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A randomized controlled trial of two 10-session cognitive behaviour therapies for eating disorders: an exploratory investigation of which approach works best for whom

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Abstract

Cognitive behaviour therapy for eating disorders (CBT-ED) outperforms other treatments for non-underweight eating disorders in adults, but we have limited ability to match CBT-ED to individual profiles. We examined if we could identify who benefits most from two forms of 10-session CBT-ED; one emphasising early behaviour change with substantial content on improving body image (CBT-T), and the other including motivational work and no content on body image using chapters from self-help books (CBTm). Participants were 98 consecutive referrals to the Flinders University Services for Eating Disorders. Fourteen clinical psychology postgraduates delivered the treatment under expert supervision. Outcome measures were completed on five occasions: baseline, 4-, 10-, 14- and 22-weeks post-randomization. Our primary outcome was global eating psychopathology. Moderators included motivation (readiness and confidence to change) and body avoidance and body checking. Intent-to-treat analyses showed no difference between the groups with a significant main effect of time associated with large effect size improvements, commensurate with longer forms of CBT-ED. Participants with lower readiness to change in CBTm had significantly greater decreases in disordered eating over follow-up compared to those with low motivation in CBT-T. People with lower readiness to change might benefit from the incorporation of motivational work in CBT-ED.

Keywords: Cognitive behaviour therapy, eating disorders, moderation, motivation

Highlights

- Two 10-session cognitive behaviour therapies for eating disorders were compared
- Within group effect size changes were commensurate with longer therapies
- No difference was detected between the two therapies
- Benefit was greater when motivation was addressed for those low in motivation

Cognitive behaviour therapy (CBT) formulated for eating disorders (CBT-ED) is widely considered the treatment of choice for adult eating disorders, particularly in non-underweight populations. For bulimia nervosa, it outperforms all active psychological comparisons including interpersonal psychotherapy (Linardon, Wade et al., 2017; Slade et al., 2018). A meta-analysis of 37 studies of the delivery of CBT to individuals with bulimia nervosa showed that manualized 20-session treatment protocols (e.g., Fairburn, 2008) produced significantly larger effect sizes on cognitive symptoms than less structured CBT (Linardon, Wade et al., 2017). A further meta-analysis of treatment studies of binge eating disorder showed that those involving CBT (psychotherapy [n=58], self-help [n=17], combined [n=34]) resulted in significant decreases in binge-eating episodes, eating disorder psychopathology, and depression at 12-month follow-up (Hilbert et al., 2020). CBT for bulimia nervosa and binge eating disorder may also improve self-esteem more than non-CBT approaches (Linardon et al., 2019).

This evidence is reflected in the National Institute for Health and Care Excellence guidelines (NICE, 2017) for adults with bulimia nervosa and binge eating disorder, which suggests CBT-ED as a frontline treatment. Initially guided self-help (GSH) is recommended, involving four to nine twenty-minute sessions. If this approach is unacceptable, contraindicated or ineffective, then 20 sessions of CBT-ED over 20 weeks is recommended. At post-treatment, an average of 40% of people who complete CBT-ED report abstinence from binge-eating and purging, versus 32% for GSH (Linardon & Wade, 2018).

An obvious gap in service provision is a therapy that is more intensive than GSH but shorter than 20-sessions of CBT-ED, thus providing an option for a less expensive therapy if GSH is contraindicated. A new 10-session CBT for eating disorders (CBT-T; Waller et al., 2019) has been developed to address this gap, with promising findings. This transdiagnostic, manualised outpatient treatment developed for use with patients who have a body mass index

(BMI) > 17.5 is suitable for use by trainee and qualified therapists. It adopts the key elements of CBT-ED (e.g., in-session weighing, exposure, nutrition, cognitive restructuring, relapse prevention) and includes a major focus on body image work. The approach takes on board the compelling evidence showing that early change in therapy is the strongest predictor of good outcome (Chang et al., 2021; Vall & Wade, 2015), and requires evidence of early behavioural change for therapy to continue past the fourth session. A case series evaluation of CBT-T (106 patients, BMI > 17.5) with treatment offered by supervised clinical assistants in the United Kingdom showed that clinically significant reductions were observed for both behavioural and cognitive measures of eating disorder symptoms at end of treatment and three-month follow-up (Waller et al., 2018). Symptom reduction, abstinence and remission were found to be comparable to longer versions of CBT-ED at end of treatment (e.g., Byrne et al., 2011; Fairburn et al., 2009; Knott et al., 2015; Turner et al., 2015; Waller et al., 2014). Two case series designs using postgraduate trainee therapists replicated these findings (Pellizzer et al., 2019a; Pellizzer et al., 2019b), with the latter showing a very large within-group effect size decrease in global eating psychopathology at three-month follow-up (d=1.92). A non-randomized comparison of 10- and 20-session CBT-ED showed very similar results in terms of degree of improvement in eating pathology, remission rate, and quality of life at six-month follow-up (Tatham et al., 2020).

Another short therapy (8 sessions) associated with one promising evaluation (Steele & Wade, 2008) utilizes the CBT self-help books “Bulimia Nervosa and Binge-eating” (Cooper, 1993) and “Bulimia Nervosa: a Cognitive Therapy Programme for Clients” (Cooper et al., 2001). At six-month follow-up, it was associated with moderate to large effect size decreases in eating disorder behaviours and a d = 1.88 within group effect size decrease in disordered eating, as indicated by the global Eating Disorder Examination (Fairburn et al., 2008) score. An early focus of the approach is on enhancing motivation before moving to behavioural

115 change in the third session, and thus we have named it CBTm for the purpose of the current
116 research. While baseline motivation has a small, significant effect on predicting improved
117 treatment outcome in eating disorders (Sansfaçon et al., 2020), the usefulness of including
118 motivational work in CBT-ED has not yet been supported (Dray & Wade, 2012; Knowles et
119 al., 2013).

120 An understanding of moderators - which treatments work best for whom and under
121 what conditions (Kraemer, 2016) – is considered useful for improving treatment outcomes, as
122 it informs matching of clients to the most effective approach for their individual profile.
123 However, a meta-analysis across all eating disorders following CBT (Linardon, de la Piedad
124 Garcia, et al., 2017) shows minimal research has been devoted toward testing moderators in
125 samples other than binge eating disorder. Currently we have extremely limited knowledge
126 about how to match manualised CBT to individual profiles. An evaluation of 20-session
127 enhanced CBT with a transdiagnostic sample (BMI>17.5) suggested that when patients with
128 more complex presentations received an augmentation related to their presentation, they
129 tended to have a better response to treatment (Fairburn et al., 2009). Of relevance to the
130 current study, these results would suggest that those with higher levels of body image
131 disturbance would benefit from a focus on body image interventions in CBT, while those low
132 in motivation would benefit from motivational enhancement work. Conversely, inclusion of
133 such therapeutic content would not be expected to produce extra benefit for those with lower
134 levels of body image disturbance or those with higher levels of motivation.

