The Efficacy of Psychological Interventions for Complex Trauma: A Systematic Review and Meta-Analysis

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This study meta-analyzed interventions for symptom constructs of complex posttraumatic stress disorder related to complex trauma, such as child abuse, multiple interpersonal trauma, and organized violence. From 42 randomized controlled studies, 164 effect sizes were calculated comprising various treatment comparisons and outcomes. Cognitive processing therapy/cognitive therapy (CPT/CT), narrative exposure therapy (NET), phase-based trauma-focused cognitive behavior therapy (phased TF-CBT), single-phased TF-CBT (single TF-CBT), prolonged exposure (PE), eye movement desensitization and reprocessing (EMDR), and present-centered therapy (PCT) each showed moderate to large effect sizes on PTSD. For depression, CPT/CT, phased TF-CBT, single TF-CBT, NET, and PE showed moderate to large effect sizes. Meta regression revealed that efficacy on PTSD and depression was greater with trauma-focused than with present-centered interventions. Limited evidence made it impossible to compare phased treatments and single-phase treatments. Outcomes of disturbance in self organization (DSO) were relatively scarce; however, among those, CPT/CT, PE, and PCT showed large to moderate effect sizes on negative self-concept. For emotion regulation and interpersonal problems, phased TF-CBT seemed to be promising. Treatment completion rates were similar between trauma-focused and present-centered. Population and study characteristics did not affect efficacy; however, we discussed related clinical issues.

Keywords: complex trauma; evidence-based interventions; posttraumatic stress disorder; complex posttraumatic stress disorder; meta-analysis

Recently, the International Classification of Diseases 11th Revision (ICD-11) included a diagnosis of complex posttraumatic stress disorder (CPTSD), which consists of three core posttraumatic stress symptoms (reexperience, avoidance, and sense of threat) and additional symptoms of disturbance in self organization (DSO) represented by affect dysregulation, negative self-concept, and disturbances in relationships (World Health Organization, 2018). This inclusion reflects previous understandings about the complicated impacts of complex trauma (Briere, 1992; Herman, 1992; van der Kolk, 1996), and has foundations from recent empirical studies that revealed profiles of CPTSD or DSO that are independent from PTSD (Cloitre, Garvert, Brewin, Bryant, & Maercker, 2013; Knefel, Garvert, Cloitre, & Lueger-Schuster, 2015), or borderline personality disorder (BPD) (Cloitre, Garvert, Weiss, Carlson, & Bryant, 2014). A measurement for CPTSD has also been developed and validated emphasizing clinical utility as well as universal applicability (Cloitre et al., 2018).

Since the official recognition of CPTSD has shown recent progress, searching for empirically supported psychological treatment of CPTSD is required. For PTSD, clinical guidelines of psychological treatments are clearly established (American Psychological Association, 2017); however, some controversial issues remain in the treatment of CPTSD. There are clinical guidelines for CPTSD; for example, the International Society of Traumatic Stress Studies

(ISTSS) expert consensus, suggests that phase-oriented treatment may be beneficial to individuals with complex symptoms (Cloitre et al., 2012). Critiques pointed out that trauma-focused CBT (TF-CBT) developed for PTSD also may be efficacious for people with complex trauma, and that phase orientation lacks evidence in utility (e.g., De Jongh et al., 2016). However, this discussion may be refuted, that it focused on PTSD and depressive symptoms and exclude broad symptoms of DSO and did not consider the possible adverse effects, such as increased distress during the exposure process. A systematic review among women survivors of childhood abuse reported that exposure-based CBTs had shown above moderate effect size for PTSD; however, with CPTSD, affect management interventions brought better improvement and lower drop out (Dorrepaal et al., 2014). They concluded that phase-based treatment would be more suitable for CPTSD which prepares clients with distress tolerance for subsequent trauma-focused and exposure-based treatments.

This study aimed to meta-analyze the efficacy of interventions for CPTSD constructs and to identify optimal treatment for complex trauma, including PTSD and related pervasive symptoms. Unlike review studies that rely on a subjective synthesis, a meta-analysis calculates the effect size (Jang & Shin, 2011) and by comparing randomize controlled trials, meta-analysis can give a comprehensive understanding in which treatment for whom may be efficacious (Seidler & Wagner, 2006), providing critical evidence to clinical guidelines and policy making (Cooper, 2010).

Karatzias et al. (2019), which is the first meta-analysis according to the ICD-11 CPTSD, recently reported the efficacy of 51 randomized controlled studies that included outcomes of PTSD and at least one DSO symptom. Studies using compact measurement tools for CPTSD should be first considered, as Brewin et al. (2017) mentioned that not the type of trauma but the symptomatology post trauma would decide the diagnosis of CPTSD. However, because to date, efficacy studies using a dedicated measure for CPTSD were rare (Karatzias et al., 2019), focusing on the type of the trauma for a meta-analysis may provide additional guidelines in real-world settings. To expand the findings, our study focused on populations that had experienced what represents previous definition of complex trauma.

Earlier, Herman (1992, 1997) had identified complex trauma re-

sulting from multiple, repeated, prolonged, and systematic traumatization, especially of an interpersonal nature, such as child abuse, domestic violence, sexual exploitation, combat, or torture may complicate posttraumatic adaptation. Also, Hobfoll and colleagues discovered that it is the degree of resource loss during sustained trauma exposure that leads to severe and chronic symptom trajectories (Hobfoll, Mancini, Hall, Canetti, & Bonanno, 2011). Similarly, as reported by Courtois and Ford (2013), complex trauma involves "traumatic attachment (p. 25)", which is repetitive and cumulative, causing severe alterations in one's ordinary developmental process, life, and identity. These conditions were considered to be associated with symptom complications, such as emotion dysregulation, identity problems, disruptions in relationships, somatization, alterations in consciousness, and altered systems of meaning (Briere, 1992; Herman, 1992; Pelcovitz et al., 1997), in addition to core symptoms of PTSD.

Therefore, we focused on studies including the above previous descriptions of complex trauma, and those that dealt with symptoms, such as PTSD, depression, anxiety, dissociation, negative self-concept, emotion dysregulation, interpersonal problems, borderline personality disorder, and self-harm behaviors. Systematic review and meta-analyses included randomized controlled studies of major psychological treatments, including phase-based treatments, trauma-focused treatments, and other psychosocial approaches. For trauma-focused treatments, effect size of each treatment was calculated, because in the applied setting each treatment is trained and conducted distinctively, and fidelity of each treatment is an important issue. Predictors of treatment efficacy were examined using meta-regression analyses. We hypothesized that trauma-focused treatments would be efficacious for PTSD compared to non-trauma focused treatments. For other complex symptoms, phased-based trauma-focused treatments would show higher efficacy compared to a single-phase trauma-focused treatment.

