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A Systematic Review and Meta-Analysis of a 10-Session Cognitive Behaviour Therapy for Non-Underweight Eating Disorders

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Abstract

Objective: Treatment guidelines recommend that people with non-underweight eating disorders should receive up to 20 sessions of eating-disorder-focused cognitive behavioural therapy (CBT-ED). The present study reviewed ten studies of 10-session cognitive behaviour therapy for non-underweight patients (CBT-T).

Method: We conducted a systematic review using four electronic databases and contacted researchers in the field for unpublished data. Random effects meta-analyses were conducted to pool within-group effect sizes.

Results: From pre- to post-treatment, medium to very large effect sizes were observed for eating disorder psychopathology, clinical impairment, depression, anxiety, and weekly frequencies of objective bingeing and vomiting. Furthermore, the effect of CBT-T appears to last after treatment with eating disorder psychopathology remaining below the norm for non-clinical females at follow-up. The dropout rate from CBT-T was 39%, and 65% of completers achieved a good outcome.

Conclusions: While results should be interpreted as preliminary due to a number of limitations, the present study suggests that CBT-T is a promising treatment for people with non-underweight eating disorders, which can achieve a good outcome in half the time currently recommended in treatment guidelines. The present study, therefore, provides valuable justification for future randomised controlled trials directly comparing short and long forms of CBT-ED as well as examining who does best with which version.

Keywords: CBT-T; brief therapy; cognitive behavioural therapy; non-underweight eating disorders; outcomes; dropout

Key Points

- Medium to very large improvements were observed for all treatment outcomes, the dropout rate from CBT-T was 39%, and 65% of completers achieved a good outcome
- CBT-T is a promising treatment for people with non-underweight eating disorders
- Future controlled studies should directly compare short and long forms of CBT-ED

For people with non-underweight eating disorders (i.e., bulimia nervosa, binge eating disorder, and atypical eating disorders), the treatment of choice is eating-disorder-focused cognitive behavioural therapy (CBT-ED; National Institute for Health and Care Excellence [NICE], 2017). The NICE guidelines recommend that individual CBT-ED treatment should comprise up to 20 sessions, which is substantially longer than recommendations for other psychological disorders, such as depression and anxiety. Furthermore, clinicians routinely extend the length of treatment and provide far more than the recommended 20 sessions (Cowdrey & Waller, 2015). Consequently, CBT-ED is usually very expensive to deliver, waitlists tend to be long, and people with non-underweight eating disorders are typically unable to access the treatment that they require in a timely fashion.

Crucially, there is no evidence to suggest that 20 sessions are the optimal number to treat people with non-underweight eating disorders. Indeed, there is evidence to suggest that longer time in treatment does not equate to better treatment outcomes (Radunz et al., 2020). For example, Rose and Waller (2017) found that the length of CBT-ED was not significantly associated with final outcomes. They also examined curve fit estimates, which indicated that gains in CBT-ED were made by sessions eight to 12 sessions, after which there was no pattern of further gains. This aligns with findings for a range of psychological disorders. For example, for mild-to-moderate depressive and anxiety disorders, the optimal length of treatment is 4 to 6 sessions, after which additional sessions do not result in better treatment outcomes (Delgadillo et al., 2014). Additionally, up to 80% of the decrease in severity of depression occurs by the fourth session of CBT (Ilardi & Craighead, 1994), and change in symptoms at this point predicts remission (Persons & Thomas, 2019).

Rather than the length of treatment predicting outcome, the critical predictor is

early change in eating disorder symptoms. Meta-analyses synthesising over 20 years of evidence have established that the change achieved in the first four to six sessions or weeks of treatment is the most robust predictor of treatment outcomes for people with eating disorders (Chang et al., 2021; Linardon et al., 2016; Vall & Wade, 2015). This value of early change has been demonstrated for end of treatment and follow-up, among both children and adults, across eating disorder diagnoses, for inpatient, day patient and outpatient treatments, and for a range of eating disorder symptoms from weight gain to decrease in binge/purge frequency (Bell et al., 2017; Chang et al., 2021; Vall & Wade, 2015).

Given the combined evidence outlined here (longer treatments may not improve outcomes [Rose & Waller, 2017]; early change is important in predicting outcomes [Bell et al., 2017; Chang et al., 2021; Linardon et al., 2016; Vall & Wade, 2015]; and most change happens in the first 8-12 sessions of treatment [Rose & Waller, 2017]), alongside the imperative to use resources wisely, it is clearly important to evaluate the potential of shorter CBT-ED treatments. Indeed, NICE (2017) has recommended evaluating briefer treatments (<20 sessions) in order to determine whether a reduced number of sessions is as effective as longer treatment. A shorter treatment should be more cost-effective to deliver, reduce waitlist times, and allow more clients to be seen in a timely fashion.