135 Hence the aim of the current study was to compare the efficacy of two forms of CBT-
136 ED for patients with a BMI of more than 17.5 - CBT-T and an expanded (10-session) CBTm
137 - and to conduct an exploratory investigation of moderators. The three hypotheses to be tested
138 were as follows. First, given the greater emphasis of CBT-T on early change compared to
139 CBTm, we predicted that participants in CBT-T will experience more rapid improvement in

eating disorder symptoms by the fourth session than participants in CBTm (i.e., a group x time interaction). Second, baseline motivation will moderate different rates of change in disordered eating between the two treatments. Given that only CBTm includes motivational work, we specifically predict that the smallest reductions over the duration of therapy will be observed for participants in CBT-T with low motivation. Third, body image variables will moderate different rates of change in disordered eating between the two treatments. Given that only CBT-T includes body image work, we predict that the smallest reductions over the duration of therapy will be observed for participants with higher levels of body dissatisfaction in CBTm.

METHOD

Sample size calculation

The outcome of interest for our moderator analyses was global eating psychopathology. We considered a small (0.50) between group effect size difference on this outcome in a moderator analysis to be desirable in terms of clinical significance. Using a power level of 0.80, with an alpha of 0.05, 32 participants per group were required (Hedeker, Gibbons, & Waternaux, 1999), or 128 in total given the use of four groups in moderation analyses.

Participants

Participants were 98 consecutive referrals to the Flinders University Services for Eating Disorders (FUSED) who were eligible for participation between June 2017 and April 2020. While face to face appointments continued with current clients over the COVID lockdowns, this proved more difficult for new referrals, who were offered telehealth. Hence, recruitment ceased in April 2020. Thus, the study was slightly underpowered. Inclusion criteria were as follows: aged ≥ 15 years; a BMI > 17.5; a DSM-5 (APA, 2013) diagnosis of an eating disorder; agreed to allow FUSED to communicate with their general practitioner;

and agreed to commit to therapy. The BMI inclusion criterion is consistent with more recent investigations of CBT-ED, which have adopted a transdiagnostic approach, including patients who have a BMI > 17.5 (Fairburn et al., 2009; Fairburn et al., 2015). This BMI range includes the DSM-5 (American Psychological Association [APA], 2013) description of "weight that is less than minimally normal", part of the anorexia nervosa diagnosis, adopting the World Health Organisation definition of a healthy BMI (≥ 18.5). Diagnoses represented in the current study include Anorexia Nervosa (n=5, 5%), Bulimia Nervosa (n=68, 69%), Binge Eating Disorder (n=5, 5%) or Otherwise Specified Feeding and Eating Disorder (OSFED, n=20, 21%). Exclusion criteria included information obtained from the assessment interview, including: current rapid weight loss; answering "yes" to the question "Are you about take any active steps to prepare to injure yourself or to prepare for a suicide attempt in which you expect or intend to die? (Sheehan et al., 1998); evidence of active psychosis or substance dependence that was impairing an ability to participate in the interview; already receiving psychotherapy for an eating disorder; difficulty speaking or understanding English. Referrals from across the state of South Australia were accepted, and came from the following sources: the Statewide Eating Disorder Service (n=57, 58%), self-referred (n=35, 36%), or a health professional (n=6, 6%).

Procedure and design

Participants were randomized to one of two cognitive behaviour therapies for eating disorders: CBT-T (Waller et al., 2019) or CBTm (Steele & Wade, 2008). Block randomisation was conducted using a function in Excel (block size of 4 participants) by a research assistant who generated a sealed envelope containing group allocation that was given to the therapist who opened it at the end of the baseline assessment (which constituted two appointments, one week apart), if it was deemed that the participant was eligible and willing to commit to therapy. All outcomes apart from body mass index were self-reported

and were completed on five occasions: baseline, 4- and 10-weeks post-randomisation, then over the follow-up period (14- and 22-weeks post-randomization). Ethical approval for the trial was obtained from the Southern Adelaide Clinical Human Research Ethics Committee (204.15).

Treatments

The content of the two treatments is summarized in **Table 1**. Each consisted of two assessment sessions, 10 weekly sessions (50 minutes duration), and two follow-up sessions. CBT-T is supported with a published manual (Waller et al., 2019), whereas CBTm is based on the content of chapters from two self-help books (Cooper, 1993; Cooper et al., 2001), which the participant was asked to read for homework with follow-up discussion and application in the subsequent session. Two sessions were added to CBTm in order to match CBT-T for contact time. Both therapies include accepted good CBT practice of monitoring eating, sessional collaborative open weighing, psychoeducation, supporting the person to institute regular eating and to quickly cease vomiting and laxative use, and monitoring self-harm and suicidality. Both therapies review engagement and progress (session 4 in CBT-T and session 6 in CBTm, given the slower start to behaviour change), with an emphasis on ceasing therapy if no progress is evident with respect to behavioural indices of the eating disorder (prioritising reduction in the days of restriction and self-induced vomiting which would interfere with the participant's ability to accurately predict any changes of weight due to changed eating patterns). This is informed by the strong prognostic indicator of these early changes in therapy (Chang et al., 2021; Vall & Wade, 2015). Participants who did not continue at this point were referred back to their GP or to other therapy approaches if indicated, and were invited to return to FUSED whenever they felt that the time was right for them to engage with the therapy and make changes.

There are two main differences in *content* between the two therapies. First, CBT-T

focuses on changing eating more quickly than CBTm, starting in session 1, while the latter has a focus on motivational work over the first two sessions (i.e., emphasizing the vicious cycle in a personalized collaboration and consideration of advantages of change and how to combat fears of change). Second, CBT-T includes a substantial component of body image work, while CBTm contains no such content and instead has sessions on problem solving and cognitive challenging of eating-related beliefs. While problem solving was explored formally in CBTm, it was invoked informally as relevant in CBT-T. There was also a difference in *process*, in that CBT-T challenges cognition primarily through behaviour experiments while CBTm relies on cognitive restructuring.

Therapists and monitoring adherence to therapy

Fourteen clinical psychology postgraduates delivered the treatments under expert supervision (TDW, GW). Supervision occurred bi-weekly for CBT-T and weekly for CBTm. Therapists saw patients in both conditions, to control for therapist effects. In supervision, adherence was closely monitored against: a detailed one-page protocol per session for CBT-T (http://cbt-t.group.shef.ac.uk/wp-content/uploads/2019/05/CBT-T-protocol-4-Book-version-Appendix-1.pdf); and a five-page protocol for CBTm, which specified the chapters to read and the subsequent content to be covered in each session.

