pathology), and motivation (readiness to change and confidence in ability to change [self-efficacy]) (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015). Therefore, the present study contributes to the field by exploring predictors of outcome with more novel or less explored predictors in a transdiagnostic sample. First, it is hypothesised that the two motivation items (readiness to change and self-efficacy) will be a significant predictors of drop-out as per a previous meta-analysis (Vall & Wade, 2015). Second, it is hypothesised that higher levels of body

image flexibility and lower levels of body image avoidance, body checking, negative affect, personality beliefs, and motivation will be significant predictors of variance in global eating disorder psychopathology over the course of treatment. Third, it is hypothesised that only the body image variables will significantly interact with time to result in significantly greater decreases in global eating disorder psychopathology over the course of treatment.

Method

Participants

Data from the two case series reported in **Chapter Five** were combined to explore treatment predictors and moderators, resulting in 105 participants being assessed for suitability. Nine participants were ineligible and four chose not to continue past assessment, thus a total of 92 participants were offered, and 78 (85%) started, treatment. In this latter group, mean age was 27.19 years ($SD = 9.60$; range 15.69 – 68.97) and the mean BMI was 26.78 ($SD = 7.84$; range 18.20 – 52.40). The majority were female (92.3%) and Caucasian (88.5%). Diagnosis, using DSM-5 criteria, was assessed at baseline and confirmed in supervision. Using DSM-5 criteria (American Psychiatric Association, 2013), 53 met criteria for Bulimia Nervosa (BN), 18 for Other Specified Feeding and Eating Disorder (OSFED; 13 BN low frequency/limited duration, five Atypical Anorexia Nervosa), three for Unspecified Feeding and Eating Disorder (UFED), two for Anorexia Nervosa (AN) and two for Binge Eating Disorder (BED). Approximately half of the sample were purging at baseline (47.4%). The five most common comorbidities at pre-treatment, as per the MINI International Neuropsychiatric Interview 6.0 (MINI; Sheehan et al., 1997), were Generalized Anxiety Disorder (46.1%), Social Anxiety Disorder (31.6%), Agoraphobia (without Panic Disorder; 19.7%), Major Depressive Disorder (15.8%), and Obsessive Compulsive Disorder and Alcohol Dependence (both 13.2%). In

addition, 43.6% of the sample were taking psychiatric medication (mostly antidepressants) and were asked to keep medication stable during the course of treatment.

Measures

Participants completed measures at baseline (assessment session), mid-treatment (session 4), post-treatment (session 10), and one- and three-month follow-up.

Weight and frequency of disordered eating. As described in **Chapter 5**, height was measured at baseline and weight was measured collaboratively with participants at each session as part of therapy. Frequency of objective bingeing, vomiting, and laxative abuse were calculated each session (obtained from daily food intake diaries and clarified during session). Laxatives and vomiting were combined to create a purging score, given the low frequency of the former.

Global eating disorder psychopathology. The 22-item global eating disorder psychopathology from the Eating Disorder Examination – Questionnaire (EDE-Q; Fairburn & Beglin, 2008) was used (α=.90 in the combined sample). As described in **Chapter 3**, the EDE-Q global score has good psychometric properties.

Body image flexibility. The Body Image Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013) is a 12-item measure of body image flexibility. Higher scores indicate greater body image flexibility. It has strong psychometric properties (see **Chapter 3**). Internal consistency in the current study was .92.

Body image avoidance. The Body Image Avoidance Questionnaire (BIAQ; Rosen et al., 1991) assesses the avoidance of body image related situations. The response format was changed from a 6-point to 7-point scale in the present study to match that of the BI-AAQ (α=.90). Psychometric properties vary across studies due to differing factor structures (see **Chapter 3**). The 14-item version was recently found to have superior fit indices compared to other models (Pellizzer, Tiggemann, et al., 2018) and thus was used for this study.

Body checking. The Body Checking Questionnaire (BCQ; Reas et al., 2002) is a 23-item measure of body checking behaviours. The response format has been changed from a 5-point to 7-point scale in the present study to match that of the BI-AAQ (α=.96). Higher scores indicate greater body checking. Psychometric properties vary across studies (see **Chapter 3**).

Negative affect. The Depression Anxiety and Stress Scales (DASS21; Lovibond & Lovibond, 1995) is a 21-item measure and a higher total score indicates greater negative affect. The scale has good psychometric properties (see **Chapter 3**). Internal consistency was similar in the current study (α=.94 total score).

Personality beliefs.

Description. The Personality Beliefs Questionnaire short form (PBQ-SF; Butler, Beck, & Cohen, 2007) is a 65-item measure of personality traits related to maintenance of psychopathology. The PBQ-SF was developed from the longer, original Personality Beliefs Questionnaire (Beck & Beck, 1991). Items (e.g. "I should be the centre of attention") are scored on a 5-point Likert scale (0 = *Not at all*, 4 = *Totally*) and are used to measure 10 dimensions based on DSM-IV personality diagnoses: Avoidant, Dependent, Passive-Aggressive, Obsessive-Compulsive, Antisocial, Narcissistic, Histrionic, Schizoid, Paranoid and Borderline (Butler et al., 2007). Each subscale is scored by summing the appropriate items. Higher scores indicate greater personality psychopathology. For this study, a total personality psychopathology score was calculated by summing all items.

Factor structure. The PBQ-SF was developed by selecting items with the highest item-total correlations from each subscale. However, while reliability and validity were examined (see below), factor analysis was not conducted at the initial investigation (Butler et al., 2007). An EFA was later completed using a sample of outpatients with depression. A 59-item 7-factor solution was found to be the best solution using criteria such as: factor loadings equal to or greater than .40, at least three items per factor, internal consistency greater than

.70, parsimonious and interpretable structure (Fournier, DeRubeis, & Beck, 2012). This structure was then confirmed using a CFA where all item loadings were greater than .50 and fit indices were acceptable (Fournier et al., 2012). However, the samples used for the EFA and CFA did not include several personality disorder diagnoses (borderline, schizotypal, and antisocial) and the EFA sample was comprised entirely of participants with depression (Fournier et al., 2012). Although factor analysis found the slightly shorter 59-item version, recent research has tended to use either the 65-item version or the full length PBQ. To be consistent with the initial investigation of CBT-T (Waller et al., 2018), the 65-item version is used in the present study.

Reliability and validity. Internal consistency is strong (α = .97 total score), test-retest reliability is moderate *(r = .57 - .82* across subscales after a four-week interval), and the measure is correlated with measures of depression, anxiety, dysfunctional attitudes, neuroticism, self-esteem, and psychosocial functioning (Butler et al., 2007). For the 59-item version, internal consistency was adequate (α = .85 - .94 across subscales) and the PBQ-SF was found to differentiate between those with and without personality disorders and between those with varying personality disorder diagnoses. Internal consistency was strong in the current study (α = .96 total score).

Motivation. Two 100-point visual analogue scales: "How ready are you to change?" and, "If you decided to change, how confident are you that you would succeed?" assessed two aspects of motivation, readiness to change and self-efficacy (Feld, Woodside, Kaplan, Olmsted, & Carter, 2001). Both items are sensitive to changes in motivation and have predicted outcome in AN and BN treatment studies (Feld et al., 2001; Steele, Bergin, & Wade, 2011; Wade, Frayne, Edwards, Robertson, & Gilchrist, 2009).

Procedure

The procedure is identical to the description provided in **Chapter 5**.

Statistical Analyses

Analyses were conducted with IBM SPSS Version 22. Multi-level modelling (MLM) was used, enabling inclusion of cases with missing data via maximum likelihood estimation. Little's Missing at Random (MAR) test was used to assess whether data were missing at random and potential predictors of attrition were assessed using binomial logistic regression. Predictors were first standardised to aid interpretation. Thus, the resulting odds ratio (OR) indicated whether participants were more likely to drop out or complete for every standard deviation change in the predictor.

A predictor was considered to be a significant moderator if the size, sign, or strength of the effect of time on the changing scores of the dependent variable (EDE-Q global score) was dependent on the predictor (Kelly et al., 2013). Seven predictors were examined: Body image flexibility, body image avoidance, body checking, negative affect, personality beliefs, readiness to change, and self-efficacy. Models included a fixed- and random-effects portion, to model constant and variable effects across participants. Intercept and time were included as random effects and an autoregressive (AR[1]) structure for random error was applied. All between-participant predictors were standardised to facilitate interpretation. The unconditional (null) "Model 1" and conditional "Model 2", where time was the sole predictor, were first examined to confirm there was significant variance in global eating disorder psychopathology and whether time explained some of that variance (i.e., a significant change in psychopathology occurred over time). "Model 3", a conditional model, included the main effects of time and the predictor, and a two-way interaction between time and predictor. If a significant interaction existed, and to enable graphing, a dichotomous variable of the predictor was created using a median split, and each analysis was rerun using the dichotomous variable to generate the mean and standard error for the EDE-Q at each time point for low and high values of the predictor.

Results

Preliminary Analyses

Data were first checked for normality to ensure the suitability of parametric tests, using visual inspection of distributions and formal inference tests (Tabachnick and Fidell (2012). Some baseline variables were not normally distributed (EDE-Q, BI-AAQ, and Readiness to Change). To aid interpretation, transformations were not performed given variables correspond to meaningful values (Tabachnick & Fidell, 2012). Little's missing completely at random test (considering all variables used in analyses) was not significant $\chi^2(116) = 115.75$, $p = .49$, indicating data were missing completely at random.

Predictors of Attrition

Attrition, defined as starting treatment but not completing it, occurred for 33 of the 78 participants (42.31%), either because of drop-out ($N = 21$) or collaborative agreement with the therapist that the client was unable to commit to therapy ($N = 12$). These categories of attrition were combined and, when considered individually, two variables emerged as significant predictors of attrition: negative affect and personality psychopathology (**See Table 1**), such that higher scores for either was likely to result in greater attrition. When both significant variables were considered together, neither remained significant: Odds Ratio (OR) = 1.23 (95% CI: 0.66 – 2.28) and OR = 1.77 (95% CI: 0.93 – 3.36) respectively.

Descriptive Statistics

Table 2 presents correlations between predictors and the dependent variable at baseline. For eating disorder psychopathology, significant large correlations were found with most predictors except personality beliefs (medium) and readiness to change (small and not significant). All relationships were positive except for body image flexibility, readiness to change, and self-efficacy, which were negative. The strongest correlation with the EDE-Q

Table 1

Binary Logistic Regression Analyses Assessing Predictors of Attrition

Variable	Completers *M (SD)*	Attrition *M (SD)*	OR (95% CI)
Body Image Flexibility	30.66 (12.40)	32.41 (14.04)	1.15 (0.72 – 1.82)
Body Image Avoidance	50.58 (15.51)	53.69 (19.17)	1.20 (0.76 – 1.91)
Body Checking	86.26 (26.84)	92.81 (37.10)	1.24 (0.78 – 1.96)
Negative Affect	26.08 (13.74)	33.34 (14.08)	**1.72 (1.05 – 2.81)**
Personality Beliefs	83.19 (36.17)	111.34 (47.95)	**2.04 (1.21 – 3.45)**
Readiness to Change	81.81 (20.88)	75.53 (17.97)	0.72 (0.45 – 1.16)
Self-Efficacy	63.70 (22.53)	62.03 (21.91)	0.93 (0.59 – 1.47)

Note. Significant analyses are bolded.
Means and standard deviations for original, unstandardized predictors.

Table 2

Pearson Correlations between Predictors and Dependent Variable at Baseline

	BI-AAQ	BIAQ	BCQ	DASS	PBQ	RTC	SE
EDE-Q	-.75**	.61**	.58**	.51**	.34*	-.20	-.42**
BI-AAQ	-	-.55**	-.62**	-.48**	-.30*	.06	.34*
BIAQ		-	.34*	.42**	.31*	-.04	-.44**
BCQ			-	.42**	.40**	-.05	-.17
DASS				-	.63**	-.25*	-.30*
PBQ					-	-.04	-.13
RTC						-	.45**

Note. EDE-Q = Eating Disorder Examination Questionnaire; BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking Questionnaire; DASS = Depression Anxiety and Stress Scales; PBQ = Personality Beliefs Questionnaire; RTC = Readiness To Change; SE = Self-Efficacy. * $p < .05$, ** $p < .001$

was body image flexibility, which was strong and negative. The means and standard

deviations at each assessment point for the dependent variable, global eating disorder psychopathology, are presented in **Table 3** and demonstrate a decrease in symptoms across treatment which is maintained at both follow-ups.

Table 3

Means and Standard Deviations for Global Eating Disorder Psychopathology

Variable	Mean	SD	N
Global EDE-Q	4.01	1.05	77
Global EDE-Q Mid-Treatment	2.76	1.15	56
Global EDE-Q Post-Treatment	1.57	1.09	45
Global EDE-Q 1-Month Follow-Up	1.58	1.21	40
Global EDE-Q 3-Month Follow-Up	1.50	1.08	37

Note. EDE-Q = Eating Disorder Examination Questionnaire. 78 participants started treatment, 58 completed the mid-treatment assessment, 45 completed treatment, 43 completed the 1-month follow-up and 38 completed the 3-month follow-up. Therefore, there are missing data present for a few participants at each time point.

Predictors of Eating Disorder Symptoms

Table 4 presents the coefficients for all fixed effects in the null model and conditional models predicting global eating disorder psychopathology. Model 1 shows that there was significant within- and between-subject variance (1.56, $SE = .16$ and .82, $SE = .23$, respectively) in global eating disorder psychopathology. Model 2 demonstrates that at baseline there was a mean global psychopathology of 4.33 across all participants, and at each time point this decreased by an average of .65 points, showing a significant contribution of time to the decrease in eating psychopathology. Model 3 results show that, with the exception of readiness to change, all variables were significant predictors of variance in eating psychopathology in the expected directions (i.e. positive for body image avoidance, checking, negative affect and personality beliefs and negative for body image flexibility, readiness to change, and self-efficacy) in addition to time. The greatest impact

Table 4

Fixed Effect Estimates and Model Fit Indices for Models Predicting Eating Disorder Symptoms

	Intercept	Time	Predictor	Predictor * Time	AIC	BIC	Within-Subjects Variance	Between-Subjects Variance
Model 1	2.75 (.13) **				915.43	926.06	1.56 (.16) **	.82 (.23) **
Model 2	4.33 (.12) **	-.65 (.05) **			741.04	758.75	.70 (.07) **	.05 (.01) **
Model 3:								
BI-AAQ	4.30 (.10) **	-.66 (.05) **	-.92 (.11) **	.12 (.05)*	664.49	689.23	.53 (.06) **	.04 (.02)
BIAQ	4.32 (.10) **	-.65 (.05) **	.81 (.11) **	-.13 (.05)*	686.87	711.63	.56 (.06) **	.04 (.01) **
BCQ	4.32 (.11) **	-.66 (.05) **	.66 (.12) **	-.08 (.06)	703.58	728.35	.62 (.06) **	.04 (.01) **
DASS	4.33 (.11) **	-.65 (.05) **	.73 (.11) **	-.08 (.05)	673.37	697.99	.58 (.06) **	.03 (.01) **
PBQ	4.36 (.11) **	-.67 (.05) **	.57 (.12) **	-.10 (.06)	716.30	741.06	.64 (.07) **	.04 (.01) **
Readiness to Change	4.32 (.12) **	-.65 (.05) **	-.31 (.12)	.05 (.05)	725.71	750.36	.69 (.07) **	.05 (.01) **
Self-Efficacy	4.32 (.11) **	-.65 (.05) **	-.50(.12) **	.06 (.05)	711.14	735.79	.66 (.07) **	.04 (.01) **

Note. $* p < .05; ** p < .001$.
Predictors were only considered significant if $< .01$ to correct for multiple comparisons.
Estimate (Standard Error).
BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking Questionnaire; DASS = Depression Anxiety and Stress Scales; PBQ = Personality Beliefs Questionnaire.

was that of body image flexibility, followed by body image avoidance, negative affect, body checking, personality beliefs, and then self-efficacy.

Only two significant interactions with time emerged, body image flexibility, $F(1, 46.34) = 5.97$, $p = .02$, and body image avoidance, $F(1, 167.46) = 6.24$, $p = .01$. Participants with high body image flexibility had significantly lower eating disorder symptoms at every time point and participants with lower body image avoidance had significantly lower eating disorder symptoms at baseline, mid-treatment, and post-treatment (see **Figure 1**). Considering all models, fit indices support the body image flexibility model as being closest to the true model.

All analyses were rerun sequentially including age, duration of eating disorder, and negative affect as covariates (see **Tables 5-7**). Only negative affect significantly contributed to outcome, but it did not change the pattern of significance of other variables (with the exception of personality beliefs, which was no longer a significant predictor). Readiness to change became a significant predictor when duration was included in the model.

Discussion

The aim of the present study was to explore body image flexibility, avoidance, and checking as potential predictors and moderators of outcome. Contrary to the first hypothesis, neither readiness to change or self-efficacy were significant predictors of dropout in this brief version of CBT-ED. The second hypothesis was partially supported, as all variables (excluding readiness to change) were significant baseline predictors (in the predicted directions) of changes in global eating disorder psychopathology over treatment. The third hypothesis was also partially supported, as body image flexibility and avoidance (but not checking) at the start of treatment were moderators between time and global eating disorder psychopathology over the course of treatment.

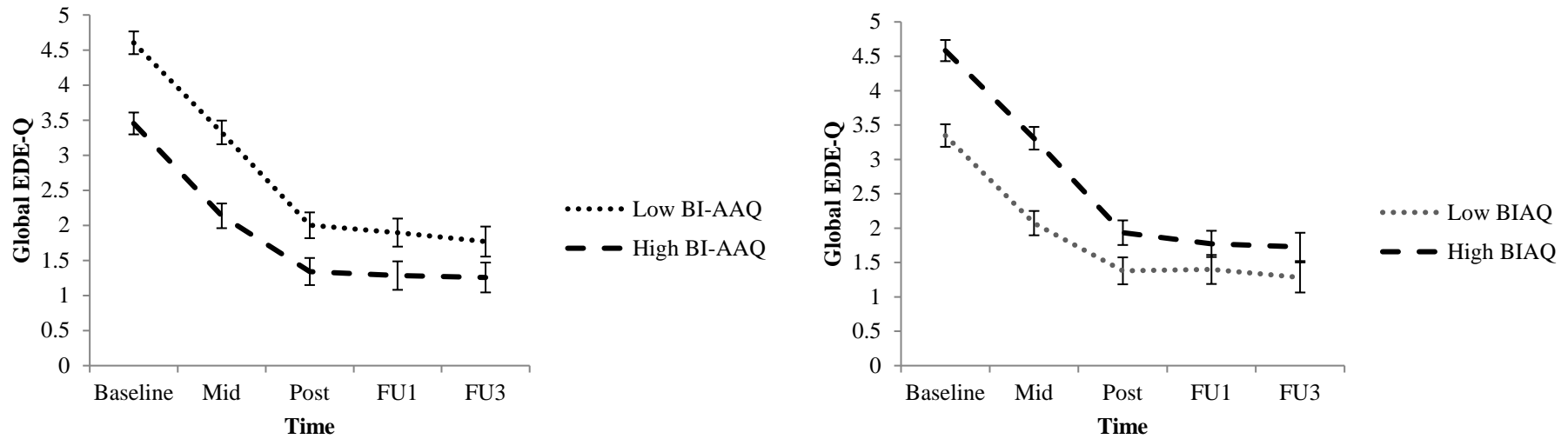Figure 1. Body image flexibility (BI-AAQ) and body image avoidance (BIAQ) x Time predicts rate of change in eating disorder symptoms

(EDE-Q).