Currently, the shorter CBT-ED treatment with the most evidence is 10-session cognitive behavioural therapy for non-underweight patients (CBT-T; Waller et al., 2019). CBT-T is a manualised outpatient treatment for people with non-underweight eating disorders that includes nutritional change, collaborative in-session weighing, exposure based on inhibitory learning principles, cognitive restructuring, behavioural experiments, addressing emotional triggers, body image work, and relapse

prevention (Waller et al., 2019). CBT-T has been shown to reduce both the behavioural and cognitive symptoms of eating disorders, as well as secondary outcomes such as depression and anxiety (Pellizzer et al., 2019a, 2019b; Waller et al., 2018).

While no direct randomised comparisons have been made between CBT-T and longer CBT-ED treatments, there are now enough evaluations of CBT-T from a variety of settings to conduct a systematic review and meta-analysis of within-group effect sizes. We note that Cuijpers and colleagues (2017) have expressed several concerns about the inclusion of within-group effect sizes in meta-analyses. First, case series evaluations are unable to account for any spontaneous recovery or other alternative explanations of change. Second, the population of these studies may differ from those entering randomised controlled trials (RCTs), where allocation to a less effective alternative is a possibility. Additionally, clients who are deemed to have more severe eating disorders can be offered longer courses of CBT-ED over CBT-T (e.g., Tatham et al. 2020). Third, scores on outcome measures at pre- and post-treatment are not independent of each other. Fourth, there can be large differences between within-group effect sizes across studies, introducing considerable heterogeneity. However, where there is sufficient evidence of pre-post outcomes within groups, such data can provide valuable justification for further work assessing those effects within more robust designs such as RCTs. Therefore, this study is intended to provide formative evidence, to justify development of future controlled studies.

The present study evaluated the effect of CBT-T from pre- to post-treatment on eating disorder psychopathology, clinical impairment, depression, anxiety, weekly objective bingeing frequency, and weekly vomiting frequency. We also examined the

percentage of participants who dropped out of CBT-T and the percentage of completers who achieved a good outcome. To determine whether outcomes last beyond end of treatment, we examined the effect of CBT-T on eating disorder psychopathology from pre-treatment to follow-up. We sought to minimise the limitations outlined above in the following ways. First, we compared the baseline characteristics of participants in our studies to those of RCTs and longer forms of CBT-ED. Second, we accounted for the correlation between pre- and post-treatment scores on each continuous outcome measure for each study when calculating effect sizes, to manage non-independence. In line with best practice, we used the exact value of the correlation for each study rather than assuming a fixed value or using a value based on previous reports. Third, we interpreted variables showing significant heterogeneity with caution. Thus, our robust methodology allowed us to present reliable within-group effect sizes that are suitable for synthesising in a meta-analysis.

Method

The present study was conducted in line with the preferred reporting items for systematic review and meta-analysis (PRISMA Statement; Moher et al., 2009).

Search Strategy

The primary search strategy involved searching for relevant papers in four electronic databases: Scopus, Medline, PsychINFO, and ProQuest Dissertations & Theses Global. The following search terms were searched for in the title and abstract of papers: ((CBT-T OR "brief cognitive behavioural therapy" OR "10-session cognitive behavioural therapy") AND (eat* AND disord*)). The first author conducted the final database search on the 30th of August 2021. The secondary search strategy aimed to identify further papers from the reference lists and forward citation searches of relevant papers identified in the primary search. The first author also located grey

literature by contacting researchers in the field for unpublished data.

Inclusion Criteria

The following inclusion criteria were applied: (a) English language; (b) participants aged 15 years and over; (c) administered CBT-T; (d) conducted assessments at pre- and post-treatment; and (e) assessed any of the following variables: eating disorder psychopathology, clinical impairment, depression, anxiety, weekly objective bingeing frequency, weekly vomiting frequency, dropout, and/or good outcome. Case studies were excluded due to the impossibility of calculating an effect size.

Data Extraction Process

The first author and a research assistant independently extracted the information required for the qualitative synthesis and to calculate effect sizes for meta-analysis. The information extracted by the first author and research assistant aligned 94%. This percentage was calculated by dividing the number of extractions that aligned out of the total number of extractions and multiplying by 100. When the information extracted by the first author and the research assistant was not identical, it was double checked by the first author. When papers did not report the information required to calculate effect sizes, the first author requested it from the corresponding authors of those papers. The first author also requested the correlation between pre- and post-treatment and pre-treatment and follow-up for all continuous variables. These data were provided in all cases. Demographic information, such as the age, sex, and race of participants, was also extracted from each paper.