Measures

Our primary outcome was global eating psychopathology over the previous 28-day period. Secondary outcomes included weekly frequency of disordered eating behaviours (objective binge episodes, self-induced vomiting episodes, laxative abuse, and/or driven exercise), body mass index (BMI; recorded by the therapist at each session), clinical impairment caused by the eating, negative affect, remission and good outcome. The moderators were body avoidance, body checking, and motivation (readiness and confidence to change).

Global Eating Disorder Psychopathology. The Eating Disorder Examination Questionnaire (EDE-Q) was used to measure the severity of eating disorder features (Fairburn & Beglin, 2008). The EDE-Q contains 22 items that assess four cognitive dimensions of eating disorders (dietary restraint, weight concerns, shape concerns, and eating concerns) in the previous 28 days. A global score can be calculated from the four subscales. A higher score indicates greater severity of symptoms. The EDE-Q global score has displayed both strong internal consistency ($\alpha = .95$; Kelly et al., 2013), and high convergent validity with the global score on the EDE interview (Fairburn et al., 2008) with $r = .84$ (Mond et al., 2006). In the present study, internal consistency was $\alpha = 0.89$.

Disordered eating behaviours. The ED-15 is a brief measure of eating disorder cognitions and behaviours, designed to be used at each session and assessing the previous week (Tatham et al., 2015). In the current study only four of the behavioural count measures (occasions per week of objective binge episodes, self-induced vomiting, laxative abuse, driven exercise) were utilized for the repeated measures analysis.

Clinical Impairment. The Clinical Impairment Assessment (CIA; Bohn et al., 2008; Bohn & Fairburn, 2008) assesses psychosocial impairment caused by disordered eating using 16 items, rated on a 4-point Likert scale. The higher the sum of the items, the greater the impairment. The CIA demonstrates good psychometric properties (Bohn et al., 2008). In the present study, internal consistency was $\alpha = 0.89$.

Depression, anxiety and stress. The Depression Anxiety and Stress Scales 21 (DASS-21; Lovibond & Lovibond, 1995) is a 21 item measure of general psychopathology. The total score was used in all analyses. Items are rated on a 4-point Likert scale for the previous week. A higher total score indicates greater negative affect. The scale is correlated with other measures of depression and anxiety, and discriminates well between clinical and non-clinical samples (Antony et al., 1998). Internal consistency was strong in the present

study (α = .94).

Remission and good outcome. We used the most widely adopted three-component definition of remission at the last follow-up (Bardone-Cone, Harney et al., 2010): BMI > 18.5 (i.e., not underweight); an absence of eating disorder behaviours (binge eating, purging, driven exercise and fasting); and normative levels of eating disorder psychopathology in the past month. In the current study, the second and third criteria were assessed over the previous 28 days using the EDE-Q, with the third criterion assessed using a cut-off of 1 standard deviation from Australian community norms on the global score (Mond et al., 2006) i.e., < 2.77. We also report 'good outcome' (Fairburn et al., 2009; 2015) at last follow-up, namely the first and second criteria.

Body Avoidance. The Body Image Avoidance Questionnaire (BIAQ; Rosen, Srebnik, Saltzberg, & Wendt, 1991) is 19-item behavioural measure used to evaluate the avoidance of situations related to body image. This questionnaire measures four factors: social activities, eating restraint, clothing, plus grooming and weighing (Rosen et al., 1991). A higher total score is indicative of greater body image avoidance. In this study, the response format was modified from a 6-point to a 7-point Likert scale. Although it is noted that the psychometric properties can differ depending on the factor structure, the 19-item version has been reported to be a good fit with two of the three indices from a confirmatory factor analyses conducted in a study (Pellizzer et al., 2018). In the present study, internal consistency was α = 0.81.

Body Checking. The Body Checking Questionnaire (BCQ; Reas et al., 2002) is a 23-item measure of body checking behaviours. The BCQ assesses three factors: overall appearance, idiosyncratic checking, and specific body parts. The higher the overall score, the greater the frequency of body checking behaviours. To match the response format of the other body image questionnaires, a 7-point Likert scale was used instead of the original 5-point scale. Psychometric properties have been reported to vary across studies (Pellizzer et

al., 2018). However, there was excellent internal consistency within the current study, α = 0.95.

Motivation. This was assessed using two 100-point Likert scales of readiness to change and confidence to change. These Likert scales have been found to predict outcome in guided self-help treatment for bulimia nervosa (Steele et al., 2011), as well as change in the global EDE score in anorexia nervosa over inpatient treatment (Wade et al., 2009). It has a significant association with a 24-item Adapted Stages of Change Questionnaire (Rushford, 2006).

Statistical Analyses

All analyses were conducted using the IBM Statistical Package for the Social Sciences (SPSS, Version 25). Linear mixed-model (LMM) analyses were conducted to evaluate the effectiveness of each treatment on the continuous outcomes. This type of analysis retains *all* participants randomized to a condition, even if they are missing data across different time points. A 2 (condition: CBTm, CBT-T) × 5 (time: baseline, week 4, week 10, 1-month follow-up and 3-month follow-up) fixed effect model was created for each outcome variable. In these analyses, the fixed effects are time, condition, and interaction between time and condition, and an unstructured error covariance matrix was used. Given power constraints, we used least-squares post-hoc comparisons. Within-group effect sizes were calculated at end of treatment (session 10) and at 14- and 22-weeks post-randomization, using a procedure recommended by Morris (2008) that involves calculating an effect size for single-group pretest-posttest designs by accounting for the within-group correlation between pre- and post-test scores. Small effect sizes were between 0.30 and 0.50, medium effect sizes were between 0.50 and 0.80, and large effect sizes were > 0.80, as per custom (Cohen, 1988). Generalized linear mixed modelling was used to analyse the count variables (disordered eating behaviours) using a negative binomial distribution and link=power.

We also utilized linear mixed models for the moderation analyses, with fixed effects of group, time, moderator, group x time, group x moderator, moderator x time, and group x time x moderator. Four potential moderators of change in global EDE between groups were examined, two related to motivation and two related to body image. The moderator was scored as low or high depending on the median baseline score: readiness to change (84.91), confidence to change (63.44), body avoidance (3.87), and body checking (3.59). While the readiness to change mean was quite high, this may reflect the fact that in assessment 24 people declined to participate after the treatment was described to them (see **Figure 1**), leaving only those for whom change was more important. In a sample of 328 female undergraduate university students aged 17-25 years, the means on these respective questionnaires were 1.99 and 3.22 (Pellizzer et al., 2018). Significance level required for significant moderation was adjusted for four tests, $p < .01$.