The median was used to split scores into high and low. High scores are 31 and above for body image flexibility and 53 and above for body image

avoidance. BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire.

Table 5

Fixed Effect Estimates and Model Fit Indices for Models Predicting Eating Disorder Symptoms where Age is entered as a Covariate

	Intercept	Age	Time	Predictor	Predictor * Time	AIC	BIC	Within-Subjects Variance	Between-Subjects Variance
Model 3:									
BI-AAQ	4.51 (.24) **	-.01 (.01)	-.66 (.05) **	-.91 (.11) **	.12 (.05)*	665.58	693.84	.53 (.06) **	.04 (.02)
BIAQ	4.67 (.26) **	-.01 (.01)	-.65 (.05) **	.81 (.11) **	-.13 (.05)*	686.60	714.90	.55 (.06) **	.04 (.01) **
BCQ	4.23 (.27) **	.00 (.01)	-.66 (.05) **	.67 (.12) **	-.08 (.06)	705.47	733.77	.62 (.06) **	.04 (.01) **
DASS	4.21 (.26) **	.00 (.01)	-.65 (.05) **	.74 (.11) **	-.08 (.05)	675.14	703.28	.59 (.06) **	.03 (.01) **
PBQ	4.54 (.27) **	-.01 (.01)	-.67 (.05) **	.57 (.12) **	-.09 (.06)	717.77	746.07	.63 (.07) **	.04 (.01) **
Readiness to Change	4.45 (.29) **	-.00 (.01)	-.65 (.05) **	-.30 (.12)	.05 (.05)	727.49	755.67	.69 (.07) **	.05 (.01) **
Self-Efficacy	4.43 (.28) **	-.00 (.01)	-.65 (.05) **	-.49 (.12) **	.06 (.05)	712.93	741.11	.66 (.07) **	.04 (.01) **

Note. * $p < .05$; ** $p < .001$.
Predictors were only considered significant if < .01 to correct for multiple comparisons.
Estimate (Standard Error).
BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking Questionnaire; DASS = Depression Anxiety and Stress Scales; PBQ = Personality Beliefs Questionnaire.

Table 6

Fixed Effect Estimates and Model Fit Indices for Models Predicting Eating Disorder Symptoms where Duration is entered as a Covariate

	Intercept	Duration	Time	Predictor	Predictor * Time	AIC	BIC	Within-Subjects Variance	Between-Subjects Variance
Model 3:									
BI-AAQ	4.35 (.14) **	-.01 (.01)	-.66 (.05) **	-.92 (.11) **	.12 (.05)*	666.22	694.49	.53 (.06) **	.04 (.02)
BIAQ	4.48 (.14) **	-.02 (.01)	-.65 (.05) **	.84 (.11) **	-.13 (.05)*	686.41	714.71	.55 (.06) **	.04 (.01) **
BCQ	4.26 (.15) **	.01 (.01)	-.66 (.05) **	.67 (.12) **	-.09 (.06)	705.20	733.50	.62 (.06) **	.04 (.01) **
DASS	4.24 (.14) **	.01 (.01)	-.65 (.05) **	.74 (.11) **	-.08 (.05)	674.60	702.74	.59 (.06) **	.03 (.01) **
PBQ	4.32 (.15) **	.01 (.01)	-.67 (.05) **	.57 (.12) **	-.10 (.06)	718.10	746.40	.64 (.07) **	.04 (.01) **
Readiness to Change	4.21 (.16) **	.01 (.01)	-.65 (.05) **	-.33 (.12)*	.05 (.05)	726.58	754.75	.69 (.07) **	.05 (.01) **
Self-Efficacy	4.31 (.15) **	.00 (.01)	-.65 (.05) **	-.50 (.12) **	.06 (.05)	713.14	741.31	.66 (.07) **	.04 (.01) **

Note. * $p < .05$; ** $p < .001$.
Predictors were only considered significant if < .01 to correct for multiple comparisons.
Estimate (Standard Error).
BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking Questionnaire; DASS = Depression Anxiety and Stress Scales; PBQ = Personality Beliefs Questionnaire.

Table 7

Fixed Effect Estimates and Model Fit Indices for Models Predicting Eating Disorder Symptoms where Negative Affect is entered as a Covariate

	Intercept	Negative Affect	Time	Predictor	Predictor * Time	AIC	BIC	Within-Subjects Variance	Between-Subjects Variance
Model 3:									
BI-AAQ	3.50 (.21) **	.03 (.01) **	-.64 (.05) **	-.72 (.11) **	.11 (.05)*	631.79	659.90	.49 (.05) **	.04 (.02)
BIAQ	3.41 (.21) **	.03 (.01) **	-.64 (.05) **	.60 (.11) **	-.11 (.05)*	649.10	677.24	.52 (.05) **	.03 (.01) **
BCQ	3.31 (.21) **	.03 (.01) **	-.64 (.05) **	.45 (.12) **	-.08 (.05)	661.60	689.74	.56 (.06) **	.03 (.01) **
DASS	4.33 (.11) **		-.65 (.05) **	.73 (.11) **	-.08 (.05)	673.37	697.99	.58 (.06) **	.03 (.01) **
PBQ	3.18 (.24) **	.04 (.01) **	-.66 (.05) **	.24 (.13)	-.10 (.06)	673.50	701.64	.58 (.06) **	.03 (.01) **
Readiness to Change	3.06 (.21) **	.04 (.01) **	-.63 (.05) **	-.17 (.11)	.07 (.05)	665.47	693.48	.60 (.06) **	.03 (.01) **
Self-Efficacy	3.16 (.21) **	.04 (.01) **	-.63 (.05) **	-.33 (.11) *	.06 (.05)	658.64	686.65	.57 (.06) **	.03 (.01) **

Note. * $p < .05$; ** $p < .001$.
Predictors were only considered significant if < .01 to correct for multiple comparisons.
Estimate (Standard Error).
BI-AAQ = Body Image Acceptance and Action Questionnaire; BIAQ = Body Image Avoidance Questionnaire; BCQ = Body Checking Questionnaire; DASS = Depression Anxiety and Stress Scales; PBQ = Personality Beliefs Questionnaire.

.

Body image flexibility emerged as the strongest predictor of variance in global eating

disorder psychopathology with higher flexibility predicting significantly better outcomes

at each assessment point. Results support the protective quality of body image flexibility

(Sandoz et al., 2013; Tylka & Wood-Barcalow, 2015; Webb et al., 2015), and also support

prior clinical studies which found associations between body image flexibility and

improved post-treatment eating disorder symptomatology and quality of life (Bluett et al.,

2016; Butryn et al., 2013; Lee et al., 2018). To our knowledge, this is the first study to find

body image flexibility as a significant predictor and moderator of global eating disorder

psychopathology using a prospective analytic strategy in an outpatient adult sample.

Body image avoidance was the only other predictor that significantly moderated

the relationship between time and global eating disorder psychopathology, with less

avoidance associated with significantly better outcomes over treatment, though not into

follow-ups. This change might be explained by the explicit focus on body image

avoidance during treatment for those clients where avoidance was identified as a key

behavioural manifestation of body image disturbance. Body image avoidance is also a key

target of treatment in CBT-ED, where exposure work (mirror use, weighing) is typically

utilised (Fairburn, 2008; Waller et al., 2007). It appears that the focus on overcoming body

image avoidance during treatment allows clients who are higher in avoidance at baseline

to 'catch up' by follow-up. To our knowledge, this is the first study to have assessed

whether body image avoidance influences treatment outcomes. In addition, while body

checking was not found to be a significant moderator, body checking at baseline was a

significant predictor of global eating disorder psychopathology. These results suggest that

a greater focus on body checking is an important treatment target.

While other variables were not significant moderators, the majority were

significant predictors of variance in global eating disorder psychopathology. Results are

consistent with previous reviews that found negative affect, personality beliefs and self-efficacy to be significant predictors of global eating disorder psychopathology in some studies (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015). Results are also consistent with several studies that found neither negative affect nor personality to moderate outcomes in BED samples (Grilo, Masheb, Wilson, & Crosby, 2012; Masheb & Grilo, 2008; Wilson et al., 2010). However, in contrast to what has been found in several studies (Vall & Wade, 2015), readiness to change was not a significant predictor of outcome nor attrition in this brief form of CBT-ED. It has previously been suggested and found that behavioural change, rather than stated motivation, is a more powerful predictor of outcome (Waller, 2012). Thus, the use of a treatment which strongly emphasises early behavioural change, identifying and addressing therapy interfering behaviours and cognitions, and a review at session four where progress is contingent on engagement and behavioural change (Waller et al., 2018), may make baseline motivational measures irrelevant to outcome.

Further research is needed to address limitations and replicate findings. First, CBT-T is a new, shorter therapy that has thus far only been evaluated with case series. Future investigation of moderators using a randomised controlled design with a longer follow-up and larger sample size is needed to confirm the importance of body image variables as a moderator of treatment. Second, while the sample was transdiagnostic, clients with a BMI under 17.5 were not included. Thus, findings cannot be generalised to this population. Third, the measure of body image flexibility used in the present study has been criticised for the use of negatively worded items, which might assess experiential avoidance of body image rather than body image flexibility (Sandoz et al., 2013; Timko et al., 2014; Webb et al., 2015). When examined together, components of both the body image avoidance and body image flexibility measures contributed unique variance to eating disorder

psychopathology in a non-clinical sample and multicollinearity was not indicated (Pellizzer, Tiggemann, et al., 2018). However, further research may be required to confirm the utility of the BI-AAQ as a measure of body image flexibility. Fourth, the sample size is small and thus further work with a larger sample is required. Fifth, future work may include a measure of general psychological flexibility to assess the unique contribution of body image flexibility. Lee et al. (2018) found body image flexibility remained as a significant, unique predictor of eating disorder risk, quality of life, and wellbeing after accounting for general psychological flexibility, suggesting that body image flexibility is an important and unique predictor. Finally, though trainees were used, in line with previous research (e.g. Öst et al., 2012), the provision of expert supervision has ensured that effect sizes are commensurate to experienced therapists in clinical trials.

It is suggested that future treatment studies should explore whether a more explicit focus on body image flexibility increases rates of remission and good outcome, either by modifying treatment protocols or using adjunct therapies. Imagery rescripting has been suggested as a promising adjunct to eating disorder treatment (Tatham, 2011). Recently, an imagery rescripting intervention was found to result in significantly higher body image flexibility compared to a cognitive dissonance intervention in a sample of body-dissatisfied young women (Pennesi & Wade, 2018). While Pennesi and Wade (2018) found body image flexibility and self-compassion to mediate the relationship between the intervention and disordered eating, further research evaluating this link in a clinical sample is required. While previous treatment studies found improvements in body image flexibility post-treatment, it is difficult to know which treatment modality was responsible, due to all three studies reporting an eclectic mix of treatments, including CBT, Acceptance and Commitment Therapy (ACT) and mindfulness (Bluett et al., 2016; Butryn et al., 2013; Lee et al., 2018). Self-compassion and mindfulness-based approaches have been found to

improve positive body image and intuitive eating and decrease negative body image in non-clinical samples (Albertson, Neff, & Dill-Shackleford, 2014; Bush, Rossy, Mintz, & Schopp, 2014). Further work exploring body image flexibility and potential adjunct treatments such as imagery rescripting presents as an exciting avenue for future treatment research. For example, a body image flexibility module could be developed and offered for those clients with lower flexibility, as per Fairburn's (2008) approach with CBT-E.

In summary, the findings from the present study contribute to the literature in several important and novel ways. Body image flexibility emerged as the strongest predictor and moderator of global eating disorder psychopathology, indicating a stronger focus on body image flexibility during treatment or via an adjunct treatment is warranted. Body image avoidance was a second moderator, and both avoidance and body checking were significant predictors of outcome. This pattern highlights the importance of focusing on body image and avoidance during treatment.

CHAPTER 7

Predictors of Outcome in Cognitive Behavioural Therapy for Eating Disorders:

Enhancing our Understanding[6]

---

[6] A version of this chapter is under review at *Behaviour Research and Therapy*.

Abstract

Objective: Early decrease in symptoms is a consistent predictor of good treatment outcome across all eating disorders. The current study explored the predictive value of novel early change variables in a transdiagnostic, non-underweight sample receiving 10-session cognitive behavioural therapy (CBT-T).

Method: Participants who reported bingeing and/or purging in the week preceding baseline assessment ($N = 62$) were included in the analyses. Early change variables were calculated for novel (body image flexibility, body image avoidance, body checking, and fear of compassion) and established predictors (behavioural symptoms and therapeutic alliance). Outcomes were global eating disorder psychopathology and clinical impairment at post-treatment and three-month follow-up. Completer and intent-to-treat analyses were conducted using linear regression, adjusting for baseline values of the relevant outcome and early change in behavioural symptoms.

Results: Early improvement in body image flexibility was the most consistent predictor of good outcome, followed by body image avoidance. Early change in body checking and the fear of expressing and receiving compassion to/from others were significant predictors in several analyses.

Discussion: Novel early change variables significantly predicted eating disorder outcomes. Further work might explore the potential benefit of modifying existing protocols to incorporate a stronger focus on body image and fear of compassion.

Introduction

Early symptom change is the most robust and consistent predictor of outcome across all eating disorders (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015). Early change in therapeutic alliance also has a small but significant relationship with eating disorder symptom change (Graves et al., 2017). Beyond early change in symptoms and therapeutic alliance, exploration of additional early change predictors has been limited. Thus far, there is emerging evidence for early improvements in body image (Cavallini & Spangler, 2013; Danielsen & Rø, 2012; Spangler et al., 2004; Turner, Bryant-Waugh, et al., 2015), shame and self-compassion (Kelly, Carter, et al., 2014), and emotion regulation (MacDonald, Trottier, et al., 2017; Peterson et al., 2017) predicting improvements in eating disorder psychopathology at post-treatment. However, available studies typically do not control for early symptom change.

The aim of the present study is to explore novel early change variables (aspects of body image [body image flexibility, avoidance, checking] and fear of compassion) as predictors of eating disorder treatment outcomes at post-treatment and three-month follow-up (global eating disorder psychopathology and clinical impairment). This will be done using an adult transdiagnostic non-underweight sample who received ten-session CBT for eating disorders (CBT-T; Waller et al., 2018). To adjust for its effect, early symptom change in behaviours was included in each model as a covariate, while therapeutic alliance was included as an established predictor. It was hypothesised that early change in the novel variables would significantly predict global eating disorder psychopathology and clinical impairment (after adjusting for the effect of early symptom change).

Method

Participants

Participants in the present study were drawn from the combined sample presented

in **Chapter Six**. To assess early change variables after adjusting for early behavioural change, only those participants who started treatment and reported behaviours (i.e., objective binges and/or purging) in the week preceding baseline assessment were included *(N* = 63, aged ≥ 15 years)*. One participant was excluded from analyses as the data for behavioural variables was missing, leaving a final sample of 62 with a mean age of 27.37 years (*SD* = 9.77; range 15.69 – 68.97), and a mean BMI of 27.79 (*SD* = 8.40; range 18.20 – 52.40). Most were women (91.9%) and Caucasian (87.1%).

Measures

Measures were completed at baseline (assessment session), mid-treatment (session four), post-treatment (session 10), and after three-month follow-up.

Weight and frequency of disordered eating. As described in **Chapter 5**, collaborative, open weighing occurred at each session as part of the therapy. Daily food intake diaries were used to obtain the frequency of disordered eating behaviours (objective binges, vomiting, and laxative abuse) and confirmed frequencies during session. For the present study, a total behaviour score was created at each time point by summing reported behaviours.

Global eating disorder psychopathology. The 22-item global score from the Eating Disorder Examination – Questionnaire (EDE-Q) assesses eating disorder psychopathology over the previous 28 days (Fairburn & Beglin, 2008), using 22 items rated on a 7-point Likert scale (Fairburn & Beglin, 2008). The EDE-Q global score has strong psychometric properties (see **Chapter Three**). Internal consistency in the present study was .89.

Clinical impairment. The Clinical Impairment Assessment (CIA; Bohn et al., 2008; Bohn & Fairburn, 2008) assesses psychosocial impairment caused by disordered eating using 16 items. The CIA demonstrates good psychometric properties (see **Chapter**

Three). In the current study internal consistency was .88.

Body image flexibility. The unidimensional 12-item Body Image Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013) measures body image flexibility. Psychometric properties are strong (see **Chapter Three**). Internal consistency in the current study was .90.

Body image avoidance. The Body Image Avoidance Questionnaire (BIAQ; Rosen et al., 1991) assesses body image avoidance. The 14-item two-factor solution (Lydecker et al., 2014) was recently found to have superior fit indices compared to other models (Pellizzer, Tiggemann, et al., 2018). Thus, the total score from the 14-item model was used in the present study, yielding adequate internal consistency ($\alpha = .90$). See **Chapter Three** for a review of previous factor structures and psychometric properties. The response format has been changed from a 5-point to 7-point Likert Scale in the present study to match the BI-AAQ.

Body checking. The Body Checking Questionnaire (BCQ; Reas et al., 2002) is a 23-item 3-factor measure of body checking behaviours. The response format has been changed from a 5-point to 7-point Likert Scale in the present study to match the BI-AAQ and BIAQ. Factor structure has been inconsistent (see **Chapter Three**) however the original version was found to yield good fit indices (Pellizzer, Tiggemann, et al., 2018) and is used in the present study, resulting in strong internal consistency ($\alpha = .97$).

Fears of compassion.

Description. The Fears of Compassion Scales (FCS; Gilbert et al., 2011) consists of 38 items to measure the fear of compassion in three domains. Items (e.g., "I feel that I don't deserve to be kind and forgiving to myself") are rated on a 5-point Likert scale (0 = *don't agree at all*, 4 = *completely agree*) and are summed to calculate total scores for each subscale (Gilbert et al., 2011). Higher scores indicate a greater fear of compassion.

Subscales include Expressing Compassion for Others, Responding to the Expression of Compassion from Others, and Expressing Kindness and Compassion Towards Yourself and assess the fear of expressing compassion to others, fear of receiving compassion from others, and the fear of self-compassion, respectively (Gilbert et al., 2011). Note, the later names are referred to throughout this chapter for simplicity.

Factor structure. An item pool was generated for each domain, informed by relevant literature and discussions with clients. Items were subsequently ranked for face validity and items low in validity or perceived as difficult to understand were omitted, leaving 13 items for the fear of expressing compassion to others, 15 items for the fear of receiving compassion from others, and 17 items for the fear of self-compassion (Gilbert et al., 2011). EFA using maximum-likelihood extraction and oblique rotation confirmed each scale was a single-factor solution with eigenvalues greater than one (Gilbert et al., 2011). After removing items with small factor loadings, the fear of expressing compassion to others contained 10 items (factor loadings .46 - .82, 43.82% variance explained), the fear of receiving compassion from others contained 13 items (factor loadings .42 - .70, 35.05% variance explained), and the fear of self-compassion contained 15 items (factor loadings .46 - .82, 43.35% variance explained; Gilbert et al., 2011). It does not appear that subsequent investigations of factor structure or psychometric properties have occurred.

Reliability and validity. The subscales have good internal consistency ($\alpha = .78$ - .92) and are correlated with measures of self-compassion, self-criticism, insecure attachment, depression, anxiety, and stress (Gilbert et al., 2011). Internal consistency in the present study was .88 - .92.