Calculation of Effect Sizes

We calculated all effect sizes using Comprehensive Meta-Analysis software (CMA; Version 3.3; Borenstein et al., 2009). When studies reported standard error

instead of standard deviation, the standard deviation was calculated by multiplying the standard error by the square root of the sample size. In some studies, the number of participants who completed measures was different from the number of participants who completed CBT-T. In these cases, we used the number of participants who completed CBT-T. The same approach was taken for follow-up data. Cohen's (1992) benchmarks were used to interpret effect sizes as small (0.20), medium (0.50), or large (0.80).

For continuous variables (eating disorder psychopathology, clinical impairment, depression, and anxiety), we calculated both within-group intent-to-treat and within-group completer effect sizes. The within-group intent-to-treat effect sizes were calculated as Hedge's *g,* using the number of participants who were randomised to/started CBT-T, the adjusted pre- and post-treatment means, the pre- and post-treatment standard deviations, and the correlation between pre- and post-treatment. The within-group completer effect sizes were also calculated as Hedge's *g,* with the same method described above but using the number of participants who completed CBT-T and unadjusted means. Some of the authors of the original papers did not adjust for the correlation between pre- and post-treatment. Therefore, in some cases, our reported effect sizes are slightly different from those reported in the published papers.

For count variables (weekly frequencies of objective bingeing and vomiting), we calculated within-group completer effect sizes as Hedge's *g*. We used the same method described for continuous variables. However, it would not have been appropriate to adjust for the correlation between pre- and post-treatment for count variables.

For binary variables (dropout and good outcome), we calculated effect sizes

as percentages. For dropout, we calculated the percentage of participants who dropped out of the number who were randomised to/started CBT-T. For good outcome, we calculated the percentage of participants who achieved a post-treatment global eating disorder examination questionnaire (EDE-Q) score of no more than one standard deviation above the norm for nonclinical females (2.77; Mond et al., 2006) out of the number of participants who completed treatment.

Finally, for follow-up data, we calculated within-group intent-to-treat effect sizes for eating disorder psychopathology. These effect sizes were calculated as Hedge's *g* using the number of participants who were randomised to/started CBT-T, the adjusted pre-treatment and follow-up means, the pre-treatment and follow-up standard deviations, and the correlation between pre-treatment and follow-up. Intent-to-treat follow-up data were available for six studies. For each study, the final follow-up was selected.

Meta-Analyses

We performed the meta-analyses using CMA (Borenstein et al., 2009). Separate random effect meta-analyses were performed to obtain 1) the pooled within-group intent-to-treat and completer effect sizes for each continuous variables from pre- to post-treatment, 2) the within-group completer effect sizes for the count variables from pre- to post-treatment, 3) the overall percentage of participants who dropped out, and 4) the overall percentage of completers who achieved a good outcome. For the main outcome variable, eating disorder psychopathology, we also conducted a random effect meta-analysis to determine whether the effect of CBT-T was lasting, and a sensitivity analysis to determine whether our results were influenced by the quality of the studies synthesised in the meta-analyses.

Heterogeneity

We examined heterogeneity using the *Q*-test and I^2 statistic. A significant *Q*-test provides evidence of heterogeneity, and the I^2 statistic indicates the percentage of total variance between studies that is due to heterogeneity compared to chance (Cuijpers, 2016). For I^2, percentages of 25, 50, and 75 are interpreted as indicating low, moderate, and high heterogeneity, respectively (Higgins et al., 2003).

Publication Bias

We used Egger's regression intercept to assess publication bias (Moreno et al., 2009). Egger's regression intercept examines the relationship between effect sizes and standard error of effect sizes, to determine whether study effect size and study precision are significantly related (Laird et al., 2017). A significant regression intercept indicates the likely presence of publication bias (Laird et al., 2017).

Quality Assessment

The first author and a research assistant independently assessed the quality of all studies included in the meta-analysis using the CONSORT 2010 checklist (Schulz et al., 2010). As the meta-analysis included case series, cohort studies, and an RCT, eight items that applied to all the study designs were selected from the original 25 items. The selected items were: eligibility criteria for participants (Item 4a); settings and locations where data were collected (Item 4b); description of the intervention with sufficient details to allow replication (Item 5); defined outcome measures including how and when they were assessed (Item 6a); how sample size was determined (Item 7a); the number of participants who received treatment and were analysed for the primary outcome (Item 13a); losses and exclusions with reasons (Item 13b); and baseline demographic and clinical characteristics (Item 15). Items were scored ‘Y’ when fully conforming to CONSORT, ‘N’ when not conforming

to CONSORT, and ‘P’ when partially conforming to CONSORT. The ratings from the first author and research assistant aligned 100%. For the purpose of the sensitivity analysis, high quality was defined as papers that fully conformed to CONSORT on six or more items.

