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A pragmatic effectiveness study of ten-session cognitive behavioural therapy (CBT-T) for eating disorders: Targeting barriers to treatment provision

Abstract

Objective: Ten-session Cognitive Behavioural Therapy (CBT-T) for transdiagnostic eating disorders targets several barriers to treatment, including cost, therapist expertise, and lengthy wait lists.

Method: We used a case series design to investigate the effectiveness of CBT-T delivered by trainee psychologists in a postgraduate training clinic. Participants were randomly allocated to commence treatment either immediately or after a four-week waitlist period. CBT-T was delivered to 52 patients, by six different trainees under supervision. Measures of eating disorder cognitions and behaviours, quality of life, and general psychopathology were examined in completer and intention-to-treat analyses using multi-level modelling. Last-observation-carried-forward was applied for abstinence, remission, and good outcome analyses to aid comparison with prior studies.

Results: Significant improvements, associated with medium to large effect sizes, were found for eating disorder cognitions, behaviours, quality of life, and negative affect from baseline to post-treatment, and at one- and three-month follow-up. Attrition (38.5%) was comparable to other treatment studies.

Conclusion: Results provide evidence for the effectiveness of CBT-T delivered by trainee psychologists for transdiagnostic eating disorder patients, thus tackling some important barriers for treatment. Longer follow-up, randomised controlled trial designs, and moderator analyses will provide more robust evidence about which patients do best with a shorter therapy.

Key Words: Eating disorders; cognitive-behavioural therapy; intensive; remission; abstinence

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A pragmatic effectiveness study of ten-session cognitive behavioural therapy (CBT-T) for eating disorders: Targeting barriers to treatment provision

For transdiagnostic eating disorders where BMI is greater than 17.5, recommended psychological interventions include cognitive behavioural therapy (CBT) and interpersonal psychotherapy (IPT) (Hay et al., 2014; National Institute for Health and Care Excellence [NICE], 2017; Waller, 2016). A recent review has suggested that CBT for eating disorders outperforms all active psychological comparisons including IPT (Linardon, Wade, de la Piedad Garcia, & Brennan, 2017). The recommended dose of CBT for eating disorders where body mass index (BMI) is greater than 17.5 is 20 sessions over a 5 month period with an experienced therapist (Fairburn, 2008). However, there is increasing pressure for shorter, cost-effective psychological therapies that are also efficacious. Waitlists for eating disorder treatment are often lengthy and long waits have been demonstrated to decrease engagement and treatment outcomes (Carter et al., 2012; Sánchez-Ortiz et al., 2011).

Waller et al. (2018) recently developed 10-session CBT for eating disorders (CBT-T) - a transdiagnostic, manualised outpatient treatment for patients with a BMI greater than 17.5 that adopts some of the key elements of CBT for eating disorders (CBT-ED; NICE, 2017), such as in-session weighing, exposure, nutrition, cognitive restructuring, body image work, and relapse prevention. 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 patients not actively engaging in CBT-T to return to treatment when they are ready to engage (Waller et al., 2018). An initial evaluation of CBT-T with 106 patients (BMI > 17.5) treated by supervised clinical

assistants in the United Kingdom 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). Symptom reduction, abstinence and remission were found to be comparable to longer versions of CBT-ED (Byrne, Fursland, Allen, & Watson, 2011; Fairburn et al., 2009; Knott, Woodward, Hoefkens, & Limbert, 2015; Turner, Marshall, Stopa, & Waller, 2015; Waller et al., 2014). There were also improvements in secondary outcomes, such as depression and anxiety symptoms. A subsequent small case series design replicated these findings (Pellizzer, Waller, & Wade, 2018).