Working alliance.

Description. The Working Alliance Inventory – Short Revised (WAI-SR; Hatcher & Gillaspy, 2006), based on the original Working Alliance Inventory (WAI; Horvath &

Greenberg, 1989), is a 12-item measure that assesses the quality of therapeutic alliance. Items (e.g., "My clinician and I collaborate on setting goals for my therapy") are rated on a 7-point Likert scale (1 = *Not at all*, 7 = *Completely*) and are averaged to provide a total score, where higher scores indicate greater working alliance. Items can be differentiated into three subscales (or dimensions) including Goal, Task, and Bond (Hatcher & Gillaspy, 2006).

   Factor structure. A short version of the WAI (the WAI-S) was initially developed by Tracey and Kokotovic (1989) by selecting the four highest factor loadings for each dimension from their initial CFA of the original WAI. Hatcher and Gillaspy (2006) identified methodological issues in the development of the WAI-S and reviewed inconsistencies found in subsequent factor analytic studies, and thus developed an alternative short form (the WAI-SR). CFAs using maximum likelihood estimation found a poor fit for the Tracey and Kokotovic (1989) WAI-S and thus an EFA was performed on the original WAI which found a 6 factor solution that explained 56% of variance (Hatcher & Gillaspy, 2006). After removing negatively worded items, three positively worded factors (Goal, Task, and Bond) emerged with differing items from the WAI-S for two of the three dimensions (Hatcher & Gillaspy, 2006). Pattern coefficients ranged between .45 to .82 (Hatcher & Gillaspy, 2006). A CFA of the resulting solution demonstrated good fit indices as did a second CFA using a second sample to provide cross-validation (Hatcher & Gillaspy, 2006). The factor structure of the WAI-SR was later confirmed by Munder, Wilmers, Leonhart, Linster, and Barth (2010) using both an inpatient and outpatient sample. However, a more recent study that compared a CFA with maximum likelihood and a CFA using Bayesian structural equations modelling found a two-factor model (Task and Goal collapsed into one factor) to have the best psychometric properties (Falkenström, Hatcher, & Holmqvist, 2015). In the present study, a total score only is provided for

simplicity and to avoid over-testing the data.

Reliability and validity. The scale has good internal consistency (α = .75 - .92

subscales, .91 - .92 total), correlates well with the original WAI (r = .60 – .94

subscales, .94 - .95 total) and other measures of working alliance (Hatcher & Gillaspy,

2006; Munder et al., 2010). In addition, the WAI has good predictive validity (Horvath &

Greenberg, 1989). In the present study, the measure was administered at session one

(rather than baseline) and exhibited good internal reliability (α = .93).

Procedure

The procedure is identical to the description provided in **Chapter Five**.

Statistical Analyses

The majority of analyses were conducted using Mplus version 7.31 (Muthén &

Muthén, 1998-2017). Data cleaning, demographic information, and descriptive statistics

were performed using SPSS version 22 (IBM Corp, 2013). Little's Missing at Random

(MAR) test was used to assess whether data were missing at random. As >5% of data were

missing, multiple imputation using Bayesian analysis (Muthén & Muthén, 1998-2017) was

performed for predictors and outcomes of interest. Ten imputed data sets were specified

and resulting parameter estimates and standard errors were averaged across the ten sets of

analyses. Imputed data sets were merged and averaged to perform descriptive statistics in

SPSS.

We used linear regression to test whether early change (at the fourth treatment

session) predicted changes in global eating disorder psychopathology and clinical

impairment at post-treatment and three-month follow-up. We calculated change scores for

each predictor of interest, and included change in binge/purge behaviours between

baseline and session four as a covariate, consistent with previous methodology

(MacDonald, Trottier, et al., 2017). To aid interpretation, difference scores were calculated

such that positive values indicate improvements in the desired direction. The outcome variable was either global eating disorder psychopathology or clinical impairment at post-treatment or follow-up, with the appropriate baseline value included as a covariate. We examined seven predictors: body image flexibility, body image avoidance, body checking, fear of expressing compassion for others, fear of receiving compassion from others, fear of self-compassion, and working alliance.

We analysed both completer and intent to treat (ITT) samples. A total of 56 models were run (two outcome variables, seven predictors, two time points, and two samples). For each model we present the estimate, standard error, and significance value for the baseline value of the outcome variable, early behaviour change, and early change for the predictor variable. Hence we are able to examine each predictor of interest after adjusting for early behaviour change. In addition, we performed supplementary analyses by rerunning analyses sequentially to assess the impact of age and duration of eating disorder as covariates.

Results

Preliminary Analyses

Data were first checked for normality to ensure the suitability of parametric tests, using visual inspection of distributions and formal inference tests (Tabachnick and Fidell (2012). Some variables were not normally distributed, including EDE-Q (baseline only), CIA (follow-up only), and change scores for behaviours, BI-AAQ, Fear of Self-Compassion, and WAI. To aid interpretation, transformations were not performed given the majority of variables correspond to meaningful values (Tabachnick & Fidell, 2012). Prior to imputing missing data, Little's missing completely at random test (considering all variables used in analyses) was non-significant $\chi^2(60) = 50.15$, $p = .81$, indicating that data were missing at random.

Table 1 provides the means and standard deviations for each outcome and predictor (change scores) for both ITT and completer samples. Working alliance change ($M = 0.37$, $SD = 0.59$) was low. However, strong alliance was observed at the first treatment session ($M = 6.22$, $SD = .79$), thus limiting the potential for substantial change.

Table 1

Means (Standard Deviations) for ITT and Completer Analyses

Variable	ITT	Completer
	($N = 62$)	($N = 40$)
EDE-Q Baseline	4.08 (0.98)	4.07 (1.01)
EDE-Q Post-treatment	1.71 (1.01)	1.55 (1.05)
EDE-Q Three-Month Follow-Up	1.57 (0.94)	1.45 (1.00)
CIA Baseline	31.98 (8.31)	30.33 (8.95)
CIA Post-treatment	11.88 (7.45)	10.70 (7.89)
CIA Three-Month Follow-Up	10.32 (9.04)	9.19 (9.59)
Behaviour Change	6.63 (6.63)	5.85 (5.76)
Body Image Flexibility Change	9.92 (10.95)	11.80 (12.48)
Body Image Avoidance Change	7.83 (9.95)	8.36 (11.91)
Body Checking Change	17.83 (17.76)	20.77 (20.06)
Fear of Expressing Compassion Change	0.36 (6.64)	1.41 (7.43)
Fear of Receiving Compassion Change	2.64 (7.71)	3.62 (8.42)
Fear of Self-Compassion Change	3.87 (9.06)	4.96 (10.66)
Working Alliance Change	0.37 (0.59)	0.36 (0.53)

Note.
EDE-Q = Eating Disorder Examination Questionnaire Global; CIA = Clinical Impairment Assessment

Global Eating Disorder Psychopathology

Table 2 presents the estimates and standard errors for early change models at post-treatment and three-month follow-up. At post-treatment for both ITT and completers, and at three-month follow-up for completers, five change variables were significant predictors of global eating disorder psychopathology: body image flexibility, body image avoidance, body checking, fear of expressing compassion, and fear of receiving compassion. At three-month follow-up, ITT analyses indicated that body checking and fear of receiving compassion were no longer significant. Behaviour change was not significant in any model. Covariate analyses are presented in **Table 3** and **4**. Age and disorder duration were not significant and did not change the pattern of results for any model at post-treatment. However, for completers at three-month follow-up, body checking was no longer significant when duration was a covariate and the fear of receiving compassion was not significant when duration or age were included. Significant estimates were similar in size across all models except for body checking, which were the lowest.

Summary. Early change in body image flexibility, body image avoidance, and the fear of expressing compassion were the most consistent predictors of global eating disorder psychopathology across both time points, analysis types (completers and ITT), and after adjusting for covariates. Early change in body checking and the fear of receiving compassion were significant predictors in some analyses.

Clinical Impairment

Table 5 (and covariate results presented in **Table 6** and **7**) presents the estimates and standard errors for early change models predicting clinical impairment at post-treatment and three-month follow-up. At post-treatment for both ITT and completers, four change variables were significant predictors of clinical impairment: body image flexibility, body image avoidance, body checking, and fear of receiving compassion. Behaviour

Table 2

Early Change Models Predicting Global Eating Disorder Psychopathology at Post-Treatment and Three-Month Follow Up

Predictor	End of treatment, completer analyses			End of treatment, ITT analyses			3-month follow-up, completer analyses			3-month follow-up, ITT analyses		
Variable (change scores)	Baseline value of outcome	Behaviour change	Early change variable	Baseline value of outcome	Behaviour change	Early change variable	Baseline value of outcome	Behaviour change	Early change variable	Baseline value of outcome	Behaviour change	Early change variable
	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p
Body Image Flexibility	.39 (.14) **.01**	-.05 (.03) .07	-.04 (.01) **<.001**	.40 (.16) **.01**	-.03 (.03) .33	-.05 (.01) **< .001**	.25 (.14) .09	-.03 (.03) .33	-.04 (.01) **.001**	.23 (.16) .15	-.01 (.03) .59	-.04 (.01) **.001**
Avoidance	.38 (.14) **.01**	-.02 (.03) .51	-.04 (.01) **.001**	.44 (.17) **.01**	-.01 (.03) .80	-.04 (.02) **.01**	.24 (.14) .10	.00 (.03) .98	-.04 (.01) **.001**	.27 (.17) .11	.00 (.03) .91	-.04 (.02) **.01**
Checking	.44 (.15) **.003**	-.03 (.03) .34	-.02 (.01) **.01**	.48 (.16) **.002**	-.02 (.03) .37	-.02 (.01) **.01**	.29 (.15) .06	-.01 (.03) .76	-.02 (.01) **.03**	.31 (.16) .06	-.01 (.03) .69	-.02 (.01) .06
Compassion Fear Expressing compassion	.44 (.15) **.003**	-.03 (.03) .24	-.05 (.02) **.01**	.50 (.16) **.002**	-.02 (.03) .42	-.06 (.02) **.004**	.30 (.15) **.047**	-.01 (.03) .60	-.05 (.02) **.01**	.33 (.16) **.04**	-.01 (.03) .64	-.06 (.02) **.01**
Fear Receiving Compassion	.48 (.15) **.002**	-.02 (.03) .59	-.05 (.02) **.01**	.47 (.15) **.002**	-.01 (.03) .60	-.05 (.02) **.01**	.32 (.16) **.04**	.00 (.03) .99	-.04 (.02) **.04**	.30 (.15) .05	-.01 (.03) .90	-.03 (.02) .10
Fear self-Compassion	.42 (.16) **.01**	-.02 (.03) .46	-.02 (.02) .10	.47 (.16) **.004**	-.01 (.03) .68	-.02 (.02) .15	.27 (.16) .09	-.01 (.03) .84	-.02 (.02) .27	.29 (.16) .07	-.00 (.03) .94	-.01 (.02) .49
Therapeutic Alliance Working alliance	.39 (.16) **.02**	-.03 (.03) .24	.25 (.30) .40	.45 (.17) **.01**	-.02 (.03) .57	.20 (.31) .52	.23 (.16) .15	-.02 (.03) .47	.44 (.30) .14	.28 (.16) .08	-.01 (.03) .76	.46 (.29) .11

Note. Significant estimates are bolded.

Table 3

Early Change Models Predicting Global Eating Disorder Psychopathology at Post-Treatment and Three-Month Follow Up including Age as a Covariate

Predictor Variable (change scores)	End of treatment, completer analyses				End of treatment, ITT analyses				3-month follow-up, completer analyses				3-month follow-up, ITT analyses			
	Baseline value of outcome	Age	Behaviour change	Early change variable	Baseline value of outcome	Age	Behaviour change	Early change variable	Baseline value of outcome	Age	Behaviour change	Early change variable	Baseline value of outcome	Age	Behaviour change	Early change variable
	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p
Body Image																
Flexibility	.39 (.14) **.01**	.01 (.01) .45	-.05 (.03) .06	-.04 (.01) **<.001**	.40 (.16) **.01**	.00 (.01) .96	-.03 (.03) .33	-.05 (.01) **< .001**	.24 (.14) .09	.01 (.01) .38	-.03 (.03) .28	-.04 (.01) **.002**	.24 (.16) .15	.01 (.02) .65	-.01 (.03) .57	-.04 (.02) **.001**
Avoidance	.37 (.14) **.01**	.02 (.01) .26	-.02 (.03) .43	-.04 (.01) **.001**	.44 (.17) **.01**	.01 (.02) .52	-.01 (.03) .77	-.04 (.02) **.01**	.23 (.14) .11	.02 (.01) .21	-.00 (.03) .90	-.04 (.01) **.001**	.27 (.16) .10	.02 (.02) .34	.00 (.03) .96	-.04 (.02) **.01**
Checking	.43 (.15) **.004**	.01 (.01) .71	-.03 (.03) .32	-.02 (.01) **.01**	.48 (.16) **.002**	.00 (.02) .88	-.03 (.03) .36	-.02 (.01) **.01**	.28 (.15) .07	.01 (.02) .55	-.01 (.03) .70	-.02 (.01) **.049**	.31 (.16) .06	.01 (.02) .58	-.01 (.03) .66	-.02 (.01) .07
Compassion																
Fear Expressing compassion	.44 (.15) **.004**	.00 (.02) .87	-.03 (.03) .23	-.05 (.02) **.01**	.50 (.16) **.002**	-.00 (.02) .90	-.02 (.03) .42	-.06 (.02) **.01**	.30 (.15) .05	.00 (.02) .80	-.02 (.03) .59	-.05 (.02) **.02**	.33 (.16) **.04**	.00 (.02) .84	-.01 (.03) .63	-.06 (.02) **.01**
Fear Receiving Compassion	.49 (.15) **.002**	-.01 (.02) .60	-.01 (.03) .70	-.06 (.02) **.01**	.47 (.15) **.002**	-.00 (.02) .81	-.01 (.03) .61	-.05 (.02) **.016**	.32 (.16) **.047**	.00 (.02) .995	.00 (.03) .99	-.04 (.02) .09	.30 (.15) .05	.01 (.02) .79	-.00 (.03) .88	-.03 (.02) .15
Fear self-Compassion	.41 (.16) **.01**	.01 (.02) .48	-.02 (.03) .39	-.02 (.02) .14	.47 (.16) **.004**	.01 (.02) .73	-.01 (.03) .66	-.02 (.02) .16	.26 (.16) .10	.01 (.02) .36	-.01 (.03) .73	-.01 (.02) .36	.29 (.16) .06	.01 (.02) .49	-.00 (.03) .89	-.01 (.02) .51
Therapeutic Alliance																
Working alliance	.38 (.16) **.02**	.02 (.02) .32	-.04 (.03) .19	.25 (.29) .40	.45 (.17) **.01**	.00 (.02) .78	-.02 (.03) .55	.18 (.30) .54	.22 (.16) .16	.02 (.02) .27	-.03 (.03) .39	.43 (.29) .14	.28 (.16) .08	.01 (.02) .71	-.01 (.03) .74	.44 (.28) .12

Note.
Significant estimates are bolded.

Table 4

Early Change Models Predicting Global Eating Disorder Psychopathology at Post-Treatment and Three-Month Follow up including Duration as a Covariate

Predictor Variable (change scores)	End of treatment, completer analyses				End of treatment, ITT analyses				3-month follow-up, completer analyses				3-month follow-up, ITT analyses			
	Baseline value of outcome	D	Behaviour change	Early change variable	Baseline value of outcome	D	Behaviour change	Early change variable	Baseline value of outcome	D	Behaviour change	Early change variable	Baseline value of outcome	D	Behaviour change	Early change variable
	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p
Body Image																
Flexibility	.37 (.14) **.01**	.02 (.02) .36	-.04 (.03) .08	-.04 (.01) **<.001**	.40 (.16) **.01**	.01 (.02) .71	-.03 (.03) .32	-.04 (.01) **< .001**	.22 (.14) .13	.02 (.02) .26	-.02 (.03) .37	-.04 (.01) **.002**	.23 (.16) .16	.02 (.02) .42	-.01 (.03) .58	-.04 (.01) **.001**
Avoidance	.36 (.14) **.01**	.02 (.02) .26	-.02 (.03) .54	-.04 (.01) **.001**	.43 (.17) **.01**	.02 (.02) .42	-.01 (.03) .78	-.04 (.02) **.01**	.21 (.14) .15	.02 (.02) .19	.00 (.03) .93	-.04 (.01) **.001**	.26 (.16) .11	.02 (.02) .25	.00 (.03) .94	-.04 (.02) **.015**
Checking	.42 (.15) **.01**	.01 (.02) .49	-.02 (.03) .35	-.02 (.01) **.01**	.48 (.16) **.003**	.01 (.02) .65	-.03 (.03) .36	-.02 (.01) **.01**	.26 (.16) .10	.02 (.02) .32	-.01 (.03) .79	-.01 (.01) .06	.30 (.16) .06	.02 (.02) .37	-.01 (.03) .67	-.02 (.01) .08
Compassion																
Fear Expressing compassion	.42 (.15) **.01**	.02 (.02) .33	-.03 (.03) .26	-.05 (.02) **.02**	.49 (.16) **.003**	.01 (.02) .63	-.02 (.03) .41	-.06 (.02) **.01**	.27 (.15) .07	.02 (.02) .25	-.01 (.03) .65	-.05 (.02) **.02**	.32 (.16) **.04**	.02 (.02) .41	-.01 (.03) .62	-.06 (.02) **.01**
Fear Receiving Compassion	.47 (.16) **.003**	.01 (.02) .80	-.02 (.03) .58	-.05 (.02) **.02**	.47 (.15) **.002**	.01 (.02) .77	-.02 (.03) .58	-.05 (.02) **.017**	.29 (.16) .07	.01 (.02) .47	-.00 (.03) .98	-.03 (.02) .11	.29 (.15) .06	.02 (.02) .45	-.00 (.03) .87	-.03 (.02) .16
Fear self-Compassion	.40 (.16) **.01**	.02 (.02) .37	-.02 (.03) .46	-.02 (.02) .17	.47 (.16) **.004**	.01 (.02) .52	-.01 (.03) .66	-.02 (.02) .19	.23 (.16) .14	.02 (.02) .23	-.01 (.03) .85	-.01 (.02) .43	.28 (.16) .07	.02 (.02) .30	-.00 (.03) .90	-.01 (.02) .56
Therapeutic Alliance																
Working alliance	.36 (.16) **.02**	.02 (.02) .28	-.03 (.03) .29	.17 (.30) .57	.44 (.17) **.01**	.01 (.02) .52	-.02 (.03) .56	.15 (.30) .62	.21 (.16) .19	.02 (.02) .26	-.02 (.03) .55	.36 (.30) .24	.27 (.16) .09	.01 (.02) .50	-.01 (.03) .75	.41 (.28) .15

Note.

Significant estimates are bolded. D = Duration.