Results

Study Selection

Initially, 38 published papers were identified through database searching. An additional two unpublished papers were provided by lead researchers in the field when the first author contacted them for unpublished data. The search results from each electronic database and the unpublished papers were imported into Covidence systematic review management software. All papers were then cross-referenced, and duplicate papers were removed. After removing duplicates, 25 papers remained. The first author and a research assistant independently screened all titles and abstracts to determine whether papers broadly related to the research question. Thirteen of these papers were excluded as they did not relate to the research question. Next, the full texts of the remaining 12 potentially relevant papers were retrieved and read independently to determine whether they met the full inclusion criteria. Two of these papers (Pellizzer et al., 2018; Pellizer et al., 2019c) were excluded due to overlapping samples, leaving 10 papers that met the inclusion criteria for the systematic review and meta-analysis. Throughout this process, discrepancies were discussed until a consensus was reached. The agreement rate was 95% for title and abstract screening and 100% for full text. Figure 1 presents a PRISMA flow diagram of the study selection process.

Description of Studies

An overview of the 10 studies examined in this systematic review and meta-

analysis is shown in Table 1. These studies are also indicated by * in the reference list. Of these studies, seven were published papers, one was a Masters thesis, and two were unpublished manuscripts. The study designs comprised six case series, three cohort studies, and one RCT. Seven of the studies were conducted in the United Kingdom and three in Australia. Sample sizes ranged from 16 to 139 (total pre-treatment N = 565 and the total completer N = 346). While participants were primarily white females, the range of non-underweight eating disorder diagnoses were represented across the studies.

Pre-Treatment Severity

We determined whether the participants included in our meta-analysis were different from 1) those participating in RCTs receiving a form of CBT-ED (where allocation to a less effective alternative is a possibility) or 2) those receiving longer CBT-ED (which is sometimes offered over CBT-T to people who are deemed to have more severe eating disorders). To do so, we compared pre-treatment eating disorder psychopathology, measured using the global score of the EDE-Q (Fairburn & Beglin, 2008), between participants in our meta-analysis, participants in RCTs receiving a form of CBT-ED, and participants receiving longer CBT-ED. As shown in Table 2, 40% of the CBT-T studies had an entry mean that was equal to or higher than the highest entry means for RCTs and studies of longer CBT-ED. Additionally, the number of standard deviations above the norm was very similar for studies of CBT-T (1.34 to 2.38), RCTs (1.34 to 2.11), and studies of longer CBT-ED (1.35 to 2.12). Therefore, pre-treatment severity was not consistently or substantially different between participants in our meta-analysis, participants in RCTs receiving a form of CBT-ED, or participants receiving longer CBT-ED.

Summary of Measures

A range of measures were used across the included studies. All 10 studies measured eating disorder psychopathology using the global score of the EDE-Q (Fairburn & Beglin, 2008). Clinical impairment was measured in five studies, all of which used the Clinical Impairment Assessment (CIA; Bohn et al., 2008). Depression was measured in seven studies. Four of these studies measured depression using the Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001) and three using the Depression, Anxiety, and Stress Scale short form (DASS21; Lovibond & Lovibond, 1995). Anxiety was measured in six studies; three used the Generalized Anxiety Disorder questionnaire (GAD-7; Spitzer et al., 2006) and three used the DASS-21. Weekly objective bingeing frequency was measured in eight studies. This was obtained from food diaries in five studies and from the Eating Disorder-15 (ED-15; Tatham et al., 2015) in three studies. Weekly vomiting frequency was measured in seven studies. This was obtained from food diaries in four studies and the ED-15 in three studies. Bingeing and vomiting frequencies were obtained from food diaries and the ED-15 rather than the EDE-Q, as we regarded weekly reports of behaviours more reliable than a once-a-month recall. For all studies, we defined dropout as the percentage of participants who did not complete the 10 sessions of CBT-T (unless an earlier finish was agreed upon as treatment had met its targets). Finally, for all studies, we calculated the percentage of completers who achieved a good outcome, that is, a post-treatment global EDE-Q score less than 2.77 (Mond et al., 2006).

Quality Assessment

Table 4 presents the results from the quality assessment of studies included in the meta-analysis. The average quality rating was 5.9 out of 8, indicating high

quality. Furthermore, interrater reliability for quality ratings was excellent (100% alignment). All 10 studies reported a description of the intervention with sufficient detail to allow replication and defined outcome measures including how and when they were assessed. Nine out of 10 studies reported eligibility criteria for participants and the number of participants who received treatment and were analysed for the primary outcome. Additionally, most studies reported losses and exclusions with reasons and baseline demographic and clinical characteristics. In contrast, information regarding the settings and locations where data were collected was somewhat vague, and only four studies reported how sample size was determined.