CBT-T has been developed as a therapy suitable for delivery by novice therapists, such as provisional psychologists currently undertaking their postgraduate qualifications (Waller et al., 2018). Evidence suggests that under specialist supervision, novice therapists are able to deliver outcomes comparable with experienced therapists in clinical trials for mental health issues, including eating disorders (e.g. Öst, Karlstedt, & Widén, 2012; Zandberg & Wilson, 2013). Several studies of guided self-help (CBTgsh) for binge eating found comparable results to experienced therapists with a variety of novice or non-specialist therapists (see Wilson & Zandberg, 2012 for a review) and effectiveness studies of CBT-ED with a combination of experienced and non-experienced therapists also demonstrate comparable outcomes (Rose & Waller, 2017; Turner et al., 2015; Wade, Byrne, & Allen, 2017). Given the phenomenon of therapist drift away from evidence-based practice over time (Cowdrey & Waller, 2015; Waller & Turner, 2016), associated with decreasing effectiveness over time (Goldberg et al., 2016), the use of trainee psychologists under expert supervision is both viable and cost-effective.

The overall aim of the current study is to explore the effectiveness of outpatient CBT-T delivered by trainee psychologists in an Australian sample of transdiagnostic

patients with eating disorders. A key step in developing new therapies is establishing replicability (Open Science Collaboration, 2015), and therefore replicating the Waller et al. (2018) and Pellizzer et al. (2018) findings is an important first aim. This is especially important as the majority of prior effectiveness studies of CBT have predominantly used experienced therapists (Byrne et al., 2011; Knott et al., 2015; Signorini, Sheffield, Rhodes, Fleming, & Ward, 2018; Waller et al., 2014) with few using clinical assistants and inexperienced therapists from varying fields (Rose & Waller, 2017; Turner et al., 2015; Waller et al., 2018). It was hypothesised that significant reductions in behavioural and cognitive eating disorder symptoms would be found, with comparable effect sizes, and similar abstinence and remission rates to the initial evaluation of CBT-T (Waller et al., 2018). 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 et al., 2015; Waller et al., 2014). Although, across such studies that are differences in sample characteristics (e.g. whether or not participants with a BMI < 17.5 are included), definitions of drop out, and treatment lengths, which may limit some comparisons. Given the shorter nature of this treatment, and exclusion of participants with a BMI < 17.5, it is expected that attrition will not exceed this range. The present study also sought to examine whether a waitlist between assessment and starting treatment would impact attrition by randomly allocating participants to either start treatment immediately or after one month. Waitlist length has previously been found to be a significant predictor of dropout (Carter et al., 2012). Therefore, it was predicted that attrition would be higher for those participants assigned to the one-month waitlist condition.

METHOD

Participants

Seventy participants (aged ≥ 15 years and with a body mass index [BMI] > 17.5) were assessed for suitability for CBT-T. Exclusion criteria included: any severe physical and/or psychiatric condition that would interfere with treatment (e.g., high suicidality, psychosis); already receiving psychotherapy for an eating disorder; or difficulty speaking or understanding English. Seven participants were ineligible, four chose not to continue past the assessment, and 59 were offered CBT-T and randomised. 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), a median BMI of 24 (IQR = 21.35 – 29.13. M= 26.29, SD = 7.81; range 18.2 – 52.4). Only 1 participant was under the age of 18 due to the nature of the clinic (a university outpatient clinic, typically accessed by university students). Furthermore, patients under the age of 18 are typically referred for Family Based Therapy (FBT; not offered at this clinic) unless it is contraindicated, thus limiting potential referrals for this age group. The majority were female (90.4%) and Caucasian (82.7%). Using DSM-5 criteria (American Psychiatric Association [APA], 2013), 29 met criteria for BN, 17 for Other Specified Feeding and Eating Disorder (OSFED; 13 BN low frequency/limited duration, 4 Atypical Anorexia Nervosa [AN]), two for AN, two for Unspecified Feeding and Eating Disorder (UFED), and two for Binge Eating Disorder (BED). Almost half of the sample were purging at baseline (48.08%). The five most common comorbidities at pre-treatment, as per the MINI International Neuropsychiatric Interview 6.0 (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%). In addition, 36.5% of the sample were taking psychiatric medication (mostly antidepressants) and were asked to keep medication stable over treatment.