Table 5
Early Change Models Predicting Clinical Impairment at Post-Treatment and Three-Month Follow Up

Predictor	End of treatment, completer analyses			End of treatment, ITT analyses			3-month follow-up, completer analyses			3-month follow-up, ITT analyses		
Variable (change scores)	Baseline value of outcome	Behaviour change	Early change variable	Baseline value of outcome	Behaviour change	Early change variable	Baseline value of outcome	Behaviour change	Early change variable	Baseline value of outcome	Behaviour change	Early change variable
	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p
Body Image Flexibility	.27 (.12) **.02**	-.38 (.19) **.04**	-.39 (.08) **<.001**	.23 (.12) .06	-.32 (.16) **.048**	-.40 (.08) **<.001**	.20 (.18) .25	-.27 (.29) .36	-.28 (.12) **.02**	.18 (.18) .32	-.29 (.32) .36	-.31 (.13) **.02**
Avoidance	.20 (.12) .10	-.08 (.19) .66	-.35 (.09) **<.001**	.21 (.13) .10	-.15 (.20) .45	-.35 (.10) **.001**	.16 (.17) .37	-.04 (.28) .89	-.31 (.12) **.01**	.17 (.18) .34	-.15 (.34) .65	-.28 (.16) .07
Checking	.24 (.14) .08	-.17 (.21) .43	-.15 (.06) **.01**	.24 (.14) .08	-.29 (.19) .13	-.15 (.07) **.03**	.17 (.19) .36	-.12 (.30) .68	-.06 (.08) .48	.18 (.19) .34	-.23 (.34) .50	-.05 (.09) .57
Compassion Fear Expressing compassion	.20 (.14) .15	-.19 (.22) .39	-.25 (.16) .12	.20 (.15) .18	-.25 (.19) .19	-.27 (.17) .12	.16 (.18) .38	-.14 (.29) .65	-.30 (.21) .16	.15 (.18) .39	-.25 (.32) .43	-.38 (.24) .11
Fear Receiving Compassion	.30 (.14) **.03**	-.09 (.21) .66	-.40 (.14) **.01**	.29 (.14) .03	-.24 (.18) .18	-.40 (.13) **.003**	.22 (.19) .23	-.06 (.30) .83	-.29 (.19) .14	.23 (.18) .20	-.23 (.32) .48	-.30 (.18) .10
Fear self-Compassion	.19 (.14) .18	-.12 (.23) .60	-.17 (.12) .13	.19 (.15) .18	-.19 (.20) .35	-.14 (.13) .26	.15 (.19) .41	-.10 (.31) .74	-.07 (.15) .64	.17 (.18) .34	-.20 (.34) .54	-.03 (.19) .89
Therapeutic alliance Working alliance	.18 (.15) .21	-.25 (.23) .28	2.95 (2.30) .20	.19 (.15) .12	-.23 (.20) .25	2.03 (2.29) .38	.12 (.18) .50	-.23 (.30) .45	4.79 (2.97) .11	.13 (.18) .47	-.23 (.33) .49	4.25 (3.43) .22

Note. Significant estimates are bolded.

Table 6

Early Change Models Predicting Clinical Impairment at Post-Treatment and Three-Month Follow Up including Age as a Covariate

Predictor Variable (change scores)	End of treatment, completer analyses				End of treatment, ITT analyses				3-month follow-up, completer analyses				3-month follow-up, ITT analyses			
	Baseline value of outcome	Age	Behaviour change	Early change variable	Baseline value of outcome	Age	Behaviour change	Early change variable	Baseline value of outcome	Age	Behaviour change	Early change variable	Baseline value of outcome	Age	Behaviour change	Early change variable
	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p
Body Image																
Flexibility	.27 (.12) **.02**	.07 (.09) .42	-.40 (.19) **.03**	-.39 (.08) **<.001**	.23 (.12) .06	.01 (.10) .95	-.32 (.16) **.047**	-.40 (.08) **<.001**	.21 (.17) .22	.14 (.14) .32	-.31 (.29) .29	-.27 (.12) **.02**	.19 (.18) .29	.08 (.16) .62	-.30 (.32) .35	-.31 (.13) **.02**
Avoidance	.21 (.12) .08	.12 (.10) .22	-.12 (.19) .53	-.35 (.09) **<.001**	.22 (.13) .09	.08 (.11) .45	-.17 (.20) .40	-.35 (.10) **.001**	.17 (.17) .37	.17 (.14) .21	-.09 (.28) .74	-.31 (.12) **.01**	.18 (.18) .30	.14 (.16) .38	-.18 (.34) .60	-.29 (.16) .07
Checking	.24 (.14) .07	.05 (.11) .64	-.18 (.21) .39	-.14 (.06) **.01**	.24 (.14) .08	.03 (.11) .81	-.30 (.19) .12	-.15 (.07) **.03**	.18 (.18) .34	.16 (.15) .30	-.17 (.30) .56	-.03 (.08) .67	.19 (.18) .31	.11 (.17) .52	-.25 (.35) .47	-.05 (.09) .63
Compassion																
Fear Expressing compassion	.21 (.14) .14	.07 (.12) .57	-.21 (.22) .35	-.21 (.17) .21	.20 (.15) .18	.02 (.12) .89	-.25 (.19) .18	-.27 (.18) .14	.17 (.18) .35	.12 (.16) .46	-.17 (.29) .57	-.24 (.23) .29	.16 (.18) .37	.06 (.18) .73	-.26 (.32) .41	-.36 (.25) .15
Fear Receiving Compassion	.30 (.14) **.03**	-.06 (.13) .63	-.07 (.22) .77	-.44 (.17) **.01**	.29 (.14) .03	-.03 (.12) .83	-.24 (.18) .18	-.40 (.14) **.01**	.22 (.19) .25	.08 (.18) .64	-.10 (.31) .74	-.23 (.23) .32	.23 (.18) .19	.06 (.19) .75	-.24 (.33) .47	-.29 (.20) .16
Fear self-Compassion	.20 (.14) .16	.09 (.12) .44	-.15 (.23) .50	-.16 (.12) .18	.20 (.15) .18	.05 (.12) .68	-.20 (.20) .33	-.14 (.13) .27	.17 (.18) .36	.17 (.15) .27	-.17 (.31) .59	-.04 (.15) .81	.18 (.18) .33	.12 (.17) .49	-.23 (.34) .51	-.02 (.19) .92
Therapeutic alliance																
Working alliance	.19 (.14) .18	.12 (.11) .30	-.28 (.23) .22	2.89 (2.27) .20	.19 (.15) .20	.03 (.12) .79	-.23 (.19) .24	1.93 (2.31) .40	.14 (.18) .44	.17 (.14) .24	-.28 (.30) .35	4.70 (2.93) .11	.14 (.18) .45	.06 (.16) .70	-.24 (.34) .48	4.04 (3.40) .24

Note.
Significant estimates are bolded.

Table 7

Early Change Models Predicting Clinical Impairment at Post-Treatment and Three-Month Follow Up including Duration as a Covariate

Predictor Variable (change scores)	End of treatment, completer analyses				End of treatment, ITT analyses				3-month follow-up, completer analyses				3-month follow-up, ITT analyses			
	Baseline value of outcome	D	Behaviour change	Early change variable	Baseline value of outcome	D	Behaviour change	Early change variable	Baseline value of outcome	D	Behaviour change	Early change variable	Baseline value of outcome	D	Behaviour change	Early change variable
	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p	Estimate (SE) p		Estimate (SE) p	Estimate (SE) p
Body Image																
Flexibility	.25 (.11) **.02**	.30 (.11) **.004**	-.35 (.17) **.04**	-.36 (.07) **<.001**	.22 (.12) .06	.18 (.12) .13	-.32 (.16) **.044**	-.38 (.08) **<.001**	.18 (.17) .27	.32 (.18) .08	-.24 (.28) .40	-.25 (.12) **.03**	.17 (.18) .33	.23 (.18) .21	-.29 (.32) .36	-.29 (.13) **.03**
Avoidance	.19 (.11) .09	.34 (.11) **.002**	-.08 (.17) .66	-.33 (.08) **<.001**	.20 (.13) .10	.25 (.13) **.047**	-.17 (.20) .40	-.34 (.10) **.001**	.14 (.16) .39	.34 (.18) .06	-.03 (.27) .90	-.29 (.12) **.02**	.16 (.17) .36	.28 (.18) .12	-.17 (.34) .61	-.28 (.16) .08
Checking	.22 (.13) .08	.32 (.13) **.01**	-.16 (.20) .42	-.12 (.06) **.03**	.23 (.14) .09	.21 (.14) .12	-.29 (.19) .12	-.13 (.07) .05	.15 (.18) .41	.36 (.19) .06	-.11 (.29) .70	-.02 (.08) .81	.17 (.18) .36	.28 (.19) .15	-.24 (.35) .49	-.03 (.09) .71
Compassion																
Fear Expressing compassion	.19 (.13) .15	.36 (.13) **.01**	-.17 (.20) .39	-.19 (.15) .19	.19 (.14) .18	.23 (.14) .09	-.25 (.19) .17	-.23 (.17) .17	.14 (.17) .41	.35 (.18) .06	-.12 (.28) .67	-.25 (.20) .23	.15 (.17) .40	.25 (.19) .19	-.26 (.32) .41	-.34 (.24) .15
Fear Receiving Compassion	.26 (.13) .05	.28 (.14) **.04**	-.11 (.20) .59	-.28 (.15) .06	.28 (.13) .03	.18 (.14) .19	-.25 (.18) .17	-.36 (.14) **.01**	.18 (.18) .33	.32 (.20) .11	-.08 (.29) .78	-.15 (.20) .45	.21 (.18) .23	.23 (.20) .25	-.24 (.33) .46	-.25 (.19) .19
Fear self-Compassion	.18 (.13) .17	.35 (.13) **.01**	-.13 (.21) .54	-.11 (.11) .33	.19 (.14) .18	.25 (.14) .08	-.20 (.20) .30	-.12 (.13) .35	.14 (.18) .43	.38 (.19) .05	-.11 (.29) .70	.00 (.15) .99	.16 (.18) .37	.29 (.20) .15	-.22 (.34) .51	.00 (.19) .998
Therapeutic alliance																
Working alliance	.18 (.13) .19	.36 (.14) **.01**	-.20 (.21) .34	1.54 (2.20) .48	.19 (.14) .19	.23 (.14) .10	-.23 (.19) .24	1.17 (2.36) .62	.12 (.17) .50	.32 (.19) .10	-.19 (.29) .52	3.51 (3.01) .24	.13 (.18) .46	.21 (.19) .26	-.23 (.33) .49	3.45 (3.56) .33

Note.

Significant estimates are bolded. D = Duration.

change was only significant in the body image flexibility model. At three-month follow-up, only body image flexibility was a significant predictor for both completers and ITT. Body image avoidance was significant for completers only. When assessing covariates, disorder duration was a significant predictor in all completer analyses of post-treatment clinical impairment and in ITT analysis. After adding disorder duration, body checking lost significance for ITT and fear of receiving compassion lost significance for completer analyses. Significant estimates were similar in size across all models except for checking which was the lowest.

Summary. Early change in body image flexibility thus emerged as the most consistent predictor of clinical impairment at both time points, for both analysis types, and after adjusting for covariates. Early change in body image avoidance was a significant predictor in the majority of analyses, while early change in body checking and the fear of receiving compassion were significant in some analyses.

Discussion

This study aimed to explore novel early change predictors of eating disorder treatment outcomes. Early change in body image flexibility was the most consistent predictor of both global eating disorder psychopathology and clinical impairment, followed by early change in body image avoidance. Early change in body checking and the fear of expressing and receiving compassion were additional significant predictors of outcome in several analyses. However, these predictors were not as robust in ITT and covariate analyses. Thus, the hypothesis that all novel early change variables would be significant was partially supported.

Early change in behaviour was included as a covariate to explore novel early change variables after adjusting for its effects. In contrast to previous findings (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015), early change in behaviour was not a

significant predictor of outcome for the majority of analyses. Two studies that assessed shorter CBT programs (Fischer, Meyer, Dremmel, Schlup, & Munsch, 2014; Masheb & Grilo, 2008) also did not find early change in behaviour to be a significant predictor of outcome. However, Waller et al. (2018) found early change in global eating disorder psychopathology to predict overall change. Therefore, early change in cognitive symptoms may be a stronger factor than behavioural change in predicting outcome in shorter treatments. Waller et al. (2018) also found early change in therapeutic alliance to be a significant predictor of outcome whereas the present study did not. However, others also failed to support this finding (Loeb et al., 2005; Raykos et al., 2014; Turner, Bryant-Waugh, et al., 2015; Wilson et al., 2002). In the present study, working alliance was high at the first treatment session, potentially limiting the potential for significant improvement in alliance to occur and to affect outcome. Future work should continue to explore whether, and under what circumstances, early change in behavioural symptoms and therapeutic alliance are significant predictors of outcome.

Body image flexibility was the only change variable to be significant in every analysis. Unlike body image avoidance and checking, body image flexibility is not explicitly targeted in standard CBT-ED protocols. Results are consistent with previous residential treatment studies (Bluett et al., 2016; Butryn et al., 2013; Lee et al., 2018), suggesting that CBT can improve body image flexibility. Future work should consider the potential of a modified CBT-ED with stronger focus on body image flexibility. Such an approach might consider use of imagery rescripting, which can improve body image flexibility (Pennesi & Wade, 2018). In addition to body image flexibility, early change in body image avoidance and body checking were significant predictors of outcome in the majority of analyses, confirming the importance of targeting both behaviours in treatment.

To our knowledge, this is the first eating disorder treatment study to explore all

three fears of compassion subscales. Unexpectedly, early change in the fear of self-compassion subscale was not a significant predictor of either outcome, while early change in both the fear of expressing and receiving compassion to/from others scales were related to global eating disorder psychopathology at post-treatment and three-month follow-up. Early change in the fear of receiving compassion also predicted post-treatment clinical impairment. Given that features such as self-criticism and low self-esteem are common maintaining mechanisms of eating disorders (Fairburn et al., 2003), it is not surprising that early change in the fear of expressing and receiving compassion are predictive of improved outcomes. However, it is unclear why early change in the fear of self-compassion was not significant, particularly as it was a significant predictor and moderator of outcomes in a prior study (Kelly et al., 2013). Further work is needed to clarify the role of the fears of compassion scales in eating disorder treatment outcomes.

Given the exploratory nature of the present study, further research is needed to clarify findings and address limitations. First, these findings are preliminary, and require replication. Further work with longer follow-up is required to explore these outcomes in CBT-T, which has only recently been developed (Waller et al., 2018). Finally, given the selection criteria, these findings are not generalisable to those who are underweight and/or not engaged in bingeing or purging.

These findings suggest that treatments for non-underweight eating disorders may be improved by an additional early focus on body image and fear of expressing and receiving compassion, or by adding this work if early response in therapy is absent. Novel designs may be useful in exploring this latter issue. An example might be the design used by Chen et al. (2017), who tested different methods of intensification of therapy when guided self-help CBT was not proving effective at an early stage. Thus, future work on developing CBT-T might adopt similar methodologies to enhance clinical outcomes.

CHAPTER 8

General Discussion

Summary of Aims and Findings

Replicating Initial CBT-T Findings

A key aim of the thesis was to replicate findings from the first CBT-T case series (Waller et al., 2018) with a transdiagnostic, non-underweight outpatient Australian sample using trainee therapists under supervision. This was achieved by completing two case series. Like the initial evaluation of CBT-T (Waller et al., 2018), improvements were found for global eating disorder psychopathology, clinical impairment, bingeing, purging, and negative affect from baseline to post-treatment with results largely maintained at both a one and three-month follow-up. The majority of improvements were statistically significant except for bingeing and purging in the first case series. For all variables, effects from baseline to post-treatment and both follow-ups were medium or large, suggesting non-significant findings may be a function of limited power in the first case series. Clinically significant reduction was evident for global eating disorder psychopathology, as mean scores at post-treatment and both follow-ups fell below the clinical cut-off (Kraemer et al., 2003; Mond et al., 2006). Abstinence and remission rates were also comparable to Waller et al. (2018). Thus, it was concluded that the research successfully replicated findings from the initial case series (Waller et al., 2018). Given the importance of establishing replicability in developing new therapies, this is an important first step and conforms to the MRC guidance on developing and evaluating complex interventions (Craig et al., 2008; Open Science Collaboration, 2015).

The Role of Body Image in Recovery

A second key aim of the thesis was to more closely examine the role of body image and weight concerns in recovery from an eating disorder. Three constructs of body image that are related to core eating disorder psychopathology, body image flexibility, body image avoidance, and body checking, were explored in more depth by first examining the factor structure and psychometric properties of measures assessing these constructs. Using a non-

clinical, young female undergraduate sample, confirmatory factor analysis supported the original solutions for the body image flexibility (BI-AAQ; Sandoz et al., 2013) and body checking measures (BCQ; Reas et al., 2002) while an alternative factor structure was supported for the body image avoidance measure (BIAQ; Lydecker et al., 2014; Rosen et al., 1991). Strong psychometric properties for each were demonstrated and subscales from each measure were found to predict unique variance in global eating disorder psychopathology and clinical impairment. Of the three variables, body image flexibility was the strongest predictor of both global eating disorder psychopathology and clinical impairment. Exploring factor structure and psychometric properties was an important first step given the inconsistent factor solutions found for the body image avoidance and checking measures. While the body image flexibility measure had more robust psychometric properties, before the thesis it had not been considered alongside body image avoidance and body checking.

Exploring predictors and moderators of outcome using a combined sample from both case series found body image flexibility to be the strongest predictor and moderator of global eating disorder psychopathology across treatment and follow-up. Body image avoidance also emerged as both a predictor and moderator of outcome, while body checking was a predictor of outcome only. Similarly, early change in body image flexibility, followed by body image avoidance, was the most consistent predictor of both global eating disorder psychopathology and clinical impairment at post-treatment and follow-up. Early change in body checking was predictive of good outcome in some analyses. Findings demonstrate the importance of targeting and evaluating body image disturbance in eating disorder treatment studies. Specifically, findings support the notion of body image flexibility as a protective factor against disordered eating (Tylka & Wood-Barcalow, 2015; Webb et al., 2015), while body image avoidance and body checking are risk and maintenance factors (e.g. Amin et al., 2012; Nikodijevic et al., 2018; Shafran et al., 2003; Walker et al., 2018) that are important targets

for treatment. To our knowledge, this was the first time body image avoidance and checking had been examined as predictors of outcome in eating disorder treatment research, a unique and important contribution of the thesis. In summary, overall findings have addressed the second overarching aim of the thesis by demonstrating the importance of considering aspects of body image disturbance of relevance to eating disorder psychopathology.

Integration with Recent Research and Clinical Implications

Comparisons with CBT-ED and CBTgsh

CBT-T has been described as a therapy designed to improve dissemination of CBT-ED by the use of novice therapists and a shorter treatment protocol. In addition to supporting the first evaluation of CBT-T (Waller et al., 2018), results from the thesis are consistent with studies of CBT-ED that successfully used a combination of experienced and novice therapists (Rose & Waller, 2017; Turner, Marshall, et al., 2015; Wade et al., 2017) and CBTgsh studies with trainee psychologists and inexperienced therapists (e.g. Banasiak et al., 2005; Cachelin et al., 2014; Carter & Fairburn, 1998; Wilson et al., 2010; Zandberg & Wilson, 2013). Results also provide support for the use of shorter treatment protocols, as has commonly been successfully demonstrated with CBTgsh (Wilson & Zandberg, 2012) and less so with CBT-ED (Bulik et al., 1998). While direct comparisons to longer versions of CBT-ED are limited due to the case series design, results observed in the thesis were comparable to efficacy (Fairburn et al., 2015; Fairburn et al., 2009) and effectiveness (Byrne et al., 2011; Knott et al., 2015; Rose & Waller, 2017; Signorini et al., 2018; Turner, Marshall, et al., 2015; Waller et al., 2014) studies of CBT-ED using predominantly experienced therapists, demonstrating novice therapists receiving expert supervision are able to produce commensurate outcomes (cf. Öst et al., 2012). In summary, findings from the thesis support the use of novice therapists and shorter treatment protocols as successful solutions to overcoming recently identified systemic barriers to treatment (e.g. see Ali et al., 2017; Kazdin et al., 2017; Regan

et al., 2017). However, only direct comparisons of CBT-ED and CBTgsh with CBT-T can definitively answer the issue as to whether these therapies have comparable outcomes. Further research is also required that examines who does best with which form of therapy.

