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Cognitive behavioral therapy versus compassion focused therapy for adult patients with eating disorders with and without childhood trauma: A randomized controlled trial in an intensive treatment setting

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ABSTRACT

Objective: Treatments for eating disorders are moderately effective, with cognitive behavior therapy (CBT) providing the strongest evidence. However, it remains important to investigate other interventions, particularly for eating disorders with greater complexity (e.g., substantial comorbidity; trauma history) or for patients who have not responded adequately to previous treatments.

Method: This randomized controlled trial compared CBT against compassion-focused therapy for eating disorders (CFT-E), where half of the sample had a childhood trauma history. The study was pre-registered and adequately powered. A total of 130 patients were randomly assigned to CBT or CFT-E and were assessed at pre-treatment, post-treatment and one-year follow-up. The primary outcome measure was the total score on the Eating Disorder Examination-Interview (EDE), and secondary outcome measures were the Symptom Checklist-90, Inventory of Interpersonal Problems–64 and Post-Traumatic Symptom Scale. Attrition during treatment was low (13%), suggesting good acceptability.

Results: Eating pathology (EDE scores) reduced substantially overall, with large effect sizes, and there were no differences between therapies. However, at follow-up, for patients with a childhood trauma history, CFT-E maintained benefits better than CBT. ***Conclusion***: While both CBT and CFT-E resulted in significant reductions in eating pathology, CFT-E showed superior maintenance of benefits for patients with a history of childhood trauma at one-year follow-up, underlining the necessity of tailored interventions for specific patient subgroups.

1. Introduction

At present, cognitive behavioral therapy (CBT) is the most established and empirically documented treatment for eating disorders (Hay et al., 2012; National Institute for Health and Care Excellence (NICE), 2017; Spielmans, 2014). CBT for eating disorders involves addressing behavioral changes (e.g., eating differently, reducing bingeing and purging), as well as addressing core beliefs and secondary cognitive compensatory beliefs related to control of eating, weight and shape (Waller et al., 2007). However, treatment efficacy remains moderate (Treasure, Duarte, & Schmidt, 2020), yielding remission rates ranging from 40% to 60% across the different eating disorders (Eddy et al., 2017; Linardon, 2018; Slade et al., 2018; Steinhausen, 2002; Steinhausen & Weber, 2009; Wilson et al., 2007; Zipfel et al., 2015). It has been suggested that poorer treatment outcomes and higher attrition and relapse rates are likely in those patients who have experienced childhood sexual abuse or exposure to violent acts at an early age (Mahon et al., 2001; Rodriguez et al., 2005; Vrabel et al., 2010). Considering this risk, there is a need to test treatments tailored for individuals with eating disorders and trauma histories. To date, however, no treatment approaches for this population have been empirically tested, highlighting the necessity to develop and test treatments for this specific group of patients.

Trauma is commonly associated with self-criticism (Irons & Gilbert, 2005; Lee et al., 2001). As increased self-compassion and decreased

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self-criticism have been found to be particularly beneficial in reducing psychological distress and improving well-being (Gilbert, 2007; Hoffart et al., 2015; Lutz et al., 2004; Turk & Waller, 2020), they should be considered as targets for therapy in such cases. However, people with an eating disorder often find self-compassion difficult (Barrow, 2007), and are fearful of receiving compassion from others or from themselves (Braun et al., 2016). Such fears of self-compassion are associated with more severe eating pathology and poorer treatment outcomes (Geller et al., 2019; Kelly et al., 2013).

Kirby (2017) reported that six empirically validated approaches to develop compassion have been identified. The majority of these focus on self-compassion. However, compassion-focused therapy for eating disorders (CFT-E) (Goss & Allan, 2014) was developed to address fears, blocks, and resistances to compassion to and from others, as well as self-compassion, specifically for an eating-disordered population. While standard CFT focuses on fostering compassion and alleviating emotional difficulties more broadly, this specialized approach includes interventions and techniques designed to address the complex interplay of factors characterizing eating disorders, including distorted body image, unhealthy eating behaviors, and self-criticism related to body weight and shape. Consequently, CFT-E integrates compassion-focused strategies with specific eating disorder treatments, making it distinctive in its targeted and nuanced approach to addressing this particular mental health condition. The integrated model, designed to optimize therapeutic effectiveness, serves as the focus of the present study. Recent research in this domain has demonstrated promising outcomes, revealing reduced eating disorder symptoms and improved subjective well-being in individuals undergoing this integrated approach (Gale et al., 2014; Kelly et al., 2017; Turk & Waller, 2020).

Gale et al. (2014) conducted a clinical audit involving 99 patients seeking treatment for eating disorders at a specialized service in the UK. The intervention incorporated CFT into the standard CBT group-based treatment. The results highlighted significant improvements in eating disorder symptomology, especially for patients with bulimia nervosa and other specified feeding or eating disorders.

Kelly et al. (2017) aimed to evaluate the feasibility and acceptability of a group-based CFT as an adjunct to evidence-based outpatient treatment for eating disorders. They also examined its initial efficacy compared to treatment as usual (TAU). The study included twenty-two outpatients with various types of eating disorders who were randomly assigned to either 12 weeks of TAU (n = 11) or TAU in addition to weekly CFT groups tailored for an eating disorder population (CFT + TAU; n = 11). The findings revealed strong acceptability of the CFT group, with high attendance and retention rates of over 80% of participants. Participants provided positive feedback and expressed a high likelihood of recommending the group to others with similar symptoms. Intention-to-treat analyses indicated that, compared to the TAU condition, the CFT + TAU condition led to greater improvements in self-compassion and fears related to self-compassion. In a case series by Williams et al. (2017), individual CFT-E was administered to eight adults with subthreshold and threshold bulimia nervosa, resulting in significant improvements in eating psychopathology. For a comprehensive review, please see Turk and Waller (2020). However, it is worth noting that CFT-E has not been evaluated in a randomized controlled trial design.

The primary objective of the present randomized controlled trial was to compare the effects of CBT and CFT-E on eating disorder patients with and without a history of childhood trauma. We hypothesized that CFT-E would demonstrate heightened efficacy in the treatment of individuals with eating disorders and a history of trauma, surpassing the effectiveness of established approaches (in this case, CBT). Moreover, considering CBT's well-established and empirically supported status in treating eating disorders, we were interested in exploring its potential effects across all patients, regardless of trauma history. For this comparison, the literature so far leads to no clear hypothesis. This investigation was carried out within the context of an intensive inpatient treatment facility.