Methods

Study selection

The search period covered from 1990 to September 2017, since it was in the 1990s that discussion of complex trauma first began (e.g., Terr, 1990), up to the date when the search was initiated. The

PsychINFO, PubMed, PILOTS, and Medline databases were searched using the EndNote ×5. Selections were organized by the PICOT guideline (Institute of Medicine, 2011). For population (P), intervention (I), and outcomes (O), search terms were entered as follows; (complex trauma OR multiple trauma OR child abuse OR child neglect OR child adversity OR maltreatment OR torture OR sexual trauma OR domestic violence OR intimate partner violence OR prostitution OR bereavement) AND (psychotherapy OR psychological treatment OR exposure OR EMDR OR trauma-focused cognitive behavioral therapy OR cognitive processing OR cognitive restructuring OR dialectical behavior therapy OR present-centered OR stress management OR gestalt OR psychoanalytic OR mentalization OR somatic experiencing OR sensorimotor psychotherapy OR advocacy OR group therapy OR psychoeducation) AND (PTSD OR suicid* OR self-harm OR self-injury OR emotion regulation OR self-regulation OR self-organization OR substance OR eating OR borderline personality disorder OR depress* OR identity OR interperson* OR relation*).

For comparison (C), treatment as usual, waiting list, and active treatment comparison studies were selected; and for study type (T), conducting a randomized controlled trial, using validated instruments, and peer reviewed studies were eligible. Exclusion criteria included non-peer reviewed literature, review article, participants under the age 18, offender study, non-face-to face therapy, and non-individual therapy (couple or family therapy, or group therapy as major interventions).

Intervention listed recommended treatments for PTSD (APA, 2017), which are trauma-focused treatments such as prolonged exposure (PE; Foa & Rothbaum, 1998), cognitive processing (Resick & Schnicke, 1992) or cognitive therapy (Ehlers, Clark, Hackmann, McManus, & Fennell, 2005) for PTSD, cognitive behavior therapy (CBT) composed of interventions based on cognitive behavioral principles, eye movement desensitization and reprocessing (EMDR; Shapiro, 1995), and dialectical behavior therapy (Linehan, 1993). Relatively newly recognized somatic based interventions such as somatic experiencing (SE; Levine, 2010) and sensorimotor psychotherapy (SP; Ogden & Fisher, 2015) were also included. Additionally, non-trauma focused, present-centered therapies (PCT) were included, as were treatments from traditionally established approaches in psychotherapy related to our main tar-get symptoms. Last, "advocacy" was included to seek psychosocial interventions for complicated areas of human rights violations. Comparisons for treatment completers and intent-to-treat analysis were planned. Two researchers independently worked on the search and reviewed titles and abstracts consequently. A third researcher cross-checked and discussed disagreements to find resolutions. Finally, all three researchers reviewed full texts for final selection and resolved discrepancies.

Data extraction

Two researchers each with expertise in trauma studies and statistics, extracted data for standardized differences between treatment groups, seeking agreements. Intent-to-treat scores and follow-up data (versus post data) were firstly coded. When these were not available, completer scores or post data were coded and recorded separately as study characteristics. When both self-report measurements and clinical interviews were reported, clinical interview data were used. Means and SDs were mainly extracted, and SDs were calculated if standard errors were given instead. Because no studies reported pre-post data correlations, a moderate value of $r = .5$ was coded according to Becker (1990). Studies reporting raw differences with confidence intervals, and ds were coded as such. When the number of participants from pre-intervention to follow-up differed in the reported intent-to-treat analysis, we decided using the number of pre-intervention participants, and this calculation were confirmed by being most closely matched with an alternative calculation according to Morris (2008).

Study characteristics were independently coded by three researchers, and the first author cross-checked each data. Each study characteristic was organized into a table, including intervention arms, intervention type (trauma-focused or not, and phased-oriented or not), average number of sessions, number of participants, number of treatment completers (according to the definition of completion in each study), completer rate, follow-up duration, targeted outcomes, measurements of outcomes, analysis type (intent-to-treat or completer), and study location. Each participant's characteristics was also organized, such as female gender (%), low SES (percentage of people with lowest income or insecure social status level, based on the report of each study), and European/Caucasian ethnicity (%). The type of trauma experience (organized violence

such as torture, terrorism, living in a conflict region, detention, or persecution; child abuse; multiple interpersonal trauma; and military trauma), and intervention setting (outpatient, residential, or shelter) were also coded.

Analysis

Quality assessment

Following the methodology checklist for randomized controlled trials of NICE (2012), two researchers completed the quality assessment, and final decisions were made by discussing uncertainties. Low, unclear/unknown, and high risks of bias were assessed in four domains, such as selection, performance, attrition, and detection. Overall risk of bias was decided as low, moderate, and high depending on the level of risk in each domain. At least three low risks of bias on each domain were considered overall as low risk. Two low risks without any high risks were considered to be an overall moderate risk. Overall risk was rated as high when one or more high risks were detected in any domain.

Effect size and meta regression analysis

Comprehensive Meta-Analysis 3 was used for the meta-analyses. As by "shifting the unit of analysis" (Cooper, 1998), effect size was used as the unit of analysis. Hedges' *g* was chosen as the effect size to overcome the shortcomings of Cohen's *d* which often overestimates the effect size. The effect size and 95% confidence interval were calculated for each intervention. Effect size was interpreted as large (>.80), moderate (.50 to .80), small (.20 to .50), or none (<.20) according to Cohen (1988). Heterogeneity was assessed using the I^2 and tau^2 statistics. Because we assumed heterogeneity, a random effect model was chosen, with maximum likelihood estimation. We assessed publication bias using the funnel plot, and Trim and Fill (Duval & Tweedie, 2000) and conducted sensitivity analyses. Among comparisons of psychological treatment and TAU/WL, univariate meta-regression was conducted by entering each study characteristic such as type of trauma (childhood abuse, organized violence, multiple interpersonal trauma), compositions of low SES (%), female gender (%), and European/Caucasian ethnicity (%), session length, intent-to-treat (vs. completer) study, risk of bias levels (high vs. low, and high vs. moderate), and trauma-focused treatment (vs. non-trauma focused).

Results

Study selection

A flowchart of data selections is presented in Figure 1. A total of 5,773 articles were searched, then by screening via titles and abstracts, and adding 11 primary articles searched by ancestry approach from secondary analysis articles, a total of 430 articles remained for full text screening. Studies with bereaved participants were all excluded, because the researchers agreed that information to conclude whether it would be a multiple or complex experience were insufficient. The final screening excluded 372 articles, leaving 42 randomized controlled studies eligible for the full inclusion criteria.

Study characteristics

Study and participant characteristics of the 42 randomized controlled studies are presented in Table 1 and in Appendices I and II. Most of the studies were conducted in Western countries. For target symptoms, majority assessed efficacy on PTSD and depression. Studies assessing DSO related symptoms were relatively scarce. Studies were mainly conducted in outpatient settings. Seven studies (16.7%) did not report follow-up data, and the other 35 studies (83.3%) reported follow-up data in which duration ranged from one to 24 months. There were four studies (9.5%) that had a phased-based design. Twenty-four studies (57.1%) reported data of intent-to-treat analysis clearly enough to be included in the meta-analysis.

The total number of participants from all studies was 4,455, ranging from 18 to 347 individuals in each study. Based on type of trauma, child abuse, multiple interpersonal trauma, organized violence, and military-trauma studies were identified. For gender, most studies had higher composition of females, except eight studies (19.0%) with less than 50% of female participants were all related to organized violence. There was no male-only study.