Attrition

While outcomes from the two case series were comparable to Waller et al. (2018), attrition in the first case series was considerably higher (50%). While attrition fell in the second case series (38.5%), attrition was higher than the 31.2% rate reported by Waller et al. (2018). The design of the second case series, randomising participants to either an immediate or delayed (after four weeks) start, was implemented after querying whether the four week waitlist control period between assessment and the first treatment session was responsible for increased attrition. Carter et al. (2012) found waitlist time to be a significant predictor of attrition and waitlist time has been listed as a barrier to treatment in several studies included in a recent comprehensive review (Regan et al., 2017). However, while attrition reduced in the second study, no differences were observed between the two conditions suggesting that a four week waitlist was not responsible. Rather, an increase in therapist skill and experience may have contributed. Despite attrition being higher than the initial CBT-T study, particularly in the first case series, both attrition rates are comparable to those reported in efficacy and effectiveness trials of CBT-ED using mostly experienced therapists (10.3 - 50%; Byrne et al., 2011; Fairburn et al., 2015; Fairburn et al., 2009; Knott et al., 2015; Rose & Waller, 2017; Signorini et al., 2018; Turner, Marshall, et al., 2015; Waller et al., 2014).

A unique feature presented in the thesis was to further categorise attrition into two groups: those who collaboratively decided to leave treatment (had a discussion with their therapist) and those who were dropouts. When considering true dropouts only, attrition rates were 38.5% and 21.2% for the first and second case series and thus were more consistent with rates reported in prior studies. Multinomial logistic regression was then performed by

comparing three groups, completers and the two types of attrition. To our knowledge, this has not been considered in prior CBT-ED efficacy or effectiveness studies. Examining attrition in this way also conforms to the suggestion that defining attrition should be more specific and identify who initiates leaving treatment and at what point in treatment (Linardon et al., 2018; Vall & Wade, 2015).

There were no predictors of drop-out, but higher purging at baseline emerged as a significant predictor between completers and those who collaboratively decided to leave in the second case series. Purging often functions as a form of maladaptive emotion regulation that helps clients cope with intense emotion (Fairburn, 2008; Waller et al., 2007). Fairburn (2008) used the term "mood intolerance" to describe clients who have difficulty experiencing and regulating intense emotions. Clients presenting with mood intolerance may have greater difficulty actively engaging in therapy tasks due to the increase in anxiety inherent in exposure to regular eating, feared foods, body image work etc. Vall and Wade (2015) reported two significant predictors of drop out from their systematic review and meta-analysis: higher binge/purge behaviours and lower motivation at baseline. However neither bingeing nor motivation were found to be significant predictors of attrition in this research and purging was only found to predict those who collaboratively decided to leave, not dropouts. Bingeing was also not found to be a significant predictor of attrition in a meta-analysis of CBT-ED RCTs (Linardon et al., 2018). Future research needs to identify and examine the different reasons for leaving therapy prematurely, as this confounding of different categories may explain the lack of consistent findings with dropout.

The Importance of Early Behavioural Change

CBT-T is a therapy that strongly emphasises early behavioural change and requires clients to quickly adopt to regular eating and increased carbohydrate intake (Waller et al., 2018). A unique feature of CBT-T is that only four sessions are offered to clients initially as

an extension to the full ten sessions (inclusive of earlier sessions) is contingent on active engagement and progress with therapy tasks (Waller et al., 2018). Thus the CBT-T protocol complements findings that early symptom change is the most robust and consistent transdiagnostic predictor of outcome (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015). Thus perhaps not surprisingly, early change in behaviours (bingeing and purging) was not a significant predictor of outcome in the majority of analyses in the thesis as slow responders collaboratively decided to leave as a function of the review at the fourth session.

The structure of CBT-T is a good example of translating research outcomes to real world applications. That is, given how robust early symptom change is as a predictor of outcome, the CBT-T protocol recognises this by identifying non/weak-responders and/or those not actively engaging in therapy to withdraw from treatment and return when they are ready to engage (Waller et al., 2018). The identification and intervention with slow responders has seldom been incorporated into treatment studies. Chen et al. (2017) randomised early weak responders (assessed after week four of guided self-help CBT [GSH]) to receive one of two intensive treatments, dialectical behaviour therapy (DBT) or individual and group CBT. Although participants who continued GSH (early strong responders) had less objective bingeing at the end of treatment, the between-group effect was small and all three groups demonstrated large within-treatment effects (Chen et al., 2017). No differences in objective bingeing were observed between the three groups at 6 and 12 month follow-ups (Chen et al., 2017). Similarly, Mitchell et al. (2011) compared a stepped-care condition (where the initial treatment was CBTgsh) with a CBT-ED/fluoxetine condition. Within the stepped-care condition, non-responders were identified after session six of treatment and offered fluoxetine and were later offered full CBT-ED if they had not achieved abstinence by the end of CBTgsh (Mitchell et al., 2011). At post-treatment, no significant differences were

found for primary outcomes or remission rates and at a one year follow-up, the stepped-care condition demonstrated significantly lower bingeing and compensatory behaviours compared to the CBT-ED/fluoxetine condition (Mitchell et al., 2011). In the current research, 23% of the total attrition were categorised as collaboratively decided to leave and thus were slow responders to treatment. It is recommended that future research investigate the use of adjunct or stepped-care approaches as described above more routinely, given the strength of the body of findings showing slow response to be a prognostic indicator of poor outcome.

Body Image Flexibility, Avoidance, and Checking

Across the thesis, body image flexibility emerged as the strongest and most consistent predictor and moderator of outcome. This finding is consistent with non-clinical studies where body image flexibility was protective against disordered eating (Ferreira et al., 2011; Hill et al., 2013; Moore et al., 2014; Sandoz et al., 2013; Timko et al., 2014; Wendell et al., 2012). This finding also supports early evidence from clinical research using residential and inpatient treatment samples, where greater improvement in body image flexibility was associated with improved eating disorder symptoms, quality of life, and general mental health (Bluett et al., 2016; Butryn et al., 2013; Lee et al., 2018). Although treatment studies have not yet explored body image avoidance or checking as predictors of eating disorder outcomes, findings from the thesis support the two recent meta-analyses that demonstrated strong correlations with eating disorder psychopathology, body image dissatisfaction, and negative affect (Nikodijevic et al., 2018; Walker et al., 2018). Thus, while there is limited clinical research in the area, findings from the thesis as a whole support the importance of assessing and treating body image disturbance. While there has been a more recent emphasis on the importance of treating body image disturbance in CBT-ED (Fairburn, 2008), further investigation of different approaches to this issue and where these should occur in therapy are required.

Directions for Future Research

Randomised Controlled Trials

In the most recent update to the NICE (2017) guidelines for the recognition and treatment of eating disorders, five recommendations for future research were specified. Of relevance to this thesis, one recommendation was that future research explore the optimal duration and intensity of psychological treatments given the high number of session (approx. 20 – 40), contributing to a high cost of treatment (i.e., creating systemic barriers to accessing treatment). Specifically, it was recommended that future research conduct randomised controlled trials (RCTs) comparing current treatments (i.e. CBT-ED and CBTgsh for non-underweight disorders) with shorter and/or less intensive treatments (NICE, 2017). Other rationales for shorter treatment exist, most importantly that over-treatment may undermine patient self-efficacy, which is an important predictor of treatment outcome for non-underweight eating disorders (Steele et al., 2011). Recommendations were also made regarding primary outcome measures (remission, binge eating, compensatory behaviours), follow-up duration (1 year minimum), and the need to evaluate mediating and moderating factors (NICE, 2017).

CBT-T was evaluated in two case series as opposed to a RCT in the research given the limited resources of the thesis, but this is consistent with current MRC guidelines for developing complex interventions, specifying that the use of several pilot studies (such as case series) should be conducted prior to more expensive RCTs (Craig et al., 2008). While an RCT design was not used, data from the thesis conform to the NICE (2017) recommendations for primary outcome measures and exploration of moderators and mediators (considered here as early change variables). Thus findings about CBT-T presented here and by Waller et al. (2018) support the need for future RCTs to evaluate the efficacy of CBT-T by directly comparing the protocol with longer CBT-ED, and the maintenance of effects over time by

utilising longer follow-up periods. Given similarities to CBTgsh regarding length and therapist use, RCTs comparing CBT-T and CBTgsh are also recommended to evaluate whether CBT-T produces comparable or superior outcomes.

As suggested by NICE (2017), future RCTs should explore and compare predictors, moderators, and mediators (early change variables) to assess how CBT-T is similar or differs from longer CBT-ED (and CBTgsh). In particular, when exploring novel and established predictors of outcome, the majority of results were consistent with recent reviews (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015) however readiness to change was not a significant predictor of outcome nor attrition. It may be that readiness to change is irrelevant to outcome in CBT-T due to the strong emphasis on early behavioural change, identification of therapy interfering behaviours and cognitions, and review at session four (Waller et al., 2018). However, RCTs comparing CBT-T with longer CBT-ED are required to assess whether readiness to change indeed differs between the two. Similarly, unlike the majority of research (Linardon, de la Piedad Garcia, et al., 2017; Vall & Wade, 2015) early behavioural change and early change to working alliance were not significant predictors of outcome in the present research. In the first evaluation of CBT-T, Waller et al. (2018) did find early change in working alliance and cognitive symptoms to predict global eating disorder psychopathology, but early change in behaviours was not investigated. Hence it is unclear whether early behavioural change is a key predictor of outcome in CBT-T. Two shorter BED studies did not find early behavioural change to be a predictor of outcome (Fischer et al., 2014; Masheb & Grilo, 2008) and thus it may be a finding unique to shorter protocols. RCTs comparing CBT-T and longer CBT-ED are required to explore this further. Further research is also required to examine early change in working alliance. Again, RCTs will be useful in examining whether or not early change in working alliance is predictive of outcome in CBT-T compared to longer versions of CBT-ED.

Body Image Flexibility

The relatively new construct of body image flexibility emerged as the strongest predictor and moderator of global eating disorder psychopathology, and early change in body image flexibility was the most consistent predictor of both global eating disorder psychopathology and clinical impairment at post-treatment and three-month follow-up. It is therefore recommended that future research explore the benefit of modifying existing treatment (i.e., CBT-ED) or using adjunct therapies to improve body image flexibility. Those with higher body image flexibility had lower global eating disorder psychopathology at every time point (including follow-up). Greater body image disturbance during follow-up was a significant predictor of relapse in a prospective study of participants with AN and BN who were in remission at post-treatment (Keel, Dorer, Franko, Jackson, & Herzog, 2005), thus working to decrease body image disturbance and improve aspects of positive body image (such as body image flexibility) is an important clinical target. Avenues to explore include imagery rescripting, Acceptance and Commitment Therapy (ACT), and mindfulness and compassion based approaches.

Imagery rescripting, a technique initially developed for use with posttraumatic stress disorder, involves transforming a previously distressing memory using imagery to restructure the meaning of the event (Tatham, 2011). Thus far, two preliminary studies have examined the use of imagery rescripting with bulimia nervosa either as a single session standalone intervention (Cooper, Todd, & Turner, 2007) or as an adjunct to CBT (Ohanian, 2002), finding improvements in binge-purge behaviours and urges, negative mood, and emotionally held belief ratings however neither evaluated whether body image flexibility. Pennesi and Wade (2018) recently compared cognitive dissonance and imagery rescripting interventions with a sample of body-dissatisfied young women and found that imagery rescripting resulted in significantly higher body image flexibility and self-compassion, and lower disordered

eating. Body image flexibility and self-compassion were also found to mediate the relationship between the intervention and disordered eating (Pennesi & Wade, 2018). Thus, there is emerging evidence that imagery rescripting is a viable adjunct to treatment however its capability of improving body image flexibility needs to be explored using a clinical sample.

There is some emerging evidence for the use of ACT as a treatment adjunct to improve body image flexibility. A pilot study compared treatment-as-usual (TAU) at a residential treatment facility (a mix of CBT-ED, psychodynamic, interpersonal, and feminist approaches) with TAU plus two additional ACT group sessions per week (Juarascio et al., 2013). While no significant differences were observed between the groups, there was a trend for participants in the TAU + ACT group to have greater improvements in general psychological flexibility (measured by the Acceptance and Action Questionnaire [AAQ]) at post-treatment (Juarascio et al., 2013). Specific to body image flexibility, improvements in body image flexibility were observed in a case series of two women with BED who completed 10 sessions of ACT (Hill, Masuda, Melcher, Morgan, & Twohig, 2015). Similarly, improvements to body image flexibility (measured using an earlier, unpublished version of the BI-AAQ) were observed in case series of three participants with unremitted AN who completed between 17-19 sessions of ACT (Berman, Boutelle, & Crow, 2009). Findings from these initial case series require replication with a larger sample. It is recommended that future research compare standard CBT-ED with CBT-ED plus additional ACT content or sessions to explore whether such an approach improves body image flexibility, allowing those participants with lower body image flexibility to 'catch up' to those starting treatment with higher body image flexibility.

A third potential treatment adjunct to improve body image flexibility is the use of mindfulness and compassion based approaches. A recently developed intervention for BED

that combined psychoeducation, mindfulness, and compassion elements found significant improvements in body image flexibility, in addition to decreased eating psychopathology, depression, shame, and self-criticism (Pinto-Gouveia et al., 2017). In non-clinical samples, mindfulness and self-compassion approaches were found to improve positive body image and intuitive eating, and decrease negative body image (Albertson et al., 2014; Bush et al., 2014). Taken together, there is emerging evidence for the use of imagery rescripting, ACT, and mindfulness and compassion based approaches as potential treatment adjuncts to improve body image flexibility. Further research in all three areas is required to confirm preliminary findings and look specifically at using each modality as an adjunct to CBT-ED. Examining components of other treatment modalities not specific to eating disorders has been previously explored. For instance, Safer, Telch, and Agras (2001) adapted DBT, a therapy originally intended for personality disorders, for bulimia nervosa by focusing on emotion regulation skills rather than using the entire protocol. Similarly, Chen et al. (2017) also explored the use of DBT with eating disorders (described earlier). Thus similar approaches may be applied to interventions demonstrating promise in improving body image flexibility.

Fear of Compassion

There has been increasing interest in the role of self-compassion in eating disorders. A recent systematic review of 28 clinical and non-clinical studies found self-compassion to be protective against negative body image and eating disorder psychopathology (Braun, Park, & Gorin, 2016) and early change in shame and self-compassion significantly predicted improved eating disorder symptoms in an inpatient and day hospital treatment program (Kelly, Carter, et al., 2014). A newer area of interest is the fear of self-compassion. Using a transdiagnostic inpatient and day program sample, participants with both high fear of self-compassion and low self-compassion were found to have higher eating disorder psychopathology at post-treatment (Kelly et al., 2013). Similarly, participants with a lower

baseline fear of self-compassion had greater improvements in eating disorder psychopathology and depressive symptoms after completing a self-compassion based self-help intervention for BED (Kelly & Carter, 2015). A recent study compared TAU (mostly CBT-ED and DBT) in a sample of transdiagnostic outpatients with TAU with group-based compassion-focused therapy as an adjunct (Kelly, Wisniewski, Martin-Wager, & Hoffman, 2017). Two of the fear of compassion scales were included, the fear of receiving compassion and fear of self-compassion, and both were found to significantly improve at post-treatment for the TAU + compassion group but not the TAU group (Kelly et al., 2017). This appears to be the first study to examine the fear of receiving compassion from others in an eating disorder treatment study, while no studies have examined the fear of expression compassion to others scale in this context.

An unexpected finding in the thesis was that early change in the fear of self-compassion was not predictive of outcomes while in several analyses early change in the fear of expressing and receiving compassion to/from others were often predictors of both post-treatment and follow-up global eating disorder psychopathology and clinical impairment. Interestingly, a recent non-clinical study used a community sample of women to test a path model exploring the three fears of compassion scales, disordered eating, social safeness (feeling secure, safe, and reassured in social relationships), and body shame (Dias, Ferreira, & Trindade, 2018). Similar to the thesis, unexpected findings were revealed when examining the individual subscales. Specifically, the fear of expressing compassion to others had a direct impact on disordered eating while the other fears of compassion scales had a partial impact on disordered eating via social safeness and body shame (Dias et al., 2018). Like the thesis, Dias et al. (2018) were unable to provide an explanation for this finding and recommended future research examine the fear of expressing compassion to others further. The finding that early change in the fear of self-compassion was not a significant predictor of outcome seems

inconsistent with prior research and thus further work is required to explore whether this finding is an anomaly. It is recommended that future work adopt an approach similar to Kelly et al. (2017) and compare CBT-ED as usual with CBT-ED and a compassion-focused adjunct, ensuring all three fears of compassion subscales are examined.

Limitations

Self-Report Measures

Self-report measures were relied upon across all studies in the thesis. The use of self-report measures is common, particularly in effectiveness studies of CBT-ED (Byrne et al., 2011; Knott et al., 2015; Signorini et al., 2018). Pragmatically, while the use of diagnostic interviews is preferable, self-report questionnaires are a quicker, easier way to attain data without encroaching on time allocated for therapy sessions. This is important given current restrictions to the number of rebates that can be claimed (10 per calendar year) under the Better Access to Mental Health initiative (Australian Government, 2015). However, it is important to consider limitations inherent in self-report measurements. For instance, several of the measures commonly used across the thesis have demonstrated inconsistent factor structures across studies (e.g. the BIAQ, BCQ, and EDE-Q), although total/global scores have been reported rather than individual subscales in an attempt to correct this. Some measures also have not yet been subject to an independent evaluation of factor structure (e.g. the ED15 and FCS). The measure of body image flexibility (BI-AAQ) has consistently demonstrated strong psychometric properties however it has been criticised for the use of negatively worded items and thus conceptually may be assessing experiential avoidance rather than body image flexibility (Timko et al., 2014; Webb et al., 2015).

Sample Size and Characteristics

Sample size and characteristics is another limitation that is present across studies in the thesis. In the first study, the sample size ($N = 328$) was sufficient to run confirmatory

factor analysis however not sufficient to examine cross-validation and thus ensure the stability and precision of each solution. Furthermore, all participants were young female undergraduate students which limits the ability to generalise findings. In the two case series of CBT-T, sample sizes were small ($N = 26$ and $N = 52$ respectively) and thus the number of resulting completers and follow-up observations are reduced. Furthermore, as CBT-T has been developed for clients with a BMI greater than 17.5, findings cannot be generalised to underweight participants. There are also small sample sizes for some diagnostic categories (AN, BED, and UFED) which may limit the ability to generalise findings to these groups. The majority of participants were female (92.3%), Caucasian (88.5%) and young ($M = 27.19$) which also limits the ability to generalise findings to male, older, and ethnically diverse clients. However it is noted that such characteristics are consistent with prior prevalence research (e.g. Fairweather-Schmidt & Wade, 2014; Hudson, Hiripi, Pope, & Kessler, 2007; Stice et al., 2013) and studies demonstrating an under-representation of males in eating disorder treatments (e.g. Carlat, Camargo, & Herzog, 1997; Shu et al., 2015).