RESULTS

Participant flow and baseline characteristics

Demographic and clinical characteristics for each group are summarized in **Table 2**. At baseline, the percentage of participants who reported experiencing objective binge episodes was 86%, followed by driven exercise (58%), self-induced vomiting (57%), laxative use (34%). As indicated by the 95% confidence intervals (CI) of the odds ratios (OR), the two treatment arms were reasonably balanced on all baseline characteristics. The standard deviation for the body checking measure was larger than the other two body image measures, indicating more variation in this population. Participant flow through the study is shown in **Figure 1**. All 98 participants were included in the analyses of continuous outcomes. In the CBT-T group, 26 people received 10 weekly sessions, and it was agreed collaboratively with one further person that she did not require the full 10 sessions, hence 59% received the allocated treatment. In the CBTm group, 29 people received 10 weekly sessions and a further

two were collaboratively discharged before 10 sessions was completed, hence 60% received the allocated treatment. There was no difference between the proportion of people who were withdrawn at session 4 due to lack of engagement and change in therapy (χ2=2.41, df=1, *p*=.12). Participants in the CBT-T and CBTm groups not completing 10 sessions had a mean (SD) of 3.40 (1.76) and 4.78 (3.16) sessions respectively (between-group Cohen's *d*=0.54, 95% CI: -0.07 to 1.15).

Missing data

Participants were categorized as having completed all five assessment points (N=43, 44%) or not (N=55). Baseline variables (N=15) reported in **Table 2** (except for sex) were investigated using logistic regression to investigate if they predicted non-completion of all assessments, in addition to two post-randomisation variables - treatment group and number of sessions. The only baseline variable to predict non-completion of all data points was higher levels of clinical impairment (OR=4.41, 95% CI: 1.87-10.40, p=.001).

Treatment outcomes

Hypothesis 1

Table 3 summarises the means and standard errors for the continuous variables between the two groups over time. There were no significant between-group effects at any time point, or interactions between group and time. Only a significant main effect of time was noted for all variables. Large effect size improvements were noted for disordered eating, impairment, and depression, anxiety and stress. A small effect size increase was associated with BMI.

Between baseline and 3-month follow-up, weekly episodes of objective binge episodes and self-induced vomiting decreased from a mean of 13.1 to 2.4 and 9.4 to 1.0 respectively, while episodes per week of laxative use and driven exercise decreased from a mean of 2.4 to 0.1, and 8.2 to 1.6, respectively. Generalized linear mixed modelling detected

only a significant main effect of time for objective binge episodes and driven exercise.

When examining 'good outcome' at the final follow-up (22-weeks post-randomisation), for completers, 37 met the criteria: 16/21 (76%) from the CBT-T condition and 21/22 (96%) from the CBTm condition. This was not a significant difference, χ^2=3.32, df=1, *p*=.07, with an overall rate among completers of 86%. Remission was achieved in 22 of these 43 completers (51%), 8/21 (38%) in the CBT-T condition and 14/22 (64%) in the CBTm condition (χ2=2.81, df=1, *p*=.09). Of those people who had 'good outcome' but did not achieve remission, the majority experienced objective binge episodes (N=16, four of these people also reporting self-induced vomiting), with one reporting laxative abuse, and four reporting driven exercise.

Hypotheses 2 and 3

The summary statistics for the moderation analyses are shown in **Table 4**. As expected, the adjusted significance levels indicated a main effect of time and moderator for all moderators. Only one three-way interaction between moderator, time and group was also significant, as shown in **Figure 2**. Participants with lower readiness to change in the CBTm group had a significantly greater decrease in disordered eating than the low motivation CBT-T group at the first follow-up, which was maintained at 3-month follow-up, giving this group commensurate progress to the two high motivated groups, while the low motivated CBT-T group maintained higher levels of disordered eating than the other three groups.

DISCUSSION

This study sought to further progress a targeted engagement approach to offering CBT-ED to people who have eating disorders and have a BMI > 17.5. We did this by comparing two 10-session forms of CBT-ED (Waller et al., 2019; Steele & Wade, 2008). Each included the necessary factors considered to be responsible for the significant improvements noted across manualized forms of CBT-ED - weekly sessions, collaborative

weighing at each session, psychoeducation, nutritional advice including regular eating, and support to eliminate eating disorder behaviours. The therapy was delivered by trainee therapists who had regular expert supervision, who have been shown in previous trials to deliver similar outcomes to experienced therapists when delivering CBT-ED (Pellizzer et al., 2019a; Pellizzer et al., 2019b; Waller et al., 2018). This accords with previous research in other areas, which has found that clinically inexperienced student therapists who receive supervision from experienced supervisors can achieve treatment effects that are on a par with those of experienced licensed psychotherapists (Öst et al., 2012). The two therapies did, however, have different emphases, with CBT-T making an immediate start on behaviour change, accompanied by significant input on body image interventions, while CBTm sought to increase motivation before commencing behaviour change.

Neither the number of people receiving the allocated treatment, nor the mean number of sessions completed by people not receiving the allocated treatment differed between conditions. Overall, 59% of participants received their allocated intervention, commensurate to a previous study of CBT-T (Pellizzer et al., 2019b), and an open effectiveness study conducted in an Australian eating disorder clinic (Byrne et al., 2011), at 62% and 53% respectively. It is somewhat lower than the 76% estimate across randomized controlled trials of CBT (Linardon et al., 2018), which can be expected to have more exclusion criteria. All eating disorders are attended by a high level of ambivalence, including bulimia nervosa (Wade, 2019), and engagement in treatment is challenging compared to some other psychological disorders. Our approach of informing people of the importance of early change for predicting outcome, and collaboratively ceasing therapy if this early progress was not evident, tries to manage this ambivalence by suggesting that now is not the right time for therapy rather than representing a failure, and that participants would be welcome to return when they feel more able to engage with the core therapy tasks.

We note that at the end of follow-up, in our completer sample, we had a high rate of 'good outcome' (86%), comparing favorably with most other completer rates reported across trials of CBT-ED for non-underweight patients with eating disorders at the end of treatment, ranging from 66% to 78% (Fairburn et al., 2009; Fairburn et al., 2015; Knott et al., 2015). Our remission rate of 51% is between those achieved at follow-up in other studies of CBT-T, 37% (Waller et al., 2018) and 63% (Pellizzer et al., 2019). A meta-analysis of 45 RCTS reporting abstinence from binge-eating and purging at follow-up after CBT-ED for bulimia nervosa (Linardon & Wade, 2018) found an average rate of 40.5% (95% CI: 32.9, 42.6) across completers, compared to the 61% abstinence rate for these behaviours achieved in the current study. At end of treatment, the within group effect size decrease in disordered eating was d = 1.86 (95% CI: 1.53-2.20), similar to the effect sizes observed with 20-session CBT-ED, ranging from 1.28 to 1.79 (Fairburn et al., 2009; Fairburn et al., 2015). Overall, the evidence suggests shorter therapies for eating disorders do not have to result in poorer outcomes for the participants compared to longer therapies (Tatham et al., 2019), but a direct comparison between the two is required to make a definitive conclusion in this respect.