For the ethnicity of the participants, 40.5% included European/ Caucasian people at over 50%, and the rest included diverse ethnicities. For SES, twelve studies (28.6%) had less than 50% of people with low SES. There were 12 studies (28.6%) focusing mainly on a low-resource population, including refugees and asylum seekers, a culturally diverse population with low income, and peo-
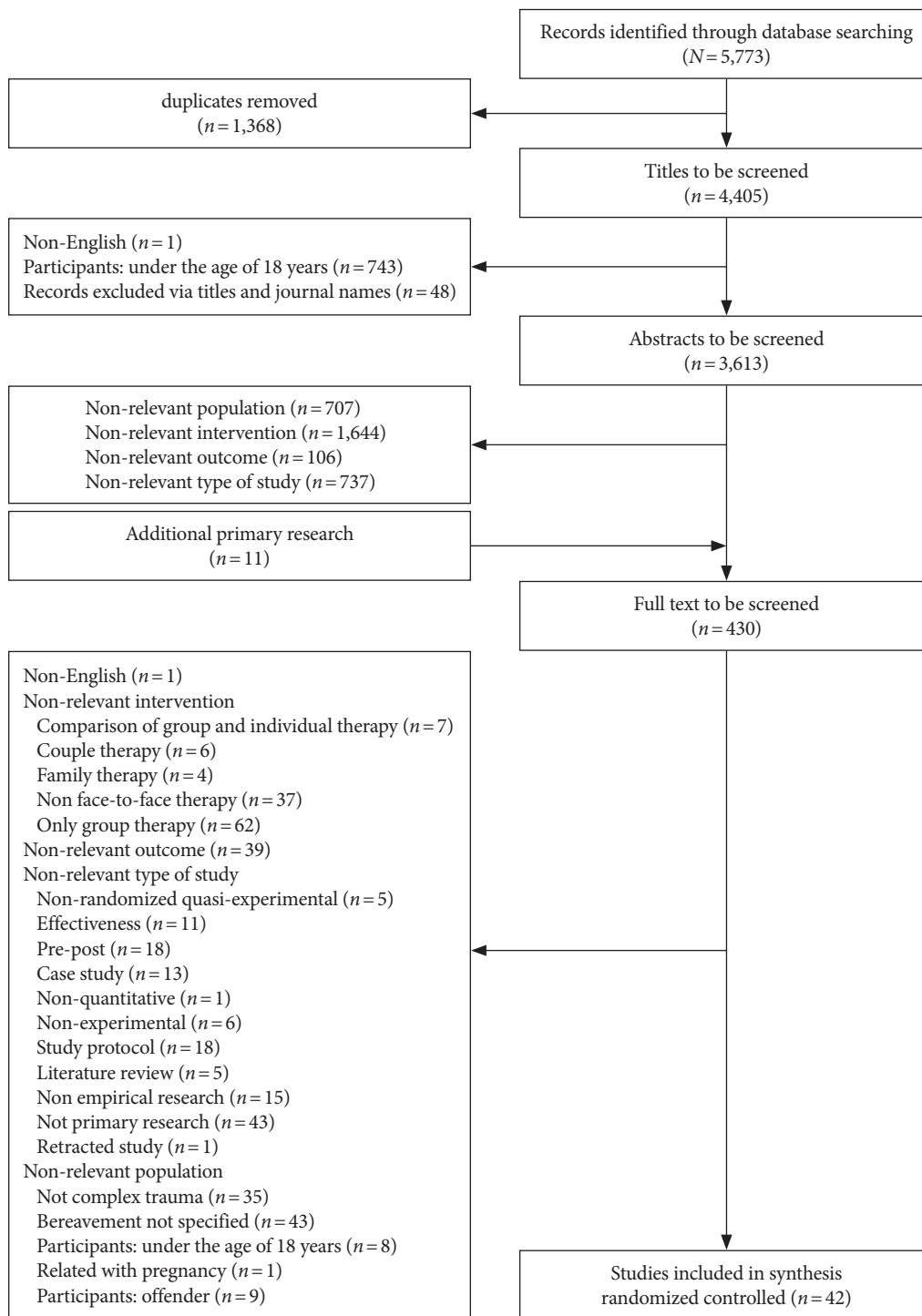
Figure 1. *Flow chart of search result.*

ple in shelter setting.

The average number of individual sessions ranged from one (psychoeducation) to 38.6 (DBT-PE) sessions, and average for all studies was 11.20 sessions. The treatment completer rate ranged from 48.2 to 100%; one study did not clearly report the number of completers. The average completer rate was calculated (all completers / all participants) to be 75.9%.

Table 1. *Number of Studies According to Study and Participant Characteristics*

Characteristics	n (%)	Characteristics	n (%)
Study characteristics		Participant characteristics	
Location		Type of trauma	
USA	22 (52.4)	Child abuse	13 (31)
Germany	9 (21.4)	Multiple interpersonal trauma	14 (33.3)
Australia	2 (4.8)	Organized violence	11 (26.2)
Canada	2 (4.8)	Military trauma	4 (9.5)
Chile	1 (2.4)	Gender	
China	1 (2.4)	Female only	24 (57.1)
Iraq	1 (2.4)	Female over 50%	8 (19)
Ireland	1 (2.4)	Female less than 50%	8 (19)
Kurdistan	1 (2.4)	Male only	0 (0)
Romania	1 (2.4)	Not clear	2 (4.8)
Thailand	1 (2.4)	Ethnicity	
Setting		European/Caucasian over 50%	17 (40.5)
Outpatient	39 (92.9)	Only non-European/Caucasian	10 (23.8)
Residential	2 (4.80)	Diverse (European/Caucasian less than 50%)	12 (28.6)
Shelter	1 (2.4)	Not clear	3 (7.1)
Target symptom		Social economic status (SES)	
PTSD	37 (88.1)	Low SES people over 50%	19 (45.2)
Depression	42 (100)	Low SES people less than 50%	12 (28.6)
Anxiety	15(35.7)	Not clear	11 (26.2)
Dissociation	6 (14.3)		
Negative self-concept	7 (16.7)		
Emotion dysregulation	2 (4.8)		
Interpersonal problem	4 (9.5)		
Borderline personality disorder	2 (4.8)		
Substance use	1 (2.4)		
Non-suicidal self-injury and suicidality	1 (2.4)		
Analysis			
Reported follow-up data (1-24 Months)	35 (83.3)		
Conducted intent-to-treat analysis	24 (57.1)		

Quality assessments

Quality assessments of the 42 randomized controlled studies are shown in Appendix II. Assessment of selection bias showed that 20 studies had a low risk of bias in randomized selection with adequate concealment, whereas the other 22 studies were rated as unclear because of limited reporting. Assessing performance bias, 26 studies had low risk, 14 were unclear, and two had a high risk which was related to the uneven number of sessions between comparisons. Whether participants were blind to allocation was mostly not clearly reported or eventually not applicable, and this was also true for the blindness of the therapists. Results of attrition bias assessment showed that 34 had low risk, one was unclear, and seven had high risk. In attrition bias, high risk was mainly related to

attrition rates between comparison groups. Assessing risk for detection, 17 studies had low risk; unclear studies had limited reports on investigator's blindness or used self-report instruments instead of standardized interviews for outcome assessment. Overall, 17 studies (40.4%) had low risk, eight (19.0%) moderate risk, and 17 (40.4%) high risks.