Meta-Analyses

Treatment Outcomes and Dropout

We found large to very large reductions in eating disorder symptoms and clinical impairment from pre- to post-CBT-T. We also found medium to large reductions in all secondary outcomes. While 39% of participants dropped out of CBT-T, 65% of completers achieved a good outcome. Significant heterogeneity was found for four outcomes (intent-to-treat and completer clinical impairment, completer anxiety, and good outcome). Table 3 displays the results from the meta-analyses and Supplementary Tables 1 and 2 display the effect sizes for each individual study. Figure 2 displays the forest plot for intent-to-treat eating disorder psychopathology from pre- to post-treatment, and Figure 3 the forest plot for intent-to-treat clinical impairment from pre- post-treatment.

Follow-Up

For the main outcome variable, eating disorder psychopathology, we conducted a random effect intent-to-treat meta-analysis including the six studies (325 participants) that had follow-up data. Final follow-up points were selected,

resulting in the inclusion of five 3-month follow-ups and one 6-month follow-up. The pooled effect sized was very large and significant (Hedge's *g* = -1.58, 95% CI: -1.82 to -1.34, *p* <.001) showing that eating disorder psychopathology decreased substantially from pre-treatment to follow-up (see Figure 4). There was evidence of heterogeneity (*Q* (5) = 13.37, p = *.02,* I^2 = 62.60) but publication bias was not indicated by Egger's regression intercept (-4.26, 95% CI = -11.78 to 3.27, *p* = .19). Supplementary Table 3 displays the effect sizes for each individual study.

Sensitivity Analysis

A sensitivity analysis was conducted for the main outcome variable, eating disorder psychopathology, using an intent-to-treat random effect meta-analysis that included only the high-quality studies (i.e., those with a quality rating of 6 or more). Five studies (270 participants) were included in the sensitivity analysis, all of which were published. The pooled effect size was very large (Hedge's *g* = -1.64, 95% CI: -1.84 to –1.44, <.001) and comparable to the pooled effect size obtained for all studies. Thus, our results do not appear to be influenced by the quality of studies included in the meta-analyses.

Discussion

The main aim of this systematic review and meta-analysis was to provide a formative evaluation of CBT-T, a brief intensive form of CBT-ED. Our study, therefore, addresses the NICE (2017) research recommendation of evaluating briefer treatments for people with eating disorders. Overall, our results provide preliminary evidence to suggest that CBT-T is a promising treatment for people with non-underweight eating disorders, and that most of these individuals can achieve a good outcome in half the time currently recommended in treatment guidelines. Our study, thereby, provides a valuable justification for future work evaluating CBT-T in a

more controlled set of studies.

Treatment Outcomes

Despite the majority of studies included in our meta-analysis assessing effectiveness in real-world settings, which tend to be less controlled and have smaller effect sizes than RCTs (e.g., Byrne et al., 2011 vs. Fairburn et al., 2015), we observed significant medium to very large effects (completer and intent-to-treat) for all treatment outcome variables. Eating disorder psychopathology significantly decreased from pre- to post-CBT-T, with very large effect sizes observed across all the studies included in the meta-analysis. Furthermore, for all the studies, following treatment both intent-to-treat and completer means for global eating disorder psychopathology were below the cut-off of one standard deviation above the norm for non-clinical females (2.77; Mond et al., 2006) following treatment. The effect of CBT-T also appears to last after treatment, with global eating disorder psychopathology remaining below this cut-off at follow-up (3- to 6-months post-treatment), and very large reductions in eating disorder psychopathology observed from pre-treatment to follow-up. Additionally, pre-treatment severity was very similar among participants in our meta-analysis compared to participants in studies of longer CBT-ED including RCTs (e.g., Allen et al., 2012; Byrne et al., 2011; de Jong et al., 2020; Fairburn et al., 2009; Garte et al., 2015; La Mela et al., 2013; Signorini et al., 2017; Turner et al., 2015; Watson et al., 2012). This comparability suggests that people with non-underweight eating disorders can be offered CBT-T regardless of pre-treatment severity. In summary, our study suggests that briefer treatment can produce good outcomes among the majority of clients with non-underweight eating disorders regardless of pre-treatment severity.

Dropout

Our study also suggests that briefer treatment for non-underweight eating disorders produces comparable dropout rates to those reported for both RCTs and uncontrolled trials of longer CBT-ED (see Atwood & Friedman, 2020). However, a direct head-to-head comparison is required to draw any firm conclusions given the wide variety of definitions of dropout used in studies of CBT for eating disorders (Linardon, et al., 2017). In CBT-T, clients are informed that the critical predictor of treatment outcome is early change in eating disorder symptoms. Their progress is reviewed at Session 4, at which point treatment is collaboratively ended if early change has not occurred (Waller et al., 2019). Our dropout rate, therefore, included both participants who dropped out and participants who were collaboratively discharged at Session 4 due to lack of early change. Despite this, our dropout rate was within the range of studies of longer CBT-ED that do not use this approach. While preliminary, this finding should reduce therapist anxiety regarding the importance of pushing for early change and implementing such a decision point. Doing so can help reduce therapist frustration and the potential sense of failure among clients who are not engaging with core treatment tasks. It may also motivate some clients to progress more quickly, while enabling others to return to treatment at a later stage. This finding also suggests that early progress reviews might also be worth considering in the treatment of other psychological disorders, such as depression and anxiety, as they do not increase dropout rate. Rather, they have the potential benefit of speeding treatment access for patients who would otherwise be forced to remain on waiting lists.