A sample size analysis was conducted to determine the number of participants

required in each group. Using the global score of the Eating Disorder Examination Questionnaire (EDE-Q) as the key outcome, a Cohen's d effect size of 0.80 was selected as a conservative estimate, given previous effectiveness studies found effect sizes varying from 0.39 to 1.22 (Byrne et al., 2011; Rose and Waller, 2017; Signorini et al., 2018; Turner et al., 2015; Waller et al., 2014; Waller et al., 2018). Using a power level of 0.80, and after adjusting for attrition, it was found that 17 participants per group were required at baseline (Hedeker, Gibbons, & Waternaux, 1999). Thus, the study was sufficiently powered.

Design

Participants were randomised to a four-week waitlist period or immediate start after completing measures at baseline. 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, to reduce participant burden.

Measures

Body mass index 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, laxatives and vomiting were combined to create a 'purging' variable.

Global eating disorder psychopathology. The Eating Disorder Examination – Questionnaire (EDE-Q; Fairburn & Beglin, 2008), a 22-item measure, was used to assess global eating disorder psychopathology over the previous 28 days. Higher scores indicate greater pathology. The EDE-Q global score has strong internal consistency ($\alpha = .95$; Kelly,

Carter, Zuroff, & Borairi, 2013) and high convergent validity with the EDE global score (r = .84; Mond, Hay, Rodgers, & Owen, 2006). Internal consistency in the current study was .90.

Clinical Impairment. 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 are rated on a 4-point Likert scale and are summed to calculate a global impairment score. Higher scores indicate greater psychosocial impairment. The CIA correlates well with the global EDE-Q score and clinician ratings of impairment, and discriminates between those with and without an eating disorder (Bohn et al., 2008). Internal consistency (Cronbach's $\alpha = .97$) and test-retest reliability ($r = .86$) are adequate (Bohn et al., 2008). In the current study, internal consistency was .89.

Negative affect. The Depression Anxiety and Stress Scales 21 (DASS21; Lovibond & Lovibond, 1995) is a 21 item measure of general psychopathology. Items are rated on a 4-point Likert scale for the previous week. A higher total score indicates greater psychopathology and negative affect (Lovibond & Lovibond, 1995). The scale has good internal consistency (Cronbach's $\alpha = .87$ - .94), is correlated with other measures of depression and anxiety, and discriminates well between clinical and non-clinical samples (Antony, Bieling, Cox, Enns, & Swinson, 1998). Internal consistency was similar in the present study ($\alpha = .94$). The total score was used in all analyses.

Eating Disorder Symptoms. A 15-item eating disorder measure (ED15; Tatham et al., 2015) assesses core diagnostic eating disorder behaviour and attitudes over the previous week on a 6-point Likert scale. Two subscales (Weight and Shape concerns and Eating Concerns) are derived and are averaged to calculate an Overall Attitudinal score. Higher scores indicate greater eating disorder psychopathology. In addition, five items assess the frequency of bingeing and compensatory behaviours. Internal consistency (Cronbach's $\alpha =$

.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) 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). The ED15 was administered weekly during therapy and at all assessment points. Internal consistency was α =.85.

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?".

Comorbidities. Comorbidities were assessed using the MINI International Neuropsychiatric Interview 6.0 (Sheehan et al., 1997), a semi-structured interview that assesses 17 DSM-IV Axis 1 disorders. 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. 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).

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. Participants were not charged for sessions. At assessment, all 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 session either one-week or four-weeks from assessment. Diagnosis, using DSM-5 criteria (APA, 2013) was assessed at the baseline assessment appointment using a standardised outline of issues to be covered (Wade & Pellizzer, 2018). Self-report measures were used to supplement this information. Diagnosis was then discussed and confirmed in supervision. Each participant received one session per week of CBT-T (Waller et al., 2018). Six trainee psychologists (postgraduate clinical psychology students) administered the treatment under the supervision of two authors (GW and TW). Supervision occurred bi-weekly for the majority of therapists except for the first author who received supervision weekly. One adolescent with BN was present in the sample which was deemed appropriate given the efficacy of CBT for adolescents with BN (NICE, 2017).