Effect size outcomes

We calculated 164 effect sizes of various comparisons and outcomes from the 42 studies. Further analyses were based on each treatment. The Hedges' *g* with its confidence interval and the I^2 and tau^2 statistics for each comparison are provided in a supplementary Tables 1–4.

Single-phased trauma-focused psychotherapy

Effect size of single phased trauma treatments such as CPT/CT, NET, PE, single TF-CBT, and EMDR studies were as follows.

Cognitive processing therapy and cognitive therapy (CPT/CT)
There were ten studies (ten comparisons) examining the efficacy of CPT/CT. Outcomes of PTSD, anxiety, depression, dissociation, and negative self-concept symptoms were assessed. In nine comparisons with TAU/WL, CPT/CT showed large effect size on PTSD ($n = 9$, $g = 1.155$, 95% CI .684 to 1.625), depression ($n = 9$, $g = 1.172$, 95% CI .657 to 1.688), and negative self-concept ($n = 3$, $g = 1.110$, 95% CI .027 to 2.193). Small effect size was shown on anxiety ($n = 2$, $g = .390$, 95% CI .140 to .641). Only one study assessed dissociation, which had shown large effect size ($g = 1.352$). Treatment completion rate for CPT/CT ranged from 48.2 to 94.7%, and the average rate was 69.8% (384/550).

Narrative exposure therapy (NET)
Seven studies (eight comparisons) examined NET. Outcomes of PTSD, depression, dissociation, and BPD symptoms were assessed. Among eight comparisons with TAU/WL, NET had large effect size on PTSD ($n = 8$, $g = .969$, 95% CI .464 to 1.474) and moderate effect size on depression ($n = 8$, $g = .580$, 95% CI .320 to .841). One study comparing NET with treatment by experts assessed dissociation ($g = .181$) and BPD symptoms ($g = .221$) showing small effect sizes. Treatment completion rate ranged from 64.7 to 100%, and the average rate was 82.4% (131/159).

Prolonged exposure (PE)
Six studies (eight comparisons) examined PE (including PE with cognitive restructuring). Outcomes of PTSD, depression, anxiety, negative self-concept, and dissociative symptoms were assessed. PE compared with TAU/WL had moderate effect size on PTSD ($n = 7$, $g = .643$, 95% CI .371 to .915), depression($n = 7$, $g = .514$, 95% CI .319 to .708), and negative self-concept ($n = 2$, $g = .643$, 95% CI .081 to 1.205). Small effect size was shown on anxiety ($n = 4$, $g = .245$, 95% CI .055 to .436). Treatment completion rate ranged from 53.2 to 65.8%, and the average rate was 61.5% (276/449).

Trauma-focused CBT (single TF-CBT)
We grouped five studies using a combination of trauma-focused CBT techniques, such as exposure and skills training, as single TF-CBT. Outcomes of PTSD, depression, anxiety, and substance use symptoms were assessed. In comparisons with TAU/WL, TF-CBT showed large effect size on PTSD ($n = 4$, $g = 1.268$, 95% CI .592 to 1.944), depression ($n = 3$, $g = 1.035$ 95% CI .194 to 1.876), and anxiety ($n = 2$, $g = 1.156$, 95% CI .331 to 1.980). One study reported the efficacy of exposure included CBT on substance use compared to the usual CBT, showing no superiority ($g = .154$). One study did not report the number of completers; other than this, treatment completion rate ranged from 67.1 to 98%, and the average rate was 82.1% (312/380).

Eye movement desensitization and reprocessing (EMDR)
Three studies (four comparisons) examined EMDR. Outcomes of PTSD, depression, anxiety, and negative self-concept symptoms were assessed. Among four comparisons with TAU/WL, EMDR showed large effect size on anxiety ($n = 4$, $g = .830$, 95% CI .351 to 1.309), moderate effect size on PTSD ($n = 4$, $g = .767$, 95% CI .361 to 1.173), and small effect size on depression ($n = 4$, $g = .374$, 95% CI .057 to .691). One study reported a result in negative self-concept that showed a small effect size ($g = .457$). Treatment completion rate ranged from 50 to 100%, and the average rate was 85.9% (55/64).

Phase-based trauma-focused cognitive behavior therapy (phased TF-CBT)
Four studies (four comparisons) examined phase-oriented treatment consisting of DBT based skills training and exposure therapy, including DBT-PTSD, STAIRS-PE (skills training in affect and interpersonal regulation-PE), and DBT-PE arms. Outcomes of PTSD, depression, anxiety, dissociation, BPD, emotion regulation, interpersonal problems, non-suicidal self-injury (NSSI), and suicidality symptoms were assessed. Among comparisons with TAU/WL, large effect size were shown on PTSD ($n = 2$, $g = 1.378$, 95% CI .984 to 1.772) and depression ($n = 2$, $g = .956$, 95% CI .195 to 1.717), and moderate effect size was found in dissociation ($n = 2$, $g = .718$, 95% CI .195 to 1.241). One study reported BPD symptoms, showing small effect size ($g = .440$). Another study reported large effect

size each on emotion regulation ($g=1.305$) and interpersonal problems ($g=1.270$). Treatment completion rate ranged from 58.8 to 84.8%, and the average rate was 76.1% (89/117).

Non−trauma focused psychotherapy

Studies of CBT without treating trauma materials, and PCTs were examined.

Non−trauma focused CBT (non−TF−CBT)

We included two studies of stabilization-oriented skills training and behavior activation in non-trauma focused CBTs (non-TF-CBT). These two comparisons with TAU/WL showed small effect size on PTSD symptoms ($n=2$, $g=.216$, 95% CI -.038 to .470) and depression ($n=2$, $g=.441$, 95% CI .120 to .762). A study of behavior activation showed moderate effect size on anxiety ($g=.513$). Treatment completion ranged from 54.3 to 71.9%, and the average rate was 67.8% (101/149).

Present−centered therapy (PCT)

There were seven PCT (seven comparisons) including three interpersonal psychotherapy (IPT) studies, one holographic reprocessing, one emotion-focused therapy, one present-centered therapy, and one brief psychodynamic psychotherapy. Outcomes of PTSD, depression, anxiety, dissociation, negative self-concept, and interpersonal problem symptoms were assessed. Compared with TAU/WL, present-centered therapies showed moderate effect size on PTSD ($n=6$, $g=.562$, 95% CI .203 to .921), anxiety ($n=3$, $g=.576$, 95% CI .175 to .978), and negative self-concept ($n=3$, $g=.588$, 95% CI .154 to 1.021). They had small effect size on depression ($n=6$, $g=.446$, 95% CI .225 to .667) and interpersonal problems ($n=2$, $g=.332$, 95% CI -.108 to .771). One study reported dissociation showing large effect size ($g=1.081$). Treatment completion ranged from 75 to 94.1%, and the average rate was 79.8% (198/248).