Limitations and Future Directions

Our findings should be interpreted as preliminary due a number of limitations,

but they and highlight several directions for future research. First, the relatively small number of studies and participants in each sample did not allow us to undertake subgroup analyses. As more studies accrue, future meta-analyses should examine diagnosis as a moderator. Second, longer-term follow-up is also required, given the longest follow-up period in the studies included in this meta-analysis was six months. This would allow us to compare remission levels and predictors with those of longer forms of CBT-ED. Third, all the studies included in this meta-analysis were conducted in Australia and the United Kingdom. Thus, it will be important to determine how CBT-T can be implemented in countries that do not have the same depth of tradition of shorter therapies (e.g., the United States and Germany) or of CBT (e.g., France and Denmark). Additionally, 60% of the studies were conducted by the developers of CBT-T. Fourth, we are unable to rule out the possibility that the change observed was confounded with competing explanations for change, such as spontaneous recovery (Cuijpers et al., 2017). We note, however, that while migration between eating disorder diagnoses is common (Milos et al., 2005), spontaneous recovery over waitlist conditions has not been evident (Fairburn et al., 2009; Steele & Wade, 2008). Fifth, significant heterogeneity was found in five meta-analyses (intent-to-treat and completer clinical impairment, completer anxiety, good outcome, and eating disorder psychopathology from pre-treatment to follow-up). These results should, therefore, be interpreted with some caution.

It would also be beneficial to evaluate the use of CBT-T in other populations, given that our meta-analysis comprised a somewhat restricted range of participants. Participants included in our meta-analysis were aged 15 years and over and the majority were diagnosed with binge eating disorder or bulimia nervosa. Future research is, therefore, needed to examine this treatment in younger adolescents with

eating disorders as well as other non-underweight eating disorders such as atypical anorexia nervosa. Additionally, of the studies included in our meta-analyses, none reported ethnicity or socio-economic status and only four reported race. When race was reported, a lack of diversity was apparent with most participants being white. Future studies are, therefore, required to determine whether our findings generalise to a more diverse sample of people with eating disorders. Additionally, people with anorexia nervosa are typically less responsive to existing treatments than non-underweight patients, with 40% of patients not completing stand-alone outpatient therapies, and only 28% reaching remission at 12-month follow-up (Byrne et al., 2017). Future research should determine whether a shorter treatment can be more effective for people with anorexia nervosa if it includes elements from CBT-T, such as emphasising the importance of early change and incorporating an early review session.

Future research also needs to investigate the optimal content of the 10 sessions of CBT-T. For example, Wade et al. (2021) compared two forms of 10-session CBT-ED: CBT-T, which includes substantial body image work, and Guided Self-Help, which does not include such content but focuses early on motivation. Despite this, they found both treatments produced similar large effect size improvements for disordered eating, clinical impairment, depression, and anxiety. It is also possible that ten sessions are not always needed, given that other psychological disorders (e.g., mild-to-moderate depressive and anxiety disorders) have even shorter optimal lengths of treatment. Future dismantling studies should, therefore, investigate the active ingredients needed for efficient and cost-effective delivery of CBT-T. The Wade et al. study also showed that people low in motivation were able to achieve the same outcomes as people with higher levels of motivation

when motivation was addressed in treatment, something that CBT-T does not currently do. Therefore, identifying mediators and moderators of CBT-T's effects would also be beneficial, to enable clinicians to move towards a precision medicine approach where the components of treatment provided can be tailored to each individual client based on the person's characteristics at baseline.

Conclusion

The present study has important clinical implications for the treatment of people with non-underweight eating disorders and future research programs. While preliminary, the findings suggest that CBT-T is a promising treatment for people with non-underweight eating disorders, and that these individuals can achieve lasting and clinically significant reductions in symptoms in half the time currently recommended by NICE (2017), regardless of pre-treatment severity. Implementing CBT-T and other briefer therapies would be substantially much more cost-effective, reduce waitlist times, and enable many more people with eating disorders to access the treatment that they require. Our results strongly support the suggestion that a vigorous research program, including direct randomized comparisons between CBT-T and longer forms of CBT-ED, should be conducted to determine whether shorter forms of treatment for non-underweight eating disorders can be justifiably recommended in treatment guidelines. Given the different approaches to managing early progress between the shorter and longer therapies, a comparison of intent-to-treat outcomes will be most meaningful.