2. Method

2.1. Ethical clearance and pre-registration

The study was pre-registered at ClinicalTrials.gov (NCT02649114). The study was approved by the Norwegian regional ethical committee (REC:2014/836). Patients gave informed consent to take part in the study. In agreement with the information given to the participants, we are prevented from submitting data to a public repository. In line with the ethical approval, videotapes, paper versions of the present and previous interviews, and the quantitative data are all securely stored in appropriate storage facilities. An anonymized version of the dataset can be obtained from the corresponding author upon request and in accordance with national legislation.

2.2. Design

The study employed a randomized controlled design. A transdiagnostic group of patients with eating disorders, with or without a childhood trauma history (two levels) were randomly allocated to either CBT or CFT-E (two levels). Before admission, all patients had received treatment in their local community and had not responded to that previous treatment. Patients in both CBT and CFT-E were assessed at intake before treatment, pre-treatment, at the end of treatment, and after one-year follow-up. At intake before treatment, the patients were assessed by trained therapists who confirmed the presence of an eating disorder using a diagnostic interview (Eating Disorder Examination-Interview - EDE), the presence or absence of childhood trauma (Childhood Trauma Questionnaire) and a diagnostic interview measuring other symptom disorders (Mini International Neuropsychiatric Interview -MINI) before randomization. A formal assessment including the EDE was conducted at the start of treatment, end of treatment and after one-year follow-up. Assessors were blind to treatment conditions. An intention to treat (ITT) approach was used to analyze the data.

Randomization was meticulously executed subsequent to the comprehensive diagnostic assessment and baseline measurements. An external researcher, independent of the study and blinded to the participant's backgrounds, conducted the random assignment procedure. The randomization was conducted four – six weeks before the start of treatment to allow the patients ample time logistical preparations and arrangement plan travel and prepare for the treatment. To ensure a balanced allocation, a blocked randomization procedure was employed guaranteeing a nearly equal distribution of patients into each condition. This entailed that for every patient in both the trauma and non-trauma groups, one was randomly assigned to either CBT or CFT-E, while the other was allocated to the alternative condition. The allocation probability that any patient would be allocated to either of the two conditions was kept constant at 0.5, and no measures were taken to correct for any imbalance in sample size between the conditions due to dropouts or discontinued treatments. Concealment of group allocation was diligently maintained throughout the study. Prior to the randomization process, neither the patients nor the research team were aware of the condition to which a patient would be assigned. This was achieved by withholding information about treatment condition allocation until the actual randomization occurred. Those administering the EDE assessments were also blinded to the treatment assignments.

2.3. Setting

Patients were referred to treatment at the Department of Eating Disorders at Modum Bad Psychiatric Centre in Norway. The unit runs an inpatient program for patients with eating disorders who have a history of failing to respond to treatment in their local community. Patients are admitted to the unit in cohorts of eight for each treatment group, leading

to a presence of 16 patients at any given time on the unit. For the patients in this sample, the beginning of treatment occurred between winter of 2015 to the autumn of 2018, and one-year follow up was finished in the spring of 2020.

2.4. Sample size analyses

We aimed for a minimum power of .80, following Cohen's (1988) suggestion, and used G*Power (Erdfelder et al., 1996) to estimate sample sizes. For a medium effect size (Cohen's $d = 0.5$) at an alpha level of 0.05, we determined the required sample sizes for three common tests: differences between means from two independent samples (n = 64 in each condition), differences between two correlated means in one sample (e.g., prescore-postscore, n = 34), and differences between mean differences from two independent samples (n = 64 in each sample). We employed ANCOVA, a conservative method for power calculation, with pre-treatment values as covariates. Assuming no treatment x pre-treatment interaction, the estimated required sample size was 62 patients per treatment condition.

The design included a dichotomous 'trauma' condition. The model formulation for the treatment × trauma interaction required a sample size of 64 patients per treatment condition to achieve the desired power. To ensure sufficient power for both core analyses in the intent-to-treat sample, a minimum of 128 patients were required. With 130 patients starting treatment, the study achieved adequate power.

2.5. Patients

To be eligible for participation in the study, patients had to meet criteria for a DSM-IV or DSM-5 eating disorder. However, patients with binge eating disorder were not included in the study since the Norwegian clinical guidelines do not recommend admission for these patients. In that sense, recruitment was designed to be liberal, using the clinical criteria for treatment used at the department. The EDE (version 12; Fairburn and Cooper (1993) and version 17; Fairburn et al. (2008)) and the MINI (Sheehan et al., 1998) were used to establish diagnosis. Inclusion criteria also included that the patient had to: (a) have failed to benefit from at least one structured psychological treatment, (b) be 18 years or older, (c) be able to speak Norwegian, and (d) be able to provide informed consent. Patients were excluded if they had: (a) a current DSM-IV diagnosis of physical disorders (brain injury, neurological conditions, or medical illness that affects brain function representing a contraindicated state for psychotherapy), (b) clear and current suicidal risk, (c) evidence of current substance abuse that might disrupt the treatment or (d) ongoing trauma (e.g., current involvement in an abusive relationship).

Patients who were included in the trial (N = 137) were randomized to treatment stratified by trauma. After the diagnostic interviews at pre-treatment, seven patients were deemed ineligible, five in CBT (three fulfilled the exclusion criteria of current substance abuse, and two did not fulfill the inclusion criteria of having an eating disorder) and two in CFT-E (one fulfilled the exclusion criteria of current suicidal risk, and one did not fulfill the inclusion criteria of having an eating disorder). The remaining 130 patients started treatment (n = 65 CBT, n = 65 CFT-E) and were included in the final analyzes. Hence, the initial cohort of 130 patients enrolled in the study fulfilled the pre-determined calculated sample size (N = 128), as elucidated above (sample size analyses).

Of the patients starting treatment, 16 did not complete the treatment program. Thus, 114 completed treatments (n = 59 in CBT, n = 55 in CFT-E), though all patients beginning treatment were included in the ITT analyzes. The sample characteristics are outlined in Table 1, and Fig. 1 shows the CONSORT diagram of all patients from recruitment onwards.

The 130 patients had on average 2.1 ($SD = 1.5$) diagnoses in addition to the primary eating disorder diagnosis at the start of treatment, with 89.2% having at least one comorbid disorder. Only 27 patients (21%) were working either part-time or full-time when entering treatment (see Tables 1 and 2). The fact that only a few patients were working regularly, in combination with the long duration of the eating disorder, indicates a sample a sample of individuals with substantial mental health challenges.

Table 1
Sample and group characteristics at pre-treatment.