Other psychosocial interventions

One study reported the efficacy of one-session individual psychoeducation vs. WL. Small effect size was shown in PTSD symptoms ($g=.264$); however, none in depression ($g=.065$) or anxiety ($g=.070$). Completer rate was 97.4%. Two studies reported efficacy of advocacy vs. usual care on depression with interpersonal vio-

lence. Results showed no effects ($n=2$, $g=.048$, 95% CI -.133 to .229). Finally, one study reported the efficacy of additional mentoring with usual care on depression compared to only usual care. It showed a moderate effect size on depression ($g=.546$). Completion rate was 79.6%.

Active treatment comparisons

There were six studies comparing major trauma-focused interventions. Comparing PE to PE with cognitive restructuring, there was no differences in efficacy on PTSD symptoms ($n=2$, $g=.117$, 95% CI -.117 to .352) and depression ($n=2$, $g=.166$, 95% CI -.070 to .403).

Two studies compared phased TF-CBT to only skills training, and phased TF-CBT had small effect size on PTSD symptoms ($n=2$, $g=.403$ 95% CI -.088 to .895), depression ($n=2$, $g=.391$, 95% CI -.099 to .881), and anxiety ($n=2$, $g=.473$, 95% CI -.021 to .967).

One study reported efficacy for phased TF-CBT (DBT-PE) on dissociation ($g=.381$), and suicidality ($g=.286$), showing small effect size compared to DBT-only intervention. Phased TF-CBT (DBT-PE) compared to DBT-only showed no better efficacy on NSSI ($g=.190$). Another comparison reported that phased TF-CBT (STAIR/exposure) showed moderate effect size on emotion regulation ($g=.576$) and interpersonal problems ($g=.626$) compared to skills training only. Also, efficacy of phased TF-CBT (STAIR/exposure) compared to exposure with supportive counseling, showing large effect size on anxiety ($g=.922$), moderate effect size on interpersonal problems ($g=.586$), and small effect size on symptoms of PTSD ($g=.350$), depression ($g=.231$), and emotion regulation ($g=.390$).

Publication bias and sensitivity analysis

Presented in the Figure 2, publication bias was examined by the funnel plot of psychological treatments vs. TAU/WL, among outcomes of PTSD, depression, and anxiety symptoms, which had more than 10 comparisons required to draw the funnel plot. Funnel plot and Trim and Fill (Duval & Tweedie, 2000) revealed no publication bias.

Forest plots of psychological treatments vs. TAU/WL on each symptom outcome are presented in Supplementary Figures 1–5.
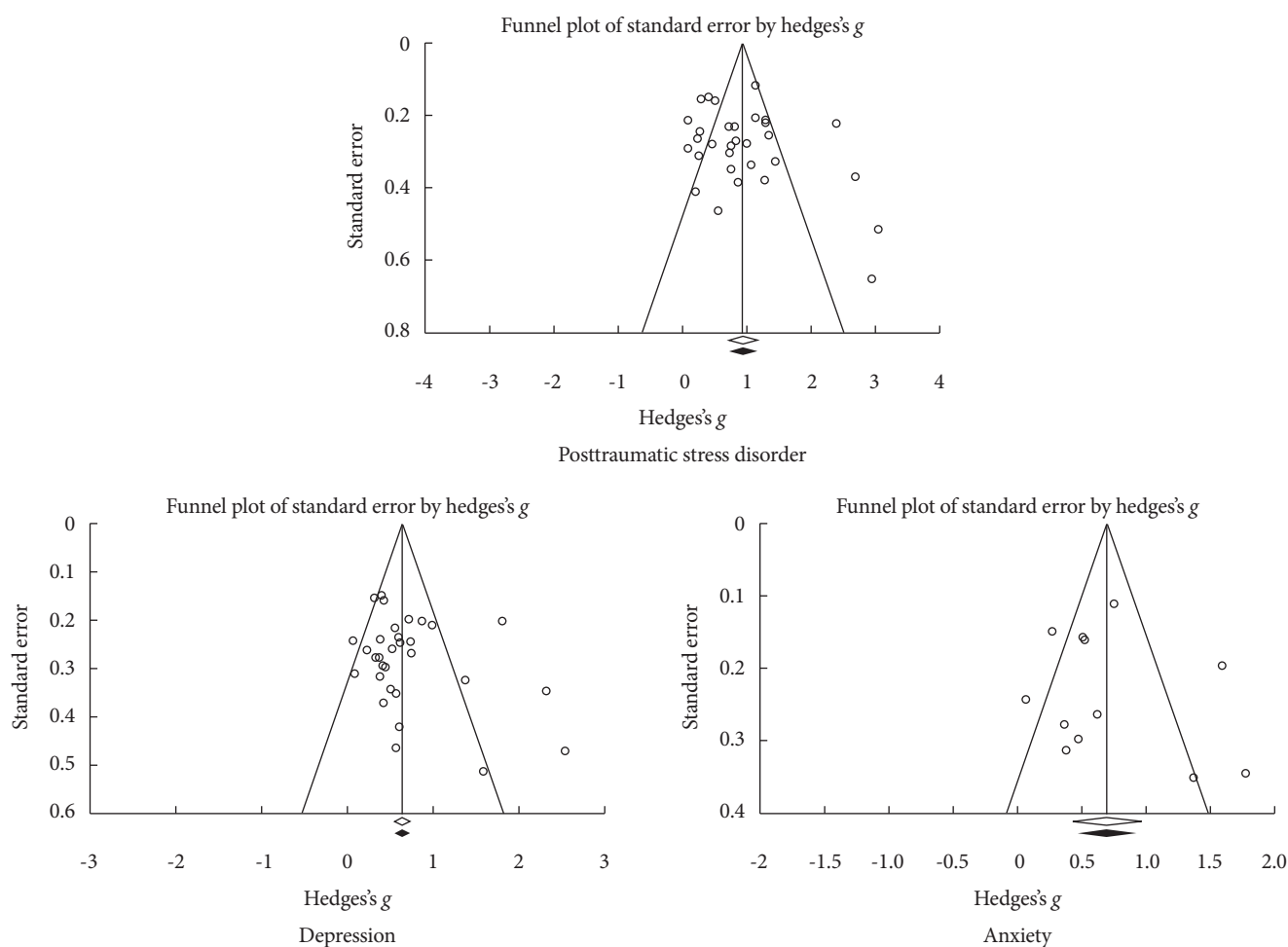
Figure 2. *Funnel plot of comparisons on outcomes of PTSD, depression, and anxiety.*

We conducted sensitivity analysis by comparing the random effect size by removing each single comparison. First, we analyzed based on outcomes that had more than five comparisons. Comparing psychological treatments to TAU/WL, for PTSD symptoms ($n = 32$, $g = .936$, 95% CI .712 to 1.161, $I^2 = 84.546$, $tau^2 = .320$), effect size was maintained when removing any comparison ($g = .871–.967$). Using Trim and Fill, effect size and 95% confidence interval values were unchanged, leaving out publication bias. Also, for depression ($n = 31$, $g = .688$, 95% CI .511 to .864, $I^2 = 73.293$, $tau^2 = .171$), removing any comparison had little impact on the effect size ($g = .637–.710$). By Trim and Fill, effect size and 95% confidence interval values remained unchanged. This was the same for anxiety symptoms ($n = 12$, $g = .699$, 95% CI .435 to .963, $I^2 = 79.894$, $tau^2 = .161$), effect size range after each removal ($g = .593–.754$), and effect size before and after Trim and Fill were maintained.