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Table 1

Summary of the 10 Studies Included in the Systematic Review and Meta-Analysis

Study	Study design	Original N	Completer N (% completed)	Follow-up	Demographics
Birtwell et al. (2021) [a]	Case series	45	25 (56)	3 months	M^{age}: 30.44 (9.83); Diagnosis: 9 OSFED, 16 BN; Sex: 96% female; Race, Ethnicity, and SES: NR
Moore, Hinde et al. (2021) [b]	Case series	53	41 (77)	3 months	M^{age}: 35.20 (12.30); Diagnosis: BED; Sex: 77% female; Race, Ethnicity, and SES: NR
Moore, Turner et al. (2021) [a]	Cohort	139	78 (56)	End of treatment	M^{age}: 35.24 (12.27); Diagnosis: BN, BED, OSFED; Sex: 93% female; Race, Ethnicity, and SES: NR
Pellizzer et al. (2019a) [b]	Case series	52	32 (62)	3 months	M^{age}: 26.42 (9.62); Diagnosis: 29 BN, 17 OSFED, 2 AN, 2 UFED, 2 BED; Sex: 90% female; Race: 82.70% Caucasian; Ethnicity and SES: NR
Pellizzer et al. (2019b) [b]	Case series	26	13 (50)	3 months	M^{age}: 28.73 years (9.57); Diagnosis: 24 BN, 1 OSFED, 1 UFED; Sex: 96% female; Race: 100% Caucasian; Ethnicity and SES: NR.
Rose et al. (2021) [b]	Case series	40	26 (65)	End of treatment	Age: 18 to 51; Diagnosis: 35 BN/atypical BN, 5 atypical AN; Sex: 90% female; Race: 90% White British, 5% other European White, 5% mixed White and Asian; Ethnicity and SES: NR
Russell (2020) [c]	Retrospective cohort study analysis	16	9 (56)	1 month	M^{age}: 23.40; Diagnosis: 1 AN, 4 BN, 1 BED, 10 OSFED; Sex: 94% female; Race: 87.50% white, 6.25% Asian, 6.25% other; Ethnicity, and SES: NR
Tatham et al. (2020) [b]	Cohort comparison	55	31 (56)	6 months	M^{age}: 29.40 (10.20); Diagnosis: 15 OSFED, 32 BN, and 8 BED; Sex: 95% female; Race, Ethnicity, and SES: NR
Wade et al. (2021) [b]	RCT	46	27 (59)	3 months	M^{age}: 26.90 (10.90); Diagnosis: DSM-5 eating disorder with BMI >17.5; Sex: 91% female; Race, Ethnicity, and SES: NR
Waller et al. (2018) [b]	Case series	93	64 (69)	3 months	M^{age}: 27.40 years (8.70); Diagnosis: 51 BN, 25 BED, 17 OSFED; Sex: 97% female; Race, Ethnicity, and SES: NR

Notes. [a] = unpublished manuscript; [b]= published paper; [c] =Masters thesis; NR=not reported; AN = anorexia nervosa; BN = bulimia nervosa; BED = binge eating disorder; OSFED = other specified feeding or eating disorder; UFED = unspecified feeding or eating disorder; SES = socioeconomic status.

Table 2

Pre-Treatment Severity (Assessed Using Global EDE-Q Scores) Among Participants in RCTs, Participants Receiving Longer CBT-ED, and Participants Receiving CBT-T

	Pre-treatment *M* (*SD*)	*SDs* above norm
RCTs of CBT-ED		
de Jong et al. (2020)	4.10 (1.00)	2.06
Fairburn et al. (2009)	4.15 (0.97) [a]	2.10
	4.04 (0.88) [b]	2.02
Jenkins et al. (2021)	4.11 (1.14) [c]	2.07
	4.16 (1.13) [d]	2.11
Wade et al. (2021)	3.92 (1.09) [e]	1.34
	4.04 (1.08) [f]	2.02
Longer CBT-ED		
Allen et al. (2012)	4.10 (0.22)	2.06
Byrne et al. (2011)	3.96 (1.28)	1.95
Garte et al. (2015)	3.89 (1.10)	1.90
La Mela et al. (2013)	3.21 (NR)	1.35
Signorini et al. (2017)	4.03 (1.30)	2.01
Turner et al. (2015)	4.17 (1.29)	2.12
Watson et al. (2012)	4.05 (1.19)	2.02
CBT-T		
Birtwell et al. (2021)	4.50 (0.80)	2.38
Moore, Hinde et al. (2021)	3.28 (1.15)	1.41
Moore, Turner et al. (2021)	4.09 (0.94)	2.06
Pellizzer et al. (2019a)	3.81 (1.08)	1.83
Pellizzer et al. (2019b)	4.42 (0.97)	2.32
Waller et al. (2018)	4.11 (1.20)	2.07
Tatham et al. (2020)	4.44 (1.56)	2.34
Wade et al. (2021)	3.92 (1.09)	1.34
Rose et al. (2021)	3.81 (1.13)	1.83
Russell (2020)	4.17 (0.98)	2.12

Notes. M = mean; *SD* = standard deviation; NR = not reported; [a] = CBT-ED focused form; [b] = CBT-ED broad form; [c] = face-to-face guided self-help; [d] = email guided self-help; [e] = CBT-T; [f] = CBTm. The mean norm for non-clinical females = 1.52 (*SD* = 1.25; Mond et al., 2006).