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). 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 were assessed using binomial logistic regression. To examine any differences in drop out across diagnoses, a survival analysis was completed (both drop out and collaborative decision to leave were combined to calculate censored means). 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. 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's 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. 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. Like the present study, effectiveness studies typically use the EDE-Q (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). Efficacy and effectiveness studies have typically applied last observation carried forward for ITT analyses (Byrne et al., 2011; Fairburn et al., 2009; Knott et al., 2015; Signorini et al., 2018; Turner 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

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 59 participants (11.86%) demonstrated unacceptability. For those who attended the first treatment session, confidence (M = 77.88, SD = 14.11) and suitability (M = 76.86, SD = 18.13) 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 terminating prematurely (n = 20 participants, 38.46%). 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 = 9, 18%), and those who ceased therapy prematurely without discussion with the therapist i.e., dropped out (n = 11, 21%). See **Figure 1**. The only significant predictor of attrition was purging (see **Table 1**), where those who collaboratively decided to leave treatment engaged in significantly greater purging at

baseline compared to completers. Assigned condition was not a significant predictor of attrition, Odds Ratio (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. drop outs), and neither were perceived confidence or suitability of treatment. Survival analysis found no significant difference in survival by diagnosis according to Log Rank statistic (χ^2 (3) = 4.264, p = .23).

First four sessions of CBT-T versus waitlist

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 than the waitlist group. 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

As shown 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 (2.77 and 16 respectively) at post-treatment. 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 baseline to post-treatment with a medium effect

size. Comorbid diagnoses 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. There were large effect size decreases in eating disorder cognitions between baseline and post-treatment (ITT d = 1.96, 95% CI: 1.49 – 2.43; completers d = 2.37, 95% CI: 1.73 – 3.01), higher than those reported in prior effectiveness and efficacy studies of CBT-ED and CBTgsh studies with trainee psychologists or inexperienced therapists (**Table 3**).

Eating disorder symptom change during follow-up

Follow-up data are presented in **Table 2** for completer and ITT analyses. For completers, 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. Large significant reductions for bingeing, purging, and negative affect were obtained at both follow-ups. The pattern of results was similar for ITT analyses, except effect sizes for purging and negative affect were medium at both follow-ups from baseline and the difference between baseline and three-month follow-up was no longer significant for purging.

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 analyses. For comparability purposes to previous studies, last observation carried forward was applied for ITT. **Table 4** 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. However, at the three-month follow-up, abstinence and remission rates were higher than those studies with data available at the same time point. Good outcome was found to outperform all comparable studies listed. The pattern of results was similar for both completer and ITT analyses.

DISCUSSION

This 10-session outpatient CBT for transdiagnostic eating disorders, delivered by trainee therapists, resulted in significantly greater reductions in eating disorder cognitions and behaviours compared to a waitlist condition. In a case series design, significant improvements were observed by the fourth session and beyond, and post-treatment results were largely maintained at both follow-up points. Effect sizes, abstinence and remission rates were comparable to Waller et al.'s (2018) initial study of CBT-T and the subsequent Pellizzer et al. (2018) case series. 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 increased further from post-treatment. 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 patients to continue working and improving. Alternatively, it is possible that the longer therapies stop having substantial impact well before the end of therapy (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.