For negative self-concept ($n = 6$, $g = .762$, 95% CI .306 to 1.218, $I^2 = 68.884$, $tau^2 = .219$), effect size range after each removal ($g = .522–.847$) was maintained. For dissociation ($n = 6$, $g = .857$, 95% CI .539 to 1.179, $I^2 = 43.627$, $tau^2 = .069$), there were some changes in effect size range after some removal ($g = .754–.968$); removal of studies with BPD participants increased the effect size to .936 and .968, respectively.

Next, we conducted sensitivity analyses based on each psychological treatment. Among comparisons of CPT/CT and TAU/WL, removing two studies that provided less than four sessions, effect size for PTSD symptoms ($n = 7$, $g = 1.348$, 95% CI .805 to 1.891), and depression ($n = 7$, $g = 1.383$, 95% CI .767 to 2.000) increased. Among comparisons of NET and TAU/WL, removing a study that provided less than four sessions, effect size for PTSD symptoms ($n = 7$, $g = 1.103$, 95% CI .570 to 1.636) and depression ($n = 7$,

$g = .702$, 95% CI .399 to 1.004) increased. Additionally, removing a study with BPD participants, effect size for PTSD symptoms ($n = 6$, $g = 1.252$, 95% CI .710 to 1.794) and depression ($n = 6$, $g = .716$, 95% CI - .391 to 1.042) increased. Among comparisons of EMDR and TAU/WL, removing a study that provided two sessions decreased the effect size of PTSD symptoms ($n = 3$, $g = .655$, 95% CI .102 to 1.207), and depression ($n = 3$, $g = .277$, 95% CI -.129 to .683). We could not remove a BPD participant study in phased TF-CBT vs. TAU/WL comparison because there were too few comparisons.

Univariate meta−regression analyses

We selected comparisons of psychological treatments to TAU/WL and did meta-regression analyses on outcome symptoms of PTSD and depression. Other outcome symptoms did not have enough comparisons for meta-regression and thus could not be examined. We did univariate analyses of study characteristics. The type of trauma (childhood abuse vs. organized violence, childhood abuse vs. multiple interpersonal trauma), compositions of low/insecure SES (%), female gender (%), European/Caucasian ethnicity (%), studies mainly with low-resource populations, session length, intent-to-treat (vs. completer) study, and risk of bias levels (high vs. low, high vs. moderate) each did not predict efficacy on PTSD or depression. Trauma-focused treatment (vs. non-trauma focused) predicted efficacy for both PTSD ($n = 31$, $R^2 = .18$, coefficient = .639, 95% CI = .042–1.240, $Z = 2.10$, $p < .05$) and depression ($n = 31$, $R^2 = .19$, coefficient = .426, 95% CI = .015–.837, $Z = 2.04$, $p < .05$).

Discussion

This meta-analysis found 42 RCT studies indicating that psychological treatments promise efficacy for people with complex trauma in various degrees across constructs of CPTSD. Most studies were conducted in American or European regions. Compared to PTSD or depression studies, studies targeting DSO symptoms, dissociation, comorbid BPD, or self-harm behaviors were scarce. No studies included low intelligence participants. These symptoms were more likely to be included in the exclusion criteria, as previous discussions point out (Bradley, Greene, Russ, Dutra, & Westen, 2005; Leeman et al., 2017). There were more female par-

ticipant studies than male, and participant ethnicity was diverse. Some studies reported SES information of participants, however, more precise reports may be helpful for future analysis.

Our meta analyses showed that on PTSD symptoms of complex trauma, psychological treatments such as CPT/CT, NET, phased TF-CBT, and single TF-CBT had large effect size, and PE, EMDR, and PCT showed moderate effect size. This result supports the idea that CPTSD treatment may benefit building from current PTSD treatments (ISTSS Guidelines Committee, 2018; Karatzias et al., 2019). For depression, CPT/CT, phased TF-CBT, and single TF-CBT showed large effect size, NET and PE moderate effect size, and EMDR, non-TF-CBT, and PCT small effect size. CBT based trauma-focused treatments seemed to work favorably on depressive symptoms of complex trauma.

That PCT showed similar effect size to PE and EMDR on PTSD, showing that it may reduce complex trauma PTSD, indicates that PCT may be an option when trauma-focused therapies cannot be adjusted because of client preferences or accessibility of intervention. Nonetheless, our meta-regression revealed that trauma-focused interventions compared to PCT or non-trauma focused interventions had higher efficacy on PTSD and depression of complex trauma. This supports previous studies reporting the superiority of trauma-focused interventions in chronic PTSD (Bisson, Roberts, Andrew, Cooper, & Lewis, 2013), organized trauma (ter Heide, Mooren, & Kleber, 2016), military PTSD (Haagen, Smid, Knipscheer, & Kleber, 2015), and child abuse related PTSD (Ehring et al., 2014).

Considering CPT/CT and NET, the number of sessions (over four) seemed to increase the efficacy for symptoms of PTSD and depression; however, this was not true for EMDR. It is hard to conclude, since there were few comparisons; however, BPD symptoms seemed to negatively influence the efficacy of interventions. Previous quantitative review of treatments for child abuse CPTSD (defined as PTSD plus disorders of extreme stress or PTSD with personality disorders) concluded that exposure promised short-term improvements; however, within intent-to-treat analysis, affect modulation rather than exposure brought more favorable outcomes, including less dropout (Dorrepaal et al., 2014). Therefore, complicated presentations, such as comorbidity of personality disorders related with complex trauma may require additional inter-

ventions, such as skills training prior to exposure. Skills training may aid the exposure process and maintain the efficacy of exposure by changing efficacy moderators, such as dissociation(e.g., Cloitre, Petkova, Wang, & Lu, 2012; Kleindienst et al., 2016) or emotion dysregulation(e.g., Hien, Lopez-Castro, Papini, Gorman, & Ruglass, 2017) frequent in complex trauma.

Among DSO symptoms, for negative self-concept, large effect size was found in CPT/CT, and moderate effect size in PE and PCT. For emotion regulation and interpersonal problems, comparisons were insufficient to reach any conclusions. Since phased TF-CBT interventions seemed to promise large efficacy, it may also be true for DSO symptoms that dealing with both trauma material and training for regulation strategies are beneficial. Not only for processing trauma memories but also for mastering how to regulate oneself and deal with outside world would lead to adjustments in current self and interpersonal life. However, we cannot confirm without more evidence using well agreed instruments for DSO symptoms. Further studies targeting DSO symptoms may find out whether this efficacy comes from sequential interventions or combinations of skills training and exposure.