Contrary to our first hypothesis, we found no difference in rate of change over the first four sessions between the two conditions. Clearly, many participants engaged in change from the start of therapy, perhaps spurred on by the psychoeducation related to the importance of early change given to all participants. Also, of relevance is that both therapies adopted a 4-session review with collaborative discharge in the absence of clear decreases in disordered eating behaviours.

Our moderation hypotheses were partially supported with respect to readiness to change over treatment and change in disordered eating. Our results show that lower levels of motivation (readiness to change) were associated with significantly higher levels of disordered eating over treatment. This is consistent with a meta-analysis of 42 studies

showing a small but significant impact of baseline motivation on improvement of overall eating disorder symptomatology over time (Sansfaçon et al., 2020), associated with a Cohen's *d* of 0.23 (CI: 0.17–0.19). It was therefore encouraging to note that those participants with lower motivation in the CBTm group showed a significantly greater decrease in disordered eating over follow-up compared to those with low motivation in the CBT-T group, and ended up with progress that was commensurate with that of the more highly motivated participants. This pattern might go some way towards explaining another general finding in the literature - that inclusion of motivational work in therapy for eating disorders does not generally improve outcomes (Dray & Wade, 2012; Knowles et al., 2013). Our results suggest such an approach can improve outcomes but only for those low in motivation, providing a useful and practical recommendation for a targeted engagement approach to CBT for non-underweight eating disorders. We were unable to support our moderation hypothesis with respect to CBT-T and body image, with results suggesting that work on disordered eating and cognitions also flows on to improve indicators of body image. For example, CBTm focused on eating-related beliefs and it is possible that some of these beliefs were related to body image.

The main limitation of the current trial is that it was underpowered by about 30% due to COVID disruptions to detect medium effect size differences between groups for our moderation analyses. It could also be argued that the study should have been powered to detect smaller than medium effect sizes, given the paucity of studies testing moderation in eating disorders, and the large degree of overlap in content between our two treatments, but in the absence of *a priori* effect sizes we set what we considered to be a clinically meaningful difference. Our analyses related to good outcome and remission should also be interpreted with caution, as we would need a large effect to be able to detect differences between conditions for a dichotomous variable. While no significant differences emerged, the results

favoured the CBTm condition, and better powered trials are required to further investigate possible differences with respect to these outcome variables. Second, there was a process difference between the two therapies (changing cognitions via behavioural experiments versus cognitive challenging) and this was not accounted for in the analyses. Third, longer-term follow-up is required in order to ascertain any further differences between the group outcomes. Fourth, the use of self-report outcome measures may impact on results, although we note that our self-report measure of global eating disorder psychopathology has strong convergent validity with the interview version. Fifth, we only included a linear model in our analyses and did not test for a quadratic model, given limited power and that the literature suggests that for shorter therapies in eating disorders, such as guided self-help, significant improvement continues over follow-up (Priemer & Talbot, 2013).

There are a number of strengths of this work. The sample resembled those presenting for treatment for an eating disorder in an Australian outpatient clinic (Byrne et al., 2011) in terms of age and global eating disorder psychopathology, albeit with a longer duration of illness, and a greater proportion of people with a current major depressive episode. This suggests it is representative of people presenting for outpatient treatment for an eating disorder in Australia. The trial adhered to CONSORT requirements for a randomized controlled trial, and the results are generalizable to community clinics, with very few exclusion criteria in place, and the use of non-expert therapists who had access to regular expert supervision. This study contributes to the sparse number of investigations that inform how to match forms of best-practice CBT to individual profiles, with the clear implication that people starting CBT-ED with lower levels of motivation should explore motivation in at least one session of therapy. Much future work is required to continue this general line of enquiry, in order to develop a more personalized tailoring of CBT-ED, in order to make it more effective for more people. However, it is critically important to reiterate that both of

these brief forms of CBT-ED (CBT-T and CBTm) had outcomes that were broadly comparable to the effects of much longer therapies, and that they potentially allow clinicians to treat more patients effectively, though a direct comparison of longer versus shorter CBT-ED has yet to be conducted.

References

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

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Bardone-Cone, A. M., Harney, M., Maldonado, C., Lawson, M., Robinson, D., Smith, R., & Tosh, A. (2010). Defining recovery from an eating disorder: conceptualization, validation, and examination of psychosocial functioning and psychiatric comorbidity. *Behaviour Research and Therapy, 48*, 194-202. doi: 10.1016/j.brat.2019.11.001

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 behaviour therapy and eating disorders* (pp. 315-317). New York, NY: Guilford Press.

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

Chang P. G. R. Y., Delgadillo, J., & Waller, G. (2021). Early response to psychological treatment for eating disorders: A systematic review and meta-analysis. *Clinical Psychology Review*. Advance online publication. doi: 10.1016/j.cpr.2021.102032

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*, 2nd ed. Hillsdale, New Jersey: Erlbaum.

Cooper, M., Todd, G. & Wells, A. (2001). *Bulimia Nervosa: a Cognitive Therapy Programme for Clients*. London: Jessica Kingsley Publishers.

Cooper, P.J. (1993). *Bulimia nervosa and binge eating. A guide to recovery*. London: Robinson.

Dray, J., & Wade, T. D.. (2012). Is the transtheoretical model and motivational interviewing approach applicable to the treatment of eating disorders? A review. *Clinical Psychology Review*, *32*, 558-565. doi: 10.1016/j.cpr.2012.06.005

Fairburn, C. G. (2008). *Cognitive behaviour 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. (2008). Eating disorder examination questionnaire (EDE-Q 6.0). In C. G. Fairburn (Ed.), *Cognitive behaviour 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-behavioural therapy for patients with eating disorders: A two-site trial with 60-week follow-up. *The American Journal of Psychiatry, 166*, 311-319

Fairburn, C.G., Cooper, Z., & O'Connor, M.E. (2008). Eating Disorder Examination (Edition 16.0D). In C.G. Fairburn (2008). *Cognitive behaviour therapy and eating disorders.* New York: Guilford Press (pp. 265-308).