Characteristic	Total (N = 130)	CFT-E (n = 65)	CBT (n = 65)	Statistics
Age, years ($M \pm SD$)	30.9 (9.7)	32.6 (10.9)	29.0 (7.6)	2.0[a]
Duration of illness, years ($M \pm SD$)	14.2 (8.9)	15.6 (9.6)	12.9 (8.1)	1.5[a]
Treatment				
Duration of treatment, years ($M \pm SD$)	5.6 (5.1)	7.2 (6.0)	4.5 (3.8)	2.9**[a]
Previous inpatient treatment n (%)	76 (58.5)	33 (50.8)	43 (66.2)	3.1[b]
Occupational status				
Disabled n (%)	54 (41.5)	38 (46.2)	24 (36.9)	1.14[b]
Unemployed n (%)	3 (2.3)	3 (4.6)	0 (0)	0.00[b]
Sick leave n (%)	30 (23.1)	15 (23.1)	15 (23.1)	0.00[b]
Employed n (%)	27 (20.8)	10 (15.4)	17 (26.2)	1.11[b]
Student n (%)	16 (12.3)	7 (10.8)	9 (13.8)	0.29[b]
Educational status				
Primary school n (%)	13 (10.0)	7 (10.8)	6 (9.2)	0.09[b]
High school n (%)	50 (38.5)	21 (32.2)	29 (44.6)	2.08[b]
Higher education (<4 years) n (%)	26 (20.0)	13 (20.0)	13 (20.0)	0.00[b]
Higher education (>4 years) n (%)	16 (12.3)	9 (13.8)	7 (10.8)	0.29[b]
Self-mutilation *n* (%)	57 (43.8)	27 (41.5)	30 (46.2)	0.8[b]
Eating disorder diagnosis				
Bulimia nervosa n (%)	51 (39.2)	21 (32.3)	30 (46.2)	2.61[b]
Anorexia nervosa n (%)	33 (25.4)	18 (27.7)	15 (23.1)	0.37[b]
Other specified eating disorder n (%)	46 (35.4)	26 (40.0)	20 (30.8	1.21[b]
Eating disorder symptoms				
BMI ($M \pm SD$)	21.5 (5.5)	20.9 (5.4)	22.2 (5.7)	1.2[a]
EDE ($M \pm SD$)	4.6 (1.2)	4.4 (1.3)	4.4 (1.1)	0.1[a]
Binging *n* (%)	70 (54.3)	32 (49.2)	38 (58.5)	1.4[b]
Vomiting *n* (%)	78 (60.5)	35 (53.8)	43 (66.2)	3.6[b]
Use of laxatives *n* (%)	25 (19.2)	12 (18.5)	13 (20.0)	0.1[b]

Note. CFT-E = compassion focused therapy; CBT = cognitive behavioral therapy; BMI = body mass index; M = mean; SD = standard deviation.
*p < .05. **p < .001. ***p < .0001.
[a] t-value.
[b] Chi-squared.

2.6. Treatments

Both treatments contained small groups and individual therapy, delivered in an inpatient setting for 13 consecutive weeks. The treatment was closed, such that each intake of eight patients started and ended treatment at the same time and the groups were not open to new patients if others ended treatment. Each patient participated in six group therapy sessions (90 min each) per week, along with three 55-min individual therapy sessions per week. Of these, two sessions were with their designated individual therapist and one session involved a nurse with specialized training in psychiatry. The group and individual sessions were based on CBT or CFT-E, according to condition. In addition to the model-specific therapy, each patient participated in group physical activity (90 min per week) and a community group meeting (60 min per week). The patients in the study were requested not to talk about the treatment outside the therapy-room and instead focus on other aspects of the inpatient setting.

2.6.1. Common content of the two therapies

Both conditions had a focus on the working alliance, in which therapist and the patient collaborated to overcome the eating disorder.

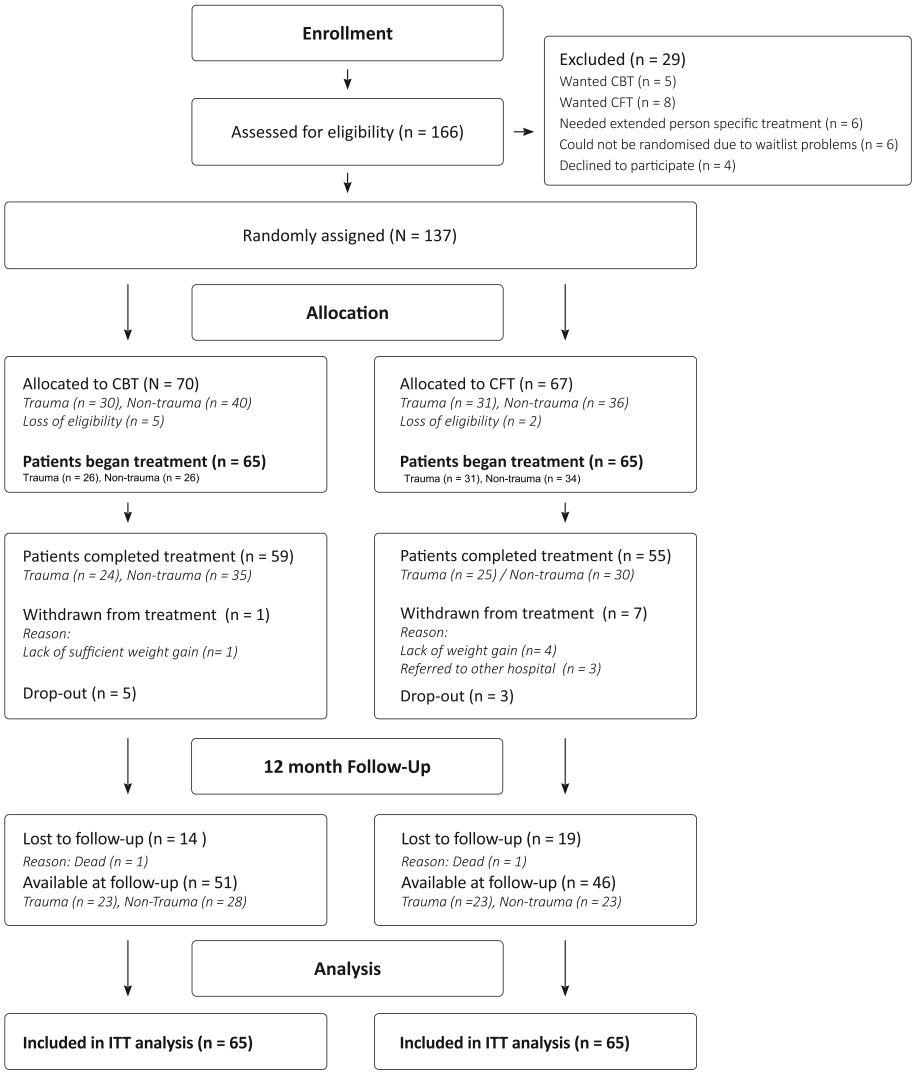

Fig. 1.