Among 42 studies, 57.1% reported numbers to code intent-to-treat data. Meta-regression showed that intent-to-treat data did not affect the effect size. Because maintaining treatment completion is an important task for CPTSD treatment, future interventions reporting intent-to-treat data would provide rich evidence.

Average treatment completer rate from all studies was 75.9%, and average treatment completion rates for each intervention were as followed; CPT/CT was 69.8%, NET was 82.4%, PE was 61.5%, phased TF-CBT was 76.1%, EMDR was 85.9%, single TF-CBT was 82.1%, non-TF-CBT was 67.8%, and PCT was 79.8%. In a previous meta-analysis of dropout rates for PTSD treatments, average dropout rate was reported to be 18.3%, including dropout rate of trauma-specific treatments as 36%, whereas for present-centered treatment the dropout rate was 22% (Imel, Laska, Jakupcak, & Simpson, 2013), showing rates similar to those in our report. However, in our study, fluctuations in comparisons exist. It should be mentioned that in our study, unlike the PTSD study of Imel et al. (2013), non-trauma focused, present-centered treatments did not show a superior completion rate compared to trauma-focused treatments. The differences in completion rate across studies require further evidence

seeking participant or context-related moderators that influence attrition, which will support evidence-based decision-making in practice.

Six studies focused on active treatment comparisons; for instance, adding cognitive restructuring to exposure did not change efficacy on PTSD. However, adding skills training to exposure seemed to decrease DSO, also, on anxiety and interpersonal problems large to moderate efficacy was shown, and on PTSD, depression, and emotion regulation small efficacy was shown. Adding exposure to skills training showed moderate efficacy for emotion regulation and interpersonal problems, and small efficacy for PTSD, depression, anxiety, dissociation, and suicidality, but showed similar results in NSSI. From this evidence we may suggest that for complex traumas, multiple interventions, such as skills training along with trauma-focused exposure treatments, may have more benefits on DSO than does single intervention. However, as mentioned above, evidence is scarce to conclude whether this means that phase-based treatments are superior to non-phased treatments in CPTSD.

Since lack of social resources may influence trajectories of trauma recovery (e.g., Hall, Murray, Galea, Canetti, & Hobfoll, 2015; Miller & Rasmussen, 2010), it was important in our study to seek social conditions of participants as moderators of efficacy. Most studies were conducted in North America and Europe. Further evidence from diverse cultural regions is in need. We found that studies were evenly conducted among various ethnicities, and ethnicity had no influence on PTSD and depression efficacy outcomes in the meta-regression. Also, SES of participants did not affect treatment efficacy on PTSD and depression, which is in line with previous discussions that prolonged economic loss may have little effect on the imminent course of PTSD (Hall et al., 2015).

However, given that SES of participants was mostly not clearly reported, and that we did not use robust indicators for SES, it is difficult to draw conclusions. In addition, social conditions influencing efficacy on DSO symptoms could not be analyzed, bringing attention to the concern that PTSD focused treatment would overlook various difficulties and the effect of daily psychological distress of social conditions (Miller & Rasmussen, 2010). Future studies may help by seeking social conditions as moderators on outcomes of DSO. Advocacy and mentoring were adapted in interventions for interpersonal abuse; however, outcome measure-

ments were limited and showed no significant efficacy. We may mention that some studies of non-trauma focused brief interventions were conducted with participants of diverse ethnicity with unstable social economic resources, implying that people with the least resources may also have the fewest treatment opportunities. Compared to these studies, studies adjusting trauma-focused intervention to low-resource populations showed strong efficacy. Therefore, gathering resources to provide both trauma-focused interventions and consistent psychosocial resource support for marginalized people should be considered.

Most studies dealt with interpersonal trauma including child abuse; however, the type of trauma did not affect treatment efficacy. Previous meta regression reported that childhood onset of trauma is related to a smaller effect (Karatzias et al., 2019); so, more evidence is needed to conclude whether it is the onset age that matters, or cumulative aspect or loss of resources is what is associated.

Overall assessment of risk of bias concluded that 59.5% of the studies had low to moderate risk; however, high risk studies were up to 40%, reflecting the limitations of conducting a rigor methodology trial with complex trauma experienced people. A previous analysis reported that rigorous methodology was related to higher efficacy in CPTSD (Karatzias et al., 2019); however, in our study, having a high risk did not affect efficacy on PTSD and depression. In our study, PCT studies tend to have high risks; so, according to previous findings, lowering the risk of bias in PCT studies may change its efficacy.

We have limitations to consider. We included studies dealing with complex trauma and did not limit to CPTSD diagnosis. Therefore, we cannot conclude that our results indicate efficacy for ICD-11 CPTSD; however, we sought important evidence dealing with PTSD and the pervasive symptoms, including DSO, of complex trauma. Limitations are that meta-regression focused on only PTSD and depression, given that DSO symptoms or dissociation were measured in less than 16.6% of the studies. Further studies targeting CPTSD symptoms with validated instruments will improve future discussions in CPTSD treatment. Also, we excluded group therapies. Previous meta-analyses found that for PTSD, individual therapies were more effective than were group approaches (Ehrings et al., 2014); however, for CPTSD, no such evidence was found (Karatzias et al., 2019). Future research may ana-

lyze how group therapy would be effective in DSO symptoms. In study selection and coding procedures, four researchers were involved to minimize possible errors or omissions; however, the limitation is that the intercoder reliability was not calculated. Also, excluding non-peer reviewed articles hindered encompassing grey literature, giving a possibility of publication bias, so effect size may be less accurate (Conn, Valentin, Cooper, & Rantz, 2003). However, including grey literature in psychiatry research also have risks (Martin, Pérez, Sacristán, & Álvarez, 2005), so future research may consider including grey literature, only with sensitivity analysis supporting the evidence. Lastly, adverse effects of treatments were not examined, and further study should address evidence of possible distress following therapeutic gain.

Despite its limitations, this study synthesized the evidence in the treatment of complex trauma. Implications suggest that current PTSD interventions are equally beneficial for people with complex trauma, and a combination of skills training and exposure in a phase-oriented way seems promising. More evidence is in need to identify which intervention for whom, when, in which order, and for how long would be effective for specific profiles of CPTSD, and we may expect future advances and moderations in current treatments to improve efficacy on CPTSD.

Supplemental materials

Supplemental materials are available at https://doi.org/10.15842/kjcp.2020.39.2.007.

Author contributions statement

HJC, assistant professor in the Department of Psychology at Chungbuk National University, as the principal investigator of the research grant, designed the research, participated in selection and coding, analyzed data, and prepared the manuscript. WYL, assistant professor in the Department of Psychology at Chungbuk National University, supervised data coding and statistical analyses, and prepared the manuscript. SYH, a certified mental health professional, and JHK, a certified mental health professional who is now a doctoral student at Chungbuk National University, both selected, assessed, and coded research data. All authors provided critical feedback, participated in preparing the manuscript, and approved the final submission.