Case Series Design

The use of a case series design, with no active control group and a shorter follow-up period (three months) presents further limitations as claims regarding efficacy cannot be made. A case series design was chosen as part of the recommendations for developing complex interventions in a stepwise manner (Craig et al., 2008) however further research will need to explore the use of RCTs with longer follow-ups as described earlier. This is an important next step in the development of CBT-T and will allow exploration of efficacy. While efficacy could not be established in the thesis, a strength was demonstrating the effectiveness of CBT-T in a university outpatient clinic using provisional psychologists under supervision. To our knowledge this was the first effectiveness study of eating disorder where all therapists were trainee psychologists as prior studies have utilised a variety of different

therapists and clinical assistants. Thus, findings from the thesis demonstrate that trainee/provisional psychologists can successfully deliver evidence-based treatment in routine settings, while under expert supervision.

Conclusions

The two case series of CBT-T and resulting predictor and moderator analyses have demonstrated a replication of the initial evaluation of CBT-T (Waller et al., 2018). Findings are promising considering systemic barriers to accessing evidence-based eating disorder treatments. The thesis has also demonstrated the need to consider body image flexibility as a strong predictor and moderator of outcome. Additionally, the importance of focusing on body image avoidance and checking in CBT-ED has been confirmed. To our knowledge, neither aspect of body image disturbance had been examined as a predictor of outcome in eating disorder treatment research. It is recommended that future research examine the efficacy of CBT-T using RCTs with longer follow-ups and explore the utility of modifying or incorporating adjuncts to treatment that focus on increasing body image flexibility and compassion. Further research is also required to replicate the novel findings presented in the thesis and create a better understanding of the factors that improve outcomes.

REFERENCES

Agras, W. S., Fitzsimmons-Craft, E. E., & Wilfley, D. E. (2017). Evolution of cognitive-behavioral therapy for eating disorders. *Behaviour Research and Therapy, 88*, 26-36. doi: 10.1016/j.brat.2013.09.004

Albertson, E. R., Neff, K. D., & Dill-Shackleford, K. E. (2014). Self-compassion and body dissatisfaction in women: A randomized controlled trial of a brief meditation intervention. *Mindfulness, 6*, 444-454. doi: 10.1007/s12671-014-0277-3

Ali, K., Farrer, L., Fassnacht, D. B., Gulliver, A., Bauer, S., & Griffiths, K. M. (2017). Perceived barriers and facilitators towards help-seeking for eating disorders: A systematic review. *International Journal of Eating Disorders, 50*, 9-21. doi: 10.1002/eat.22598

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). 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. doi: 10.1017/S1352465812000914

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*, 176-181. doi: 10.1037/1040-3590.10.2.176

Australian Government. (2015). *Better access to psychiatrists, psychologists and general practitioners through the MBS (Better Access) initiative.* Retrieved from http://www.health.gov.au/mentalhealth-betteraccess.

Bamford, B. H., Attoe, C., Mountford, V. A., Morgan, J. F., & Sly, R. (2014). Body checking and avoidance in low weight and weight restored individuals with anorexia nervosa

and non-clinical females. *Eating Behaviors, 15*, 5-8. doi: 10.1016/j.eatbeh.2013.10.011

Banasiak, S. J., Paxton, S. J., & Hay, P. (2005). Guided self-help for bulimia nervosa in primary care: A randomized controlled trial. *Psychological Medicine, 35*, 1283-1294. doi: 10.1017/S0033291705004769

Beck, A. T., & Beck, J. S. (1991). *The personality belief questionnaire*. Unpublished instrument. The Beck Institute for Cognitive Therapy and Research. Bala Cynwyd, Pennsylvania.

Beintner, I., & Jacobi, C. (In press). Are we overdosing treatment? Secondary findings from a stufy following women with bulimia nervosa after inpatient treatment. *International Journal of Eating Disorders*.

Bell, C., Waller, G., Shafran, R., & Delgadillo, J. (2017). Is there an optimal length of psychological treatment for eating disorder pathology? *International Journal of Eating Disorders, 50*, 687-692. doi: 10.1002/eat.22660

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238-246.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*, 588-606.

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. doi: 10.1002/eat.20931

Berman, M. I., Boutelle, K. N., & Crow, S. J. (2009). A case series investigating acceptance and commitment therapy as a treatment for previously treated, unremitted patients

with anorexia nervosa. *European Eating Disorders Review, 17*, 426-434. doi:

10.1002/erv.962

Bluett, E. J., Lee, E. B., Simone, M., Lockhart, G., Twohig, M. P., Lensegrav-Benson, T., &

Quakenbush-Roberts, B. (2016). The role of body image psychological flexibility on

the treatment of eating disorders in a residential facility. *Eating Behaviors, 23*, 150-

155. doi: 10.1016/j.eatbeh.2016.10.002

Bohn, K., Doll, H. A., Cooper, Z., O'Connor, M., Palmer, R. L., & Fairburn, C. G. (2008).

The measurement of impairment due to eating disorder pathology. *Behaviour*

Research and Therapy, 46, 1105-1110. doi: 10.1016/j.brat.2008.06.012

Bohn, K., & Fairburn, C. G. (2008). Clinical Impairment Assessment Questionnaire (CIA

3.0). In C. G. Fairburn (Ed.), *Cognitive behavior therapy and eating disorders* (pp.

315-317). New York, NY: Guilford Press.

Bond, F. W., & Bunce, D. (2003). The role of acceptance and job control in mental health,

job satisfaction, and work performance. *Journal of Applied Psychology, 88*, 1057-

1067. doi: 10.1037/0021-9010.88.6.1057

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., . . .

Zettle, R. (2011). Preliminary psychometric properties of the Acceptance and Action

Questionnaire II: A revised meaure of psychological inflexibility and experiential

avoidance. *Behavior Therapy, 42*, 676-688. doi: 10.1016/j.beth.2011.03.007

Braun, T. D., Park, C. L., & Gorin, A. (2016). Self-compassion, body image, and disordered

eating: A review of the literature. *Body Image, 17*, 117-131. doi:

10.1016/j.bodyim.2016.03.003

Brown, T. (2006). *Confirmatory factor analysis for applied research*. New York: Guilford.

Bulik, C. M., Sullivan, P. F., Carter, F. A., McIntosh, V. V., & Joyce, P. R. (1998). The role of exposure with response prevention int he cognitive-behavioural therapy for bulimia nervosa. *Psychological Medicine, 28*, 611-623.

Burgess, A. M., Frost, R. O., & Marten DiBartolo, P. (2016). Development and validation of the Frost Multidimensional Perfectionism Scale - Brief. *Journal of Psychoeducational Assessment, 34*, 620-633. doi: 10.1177/0734282916651359

Bush, H. E., Rossy, L., Mintz, L. B., & Schopp, L. (2014). Eat for life: A work site feasibility study of a novel mindfulness-based intuitive eating intervention. *American Journal of Health Promotion, 28*, 380-388. doi: 10.4278/ajhp.120404-QUAN-186

Butler, A. C., Beck, A. T., & Cohen, L. H. (2007). The personality belief questionnaire-short form: Development and preliminary findings. *Cognitive Therapy and Research, 31*, 357-370. doi: 10.1007/s10608-006-9041-x

Butryn, M. L., Juarascio, A., Shaw, A., Kerrigan, S. G., Clark, V., O'Planick, A., & Forman, E. M. (2013). Mindfulness and its relationship with eating disorders symptomatology in women receiving residential treatment. *Eating Behaviors, 14*, 13-16. doi: 10.1016/j.eatbeh.2012.10.005

Butterfly Foundation. (2012). *Paying the price: The economic and social impact of eating disorders in Australia.* Retrieved from http://thebutterflyfoundation.org.au/wp-content/uploads/2012/12/Butterfly_Report.pdf.

Byrne, S. M., Fursland, A., Allen, K. L., & Watson, H. (2011). The effectiveness of enhanced cognitive behavioural therapy for eating disorders: An open trial. *Behaviour Research and Therapy, 49*, 219-226. doi: 10.1016/j.brat.2011.01.006

Cachelin, F. M., Shea, M., Phimphasone, P., Wilson, G. T., Thompson, D. R., & Striegel, R. H. (2014). Culturally adapted cognitive behavioral guided self-help for binge eating:

A feasibility study with Mexican Americans. *Cultural Diversity and Ethnic Minority Psychology, 20*, 449-457. doi: 10.1037/a0035345

Calugi, S., Dalle Grave, R., Ghisi, M., & Sanavio, E. (2006). Validation of the Body Checking Questionnaire (BCQ) in an eating disorders population. *Behavioural and Cognitive Psychotherapy, 34*, 1-10. doi: 10.1017/S1352465805002730

Calugi, S., Sartirana, M., Milanese, C., Ghoch, M. E., Riolfi, F., & Dalle Grave, R. (2018). The clinical impairment assessment questionnaire: Validation in Italian patients with eating disorders. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity, Advanced online publication*, 1-10.

Campana, A. N. N. B., Swami, V., Onodera, C. M. K., da Silva, D., & Tavares, M. D. C. G. C. F. (2013). An initial psychometric evaluation and exploratory cross-sectional study of the Body Checking Questionnaire among Brazilian women. *PLOS ONE, 8*, 1-10. doi: 10.1371/journal.pone.0074649

Campana, A. N. N. B., Tavares, M. D. C. G. C. F., da Silva, D., & Diogo, M. J. D. E. (2009). Translation and validation of the Body Image Avoidance Questionnaire (BIAQ) for the Portuguese language in Brazil. *Behavior Research Methods, 41*, 236-243. doi: 10.3758/BRM.41.1.236

Carlat, D. J., Camargo, C. A., & Herzog, D. B. (1997). Eating disorders in males: A report on 135 patients. *American Journal of Psychiatry, 154*, 1127-1132. doi: 10.1176/ajp.154.8.1127

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

Carter, O., Pannekoek, L., Fursland, A., Allen, K. L., Lampard, A. M., & Byrne, S. M. (2012). Increased wait-list time predicts dropout from outpatient enhanced cognitive

behaviour therapy (CBT-E) for eating disorders. *Behaviour Research and Therapy, 50*, 487-492. doi: 10.1016/j.brat.2012.03.003

Cash, T. F. (2004). Body image: Past, present, and future. *Body Image, 1*, 1-5. doi: 10.1016/S1740-1445(03)00011-1

Cash, T. F., & Smolak, L. (Eds.). (2011). *Body image: A handbook of science, practice, and prevention*. New York, NY: The Guilford Press.

Cassin, S. E., von Ranson, K. M., Heng, K., Brar, J., & Wojtowicz, A. Z. (2008). Adapted motivational interviewing for women with binge eating disorder: A randomized controlled trial. *Psychology of Addictive Behaviors, 22*, 417-425. doi: 10.1037/0893-164X.22.3.417

Cavallini, A. Q., & Spangler, D. L. (2013). Sudden gains in cognitive-behavioral therapy for eating disorders. *International Journal of Cognitive Therapy, 6*, 292-310. doi: 10.1521/ijct.2013.6.3.292

Chen, E. Y., Cacioppo, J., Fettich, K., Gallop, R., McCloskey, M. S., Olino, T., & Zeffiro, T. A. (2017). An adaptive randomized trial of dialectical behavior therapy and cognitive behavior therapy for binge-eating. *Psychological Medicine, 47*, 703-717. doi: 10.1017/S0033291716002543

Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment, 6*, 284-290.

Clara, I. P., Cox, B. J., & Enns, M. W. (2001). Confirmatory factor analysis of the Depression-Anxiety-Stress Scales in depressed and anxious patients. *Journal of Psychopathology and Behavioral Assessment, 23*, 61-67. doi: 10.1023/A:1011095624717

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

Clausen, L., Rosenvinge, J. H., Friborg, O., & Rokkedal, K. (2011). Validating the Eating
Disorder Inventory-3 (EDI-3): A comparison between 561 female eating disorders
patients and 878 females from the general population. *Journal of Psychopathology
and Behavioral Assessment, 33*, 101-110. doi: 10.1007/s10862-010-9207-4

Cooper, M. J., Todd, G., & Turner, H. (2007). The effects of using imagery to modify core
emotional beliefs in bulimia nervosa: An experimental pilot study. *Journal of
Cognitive Psychotherapy: An International Quarterly, 21*, 117-122.

Cowdrey, N. D., & Waller, G. (2015). Are we really delivering evidence-based treatments for
eating disorders? How eating-disordered patients describe their expeirence of
cognitive behavioral therapy. *Behavior Research and Therapy, 75*, 72-77. doi:
10.1016/j.brat.2015.10.009

Craig, P., Dieppe, P., Macintyre, S., Mitchie, S., Nazareth, I., & Petticrew, M. (2008).
Developing and evaluating complex interventions: The new Medical Research
Council guidance. *BMJ, 337*, 979-983. doi: 10.1136/bmj.a1655

Cumella, E. J. (2006). Review of the Eating Disorder Inventory-3. *Journal of Personality
Assessment, 87*, 1166-1117. doi: 10.1207/s15327752jpa8701_11

Cvetanovski, A. (2014). *Mindful embodiment: Preliminary investigation of the relationship
between body image dissatisfaction and mindfulness, and the effectiveness of two pilot
interventions for adult men and women.* (Doctoral dissertation), RMIT University.
Retrieved from

http://researchbank.rmit.edu.au/eserv/rmit:160767/Cvetanovski.pdf&gathStatIcon=tru
e.

Danielsen, M., & Rø, Ø. (2012). Changes in body image during in patient treatment for
eating disorders predict outcome. *Eating Disorders, 20*, 261-275. doi:
10.1080/10640266.2012.689205

Dehon, C., Weems, C. F., Stickle, T. R., Costa, N. M., & Berman, S. L. (2005). A cross-
sectional evaluation of the factorial invariance of anxiety sensitivity in adolescents
and young adults. *Behavior Research and Therapy, 43*, 799-810. doi:
10.1016/j.brat.2004.06.008

Delgadillo, J., McMillan, D., Lucock, M., Leach, C., Ali, S., & Gilbody, S. (2013). Early
changes, attrition, and dose-response in low intensity psychological interventions.
British Journal of Clinical Psychology, 53, 114-130. doi: 10.1111/bjc.12031

Dias, B. S., Ferreira, C., & Trindade, I. A. (2018). Influence of fears of compassion on body
image shame and disordered eating. *Eating and Weight Disorders - Studies on
Anorexia, Bulimia and Obesity, Advance online publication*, 1-8. doi:
10.1007/s40519-018-0523-0

Dunn, E. C., Neighbors, C., & Larimer, M. E. (2006). Motivational enhancement therapy and
self-help treatment for binge eaters. *Psychology of Addictive Behaviors, 20*, 44-52.
doi: 0.1037/0893-164X.20.1.44

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

Egan, S. J., Wade, T. D., & Shafran, R. (2011). Perfectionism as a transdiagnostic process: A
clinical review. *Clinical Psychology Review, 31*, 203-212. doi:
10.1016/j.cpr.2010.04.009

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

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

Fairburn, C. G., Bailey-Straebler, S., Basden, S., Doll, H. A., Jones, R., Murphy, R., . . . Cooper, Z. (2015). A transdiagnostic comparison of enhanced cognitive behaviour therapy (CBT-E) and interpersonal psychotherapy in the treatment of eating disorders. *Behaviour Research and Therapy, 70*, 64-71. doi: 10.1016/j.brat.2015.04.010

Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16*, 363-370. doi: 10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-#:

Fairburn, C. G., & Beglin, S. J. (2008). Eating Disorder Examination Questionnaire (EDE-Q 6.0). In C. G. Fairburn (Ed.), *Cognitive behavior therapy and eating disorders* (pp. 309-314). New York, NY: The Guilford Press.

Fairburn, C. G., Cooper, Z., Doll, H. A., O'Connor, M., Bohn, K., Hawker, D. M., . . . Palmer, R. L. (2009). Transdiagnostic cognitive-behavioral therapy for patients with eating disorders: A two-site trial with 60-week follow-up. *The American Journal of Psychiatry, 166*, 311-319. doi:10.1176/appi.ajp.2008.08040608

Fairburn, C. G., Cooper, Z., & O'Connor, M. E. (2008). Eating Disorder Examination (Edition 16.0D). In C. G. Fairburn (Ed.), *Cognitive Behavior Therapy and Eating Disorders* (pp. 265-308). New York, NY: Guilford Press.

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

Fairburn, C. G., & Harrison, P. J. (2003). Eating disorders. *The Lancet, 361*, 407-416. doi: 10.1016/S0140-6736(03)12378-1

Fairweather-Schmidt, K. A., & Wade, T. D. (2014). DSM-5 eating disorders and other specified eating and feeding disorders: Is there a meaningful differentiation? *International Journal of Eating Disorders, 47*, 524-533. doi: 10.1002/eat.22257

Falkenström, F., Hatcher, R. L., & Holmqvist, R. (2015). Confirmatory factor analysis of the patient version of the Working Alliance Inventory - Short Form Revised. *Assessment, 22*, 581-593. doi: 0.1177/1073191114552472

Feld, R., Woodside, D. B., Kaplan, A. S., Olmsted, M. P., & Carter, J. C. (2001). Pretreatment of motivational enhancement therapy for eating disorders: A pilot study. *International Journal of Eating Disorders, 29*, 393-400. doi: 10.1002/eat.1035

Ferreira, C., Pinto-Gouveia, J., & Duarte, C. (2011). The validation of the Body Image Acceptance and Action Questionnaire: Exploring the moderator effect of acceptance on disordered eating. *International Journal of Psychology and Psychological Therapy, 11*, 327-345

Fischer, S., Meyer, A. H., Dremmel, D., Schlup, B., & Munsch, S. (2014). Short-term cognitive-behavioral therapy for binge eating disorder: Long-term efficacy and predictors of long-term treatment success. *Behaviour Research and Therapy, 58*, 36-42. doi: 10.1016/j.brat.2014.04.007

Fournier, J. C., DeRubeis, R. J., & Beck, A. T. (2012). Dysfunctional cognitions in personality pathology: The structure and validity of the Personality Belief Questionnaire. *Psychological Medicine, 42*, 795-805. doi: 10.1017/S0033291711001711

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of

    perfectionism. *Cognitive Therapy and Research, 14*, 449-468. doi:

    10.1007/BF01172967

Garner, D. M. (2004). *Eating disorder inventory-3: Professional manual*. Lutz, FL:

    Psychological Assessment Research Inc.