Underweight patients were encouraged to regain and maintain weight. Both groups were encouraged to replace dysfunctional eating patterns with normal eating habits and to develop strategies for resisting bingeing and purging. The patients had to eat sufficient food to meet the body's demands for energy. Ongoing self-monitoring and the accomplishment of planned homework assignments at the hospital were stressed in order to achieve and maintain the change.

2.6.2. *Cognitive behavioral therapy*

The version of CBT used was adapted from Waller et al.'s (2007) manual. It used the same procedures and strategies but was delivered more intensively in group and individual formats (see above). It was primarily concerned with the processes that maintain the patients' eating disorder psychopathology, using cognitive, behavioral, and psychoeducational strategies. The specific eating disorder diagnosis was not of relevance to the treatment. Rather, the content was dictated by the individual's problems and the processes that appeared to be maintaining them, as defined by the case formulation (built with patients at the beginning of the treatment but revised during the treatment if necessary). If the patients had trauma symptoms that maintained their eating disorder, imaginal exposure and/or imagery rescripting were used. The treatment was designed to reduce eating disorder symptoms and enhance control over life.

2.6.3. *Compassion focused therapy*

The CFT-E used in this trial was an adaptation of outpatient CFT-E for eating disorders, developed by Goss and colleagues (Gale et al., 2014; Goss & Allan, 2014). Again, its procedures and strategies were the same as the outpatient version but at a more intensive level. CFT-E involves a structured approach to help patients gain control of their chaotic eating patterns, trauma symptoms (for patients with a history of trauma), and the processes that underlie them. It develops a self-compassionate approach in the patient, helping them to manage the physical and emotional demands of following a structured eating program and helping to reduce shame (particularly body shame).

Compassionate mind training was a central part of the program and had two main aims. The first was to help patients develop their soothing system and use this to regulate other motivational systems and affective states (e.g., fear, anger, or disgust). The second was to help patients develop a compassionate motivational system and develop their capacities for giving compassion to others, receiving compassion from others, and self-compassion. It was especially focused on helping the patients imagine a future in which they can be motivated by compassion and no longer need their eating disorder. It also helped to identify and work with blocks to feeling safe and experiencing compassion from others and compassion for the self. Within the CFT-E treatment program, there was a specific target of managing eating disorder symptoms, the issues that trigger them, and the functions they serve (e.g., exploring

Table 2
Number of diagnoses, trauma categories and trauma severity.

Diagnosis	Total (N = 130)	CFT-E (n = 65)	CBT (n = 65)	Statistics
Number of diagnoses	2.1 (1.6)	2.1 (1.5)	2.1 (1.6)	0.00[b]
PTSD n (%)	36 (28.1)	22 (34.4)	14 (21.9)	2.47[a]
Panic disorder n (%)	29 (22.7)	14 (21.9)	15 (23.4)	0.05[a]
Agoraphobia n (%)	23 (18.0)	9 (14.1)	14 (21.9)	1.33[a]
Social phobia n (%)	34 (26.2)	15 (23.4)	19 (29.7)	0.64[a]
Affective disorder n (%)	90 (70.3)	44 (68.8)	46 (71.9)	0.15[a]
Obsessive compulsive disorder n (%)	20 (15.4)	10 (15.6)	10 (15.6)	0.00[a]
Abuse disorder n (%)	14 (11.0)	5 (7.9)	9 (14.1)	1.22[a]
CTQ				
Sexual abuse n (%)	25 (19.2)	15 (23.1)	10 (15.4)	1.24[a]
Emotional abuse n (%)	43 (33.1)	28 (43.1)	15 (23.1)	7.62**[a]
Emotional neglect n (%)	83 (63.8)	40 (61.5)	43 (66.2)	0.30[a]
Physical abuse n (%)	15 (11.5)	10 (15.4)	5 (7.7)	1.88[a]
Physical neglect n (%)	108 (83.1)	53 (81.5)	55 (84.6)	0.22[a]
Sexual abuse (*M* ± *SD*)	7.5 (5.8)	8.5 (7.2)	6.5 (4.0)	1.79[b]
Emotional abuse (*M* ± *SD*)	10.0 (5.5)	11.1 (5.6)	9.0 (5.4)	2.02*[b]
Emotional neglect (*M* ± *SD*)	18.3 (5.8)	17.4 (5.4)	19.2 (6.0)	−1.6[b]
Physical abuse (*M* ± *SD*)	6.3 (3.1)	6.6 (2.9)	6.1 (3.3)	0.81[b]
Physical neglect (*M* ± *SD*)	12.3 (2.0)	12.4 (2.3)	12.1 (1.6)	0.89[b]

Note. CFT-E = compassion focused therapy; CBT = cognitive behavioral therapy; PTSD = post traumatic stress disorder; CTQ = childhood traumatic questionnaire; M = mean; SD = standard deviation.
*p < .05. **p < .001. ***p < .0001.
[a] Chi-square.
[b] *t*-test.

questions such as "How would a compassionate person help you to eat?" or "What compassionate things could you do or say to help you eat breakfast?"). The aims were to develop coping thoughts and responses that were "felt" to be helpful, to enable patients to let go of eating disorder behavior that had come to feel like a "safe" way of managing difficult emotions or experiences, and to develop more "self-caring" behavior in everyday life.

In cases with complex trauma, CFT-E was used to develop capacities for addressing shame, self-disgust, and self-criticism, which have been identified as factors that limit the effectiveness exposure-based approaches to trauma. It was used to build capacities for affect regulation, soothing system enhancement, developing a more compassionate relationship with the self, and the ability to tolerate compassion from others (including therapists). Techniques such as chair work and compassionate letter writing were used to help patients change their relationship with traumatic experiences. This work was incorporated with cognitive restructuring and imagery rescripting to address traumatic memories or themes (Irons & Lad, 2017; Lee, 2012).

2.6.4. Therapists and supervision

A total of nine clinical psychologists and one psychiatrist served as CBT therapists, and six clinical psychologists and three psychiatrists served as CFT-E therapists. Each therapist treated several patients (range = 3–16). The two groups had similar levels of clinical experience (CBT mean = 8.7 years, *SD* = 3.7; CFT-E mean = 9.2 years, *SD* = 5.6). Training workshops in CBT and CFT-E were run for the team by second (GW) and third author (KG), respectively. Throughout the study period, all the individual sessions were videotaped, and GW and KG provided 90-min supervision sessions biweekly to both the nurses and individual therapists to ensure therapy fidelity.

2.7. Measures

The following measures were used.

2.7.1. Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998)

The MINI is a short structured diagnostic interview, compatible with international diagnostic criteria, including the International Classification of Diseases (ICD-10) and the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). The MINI was used to assess present psychosis, depression, suicidal risk and abuse of alcohol, medicine and/or narcotics.