Table 3

Results from the Meta-Analyses

Variable	N studies (N participants)	Pooled effect size Hedge's *g* (95% CI), *p*	Heterogeneity *Q, p,* I^2	Publication bias Egger's regression intercept (95% CI), *p*
Intent to Treat				
Eating disorder psychopathology	8 (504)	-1.49 (-1.68 to -1.31), <.001	12.43, .09, 43.67	-1.82 (-5.30 to 1.66), .25
Clinical impairment	5 (219)	-1.22 (-1.58 to -0.86), <.001	14.22, .01, 71.87	-3.64 (-12.68 to 5.39), .29
Depression	6 (310)	-0.82 (-0.96 to -0.69), <.001	6.34, .28, 21.09	1.68 (-8.88 to 5.51), .55
Anxiety	5 (270)	-0.51 (-0.67 to -0.36), <.001	6.64, .16, 39.76	-4.63 (-6.91 to -2.36), .01
Completer				
Eating disorder psychopathology	10 (346)	-1.69 (-1.86 to –1.52), <.001	8.02, .53, 0.00	-1.80 (-2.89 to -0.71), .01
Clinical impairment	5 (129)	-1.38 (-2.03 to -0.72), <.001	25.08, <.001, 84.05	-4.45 (-15.20 to 6.31), .28
Depression	7 (228)	-0.94 (-1.14 to –0.75), <.001	10.92, .09, 45.06	-2.69 (-9.14 to 3.76), .33
Anxiety	6 (202)	-0.72 (-0.92 to –0.52), <.001	11.82, .04, 57.69	-2.46 (-9.24 to 4.32), .37
Objective bingeing: weekly frequency	8 (306)	-1.20 (-1.43 to –0.97), <.001	11.73, .11, 40.30	1.19 (-3.64 to 6.01), .57
Vomiting: weekly frequency	7 (265)	-0.78 (-0.95 to –0.60), <.001	5.96, .43, 0.00	0.77 (-3.09 to 4.63), .63
Binary Outcomes (%)				
Dropout	10 (565)	39% (34 to 44), <.001	12.30, .20, 26.83	-0.31 (-3.54, 2.93), .83
Good outcome	10 (346)	65% (56 to 72), <.001	19.12, .02, 52.93	2.83 (0.32 to 5.34), .03

Table 4

Results from the CONSORT Quality Assessment for the Studies Included in the Meta-Analyses

Study	4a	4b	5	6a	7a	13a	13b	15	Quality Score
Birtwell et al. (2021)	N	Y	Y	Y	N	Y	Y	P	5
Moore, Hinde et al. (2021)	Y	P	Y	Y	Y	Y	P	Y	6 ✓
Moore, Turner et al. (2021)	Y	P	Y	Y	N	Y	P	P	4
Pellizzer et al. (2019a)	Y	Y	Y	Y	Y	Y	Y	Y	8 ✓
Pellizzer et al. (2019b)	Y	Y	Y	Y	N	Y	Y	Y	7 ✓
Rose et al. (2021)	Y	P	Y	Y	Y	P	P	Y	5
Russell (2020)	Y	P	Y	Y	N	Y	P	Y	5
Tatham et al. (2020)	Y	N	Y	Y	N	Y	Y	N	5
Wade et al. (2021)	Y	Y	Y	Y	Y	Y	Y	Y	8 ✓
Waller et al. (2018)	Y	P	Y	Y	N	Y	Y	Y	6 ✓

Notes. Y = conforming to CONSORT, N = not conforming to CONSORT, and P = partially conforming to CONSORT. ✓ = high quality and included in sensitivity analysis.

Figure 1

Prisma Flow Diagram

Figure 2

Forest Plot Showing the Within Groups Intent-to-Treat Effect Sizes for Global Eating Disorder Psychopathology from Pre- to Post-Treatment

Figure 3

Forest Plot Showing the Within Groups Intent-to-Treat Effect Sizes for Clinical Impairment from Pre- to Post-Treatment

Figure 4

Forest Plot Showing the Within Groups Intent-to-Treat Effect Sizes for Eating Disorder Psychopathology from Pre-Treatment to Follow-up