Ghaderi, A. (2006). Attrition and outcome in self-help treatment for bulimia nervosa and

    binge eating disorder: A constructive replication. *Eating Behaviors, 7*, 300-308. doi:

    10.1016/j.eatbeh.2005.11.002

Ghaderi, A., & Scott, B. (2003). Pure and guided self-help for full and sub-threshold bulimia

    nervosa and binge eating disorder. *British Journal of Clinical Psychology, 42*, 257-

    269. doi: 10.1348/01446650360703375

Gilbert, P., McEwan, K., Matos, M., & Rivis, A. (2011). Fears of compassion: Development

    of three self-report measures. *Psychology and Psychotherapy: Therapy, Research and*

    Practice, 84, 239-255. doi: 10.1348/147608310X526511

Goldberg, S. B., Rousmaniere, T., Miller, S. D., Whipple, J., Nielson, S. L., Hoyt, W. T., &

    Wampold, B. E. (2016). Do psychotherapists improve with time and experience? A

    longitudinal analysis of outcomes in a clinical setting. *Journal of Counseling*

    Psychology, 63, 1-11. doi: 10.1037/cou0000131

Graves, T. A., Tabri, N., Thompson-Brenner, H., Franko, D. L., Eddy, K. T., Bourion-Bedes,

    S., . . . Thomas, J. J. (2017). A meta-analysis of the relation between therapeutic

    alliance and treatment outcome in eating disorders. *International Journal of Eating*

    Disorders, 50, 323-340. doi: 10.1002/eat.22672

Grilo, C. M., Masheb, R. M., Wilson, G. T., & Crosby, R. D. (2012). Predictors and

    moderators of response to cognitive behavioral therapy and medication for the

treatment of binge eating disorder. *Journal of Clinical and Consulting Psychology, 80*, 897-906. doi: 10.1037/a0027001

Grilo, C. M., Reas, D. L., Brody, M. L., Burke-Martindale, C. H., Rothschild, B. S., & Masheb, R. M. (2005). Body checking and avoidance and the core features of eating disorders among obese men and women seeking bariatric surgery. *Behavior Research and Therapy, 43*, 629-637. doi: 10.1016/j.brat.2004.05.003

Hart, L. M., Granillo, M. T., Jorm, A. F., & Paxton, S. J. (2011). Unmet need for treatment in the eating disorders: A systematic review of eating disorder specific treatment seeking among community cases. *Clinical Psychology Review, 31*, 727-735. doi: 10.1016/j.cpr.2011.03.004

Hatcher, R. L., & Gillaspy, J. A. (2006). Development and validation of a revised short version of the working alliance inventory. *Psychotherapy Research, 16*, 12-25. doi: 10.1080/10503300500352500

Hay, P., Chinn, D., Forbes, D., Madden, S., Newton, R., Sugenor, L., . . . Ward, W. (2014). Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for the treatment of eating disorders. *Australian and New Zealand Journal of Psychiatry, 48*, 1-62. doi: 0.1177/0004867414555814

Hayes, S. C., Strosahl, K., Wilson, G. T., Bissett, R. T., Pistorello, J., Toarmino, D., . . . McCurry, S. M. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record, 54*, 553-578.

Henriksson, S., Anclair, M., & Hiltunen, A. J. (2016). Effectiveness of cognitive behavioral therapy on health-related quality of life: An evaluation of therapies provided by trainee therapists. *Scandinavian Journal of Psychology, 57*, 215-222. doi: 10.1111/sjop.12291

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 44*. doi: 10.1348/014466505X29657

Hill, M. L., Masuda, A., & Latzman, R. D. (2013). Body image flexibility as a protective factor against disordered eating behavior for women with lower body mass index. *Eating Behaviors, 14*, 336-341. doi: 10.1016/j.eatbeh.2013.06.003

Hill, M. L., Masuda, A., Melcher, H., Morgan, J. R., & Twohig, M. P. (2015). Acceptance and commitment therapy for women diagnosed with binge eating disorder: A case-series study. *Cognitive and Behavioral Practice, 22*, 367-378. doi: 10.1016/j.cbpra.2014.02.005

Hinrichsen, H., Wright, F., Waller, G., & Meyer, C. (2003). Social anxiety and coping strategies in the eating disorders. *Eating Behaviors, 4*, 117-126. doi: 10.1016/S1471-0153(03)00016-3

Horvath, A. O., & Greenberg, L. S. (1989). Development and validation of the Working Alliance Inventory. *Journal of Counseling Psychology, 36*, 223-233.

Hrabosky, J. I., White, M. A., Masheb, R. M., Rothschild, B. S., Burke-Martindale, C. H., & Grilo, C. M. (2008). Psychometric evaluation of the Eating Disorder Examination-Questionnaire for bariatric surgery candidates. *Obesity, 16*, 763-769. doi: 10.1038/oby.2008.3

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*, 348-358. doi: 10.1016/j.biopsych.2006.03.040

Huon, G. F. (1985). An initial validation of a self-help program for bulimia. *International Journal of Eating Disorders, 4*, 573-588. doi: 10.1002/1098-108X(198511)4:4<573::AID-EAT2260040416>3.0.CO;2-0

IBM Corp. (2013). IBM SPSS Statistics for Windows (Version 22.0). Armonk, NY: IBM Corp.

Jacobi, C., & Fittig, E. (2010). Psychosocial risk factors for eating disorders. In W. S. Agras (Ed.), *The Oxford handbook of eating disorders* (pp. 123-136). New York: Oxford University Press.

Jacobson, N. S., Dobson, K. S., Truax, P. A., Addis, M. E., Koerner, K., Jackie, K., . . . Prince, S. E. (1996). A component analysis of cognitive-behavioral treatment for depression. *Journal of Clinical and Consulting Psychology, 64*, 295-304. doi: 10.1037/0022-006X.64.2.295

Jenkins, P. E. (2013). Psychometric validation of the Clinical Impairment Assessment in a UK eating disorder service. *Eating Behaviors, 14*, 241-243. doi: 10.1016/j.eatbeh.2012.12.001

Jenkins, P. E., Hoste, R. R., Meyer, C., & Blissett, J. M. (2011). Eating disorders and quality of life: A review of the literature. *Clinical Psychology Review, 31*, 113-121. doi: 10.1016/j.cpr.2010.08.003

Juarascio, A., Shaw, J., Forman, E., Timko, C. A., Herbert, J., Butryn, M., . . . Lowe, M. (2013). Acceptance and commitment therapy as a novel treatment for eating disorders: An initial test of efficacy and mediation. *Behavior Modification, 37*, 459-489. doi: 0.1177/0145445513478633

Kazdin, A. E., Fitzsimmons-Craft, E. E., & Wilfley, D. E. (2017). Addressing critical gaps in the treatment of eating disorders. *International Journal of Eating Disorders, 50*, 170-189. doi: 10.1002/eat.22670

Keel, P. K., Dorer, D. J., Franko, D. L., Jackson, S. C., & Herzog, D. B. (2005).

    Postremission predictors of relapse in women with eating disorders. *The American*

    Journal of Psychiatry, 162, 2263-2268. doi: 10.1176/appi.ajp.162.12.2263

Kelly, A. C., & Carter, J. C. (2015). Self-compassion training for binge eating disorder: A

    pilot randomized controlled trial. *Psychology and Psychotherapy: Therapy, Research*

    and Practice, 88, 285-303. doi: 10.1111/papt.12044

Kelly, A. C., Carter, J. C., & Borairi, S. (2014). Are improvements in shame and self-

    compassion early in eating disorders treatment associated with better patient

    outcomes? *International Journal of Eating Disorders, 47*, 54-64. doi:

    10.1002/eat.22196

Kelly, A. C., Carter, J. C., Zuroff, D. C., & Borairi, S. (2013). Self-compassion and fear of

    self-compassion interact to predict response to eating disorders treatment: A

    preliminary investigation. *Psychotherapy Research, 23*, 252-264. doi:

    10.1080/10503307.2012.717310

Kelly, A. C., Vimalakanthan, K., & Miller, K. E. (2014). Self-compassion moderates the

    relationship between body mass index and both eating disorder pathology and body

    image flexibility. *Body Image, 11*, 446-453. doi: 10.1016/j.bodyim.2014.07.005

Kelly, A. C., Wisniewski, L., Martin-Wager, C., & Hoffman, E. (2017). Group-based

    compassion-focused therapy as an adjunct to outpatient treatment for eating disorders:

    A pilot randomized controlled trial. *Clinical Psychology and Psychotherapy, 24*, 475-

    487. doi: 10.1002/cpp.2018

Kenny, D. A., & McCoach, D. B. (2003). Effect of the number of variables on measures of fit

    in structural equation modeling. *Structural Equation Modeling: A Multidisciplinary*

    Journal, 10, 333-351. doi: 10.1207/S15328007SEM1003_1

Knott, S., Woodward, D., Hoefkens, A., & Limbert, C. (2015). Cognitive behaviour therapy for bulimia nervosa and eating disorders not otherwise specified: Translation from randomized controlled trial to a clinical setting. *Behavioural and Cognitive Psychotherapy, 43*, 641-654. doi: 10.1017/S1352465814000393

Kohtala, A., Lappalainen, R., Savonen, L., Timo, E., & Tolvanen, A. (2015). A four-session acceptance and commitment therapy based intervention for depressive symptoms delivered by masters degree level psychology students: A preliminary study. *Behavioural and Cognitive Psychotherapy, 43*, 360-373. doi: 10.1017/S1352465813000969

Kraemer, H. C., Kiernan, M., Essex, M., & Kupfer, D. J. (2008). How and why criteria defining moderators and mediators differ between the Baron & Kenny and MacArthur Approaches. *Health Psychology, 27*, S101-S108. doi: 10.1037/0278-6133.27.2(Suppl.).S101

Kraemer, H. C., Morgan, G. A., Leech, N. L., Gliner, J. A., Vaske, J. J., & Harmon, R. J. (2003). Measures of clinical significance. *Journal of the American Academy of Child and Adolescent Psychiatry, 42*, 1524-1529. doi: 10.1097/01.chi.0000091507.46853.d1

Kurz, A. S., Flynn, M. K., & Bordieri, M. J. (2016). How Bayesian estimatino might improve CBS measure development: A case study with body-image flexibility in Hispanic students. *Journal of Contextual Behavioral Science, In press*. doi: 10.1016/j.jcbs.2016.07.005

Lampard, A. M., Byrne, S. M., McLean, N., & Fursland, A. (2011). An evaluation of the enhanced cognitive-behavioural model of bulimia nervosa. *Behaviour Research and Therapy, 49*, 529-535. doi: 10.1016/j.brat.2011.06.002

Lappalainen, P., Granlund, A., Siltanen, S., Ahonen, S., Vitikainen, M., Tolvanen, A., & Lappalainen, R. (2014). ACT internet-based vs face-to-face? A randomized controlled

trial of two ways to deliver acceptance and commitment therapy for depressive symptoms: An 18-month follow-up. *Behavior Research and Therapy, 61*, 43-54. doi: 10.1016/j.brat.2014.07.006

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 Behaviours, 13*, 386-389. doi: 10.1177/0743558403258847

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

Lecrubier, Y., Sheehan, D. V., Weiller, E., Amorim, P., Bonora, I., Harnett Sheehan, K., . . . Dunbar, G. C. (1997). The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: Reliability and validity according to the CIDI. *European Psychiatry, 12*, 224-231. doi: 10.1016/S0924-9338(97)83296-8

Lee, E. B., Ong, C. E., Twohig, M. P., Lensegrav-Benson, T., & Quakenbush-Roberts, B. (2018). Increasing body image flexibility in a residential eating disorder facility: Correlates with symptom improvement. *Eating Disorders, 26*, 185-199. doi: 10.1080/10640266.2017.1366229

Legenbauer, T., Vocks, S., & Schütt-Strömel, S. (2007). Validierung einer deutschsprachigen version des Body Image Avoidance Questionnaire BIAQ. *Diagnostica, 53*, 218-225.

Linardon, J., Brennan, L., & de la Piedad Garcia, X. (2016). Rapid response to eating disorder treatment: A systematic review and meta-analysis. *International Journal of Behavioral Medicine, 49*, 905-919. doi: 10.1002/eat.22595

Linardon, J., de la Piedad Garcia, X., & Brennan, L. (2017). Predictors, moderators, and mediators of treatment outcome following manualised cognitive-behavioural therapy for eating disorders: A systematic review. *European Eating Disorders Review, 25*, 3-12. doi: 10.1002/erv.2492

Linardon, J., Hindle, A., & Brennan, L. (2018). Dropout from cognitive-behavioral therapy for eating disorders: A meta-analysis of randomized, controlled trials. *International Journal of Eating Disorders, Advanced online publication*, 1-11. doi: 10.1002/eat.22850

Linardon, J., & Wade, T. D. (2018). How many individuals achieve symptom abstinence following psychological treatments for bulimia nervosa? A meta-analytic review. *International Journal of Eating Disorders, 51*, 287-294. doi: 10.1002/eat.22838

Linardon, J., Wade, T. D., de la Piedad Garcia, X., & Brennan, L. (2017). The efficacy of cognitive-behavioural theapy for eating disorders: A systematic review and meta-analysis. *Journal of Clinical and Consulting Psychology, 85*, 1080-1094. doi: 10.1037/ccp0000245

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

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

Loeb, K. L., Wilson, G. T., Gilbert, J. S., & Labouvie, E. (2000). Guided and unguided self-help for binge eating. *Behavior Research and Therapy, 38*, 259-272. doi: 10.1016/S0005-7967(99)00041-8

Loeb, K. L., Wilson, G. T., Labouvie, E., Pratt, E. M., Hayaki, J., Walsh, B. T., & Agras, W. S. (2005). Therapeutic alliance and treatment adherence in two interventions for bulimia nervosa: A study of process and outcome. *Journal of Consulting and Clinical Psychology, 73*, 1097-1107. doi: 10.1037/0022-006X.73.6.1097

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*, 335-343. doi: 10.1016/0005-7967(94)00075-U

Lydecker, J. A., Cotter, E. W., & Mazzeo, S. E. (2014). Body checking and body image avoidance: Construct validity and norms for college women. *Eating Behaviours, 15*, 13-16. doi: 10.1016/j.eatbeh.2013.10.009

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130-149.

MacDonald, D. E., McFarlane, T. L., Dionne, M. M., David, L., & Olmstead, M. P. (2017). Rapid response to intensive treatment for bulimia nervosa and purging disorder: A randomized controlled trial of a CBT intervention to facilitate early behavior change. *Journal of Consulting and Clinical Psychology, 85*, 896-908. doi: 10.1037/ccp0000221

MacDonald, D. E., Trottier, K., & Olmsted, M. P. (2017). Rapid improvements in emotion regulation predict intensive treatment outcome for patients with bulimia nervosa and

purging disorder. *International Journal of Eating Disorders, 50*, 1152-1161. doi: 10.1002/eat.22766

Maïano, C., Morin, A. J. S., Monthuy-Blanc, J., & Garbarino, J. (2009). The Body Image Avoidance Questionnaire: Assessment of its construct validity in a community sample of French adolescents. *International Journal of Behavioral Medicine, 16*, 125-135. doi: 10.1007/s12529-009-9035-7

Martín, J., Padierna, A., Unzurrunzaga, A., González, N., Berjano, B., & Quintana, J. M. (2015). Adaptation and validation of the Spanish version of the Clinical Impairment Assessment questionnaire. *Appetite, 91*, 20-27. doi: 10.1016/j.appet.2015.03.031

Masheb, R. M., & Grilo, C. M. (2008). Examination of predictors and moderators for self-help treatments of binge-eating disorder. *Journal of Consulting and Clinical Psychology, 76*, 900-904. doi: 10.1037/a0012917

Masuda, A., Hill, M. L., Tully, E. C., & Garcia, S. E. (2015). The role of disordered eating cognition and body image flexibility in disordered eating behavior in college men. *Journal of Contextual Behavioral Science, 4*, 12-20. doi: 10.1016/j.jcbs.2015.01.001

Mental Health Workforce Advisory Committee. (2011). *National mental health workforce plan*. Canberra, ACT: DoHA.

Menzel, J. E., Krawczyk, R., & Thompson, J. K. (2011). Attitudinal assessment of body image for adolescents and adults. In T. F. Cash & L. Smolak (Eds.), *Body image: A handbook of science, practice, and prevention* (pp. 154-169). New York, NY: Guilford Press.

Mitchell, J. E., Agras, S., Crow, S., Halmi, K., Fairburn, C. G., Bryson, S., & Kraemer, H. (2011). Stepped care and cognitive-behavioural therapy for bulimia nervosa: Randomised trial. *The British Journal of Psychiatry, 198*, 391-397. doi: 10.1192/bjp.bp.110.082172

Mond, J. M., Hay, P. J., Rodgers, B., & Owen, C. (2006). Eating disorder examination questionnaire (EDE-Q): Norms for young adult women. *Behaviour Research and Therapy, 44*, 53-62. doi: 10.1016/j.brat.2004.12.003

Moore, M., Masuda, A., Hill, M. L., & Goodnight, B. L. (2014). Body image flexibility moderates the association between disordered eating cognition and disordered eating behavior in a non-clinical sample of women: A cross-sectional investigation. *Eating Behaviors, 15*, 664-669. doi: 10.1016/j.eatbeh.2014.08.021

Munder, T., Wilmers, F., Leonhart, R., Linster, H. W., & Barth, J. (2010). Working Alliance Inventory - Short Revised (WAI-SR): Psychometric properties in outpatients and inpatients. *Clinical Psychology and Psychotherapy, 17*, 231-239. doi: 10.1002/cpp.658

Muthén, L. K., & Muthén, B. O. (1998-2017). *Mplus user's guide* (Eighth ed.). Los Angeles, CA: Muthén & Muthén.

NICE. (2017). *Eating disorders: Recognition and treatment*. (NC69). Retrieved from https://www.nice.org.uk/guidance/ng69.

Nikodijevic, A., Buck, K., Fuller-Tyszkiewicz, M., de Paoli, T., & Krug, I. (2018). Body checking and body avoidance in eating disorders: Systematic review and meta-analysis. *European Eating Disorders Review, 26*, 159-185. doi: 10.1002/erv.2585

Nyman-Carlsson, E., Engström, I., Norring, C., & Nevonen, L. (2014). Eating Disorder Inventory-3, validation in Swedish patients with eating disoders, psychiatric outpatients and a normal control sample. *Nordic Journal of Psychiatry, 69*, 1-10. doi: 10.3109/08039488.2014.949305

Nyman-Carlsson, E., & Garner, D. M. (2016). Eating Disorder Inventory. In T. D. Wade (Ed.), *Encyclopaedia of Feeding and Eating Disorders*. Singapore: Springer.

Ohanian, V. (2002). Imagery rescripting within cognitive behavior therapy for bulimia

    nervosa: An illustrative case report. *International Journal of Eating Disorders, 31*,

    352-357. doi: 10.1002/eat.10044

Open Science Collaboration. (2015). Estimating the reproducibility of psychological science.

    Science, 349, aac4716-aac4716. doi: 10.1126/science.aac4716

Osman, A., Wong, J. L., Bagge, C. L., Freedenthal, S., Gutierrez, P. M., & Lozano, G.

    (2012). The Depression Anxiety Stress Scales - 21 (DASS-21): Further examination

    of dimensions, reliability, and correlates. *Journal of Clinical Psychology, 68*, 1322-

    1338. doi: 10.1002/jclp.21908

Öst, L., Karlstedt, A., & Widén, S. (2012). The effects of cognitive behavior therapy

    delivered by students in a psychologist training program: An effectiveness study.

    Behavior Therapy, 43, 160-173. doi: 10.1016/j.beth.2011.05.001

Öst, L., & Ollendick, T. H. (2017). Brief, intensive and concentrated cognitive behavioral

    treatments for anxiety disorders in children: A systematic review and meta-analysis.