The overall attrition rate was 38.5%. While slightly higher than the 31.2% attrition rate reported by Waller et al. (2018), the attrition rate is 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., 2009; Fairburn et al., 2015; Knott et al., 2015; Rose & Waller, 2017; Singorini et al., 2018; Turner et al., 2015; Waller et al., 2014). Within this study's attrition, 45% were individuals who collaboratively decided to leave treatment while 55% were drop outs. Thus, the review session and demand for quick behavioural change may have contributed to attrition. The only significant predictor of attrition was that those who collaboratively decided to leave treatment were purging significantly more at baseline compared to completers. While the rates of attrition varied slightly between the immediate start and delayed start conditions (35.71% immediate, 41.67% delayed), group allocation was not found to be a significant predictor of attrition. This indicates that a four-week wait list is not necessarily detrimental to engagement in CBT-T, and thus the third hypothesis was not supported. 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

were assessed and provided with psychoeducational materials designed to increase motivation, which may have increased engagement. Diagnosis also did not predict dropout, contrary to a recent evaluation finding higher dropout for OSFED compared to other diagnoses (Riesco et al., 2018). However, while a power analysis found the study to be sufficiently powered, smaller sample sizes in our diagnostic groups (e.g. those with AN, UFED, and BED, collaboratively decided to leave vs. drop out) limits power for analyses of sub-groups.

Unacceptability (11.86%) was comparable 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., 2009; Fairburn et al., 2015; Knott et al., 2015). 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 patients' treatment expectations are unchanged when treatment is delivered by trainee psychologists.

Negative affect (depression, anxiety, and stress) also significantly reduced from baseline to post-treatment and to both follow-ups, with moderate to large effects, comparable to Waller et al. (2018). Significant reductions were also found in the number of current comorbid disorders over treatment. This is consistent with findings suggesting CBT-ED is effective for comorbid problems (Linardon et al., 2017; Turner et al., 2016), even when a shorter dose is delivered.

Further research is needed to address limitations and to continue development of CBT-T as an effective therapy (Craig et al., 2008). First, a longer-term follow-up period is required to assess the durability of outcomes over time. Second, while participants were

randomized 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 direct comparison with 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. Third, we cannot extrapolate findings to patients with a BMI under 17.5. There are small sample sizes for some diagnostic categories (AN, BED, and UFED) which may limit generalisations to these groups. Fourth, future research exploring the effects of wait-list should evaluate whether an assessment and the provision of psychoeducation effects engagement. Fifth, while all therapists were supervised weekly or bi-weekly, fidelity was not formally evaluated. Sixth, although the study was sufficiently powered, only a small number of participants completed post-treatment and follow-up assessments. Finally, while attrition was comparable to other effectiveness studies, the overall rate is at the higher end of the range and comparisons to some studies are limited due to differences in sample characteristics (e.g. only two participants with AN in the present study), treatment lengths, and definitions of drop out. Although limited by sample size, a Survival Curve analysis did not find a significant difference in drop out between diagnoses. Of the 20 participants who left the study, only 11 could be classified as drop outs, or 21.15%, which falls in the lower end of the range of attrition reported by prior studies. Having a collaborative discussion with participants about leaving treatment (in the event of a failure to engage in progress) 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.

In summary, the results of this research provide support for CBT-T as an effective treatment for transdiagnostic eating disorder patients, supporting the use of expert-

supervised trainee provisional psychologists in the delivery of CBT-ED 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.

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Table 1: Binary logistic regression analyses to assess predictors of drop-out

Variable	Completers N = 32 M (SD)	Collaboratively Decided to Leave N = 9 M (SD)	Drop Out N = 11 M (SD)	OR (95% CI) Completers and Collaboratively Decided to Leave	OR (95% CI) Completers and Drop Out
Age	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	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	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	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	2.25 (3.44)	6.56 (6.69)	3.36 (7.13)	**1.15 (1.00 – 1.32)**	1.06 (0.91 – 1.23)
BMI	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	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	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	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.

Table 2: Eating pathology over the course of treatment, using completer and intention-to-treat analyses

Completer (N = 32)	Baseline (Assessment)		Mid-Treatment (Session 4)			Post-Treatment (Session 10)			1-month follow-up			3-month follow-up				Post hoc comparisons
	M	SE	M	SE	d	M	SE	d	M	SE	d	M	SE	d	F	
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
OBE	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
OBE	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. *multiple comparisons for eating related variables $p < .01$; d = within-time effect size, within-group 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; OBE=objective binge episodes. B = Baseline; S10 = Session 10; F1 = 1 month follow up; F3 = 3 month follow up.