2.7.2. Eating Disorder Examination – Interview (EDE) (Fairburn & Cooper, 1993; Fairburn et al., 2008)

The EDE was the primary outcome variable. EDE changes were assessed dimensionally using the scores in the global scale.

The authorized Norwegian version of the EDE was used both to obtain eating disorder diagnoses for inclusion and as a treatment outcome measure at discharge and 12-months follow-up. The EDE assesses the frequency of different forms of overeating, including objective bulimic episodes (i.e., binge eating defined as unusually large quantities of food with a subjective sense of loss of control), and different forms of inappropriate weight compensatory behaviors. The EDE also consists of four subscales: restraint (e.g., "Over the past four weeks have you wanted your stomach to be empty?"), shape concern (e.g., "Over the past four weeks, have you been dissatisfied with your overall shape?"), weight concern (e.g., "Over the past four weeks, have you been dissatisfied with your weight?"), and eating concern (e.g., "Over the past four weeks, have you spent much time between meals thinking about food, eating, or calories?"). A mean value is calculated on a 0–6 point scale, with higher scores reflecting greater severity or frequency. The global score in the EDE is calculated by aggregating scores across the various domains assessed, providing an overall evaluation of eating disorder psychopathology. Both version 12 and 17 were used since a validated Norwegian version of the EDE-I was launched during the project period (2016) (Fairburn et al., 2008). The interviews were performed by four trained interviewers. The Cronbach's alpha coefficients for EDE for this study at start of treatment, end of treatment, and one-year follow-up were 0.85, 0.92 and 0.87, respectively.

2.7.3. Childhood Trauma Questionnaire (CTQ) (Bernstein et al., 2003)

The CTQ was used to assess childhood trauma. To increase validity and ensure that potential negative reactions were handled in accordance with ethical standards, the CTQ was administered as an interview. This measure consists of 28 questions covering childhood maltreatment in five areas: emotional abuse (e.g., "I felt that someone in my family hated me"), emotional neglect (e.g., "There was someone in my family who helped me feel important or special", reversed), sexual abuse (e.g., "Someone tried to make me do sexual things or watch sexual things"), physical abuse (e.g., "I got hit so hard by someone in my family that it left me with bruises or marks") and physical neglect (e.g., "I didn't have enough to eat"). Scores on each subscale range from 5 to 25, after reverse coding of some items. Items can be summed to obtain a total CTQ score. Patients respond to each item using a five-point Likert scale, where they indicate the frequency or severity of their experiences, ranging from "never true" to "very often true". The Norwegian translation has good reliability and satisfactory accuracy (Dovran et al., 2013). We also used this instrument as a categorical measure to identify possible cases of trauma and to differentiate between no-trauma/trauma. This classification used scoring options recommended by Walker et al. (1999), based on receiver operating characteristic method that provided very good to excellent. sensitivity and specificity (≥0.85) for each of the five subscales. Patients were categorized in the trauma group if they achieved a score of ≥8 on the sexual abuse, physical abuse, or physical neglect subscale, or a score of ≥10 on the emotional abuse subscale, or ≥15 on the emotional neglect subscale. Cronbach's alpha coefficient for the total CTQ score at the start of treatment was 0.61. Alpha for the subscales was 0.88 for emotional neglect, 0.88 for emotional abuse, 0.73 for sexual abuse, and 0.84 for

physical abuse. However, it was −0.16 for physical neglect, which is comparable with Grassi-Oliveira et al. (2014), who reported that physical neglect items load on other factors depending on the population under study.

2.7.4. PTSD symptom scale-self-rating (PSS-SR) (Foa et al., 1993)

The PSS-SR was used to measure trauma symptoms. It contains 17 items assessing the severity of PTSD symptoms, as described in DSM-IV. The PSS-SR has good psychometric properties (Foa et al., 1993). Cronbach's alpha coefficients for PSS-SR in this study at the start of treatment, at the end of treatment, and at one-year follow-up were 0.95, 0.96 and 0.96, respectively.

2.7.5. The symptom Checklist-90 (SCL-90) (Derogatis, 1983)

The SCL-90 is an extensively utilized instrument for assessing various dimensions of psychological distress. It consists of 90 items. Each item is designed to capture a specific symptom issue (e.g. "How much were you bothered by nervousness or shakiness inside?") and is rated on a five-point Likert scale, ranging from 0 ("not at all") to 4 ("extremely"). The aggregate of the items yields a score indicative of overall distress known as the Global Severity Index (GSI), a key metric employed in this study. The SCL-90 has good psychometric properties (Schmitz et al., 2000). Cronbach's alpha coefficients for SCL-90 for this study at the start of treatment, at the end of treatment, and at one-year follow-up were 0.97, 0.98 and 0.98, respectively.

2.7.6. The Inventory of Interpersonal problems-64-circumplex (IIP 64-C) (Horowitz et al., 1988)

The IIP 64-C is a self-report measure consisting of 64 items, designed to measure interpersonal issues. The IIP 64-C consists of two types of items. The first 39 begin with the phrase: "It is hard for me to ….". The remaining 25 represent "things that you do too much." Each item describes a specific interpersonal difficulty and is rated on a five-point Likert scale, ranging from 0 ("not at all") to 4 ("extremely") to rate the extent to which they experience each problem. The aggregate of these items provides an assessment of the severity of interpersonal problems. The IIP 64-C has good psychometric properties (Horowitz et al., 1988). Cronbach's alpha coefficients for the IIP 64-C for this study at start of treatment, at the end of treatment and at one-year follow-up were 0.95, 0.96 and 0.96, respectively.

2.8. Data analyses

SPSS version 25.0, 26.0 and 27.0 were used. The data from all patients who started treatment were analyzed. Chi squared tests and t-tests (two-tailed) were conducted to check for differences at pre-treatment. Treatment differences were analyzed using Multilevel modeling (MLM) (Raudenbush & Bryk, 2002). In MLM all available data are used. Thus, a research participant with only baseline data can be included in an analyzes and contribute to the estimation of model parameters (Kwok et al., 2008). The models were built by starting with a model with only fixed intercept and no random effects. Random intercepts and random time were then added if they significantly increased model fit. The data was modelled for heteroscedastic residual variance over time. A diagonal covariance structure of the residuals gave the best model fit for EDE, IIP-64-C and PSS-SR. The AR1 covariance structure gave the best fit for the residuals for SCL-90. Maximum likelihood (ML) was used as the estimation method (Fitzmaurice, Laird, & Ware, 2012). All models were tested for model fit using log likelihood tests, and the most parsimonious model was selected. The MCAR (Missing Completely at Random) test (Little, 1988) was not significant on the main outcome measure of the EDE ($\chi 2 = 5.8$, $p = .445$) or the other measures, indicating that the data can be considered to be missing at random. Effect sizes for the primary outcome (EDE total) and secondary outcome measures (SCL-90, IIP and PSS-SR) were classified as per Cohen (1988), with 0.8 = large, 0.5 = medium, and 0.2 = small.