Hedeker, D., Gibbons, R., & Waternaux, C. (1999). Sample size estimation for longitudinal design with attrition: Comparing time-related contrasts between two groups. *Journal*

546 *of Educational and Behavioural Statistics, 24*, 70-93. doi:
547 10.3102/10769986024001070
548 Hilbert, A., Petroff, D., Herpertz, S., Pietrowsky, R., Tuschen-Caffier, B., Vocks, S., &
549 Schmidt, R. (2020). Meta-analysis on the long-term effectiveness of psychological
550 and medical treatments for binge-eating disorder. *International Journal of Eating*
551 *Disorders*, 53, 1353-1376. doi: 10.1002/eat.23297
552 Kelly, A. C., Carter, J. C., Zuroff, D. C., & Borairi, S. (2013). Self-compassion and fear of
553 self-compassion interact to predict response to eating disorders treatment: A
554 preliminary investigation. *Psychotherapy Research, 23*, 252-264. doi:
555 10.1080/10503307.2012.717310
556 Knott, S., Woodward, D., Hoefkens, A., & Limbert, C. (2015). Cognitive behaviour therapy
557 for bulimia nervosa and eating disorders not otherwise specified: Translation from
558 randomized controlled trial to a clinical setting. *Behavioural and Cognitive*
559 *Psychotherapy, 43*, 641-654. doi: 10.1017/S1352465814000393
560 Knowles, L., Anokhina, A., & Serpell, L. (2013). Motivational interventions in the eating
561 disorders: What is the evidence? *International Journal of Eating Disorders*, 46, 97-
562 107. doi: 10.1002/eat.22053
563 Kraemer, H. C. (2016). Messages for clinicians: Moderators and mediators of treatment
564 outcome in randomized clinical trials. *American Journal of Psychiatry, 173*, 672–679.
565 doi: 10.1176/appi.ajp.2016.15101333
566 Linardon, J., de la Piedad Garcia, X., & Brennan, L. (2017). Predictors, moderators, and
567 mediators of treatment outcome following manualised cognitive-behavioural therapy
568 for eating disorders: A systematic review. *European Eating Disorders Review, 25*, 3-
569 12. doi: 10.1002/erv.2492
570 Linardon, J., Hindle, A., & Brennan, L. (2018). Dropout from cognitive-behavioural therapy

for eating disorders: A meta-analysis of randomized, controlled trials. *International Journal of Eating Disorders, 51*, 381-391. doi: 10.1002/eat.22850

Linardon, J., Kothe, E. J., & Fuller-Tyszkiewicz, M. (2019). Efficacy of psychotherapy for bulimia nervosa and binge-eating disorder on self-esteem improvement: Meta-analysis. European Eating Disorder Review, 27, 109-123.

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

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

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

Morris, S. B. (2008). Estimating effect sizes from pretest-posttest-control group designs. *Organizational Research Methods, 11*(2), 364-386. doi: 10.1177/1094428106291059

NICE. (2017). *Eating disorders: Recognition and treatment*. (NC69). Retrieved from https://www.nice.org.uk/guidance/ng69.

Öst, L., Karlstedt, A., & Widén, S. (2012). The effects of cognitive behaviour 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

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. (2019a). Ten-session cognitive behavioural therapy (CBT-T) for eating disorders: Outcomes from a pragmatic pilot study of Australian non-underweight clients. *Clinical Psychologist, 23*, 124-132. doi: 10.1111/cp.12170. doi: 10.1111/cp.12170

Pellizzer M. L., Waller, G., & Wade, T. D. (2019b). A pragmatic effectiveness study of ten-session cognitive behavioural therapy (CBT-T) for eating disorders: Targeting barriers to treatment provision. *European Eating Disorder Review*, 27, 557-570. doi: 10.1002/erv.2684

Priemer, M., & Talbot, F. (2013). CBT guided self-help compares favourably to gold standard therapist-administered CBT and shows unique benefits over traditional treament. *Behaviour Change,* 30, 227-240. doi: 10.1017/bec.2013.22

Reas, D. L., Whisenhunt, B. L., Netemeyer, R., & Williamson, D. A. (2002). Development of the Body Checking Questionnaire: A self-report measure of body checking behaviours. *International Journal of Eating Disorders, 31*, 324-333. doi: 10.1002/eat.10012

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

Rushford, N. (2006). Readiness to recover in anorexia nervosa: What does it depend on in female inpatients? *European Eating Disorders Review, 14*, 388-396.

621 Sansfaçon, J., Booij, L., Gauvin, L., Fletcher, É., Islam, F., Israël, M., & Steiger, H. (2020).
622 Pretreatment motivation and therapy outcomes in eating disorders: A systematic
623 review and meta-analysis. *International Journal of Eating Disorders, 53*, 1879-1900.
624 Sheehan, D. V., Lecrubier, Y., Harnett-Sheehan, K., Amorim, P., Janavs, J., Weiller, E.,
625 Hergueta, T., Baker, R., & Dunbar, G. (1998). The Mini International
626 Neuropsychiatric Interview (M.I.N.I.): The development and validation of a
627 structured diagnostic psychiatric interview. *Journal of Clinical Psychiatry*, 59(suppl
628 20):22-33.
629 Slade, E., Keeney, E., Mavranezouli, I., Dias, S., Fou, L., Stockton, S., Sazon, L., Waller, G.,
630 Turner, H., Serpell, L., Fairburn, C. G., & Kendall, T. (2018). Treatments for bulimia
631 nervosa: A network meta-analysis. Psychological Medicine, 48, 2629-2636.
632 Steele, A. L., Bergin, J. L., & Wade TD. (2011). Self-efficacy as a robust predictor of
633 outcome in guided self-help treatm,ent for broadly-defined Bulimia Nervosa.
634 *International Journal of Eating Disorders*, *44*, 389-396. doi: 10.1002/eat.20830
635 Steele, A. L., & Wade, T. D. (2008). A randomised trial investigating guided self-help to
636 reduce perfectionism and its impact on bulimia nervosa. *Behaviour Research and*
637 *Therapy*, *46*, 1316-1323. doi:10.1016/j.brat.2008.09.006
638 Tatham, M., Hewitt, C., & Waller, G. (2019).Outcomes of brief and enhanced cognitive-
639 behavioural therapy for adults with non-underweight eating disorders: A non-
640 randomized comparison. *European Eating Disorder Review, 28*, 701-708.
641 Tatham, M., Turner, H., Mountford, V. A., Tritt, A., Dyas, R., & Waller, G. (2015).
642 Development, psychometric properties and preliminary clinical validation of a brief,
643 session-by-session measure of eating disorder cognitions and behaviours: The ED-15.
644 *International Journal of Eating Disorders, 48*, 1005-1015. doi: 10.1002/eat.22430
645 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

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

Wade, T. D. (2019). Recent research on Bulimia Nervosa. *Psychiatric Clinics of North America*, *42*, 21-32. doi: 10.10.16/j.psc.2018.10.002

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 Jounral of Psychiatry*, *43*, 235-243

Waller G, Turner H, Tatham M, Mountford VA, Wade TD. (2019). *Brief Cognitive Behavioural Therapy for Non-Underweight Patients: CBT-T for Eating Disorders*. Abingdon: Routledge, Taylor & Francis Group.