Table 3: *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	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 Pellizzer et al. (2018): 2.37 (1.37 – 3.37) 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)	Banasiak et al. (2005): 1.48 (1.01 – 1.96)
ITT	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) Pellizzer et al. (2018): 2.29 (1.59 – 2.99) 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)	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)

	Waller et al. (2014): 0.61 (0.29 – 0.93) Waller et al. (2018): 1.59 (1.26 – 1.92)	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 and 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 and Fairburn, 1998; Fairburn et al., 2009; Fairburn et al., 2015); EDE-Q (present study; Byrne et al., 2011; Knott et al., 2014; Pellizzer et al., 2018; Rose and 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 and 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.

Table 4: End of treatment abstinence and remission rates compared with previous studies

Sample	Analysis	Current study		Fairburn et al. trials	Effectiveness Studies	CBTgsh Studies
Completer (N = 32)	Abstinence	EOT	46.9%	43.8% (Fairburn et al., 2015).	57.6% (Byrne et al., 2011); 76.9% (Pellizzer et al., 2018); 56% (Waller et al., 2014)[b]; 67.2% (Waller et al., 2018)[a].	39% (Banasiak et al., 2005).
		1-FU	56.3%		61.5% (Pellizzer et al., 2018).	
		3-FU	62.5%		61.5% (Pellizzer et al., 2018); 42.8% (Waller et al., 2018)[a].	
	Remission	EOT	46.9%		53.8% (Pellizzer et al., 2018); 34.4% (Rose & Waller, 2017)[c]; 31% (Turner et al., 2015)[d]; 52.9% (Waller et al., 2014)[b]; 50.0% (Waller et al., 2018)[a].	
		1-FU	50%		38.5% (Pellizzer et al., 2018).	
		3-FU	62.5%		46.2% (Pellizzer et al., 2018); 37.1% (Waller et al., 2018)[a].	
	Good Outcome	EOT	87.5%	66.4% (Fairburn et al., 2009); 75% (Fairburn et al., 2015).	66% (Byrne et al., 2011); 78.3% (Knott et al., 2015); 76.9% (Pellizzer et al., 2018); 69.1% (Signorini et al., 2018)[e].	
		1-FU	90.6%		76.9% (Pellizzer et al., 2018).	
		3-FU	90.6%		84.6% (Pellizzer et al., 2018).	
Intent-to-treat (N = 52)	Abstinence	EOT	38.5%	42.3% (Fairburn et al., 2009); 44.8% (Fairburn et al., 2015).	42.5% (Byrne et al., 2011); 44% (Pellizzer et al., 2018); 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	44.2%		36% (Pellizzer et al., 2018).	42.1% (Zandberg & Wilson, 2013).
	3-FU	48.1%		36% (Pellizzer et al., 2018); 41.9% (Waller et al., 2018)[a].	41% (Carter & Fairburn, 1998).
Remission	EOT	32.5%		28% (Pellizzer et al., 2018); 23.4% (Rose & Waller, 2017)[c]; 19.6% (Turner 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	34.6%		20% (Pellizzer et al., 2018).	68.4% (Zandberg & Wilson, 2013)[h].
	3-FU	42.3%		24% (Pellizzer et al., 2018); 36.6% (Waller et al., 2018)[a].	
Good Outcome	EOT	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); 52% (Pellizzer et al., 2018); 42.2% (Signorini et al., 2018)[e].	69% (Carter & Fairburn, 1998).
	1-FU	65.4%		52% (Pellizzer et al., 2018).	
	3-FU	65.4%		56% (Pellizzer et al., 2018).	

Note. [a] Waller et al. (2018) assessed abstinence and remission over the last week at post-treatment and over the last two months at 3-month follow-up.
[b] Waller et al. (2014) considered remission to include abstinence and a loss of diagnosis.
[c] Rose & 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).