3. Results

3.1. Patient characteristics

The sample analyzed included 130 patients, of whom 127 were Norwegians (Caucasian), one was African, and two were Latino-Americans. Their mean age was 30.9 ($SD = 9.7$), mean duration of illness was 14.2 years ($SD = 8.9$), 127 (97.7%) were female and three (2.3%) were male. Half (n = 65; 50%) lived alone. Only 16 (12.3%) had a university degree, while the most common education level was high school only (n = 50; 38.5%).

Table 1 gives an overview of the characteristics of the patients at pre-treatment. It is important to highlight that the EDE Global scores within this group were higher than in other studies (e.g., Fairburn et al., 2015), indicating the severity of these patients' eating disorder psychopathology. The two groups of patients did not differ on key variables at pre-treatment, except for duration of previous treatment, which was higher in the CFT-E group ($t = 2.9$, $p = .03$). Further, no significant pre-treatment differences between conditions emerged on the outcome variables ($p > .05$). Levels of pre-treatment comorbidity and trauma history were on average mostly similar across groups, though Table 2 shows that the CFT-E group had a higher level of emotional abuse, defined both dimensionally and categorically.

3.2. Treatment completion

Fig. 1 shows that of the 130 patients entering treatment, five dropped out of CBT and one was withdrawn from treatment due to lack of sufficient weight gain, while three dropped out of CFT-E and seven were withdrawn from treatment (four due to lack of weight gain and three were referred to a somatic hospital). Drop-out rate in the two conditions did not significantly differ ($p = .424$; Fisher's exact test). In total, 114 patients (CBT, n = 59; CFT-E, n = 55) completed the post-treatment assessment.

3.3. Impact of trauma status on treatment outcomes

3.3.1. Preliminary analyses

The means and standard deviations for patients in the two treatments and in the two trauma conditions over time are reported in Table 3 (EDE) and Table 4 (self-report measures). These preliminary analyses indicate that both therapies were effective for both the trauma and non-trauma groups. There were large treatment effect sizes for the primary outcome variable ($d > 0.8$ in all conditions), although the impact on EDE scores was better retained in the trauma group following CFT-E, as the CBT group has a small reduction in effect between end of treatment and one-year follow-up.

3.3.2. Multi-level modelling for primary outcome (EDE score)

The results of MLMs showed that the overall main effect of time on EDE was significant ($b = −0.90$, $sd = 0.08$, $p \leq .001$), showing that the interventions had an effect over time regardless of treatment condition and trauma status (Table 5, model 1). There was no difference between the patients with a trauma history and those without (regardless of time point or treatment condition) ($b = −0.16$, $sd = 0.16$, $p = .313$) (Table 5, model 2) or between treatment conditions (regardless of trauma status or time point) ($b = 0.02$, $sd = 0.16$, $p = .891$) (Table 5, model 2).

Finally, there was an interaction between time, trauma, and condition on EDE scores ($b = −0.44$, $SE = 0.22$, $p = .04$) (Table 5. Model 3[)].

To examine the sources of the observed three-way interaction, we conducted separate analyses for the pre-to post-treatment and post-treatment to follow-up periods. The results indicated a significant interaction during the follow-up period ($b = 0.47$, $SE = 0.19$, $p = .02$). Specifically, the direction of the interaction coefficient revealed that CFT-E had a more substantial impact on EDE scores than CBT among patients with a trauma history in this timeframe. To clarify the effect

Table 3
Mean, standard deviation and effect sizes from pre-to post-treatment and 1-year follow-up (1YFW) on the primary outcome measure (Eating Disorder Examination-Interview).

Condition and trauma-group	Pre M (*SD*)	Post *M* (*SD*)	1YFW M (*SD*)	*t*-value pre-post	*d* pre-post[a]	*t*-value post-1YFW	*d* post-1YFW[a]
CBT (n = 65)	4.4 (1.1)	2.9 (1.5)	3.2 (1.7)	9.7***	1.1 CI [0.7–1.5]	−1.5	−0.2 CI [-0.2 – 0.5]
CFT-E [a]n = 65)	4.4 (1.3)	3.0 (1.5)	3.0 (1.7)	8.9***	1.0 CI [0.6–1.4]	0.2	0.0 CI [-0.4 – 0.4]
CBT trauma (n = 24)	4.7 (1.0)	2.7 (1.8)	3.6 (1.7)	6.6***	1.4 CI [0.7–1.6]	−2.2*	−0.5 CI [0.1–1.0]
CBT non-trauma (n = 35)	4.2 (1.1)	3.0 (1.3)	2.8 (1.6)	7.8***	1.0 CI [0.4–1.6]	0.5	0.1 CI [-0.4 – 0.7]
CFT-E trauma (n = 34)	4.1 (1.3)	2.6 (1.4)	2.7 (1.5)	6.4***	1.1 CI [0.5–1.7]	−0.2	−0.1 CI [-0.6 – 0.5]
CFT-E non-trauma (n = 31)	4.6 (1.1)	3.3 (1.6)	3.3 (1.6)	6.2***	0.9 CI [0.4–1.5]	0.4	0.0 CI [-0.5 – 0.5]

Note. 95% Confidence interval given in brackets. CBT = cognitive behavioral therapy; CFT-E = compassion focused therapy; M = mean; SD = standard deviation.
*p < .05. **p < .001. ***p < .0001.
[a] Cohen's $d = M1 - M2/SD_{pooled}$.

Table 4
Mean, standard deviation and effect sizes from pre-to post-treatment and 1-year follow-up ([a]YFW) on the secondary outcome measures.