    Behaviour Research and Therapy, 97, 134-145. doi: 10.1016/j.brat.2017.07.008

Palmer, R. L., Birchall, H., McGrain, L., & Sullivan, V. (2002). Self-help for bulimic

    disorders: A randomised controlled trial comparing minimal guidance with face-to-

    face or telephone guidance. *British Journal of Psychiatry, 181*, 230-235. doi:

    10.1348/01446650360703375

Pellizzer, M. L., Tiggemann, M., Waller, G., & Wade, T. D. (2018). Measures of body

    image: Confirmatory factor analysis and association with disordered eating.

    Psychological Assessment, 30, 143-153. doi: 10.1037/pas0000461

Pellizzer, M. L., Waller, G., & Wade, T. D. (2018a). Body image flexibility: A predictor and

    moderator of outcome in transdiagnostic outpatient eating disorder treatment.

    International Journal of Eating Disorders, 51, 368-372. doi: 10.1002/eat.22842

Pellizzer, M. L., Waller, G., & Wade, T. D. (2018b). Ten-session cognitive behaviour therapy for eating disorders: Outcomes from a pragmatic pilot study of Australian non-underweight clients. *Clinical Psychologist, Advance online publication*. doi: 10.1111/cp.12170

Pennesi, J.-L. P., & Wade, T. D. (2018). Imagery rescripting and cognitive dissonance: A randomized controlled trial of two brief online interventions for women at risk of developing an eating disorder. *International Journal of Eating Disorders, Advance online publication*, 1-10. doi: 10.1002/eat.22849

Peterson, C. B., Berg, K. C., Crosby, R. D., Lavender, J. M., Accurso, E. C., Ciao, A. C., . . . Wonderlich, S. A. (2017). The effects of psychotherapy treatment on outcome in bulimia nervosa: Examining indirect effects through emotion regulation, self-directed behavior, and self-discrepancy within the mediation model. *International Journal of Eating Disorders, 50*, 636-647. doi: 10.1002/eat.22669

Peterson, C. B., Crosby, R. D., Wonderlich, S. A., Joiner, T., Crow, S. J., Mitchell, J. E., . . . le Grange, D. (2007). Psychometric properties of the Eating Disorder Examination-Questionnaire: Factor structure and internal consistency. *International Journal of Eating Disorders, 40*, 386-389. doi: 10.1002/eat.20373

Pinto-Gouveia, J., Carvalho, S. A., Palmeira, L., Castilho, P., Duarte, C., Ferreira, C., . . . Costa, J. (2017). BEfree: A new psychological program for binge eating that integrates psychoeducation, mindfulness, and compassion. *Clinical Psychology and Psychotherapy, 24*, 1090-1098. doi: 10.1002/cpp.2072

Probst, M., Vandereycken, W., Van Coppenolle, H., & Vanderlinden, J. (1995). The body attitude test for patients with an eating disorder: Psychometric characteristics of a new questionnaire. *Eating Disorders, 3*, 133-144. doi: 10.1080/10640269508249156

Räsänen, P., Lappalainen, P., Muotka, J., Tolvanen, A., & Lappalainen, R. (2016). An online guided ACT intervention for enhancing the psychological wellbeing of university students: A randomized controlled clinical trial. *Behaviour Research and Therapy, 78*, 30-42. doi: 10.1016/j.brat.2016.01.001

Raykos, B. C., McEvoy, P. M., Erceg-Hurn, D., Byrne, S. M., Fursland, A., & Nathan, P. (2014). Therapeutic alliance in enhanced cognitive behavioural therapy for bulimia nervosa: Probably necessary but definitely insufficient. *Behaviour Research and Therapy, 57*, 65-71. doi: 10.1016/j.brat.2014.04.004

Raykov, T. (1997). Estimation of composite reliability for congeneric measures. *Applied Psychological Measurement, 21*, 173-184. doi: 10.1177/01466216970212006

Reas, D. L., Grilo, C. M., Masheb, R. M., & Wilson, G. T. (2005). Body checking and avoidance in overweight patients with binge eating disorder. *International Journal of Eating Disorders, 37*, 342-346. doi: 10.1002/eat.20092

Reas, D. L., Rø, Ø., Kapstad, H., & Lask, B. (2010). Psychometric properties of the Clinical Impairment Assessment: Norms for young adult women. *International Journal of Eating Disorders, 43*, 72-76. doi: 10.1002/eat.20653

Reas, D. L., von Soest, T., & Lask, B. (2009). Reliability and validity of the Norwegian version of the Body Checking Questionnaire. *Tidsskrift for Norsk Psykologforening, 46*, 260-262

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 behaviors. *International Journal of Eating Disorders, 31*, 324-333. doi: 10.1002/eat.10012

Reas, D. L., White, M. A., & Grilo, C. M. (2006). Body Checking Questionnaire: Psychometric properties and clinical correlates in obese men and women with binge

eating disorder. *International Journal of Eating Disorders, 39*, 326-331. doi:
10.1002/eat.20236

Regan, P., Cachelin, F. M., & Minnick, A. M. (2017). Initial treatment seeking from professional health care providers for eating disorders: A review and synthesis of potential barriers to and facilitators of "first contact". *International Journal of Eating Disorders, 50*, 190-209. doi: 10.1002/eat.22683

Riva, G., & Molinari, E. (1998). Replicated factor analysis of the Italian version of the Body Image Avoidance Questionnaire. *Perceptual and Motor Skills, 86*, 1071-1074. doi: 10.2466/pms.1998.86.3.1071

Rose, C., & Waller, G. (2017). Cognitive-behavioral therapy for eating disorders in primary care settings: Does it work, and does a greater dose make it more effective? *International Journal of Eating Disorders, 50*, 1350-1355. doi: 10.1002/eat.22778

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. doi: 10.1037/1040-3590.3.1.32

Safer, D. L., Telch, C. F., & Agras, W. S. (2001). Dialectical behavior therapy for bulimia nervosa. *The American Journal of Psychiatry, 158*, 632-634. doi: 10.1176/appi.ajp.158.4.632

Sánchez-Ortiz, V. C., Munro, C., Stahl, D., House, J., Startup, H., Treasure, J., . . . Schmidt, U. (2011). A randomized controlled trial of internet-based cognitive-behavioural therapy for bulimia nervosa or related disorders in a student population. *Psychological Medicine, 41*, 407-417. doi: 10.1017/S0033291710000711

Sandoz, E. K., Wilson, K. G., Merwin, R. M., & Kellum, K. K. (2013). Assessment of body image flexibility: The Body Image-Acceptance and Action Questionnaire. *Journal of Contextual Behavioral Science, 2*, 39-48. doi: 10.1016/j.jcbs.2013.03.002

Schmidt, U., Lee, S., Beecham, J., Perkins, S., Treasure, J., Yi, I., . . . Eisler, I. (2007). A randomized controlled trial of family therapy and cognitive behavior therapy guided self-care for adolescents with bulimia nervosa and related disorders. *American Journal of Psychiatry, 164*, 591-598. doi: 10.1176/ajp.2007.164.4.591

Schoenefeld, S. J., & Webb, J. B. (2013). Self-compassion and intuitive eating in college women: Examining the contributions of distress tolerance and body image acceptance and action. *Eating Behaviors, 14*, 493-496. doi: 10.1016/j.eatbeh.2013.09.001

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of Educational Research, 99*, 323-338. doi: 10.3200/JOER.99.6.323-338

Shafran, R., Cooper, Z., & Fairburn, C. G. (2002). Clinical perfectionism: A cognitive-behavioural analysis. *Behaviour Research and Therapy, 40*, 773-791. doi: 10.1016/S0005-7967(01)00059-6

Shafran, R., Fairburn, C. G., Robinson, P., & Lask, B. (2003). Body checking and its avoidance in eating disorders. *International Journal of Eating Disorders, 35*. doi: 10.1002/eat.10228

Sheehan, D. V., Lecrubier, Y., Harnett Sheehan, K., Janavs, J., Weiller, E., Keskiner, A., . . . Dunbar, G. C. (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry, 12*, 232-241. doi: 10.1016/S0924-9338(97)83297-X

Shu, C. Y., Limburg, K., Harris, C., McCormack, J., Hoiles, K. J., Hamilton, M. J., & Watson, H. J. (2015). Clinical presentation of eating disorders in young males at a tertiary setting. *Journal of Eating Disorders, 3*, 1-7. doi: 10.1186/s40337-015-0075-x

Signorini, R., Sheffield, J., Rhodes, N., Fleming, C., & Ward, W. (2018). The effectiveness of enhanced cogntive behavioural therapy (CBT-E): A naturalistic study within an

out-patient eating disorder service. *Behavioural and Cognitive Psychotherapy, 46*, 21-34. doi: 10.1017/S1352465817000352

Spangler, D. L., Baldwin, S. A., & Agras, W. S. (2004). An examination of the mechanisms of action in cognitive behavioral therapy for bulimia nervosa. *Behavior Therapy, 35*, 537-560. doi: 10.1016/S0005-7894(04)80031-5

Stark, V., & Hiltunen, A. J. (2016). Affect at the different phases of cognitive behavioral therapy: An evaluation of psychotherapy provided by candidates. *Scandinavian Journal of Psychology, 57*, 36-41. doi: 10.1111/sjop.12267

Steele, A. L., Bergin, J., & Wade, T. D. (2011). Self-efficacy as a robust predictor of outcome in guided self-help treatment for broadly defined bulimia nervosa. *International Journal of Eating Disorders, 44*, 389-396. doi: 10.1002/eat.20830

Steele, A. L., & Wade, T. D. (2008). A randomised trial investigating guided self-help to reduce perfectionism and its impact on bulimia nervosa: A pilot study. *Behaviour Research and Therapy, 46*, 1316-1323. doi: 10.1016/j.brat.2008.09.006

Stice, E., Marti, C. N., & Rohde, P. (2013). Prevalence, incidence, impairment, and course of the proposed DSM-5 eating disorder diagnoses in an 8-year prospective community study of young women. *Journal of Abnormal Psychology, 122*, 445-457. doi: 10.1037/a0030679

Striegel-Moore, R. H., DeBar, L., Wilson, G. T., Dickerson, J., Rosselli, F., Perrin, N., . . . Kraemer, H. C. (2008). Health services use in eating disorders. *Psychological Medicine, 38*, 1465-1474. doi: 10.1017/S0033291707001833

Stutts, L. A., & Blomquist, K. K. (2018). The moderating role of self-compassion on weight and shape concerns and eating pathology: A longitudinal study. *International Journal of Eating Disorders, Advanced online publication*, 1-11. doi: 10.1002/eat.22880

Swami, V., Stieger, S., Harris, A. S., Nader, I. W., Pietschnig, J., Voracek, M., & Tovée, M. J. (2012). Further investigation of the validity and reliability of the Photographic Figure Rating Scale for body image assessment. *Journal of Personality Assessment, 94*, 404-409. doi: 10.1080/00223891.2012.660259

Tabachnick, B. G., & Fidell, L. S. (2012). *Using multivariate statistics* (6th ed.). Boston, MA: Pearson.

Tatham, M. (2011). The role of imagery-based techniques in cognitive-behavioural therapy for adults with eating disorders. *Clinical Psychology Review, 31*, 1101-1109. doi: 10.1016/j.cpr.2011.06.008

Tatham, M., Turner, H., Mountford, V. A., Tritt, A., Dyas, R., & Waller, G. (2015). Development, psychometric properties and preliminary clinical validation of a brief, session-by-session measure of eating disorder cognitions and behaviors: The ED-15. *International Journal of Eating Disorders, 48*, 1005-1015. doi: 10.1002/eat.22430

Timko, C. A., Juarascio, A. S., Martin, L. M., Faherty, A., & Kalodner, C. (2014). Body image avoidance: An under-explored yet important factor in the relationship between body image dissatisfaction and disordered eating. *Journal of Contextual Behavioral Science, 3*, 203-211. doi: 10.1016/j.jcbs.2014.01.002

Tracey, T. J., & Kokotovic, A. M. (1989). Factor structure of the Working Alliance Inventory. *Psychological Assessment, 1*, 207-210.

Turner, H., Bryant-Waugh, R., & Marshall, E. (2015). The impact of early symptom change and therapeutic alliance on treatment outcome in cognitive-behavioural therapy for eating disorders. *Behaviour Research and Therapy, 73*, 165-169. doi: 10.1016/j.brat.2015.08.006

Turner, H., Marshall, E., Stopa, L., & Waller, G. (2015). Cognitive-behavioural therapy for outpatients with eating disorders: Effectivness for a transdiagnostic group in a routine

clinical setting. *Behaviour Research and Therapy, 68*, 70-75. doi: 10.1016/j.brat.2015.03.001

Turner, H., Marshall, E., Wood, F., Stopa, L., & Waller, G. (2016). CBT for eating disorders: The impact of early changes in eating pathology on later changes in personality pathology, anxiety and depression. *Behaviour Research and Therapy, 77*, 1-6. doi: 0.1016/j.brat.2015.11.011

Tylka, T. L., & Wood-Barcalow, N. L. (2015). What is and what is not positive body image? Conceptual foundations and construct definition. *Body Image, 14*, 118-129. doi: 10.1016/j.bodyim.2015.04.001

Vall, E., & Wade, T. D. (2015). Predictors of treatment outcome in individuals with eating disorders: A systematic review and meta-analysis. *International Journal of Eating Disorders, 48*, 946-971. doi: 10.1002/eat.22411

van der Veek, S. M. C., Derkx, B. H. F., Benninga, M. A., Boer, F., & de Haan, E. (2013). Cognitive behavior therapy for pediatric functional abdominal pain: A randomized controlled trial. *Pediatrics, 132*, e1163-e1172. doi: 10.1542/peds.2013-0242

Vannucci, A., Kass, A. E., Sinton, M. M., Aspen, V., Weisman, H., Bailey, J. O., . . . Taylor, C. B. (2012). An examination of the Clinical Impairment Assessment among women at high risk for eating disorder onset. *Behaviour Research and Therapy, 50*, 407-414. doi: 10.1016/j.brat.2012.02.009

Vocks, S., Moswald, C., & Legenbauer, T. (2008). Psychometrische u¨berpru¨ fung einer Deutschsprachigen fassung des Body Checking Questionnaire (BCQ). *Zeitschrift fu¨r Klinische Psychologie und Psychotherapie, 37*, 131-140.

Wade, S., Byrne, S. M., & Allen, K. (2017). Enhanced cognitive behavioral therapy for eating disorders adapted for a group setting. *International Journal of Eating Disorders, 50*, 863-872. doi: 10.1002/eat.22723

Wade, T. D., Frayne, A., Edwards, S.-A., Robertson, T., & Gilchrist, P. (2009). Motivational

    change in an inpatient anorexia nervosa population and implications for treatment.

    Australian and New Zealand Journal of Psychiatry, 43, 235-243. doi:

    10.1080/00048670802653356

Wade, T. D., & Pellizzer, M. L. (2018). Assessment of eating disorders. In M. Selbom & J.

    Suhr (Eds.), *Cambridge handbook of clinical assessment and diagnosis*. Cambridge:

    Cambridge University Press.

Wade, T. D., Treasure, J., & Schmidt, U. (2011). A case series evaluation of the Maudsley

    Model for treatment of adults with anorexia nervosa. *European Eating Disorders*

    Review, 19, 382-389. doi: 10.1002/erv.1078

Walker, D. C., White, E. K., & Srinivasan, V. J. (2018). A meta-analysis of the relationships

    between body checking, body image avoidance, body image dissatisfaction, mood,

    and disordered eating. *International Journal of Eating Disorders, Advanced online*

    publication, 1-26. doi: 10.1002/eat.22867

Waller, G. (2012). The myths of motivation: Time for a fresh look at some received wisdom

    in the eating disorders? *International Journal of Eating Disorders, 45*, 1-16. doi:

    10.1002/eat.20900

Waller, G., Cordery, H., Corstorphine, E., Hinrichsen, H., Lawson, R., Mountford, V., &

    Russell, K. (2007). *Cognitive behavioral therapy for eating disorders: A*

    comprehensive treatment guide. Cambridge, UK: Cambridge University Press.

Waller, G., Gray, E., Hinrichsen, H., Mountford, V., Lawson, R., & Patient, E. (2014).

    Cognitive-behavioural therapy for bulmia nervosa and atypical bulimic nervosa:

    Effectivness in clinical settings. *International Journal of Eating Disorders, 47*, 13-17.

    doi: 10.1002/eat.22181

Waller, G., Mountford, V., Lawson, R., Gray, E., Cordery, H., & Hinrichsen, H. (2010). *Beating your eating disorder: A cognitive-behavioral self-help guide for adult sufferers and their carers*. New York, NY: Cambridge University Press.

Waller, G., Tatham, M., Turner, H., Mountford, V. A., Bennetts, A., Bramwell, K., . . . Ingram, L. (2018). A 10-session cognitive behavioral therapy (CBT-T) for eating disorders: Outcomes from a case series of nonunderweight adult patients. *International Journal of Eating Disorders, 51*, 262-269. doi: 10.1002/eat.22837

Waller, G., & Turner, H. (2016). Therapist drift redux: Why well-meaning clinicians fail to deliver evidence-based therapy, and how to get back on track. *Behavior Research and Therapy, 77*, 129-137. doi: 10.1016/j.brat.2015.12.005

Walsh, B. T., Fairburn, C. G., Mickley, D., Sysko, R., & Parides, M. K. (2004). Treatment of bulimia nervosa in a primary care setting. *The American Journal of Psychiatry, 161*, 556-561. doi: 10.1176/appi.ajp.161.3.556

Webb, J. B., Wood-Barcalow, N. L., & Tylka, T. L. (2015). Assessing positive body image: Contemporary approaches and future directions. *Body Image, 14*, 130-145. doi: doi:10.1016/j.bodyim.2015.03.010

Wendell, J. W., Masuda, A., & Le, J. K. (2012). The role of body image flexibility in the relationship between disordered eating cognitions and disordered eating symptoms among non-clinical college students. *Eating Behaviors, 13*, 140-241. doi: 10.1016/j.eatbeh.2012.03.006

White, E. K., Claudat, K., Jones, S. C., Barchard, K. A., & Warren, S. C. (2015). Psychometric properties of the Body Checking Questionnaire in college women. *Body Image, 13*, 46-52. doi: 10.1016/j.bodyim.2014.12.004

Williams, M. J., Dalgleish, T., Karl, A., & Kuyken, W. (2014). Examining the factor

    structures of the Five Facet Mindfulness Questionnaire and the Self-Compassion

    Scale. *Psychological Assessment, 26*, 407-418. doi: 10.1037/a0035566

Wilson, G. T., Fairburn, C. G., Agras, W. S., Walsh, B. T., & Kraemer, H. (2002). Cognitive-

    behavioral therapy for bulimia nervosa: Time course and mechanisms of change.

    Journal of Consulting and Clinical Psychology, 70, 267-274. doi: 10.1037//0022-

    006X.70.2.267

Wilson, G. T., Wilfley, D. E., Agras, W. S., & Bryson, S. W. (2010). Psychological

    treatments of binge eating disorder. *Archives of General Psychiatry, 67*, 94-101. doi:

    10.1001/archgenpsychiatry.2009.170

Wilson, G. T., & Zandberg, L. J. (2012). Cognitive-behavioural guided self-help for eating

    disorders: Effectiveness and scalability. *Clinical Psychology Review, 32*, 343-357.

    doi: 10.1016/j.cpr.2012.03.001

Zandberg, L. J., & Wilson, G. T. (2013). Train-the-trainer: Implementation of cognitive

    behavioural guided self-help for recurrent binge eating in a naturalistic setting.

    European Eating Disorders Review, 21, 230-237. doi: 10.1002/erv.2210