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., Tatham, M., Turner, H., Mountford, V. A., Bennetts, A., Bramwell, K., . . . Ingram, L. (2018). A 10-session cognitive behavioural 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

669 **Table 1.**

670 *Session outline of CBT-T and CBTm (content unique to each therapy are bolded)*

Session	CBTm	CBT-T
1	a. Review current eating and provide psychoeducation, collaborative weighing b. **Personalized formulation of eating and nature of the vicious cycle**	a. Review current eating and provide psychoeducation, collaborative weighing b. Initial dietary change (structure, content, exposure with response prevention)
2	a. Review eating, collaborative weighing b. **Motivational Interviewing: Advantages of change, fears, responses to fears**	a. Review eating using monitoring sheets, collaborative weighing b. Continue to work on structure of eating, increased focus on content and feared foods
3	a. Review eating, collaborative weighing b. Monitoring eating	a. Review eating, collaborative weighing b. Increasing regular carbohydrate intake c. Stratgies to prevent binge eating: food intake and emtion regulation
4	a. Review eating, collaborative weighing b. Monitoring eating – aim for regular eating	a. Review eating, collaborative weighing b. Review progress to date and decide on continuation of therapy c. Challenging cognitions about eating, food and weight through behavioural experiments
5	a. Review eating, collaborative weighing b. Strategies to use to prevent binge eating: food content, amount and emotion regulation	a. Review eating, collaborative weighing b. Identifying further cognitions that need challenging through behavioural experiments
6	a. Review eating, collaborative weighing b. Review progress to date and decide on continuation of therapy c. Applying problem solving	a. Review eating, collaborative weighing b. **Challenging body image cognitions: behavioural experiments for checking or avoidance, mirror exposure, surveys, imagery rescripting**
7	a. Review eating, collaborative weighing b. Reducing dieting, working through a hierarchy of avoided foods	a. Review eating, collaborative weighing b. **Continue focus on body image and emotional triggers**
8	a. Review eating, collaborative weighing b. Identifying positive beliefs about the eating disorder	a. Review eating, collaborative weighing b. **Continue focus on body image and emotional triggers**
9	a. Review eating, collaborative weighing b. Cognitive challenging of positive thoughts about the eating disorder	a. Review eating, collaborative weighing b. **Continue focus on body image and emotional triggers** c. Relapse Prevention: Development of a personalised therapy blueprint for participant
10	a. Review eating, collaborative weighing b. Relapse Prevention, therapy blueprint	a. Review eating, collaborative weighing b. Relapse Prevention, therapy blueprint

671

672 Note: The timing of different phases in CBT-T is influenced by the participant's progress.

673

Table 2.

Baseline demographic and clinical characteristics

Characteristic Mean (SD)	CBT-T (N=46)	CBTm (N=52)	OR (95% CI)
Age (years)	26.91 (10.88)	25.77 (7.45)	0.99 (0.94-1.03)
Sex (female): n (%)	42 (91%)	49 (94%)	0.64 (0.14-3.04)
Duration of the eating disorder (years)	11.43 (10.61)	8.78 (7.96)	0.97 (0.93-1.01)
Global eating disorder psychopathology	3.90 (1.11)	4.09 (1.00)	1.11 (0.77-1.63)
Objective Binge Episodes/occasions past week	4.17 (3.75)	3.31 (5.24)	0.97 (0.87-1.08)
Vomiting episodes/occasions past week	1.07 (1.66)	3.50 (6.41)	1.16 (0.98-1.37)
Laxatives/occasions past week	0.63 (1.94)	0.20 (0.76)	0.73 (0.46-1.16)
Driven exercise/occasions past week	0.90 (1.77)	1.71 (2.14)	1.16 (0.91-1.47)
Body mass index	27.68 (9.64)	27.08 (7.81)	0.99 (0.95-1.04)
Clinical impairment	1.81 (0.60)	1.91 (0.56)	1.08 (0.54-2.19)
Depression, anxiety and stress	1.40 (0.65)	1.33 (0.74)	0.86 (0.47-1.57)
Readiness to change (0-100)	86.38 (13.93)	83.54 (19.02)	0.99 (0.97-1.02)
Confidence to change (0-100)	59.22 (21.90)	67.40 (23.20)	1.02 (1.00 -1.04)
Body avoidance	4.03 (0.84)	4.00 (0.80)	1.11 (0.67-1.83)
Body checking	4.11 (1.39)	4.03 (1.50)	0.93 (0.71-1.23)
Eating disorder diagnosis: n (%)			
• Anorexia nervosa	3 (7)	2 (4)	
• Bulimia nervosa	33 (71)	35 (67)	χ^2=3.68
• Binge eating disorder	3 (7)	2 (4)	p=.45
• Other specified feeding/eating disorders	7 (15)	13 (25)	
Current comorbidity[1]: n (%)			
• Major Depressive Disorder	6 (13)	7 (14)	1.13 (0.78-1.64)
• Major Depressive Episode	36 (78)	35 (67)	0.58 (0.23-1.51)
• Suicidality	25 (54)	22 (42)	0.60 (0.26-1.35)
• Social Phobia	7 (15)	10 (19)	1.36 (0.47-3.93)
• Obsessive Compulsive Disorder	3 (7)	7 (14)	2.33 (0.57-9.64)
• Post-Traumatic Stress Disorder	6 (13)	4 (8)	0.58 (0.15-2.20)
• Alcohol Use Disorder	13 (28)	9 (17)	0.58 (0.22-1.54)
• Substance Use Disorder	7 (15)	6 (12)	0.79 (0.25-2.58)

[1] Ascertained using the Mini International Neuropsychiatric Interview at initial assessment (Sheehan et al., 1998)

Table 3.