Condition and trauma-group	n	Pre *M* (*SD*)	n	Post *M* (*SD*)	n	1YFW M (*SD*)	*t*-value pre-post	*d* pre-post[a]	*t*-value post-1YFW	*d* post-1YFW[a]
SCL-90										
CBT	65	1.5 (0.6)	59	1.0 (0.6)	51	1.1 (0.7)	7.9***	0.8 CI [0.4–1.2]	−1.3	0.0 CI [-0.4 – 0.4]
CFT-E	65	1.6 (0.7)	55	1.3 (0.7)	46	1.3 (0.6)	3.7**	0.4 CI [0.1–0.8]	0.6	0.0 CI [-0.4 – 0.4]
CBT trauma	26	1.6 (0.5)	24	1.0 (0.6)	23	1.3 (0.5)	4.9***	1.1 CI [0.5–1.6]	−1.7	0.5 CI [0.0–1.1]
CBT non-trauma	39	1.4 (0.7)	35	1.0 (0.6)	28	1.0 (0.7)	6.5***	0.6 CI [0.0–1.1]	0.2	0.0 CI [-0.5 – 0.5]
CFT-E trauma	34	1.7 (0.5)	25	1.3 (0.7)	23	1.5 (0.7)	4.0**	0.7 CI [0.1–1.2]	−0.2	0.3 CI [-0.8 – 0.3]
CFT-E non-trauma	31	1.5 (0.8)	30	1.3 (0.7)	23	1.1 (0.6)	1.7	0.3 CI [-0.8 – 0.3]	0.5	0.3 CI [0.2–0.8]
IIP										
CBT	65	1.5 (0.6)	59	1.3 (0.6)	51	1.2 (0.6)	3.3**	0.3 CI [0.1–0.5]	0.8	0.2 CI [0.1–0.5]
CFT-E	65	1.6 (0.5)	55	1.5 (0.6)	46	1.5 (0.6)	1.9	0.2 CI [0.0–0.4]	0.7	0.0 CI [-0.3 – 0.3]
CBT trauma	26	1.6 (0.5)	24	1.3 (0.5)	23	1.4 (0.6)	2.9**	0.5 CI [0.2–0.9]	−0.2	0.2 CI [0.2–0.6]
CBT non-trauma	39	1.4 (0.7)	35	1.2 (0.6)	28	1.1 (0.7)	1.8	0.3 CI [-0.7 – 0.1]	1.5	0.2 CI [0.2–0.5]
CFT-E trauma	34	1.6 (0.5)	25	1.4 (0.6)	23	1.7 (0.6)	2.1*	0.4 CI [0.1–0.6]	−1.4	0.5 CI [0.1–0.9]
CFT-E non-trauma	31	1.6 (0.6)	30	1.6 (0.6)	23	1.4 (0.5)	0.6	0.0 CI [-0.6 – 0.4]	1.3	0.4 CI [0.0–0.7]
PSS-SR										
CBT	65	14.8 (14.3)	59	12.8 (13.8)	51	14.0 (14.0)	1.3	0.1 CI [0.1–0.3]	−0.6	0.1 CI [0.2–0.4]
CFT-E	65	18.6 (13.3)	55	15.6 (13.7)	46	15.6 (15.2)	2.5**	0.2 CI [0.0–0.4]	0.6	0.0 CI [-0.2 – 0.2]
CBT trauma	26	21.5 (14.0)	24	18.8 (13.3)	23	22.6 (11.4)	1.0	0.2 CI [0.1–0.5]	−1.6	0.3 CI [0.1–0.8]
CBT non-trauma	39	9.3 (12.0)	35	7.6 (12.1)	28	6.2 (10.0)	0.9	0.1 CI [-0.3 – 0.1]	1.4	0.1 CI [-0.3 – 0.1]
CFT-E trauma	34	21.5 (14.0)	25	18.8 (13.3)	23	22.6 (11.4)	1.0	0.2 CI [0.1–0.4]	−1.6	0.3 CI [0.1–0.7]
CFT-E non-trauma	31	11.9 (12.2)	30	10.0 (12.8)	23	10.9 (11.9)	1.7	0.1 CI [0.1–0.4]	−0.8	0.1 CI [-0.2 – 0.3]

Note. 95% Confidence interval given in brackets. CBT = cognitive behavioral therapy; CFT-E = compassion focused therapy; SCL-90 = symptom checklist-90; IIP = inventory of interpersonal problems; PSS-SR = post traumatic self report; M = mean; SD = standard deviation.
*p < .05. **p < .001. ***p < .0001.
[a] Cohen's $d = M1 - M2/SD_{pooled}$.

direction, we employed coding (trauma = 0, non-trauma = 1, CBT = 0, CFT-E = 1).

Conversely, the three-way interaction for the pre-to post-treatment period did not reach significance. Fig. 2 visually represents this three-way interaction. It illustrates that EDE scores from pre-treatment to post-treatment did not significantly differ between patients with and without a history of trauma, regardless of whether they were in the CFT-E or CBT group. Notably, the trauma group exhibited better-maintained EDE scores following CFT-E treatment, whereas individuals with a trauma history in the CBT condition experienced a slight reduction in effect between the end of treatment and the one-year follow-up.

3.3.3. Secondary outcomes

Table 4 shows that general psychopathology (SCL-90-R scores) had positive pre-therapy to end of therapy outcomes for both therapies and both subgroups, apart from the CFT-E non-trauma group. In contrast, interpersonal problems (IIP-64 scores) were only responsive to CBT. PTSD symptoms were affected only by CFT-E, though not for the two subgroups.

4. Discussion

This study has contrasted CBT for eating disorders with CFT-E, a less extensively researched approach believed to be effective for those patients with eating disorders who have a history of trauma. Unsurprisingly, given the inclusion criteria (which include prior treatment failures, and admission to inpatient treatment), the patients in this sample were more symptomatic than in other studies. The study was adequately powered, and treatment retention was good. Overall, at termination, there were no significant differences between the two

Table 5
Fixed effects estimates (top) and variance (bottom) for models by condition, trauma, and trauma x condition for EDE in multilevel modeling.

Parameter	EDE	EDE	EDE	EDE
	Model 1	Model 2[a]	Model 2[b]	Model 3
	Fixed	parameters		
Intercept	5.18 (0.15) *** [4.89–5.48]	5.22 (0.47) *** [4.30–6.16]	5.28 (0.22) *** [4.84–5.72]	5.27 (0.49) *** [4.31–6.23]
Slope	−0.90 (0.08) *** [-1.06 to −7.45]	−0.94 (0.26) ** [-1.44 to −0.43]	−1.00 (0.12) *** [-1.24 to −0.77]	−1.35 (0.32) *** [-1.98 to −0.73]
Condition		−0.29 (0.30) [-0.61 – 0.56]		−0.01 (0.30) [-0.60– 0.58]
Condition x Time		0.02 (0.16) [-0.29– 0.34]		0.25 (0.20) [-0.14– 0.64]
Trauma			−0.15 (0.30) [-0-74 – 0.44]	−0.14 (0.30) [-0.74 – 0.44]
Trauma x Time			0.16 (0.30) [-0.15 – 0.15]	0.82 (0.37)* [0.09–1.54]
Condition x Trauma x Time				−0.44 (0.22)* [-0.86 to −0.11]
	Random	parameters		
Intercept	0.96 (0.19) *** [0.64–1.42]	0.96 (0.19) *** [0.64–1.43]	0.98 (0.19) *** [0.66–1.45]	0.93 (0.19) *** [0.62–1.41]
-2LL	1160.56	1163.76	1162.65	1163.11

Note. 2 LL = −2 Log Likelihood. Standard error is given in parenthesis; 95% Confidence interval given in brackets.
EDE = Eating disorder examination-interview. Time: Pre-treatment = 0; Post-treatment = 1; Follow-up one year after end of treatment = 2.
Trauma = 0, Non-trauma = 1/cognitive behavioral therapy = 0; compassion focused therapy = 1/[a]Two-way interaction group x slope/[b]Two-way interaction trauma x slope/[c]Three-way interaction condition x trauma x time.
*$p < .05$. **$p < .001$. ***$p < .0001$.

treatments, with large treatment effects for core eating pathology and smaller effects for the secondary outcomes. Furthermore, overall benefits were sustained to follow-up for both conditions, as found in other studies of CBT and interpersonal psychotherapy (e.g., Fairburn et al., 1995). However, despite the equivalence of the two treatments generally, CFT-E was superior to CBT for eating pathology at follow-up among those with trauma histories.