Changes in continuous variables over time between groups (unshaded indicates CBT-T and shaded indicates CBTm)

Variable	Baseline M (SE)	Session 4 M (SE)	Session 10 M (SE)	Follow-up 1-mth M (SE)	Follow-up 3-mth M (SE)	Change over Time Cohen's *d* (95% CI)[1]
Global EDE	3.92 (0.16)	2.58 (0.21)	1.77 (0.20)	1.41 (0.17)	1.63 (0.21)	**-2.18 (-2.54 to -1.83)**
	4.04 (0.15)	2.86 (0.19)	1.83 (0.17)	1.34 (0.16)	1.25 (0.20)	
BMI	27.55 (1.29)	28.06 (1.30)	28.56 (1.59)	28.62 (1.31)	28.78 (1.33)	**0.41 (0.13 to 0.69)**
	26.61 (1.22)	26.79 (1.23)	25.69 (1.46)	27.01 (1.24)	26.82 (1.26)	
Clinical impairment	1.88 (0.08)	1.29 (0.12)	0.80 (0.10)	0.65 (0.08)	0.73 (0.10)	**-2.12 (-2.47 to -1.77)**
	1.91 (0.08)	1.35 (0.10)	0.71 (0.09)	0.45 (0.07)	0.59 (0.10)	
Depression, anxiety and stress	1.40 (0.11)	1.14 (0.12)	0.78 (0.11)	0.62 (0.09)	0.64 (0.10)	**-1.03 (-1.33 to -1.16)**
	1.35 (0.10)	0.98 (0.11)	0.57 (0.10)	0.53 (0.09)	0.49 (0.10)	

Note: Within group effect size for collapsed groups between baseline and 3-month follow-up, adjusted for the correlation between these two observations

Table 4.

Summary statistics for moderation analyses of disordered eating (T=Time, G=Group, M=Moderator)

Moderator variable	T F (df) p	G F (df) p	M F (df) p	T x G F (df) p	T x M F (df) p	G x M F (df) p	T x G x M F (df) p
Readiness to change	103.23 (4, 51.16) <.001	0.12 (1, 80.37) .74	11.12 (1, 80.37) .001	2.80 (4, 51.16) .04	2.72 (4, 51.16) .04	0.21 (1, 80.37) .65	7.17 (4, 51.16) <.001
Confidence to change	92.14 (4, 48.78) <.001	0.01 (1, 74.87) 0.93	10.16 (1, 74.87) .002	1.84 (4, 48.78) .14	3.44 (4, 48.78) .02	2.61 (1, 74.87) .11	1.43 (4, 48.78) .24
Body avoidance	107.39 (4, 47.32) <.001	0.02 (1, 70.00) .89	24.25 (1, 70.00) <.001	2.09 (4, 47.32) .10	3.28 (4, 47.32) .02	3.34 (1, 70.00) .07	1.33 (4, 47.32) .27
Body checking	93.45 (4, 46.70) <.001	0.05 (1, 73.77) .83	10.51 (1, 73.77) .002	2.40 (4, 46.70) .06	0.44 (4, 46.70) .78	0.06 (1, 73.77) .82	1.03 (4, 46.70) .40

Figure 1.
CONSORT Flow Diagram

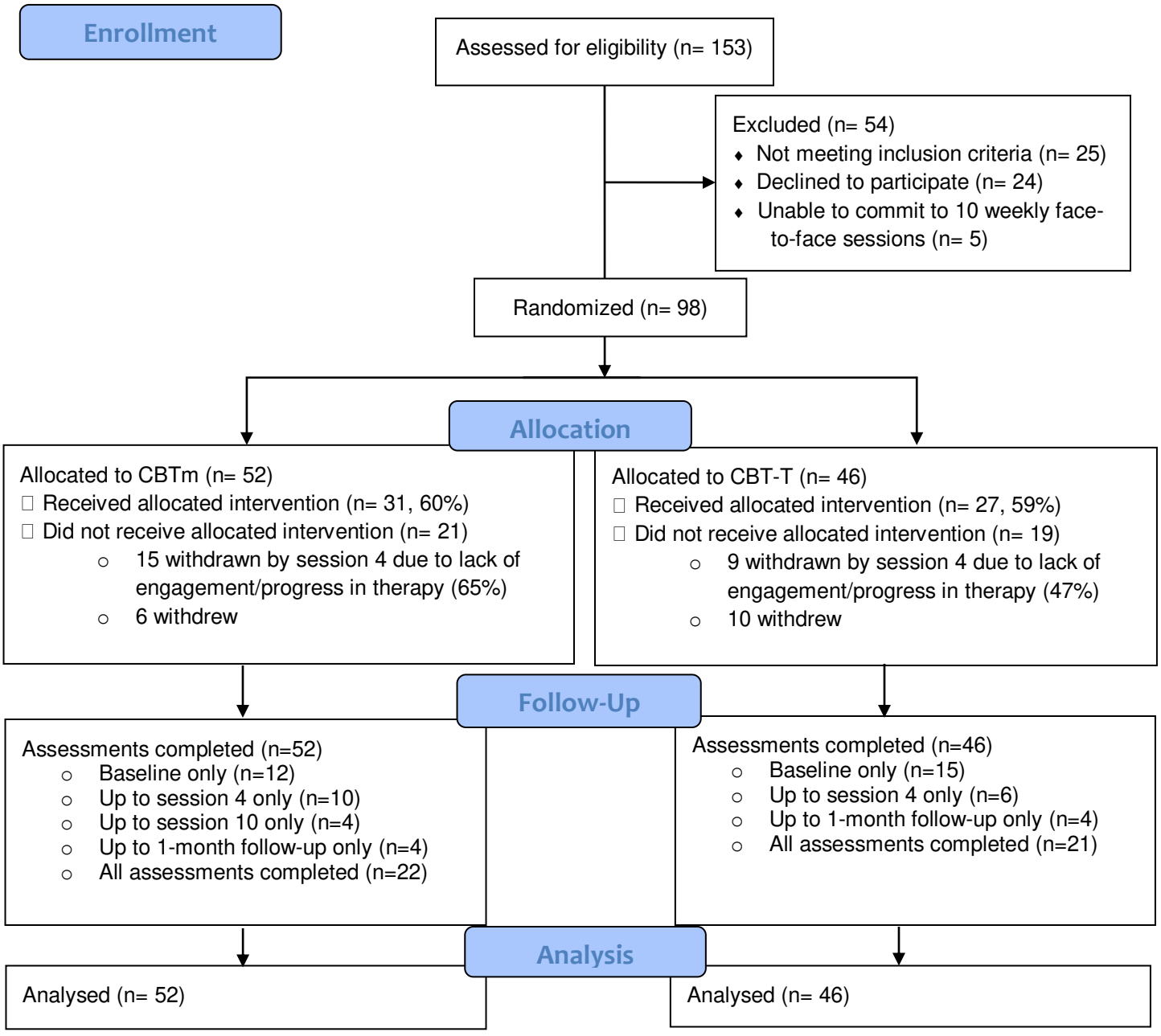

Figure 2.

Moderation of change in disordered eating by group and baseline readiness to change (low or high)