In this study, the attrition rate was notably low for both therapeutic approaches when compared to similar research (e.g., Linardon et al., 2018), underscoring the high acceptability (DeJong et al., 2012) and feasibility of employing both approaches with severely symptomatic patients. Added to large effects detected in this study for both treatments, it appears that both CBT and CFT-E are useful in generating change with patients who have a number of features that might have been seen as impeding treatment (failed previous treatments; out of work; high levels of comorbidity; high severity of the eating disorder). The effect sizes on the EDE from pre-treatment to post-treatment were comparable to other treatment studies for eating disorder (Fairburn et al., 2009; Wonderlich et al., 2014; Zipfel et al., 2014). It is noteworthy that both of the therapeutic approaches were systematically applied to individuals with eating disorders, particularly due to the intensive inpatient context. The prevailing consensus in the literature suggests comparable efficacy across these therapies, particularly when they target the spectrum of disordered eating behaviors (e.g., Zipfel et al., 2014; Poulsen et al., 2014; Fairburn et al., 2003).

The more powerful effects at follow-up of CFT-E on patients with eating disorders and a history of trauma could be attributed to its focus on cultivating on self-compassion, aiming to mitigate feelings of shame and self-criticism. Therefore, it is possible that this approach is more effective as a long-term skill development method than the more immediate CBT strategies of using imaginal exposure and imagery rescripting. Working on processes such as emotion regulation, interpersonal difficulties and compassion might increase the possibility of long-lasting effect (Millard et al., 2023; Treasure et al., 2010). While such mechanisms remain to be investigated fully as mediators of long-term therapy effects, reductions in shame and self-criticism merit further attention (Goss & Allan, 2009; Turk & Waller, 2020). This conclusion is in keeping with Turk et al.'s (2022) longitudinal study, demonstrating the specific role of shame in the link between low self-compassion and eating/body image pathology. Therefore, future research is needed to determine the role of shame reduction in the long-term effects of CFT-E for eating disorders, whether or not there is a trauma history.

This study has a number of strengths, including its rigorous testing of CFT-E, its naturalistic setting, its adequate sample size, and its focus on patients who had relatively high levels of eating pathology and comorbidity. However, the limitations of the study also need to be addressed in future work. First, there was no no-treatment control condition, which prevents examination of whether the two treatments were superior to no treatment. However, the level of spontaneous recovery among individuals with these conditions is low (Wonderlich et al., 2012), and both therapies are well established, making the use of a non-intervention condition hard to justify ethically (Devilly & McFarlane, 2009). Second, the study was carried out at one clinic, and needs to be replicated across settings, including outpatient care. The single clinic setting means that there could have been contamination of the therapies due to patients sharing experiences during the treatment phase. However, maintaining treatment-specific teams of therapists and patient groups is likely to have minimized that effect. Third, the CTQ Physical Neglect scale should

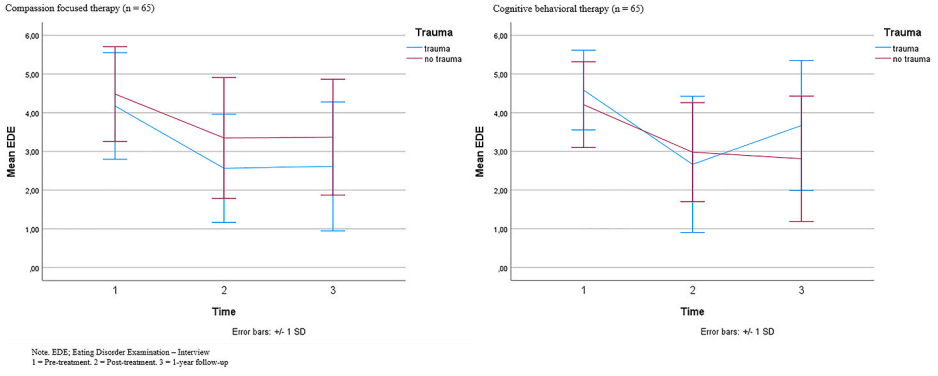

Fig. 2. Interaction of condition x trauma x time. Left: Compassion focused therapy (n = 65). Right: Cognitive behavioral therapy (n = 65)
Note. EDE; Eating Disorder Examination – Interview
1 = Pre-treatment. 2 = Post-treatment. 3 = 1-year follow-up.

only be used with caution in future research, given its limited psychometric properties, as shown here. Finally, the sample was eating disorder transdiagnostic and based on work with adults. It is not known whether these effects would be found among younger cases, or whether they would apply equally to all diagnoses, particularly given the lower levels of recovery among patients with anorexia nervosa (National Institute for Health and Care Excellence [NICE], 2017). Future diagnosis-specific trials of the same therapies would allow for meaningful comparison of these therapies for specific diagnoses, including changes at the behavioral level (e.g., frequency of binge-eating and purging) and in terms of body mass index.

This is the first randomized controlled trial comparing CFT-E and CBT for eating disorders. Both interventions demonstrated significant efficacy, especially considering the characteristics of the patients involved - patients who had not experienced improvement from prior treatments and who exhibited relatively severe pathology. CFT-E was superior in treating eating pathology in the longer term among patients with reported trauma histories. While the mechanisms explaining this difference are still to be established, CFT-E appears to be particularly justified as a treatment option for adults with severe eating disorders where a history of trauma is disclosed.

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CRediT authorship contribution statement

KariAnne R. Vrabel: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft. **Glenn Waller:** Conceptualization, Investigation, Methodology, Resources, Supervision, Writing – review & editing. **Ken Goss:** Conceptualization, Methodology, Resources, Supervision, Writing – review & editing. **Bruce Wampold:** Conceptualization, Funding acquisition, Methodology, Resources, Supervision, Validation, Writing – review & editing. **Maren Kopland:** Investigation, Validation, Writing – review & editing. **Asle Hoffart:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Supervision, Validation, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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