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Appendix I. *Study and Population Characteristics of Selected Studies*

Study	Main intervention	Trauma-focused	Treatment arms	Average structured individual session (min. per session)	N	Female (%)	Low social economic status (%)	European/ Caucasian (%)	Pre n	Completer n	Treatment completer rate	F/U months
Adenauer 2011	NET	Y	NET	12 (108)	34	48.8	87.5	0	16	15	93.8	0
			WL			44.4	100	0	18	16	88.9	
Bichescu 2007	NET	Y	NET	5 (120)	18	0	-	100	9	9	100	6
			Psychoeducation	1		11.1	-	100	9	9	100	
Bohus 2013	DBT-PTSD	Y	DBT-PTSD	23 (45)	74	100	-	-	36	29	80.6	6
			TAU/WL			100	-	-	38	29	76.3	
Bolton 2014a	BA	N	BA	12	281	57	50	0	114	82	71.9	6
	CPT	Y	CPT	12		58.4	48	0	101	67	66.3	
			WL			59.1	56	0	66	53	80.3	
Bolton 2014b	Common elements Treatment approach (CETA)	Y	CETA	9.7 (60)	347	61	59.9	0	182	148	81.3	0
			WL			64.2	58.8	0	165	126	76.4	
Chard 2005	CPT	Y	CPT	10 (60)	71	100	41	81.4	36	28	77.8	12
			WL			100	41	81.4	35	27	77.1	
Cloitre 2002	STAIR-PE	Y	STAIR-PE	16	58	100	31	46	31	22	71	0
			WL			100	31	46	27	24	88.9	
Cloitre 2010	STAIR-PE	Y	STAIR-exposure	16	104	100	32.3	37	33	28	84.8	6
		N	STAIR-support	16		100	28.1	37	38	28	73.7	
		Y	Support-exposure	16		100	46.4	33	33	20	60.6	
Duffy 2007	CBT	Y	CBT	12	58	34.5	-	100	29	20	69	4
			WL			44.8	-	100	29	29	100	
Edmond 1999	EMDR	Y	EMDR	6 (90)	59	100	38	85	20	20	100	3
		N	TAU	6		100	38	85	20	19	95	
			WL			100	38	85	19	13	68.4	
Foa 2005	PE	Y	PE	9 (90–120)	179	100	47.4	49.2	79	52	65.8	12
	PE/cognitive restructuring	Y	PE/cognitive restructuring	9 (90–120)		100	47.4	49.2	74	44	59.5	
			WL			100	47.4	49.2	26	25	96.2	
Galovski 2012	CPT	Y	CPT	7.5	100	-	67	42	53	33	62.3	3
			WL			-	67	42	47	37	78.7	
Ghafoori 2016	Psychoeducation	N	Psychoeducation	1 (90)	86	52.6	89.2	29.7	38	37	97.4	1
			WL			20.8	86.7	23.3	48	30	62.5	
Ghafoori 2017	PE	Y	PE	6.79 (60–90)	71	83	61.7	36.2	47	25	53.2	0
			Present-centered	8.67 (60–90)		83.3	66.7	12.5	24	18	75	
Harkness 2012	CBT	Y	CBT	16.56	203	63.5	-	-	70	47	67.1	12
	IPT	N	IPT	17.15		63.5	-	-	64	50	78.1	
			Antidepressant			63.5			69	43	62.3	

(Continued to the next page)

Appendix I. *Continued*

Study	Main intervention	Trauma-focused	Treatment arms	Average structured individual session (min. per session)	N	Female (%)	Low social economic status (%)	European/Caucasian (%)	Pre n	Completer n	Treatment completer rate	F/U months
Harned 2014	DBT-PE	Y	DBT-PE	38.6 (60)	26	100	75	80.8	17	10	58.8	3
		N	DBT	28.8 (120–150)		100	75	80.8	9	5	55.6	3
Hensel-Dittmann 2011	NET	Y	NET	10 (90)	28	-	89.3	2	15	12	80	12
		N	Stress inoculation	10 (90)		-	89.3	2	13	11	84.6	12
Hijazi 2014	NET	Y	NET	3 (60–90)	63	63.4	100	0	41	39	95.1	4
			WL			40.9	100	0	22	21	95.5	
Johnson 2011	Stabilization	N	Stabilization (HOPE)+standard shelter service	6.8 (60–90)	70	100	62.9	48.6	35	19	54.3	6
		N	Standard shelter service			100	82.9	37.1	35	33	94.3	
Jung 2013	CRIM (CT)	Y	Cognitive restructuring and imagery modification	2 (50–90)	34	100	-	89.3	17	14	82.4	1
		N	WL			100	-	89.3	17	14	82.4	
Katz 2014	PE	Y	PE	10	51	100	71	41	17	10	58.8	0
	Holographic reprocessing	N	Holographic reprocessing	10		100	47	41	17	16	94.1	
		N	Person centered	10		100	41	47	17	11	64.7	
Korte 2017	TF-CBT	Y	Exposure (COPE)	12 (90)	81	7.4	d/k	68.5	54		-	0
		N	Relapse prevention (CBT)	12 (90)		14.8	d/k	44.4	27		-	
Kubany 2003	CT	Y	Cognitive therapy	8.5 (90)	37	100	d/k	48.6	19	18	94.7	3
		Y	WL			100	d/k	48.6	18			
McDonagh 2005	PE	Y	PE/cognitive restructure	14 (90–120)	74	100	42	90	29	17	58.6	6
	present-centered	N	Present-centered	14 (90–120)		100	50	95	22	20	90.9	
			WL			100	30	96	23	20	87	
Neuner 2010	NET	Y	NET	8.79 (120)	32	31.3	100	0	16	14	87.5	6
		N	TAU	-		31.3	100	0	16	16	100	
Nixon 2016	CPT	Y	CPT	3.5 (90)	47	92	26	83	25	15	60	12
		N	TAU	3.5		100	18	91	22	17	77.3	
Pabst 2014	NET	Y	NET	17.2 (90)	22	100	-	-	11	9	81.8	12
		Y	TBE	14.4 (90)		100	-	-	11	8	72.7	
Paivio 2010	Emotion-focused (Imaginal Confrontation, IC)	N	Emotion-focused (IC)	16.9 (60)	56	50	20	95	27	20	74.1	6
		N	EF w/o imaginal confrontation	16.8 (60)		56	8	84	28	25	89.3	
Pigeon 2009	IPT	N	IPT	12	70	100	65	62	37	28	77	0
		N	TAU	6.3		100	73	54	33	19	58	
Resick 2002	CPT	Y	CPT	12 (60–90)	171	100	-	71	62	41	66.1	9
	PE	Y	PE	12 (60–90)		100	-	71	62	40	64.5	
			WL			100	-	71	47	40	85.1	

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Appendix I. *Continued*

Study	Main intervention	Trauma-focused	Treatment arms	Average structured individual session (min. per session)	N	Female (%)	Low social economic status (%)	European/Caucasian (%)	Pre n	Completer n	Treatment completer rate	F/U months
Resick 2008	CPT	Y	CPT	12 (60)	162	100	79	62	56	27	48.2	6
	CPT without WA	N	CPT-C	12 (60)		100	46	62	51	29	56.9	
	Written accounts	Y	WA	12 (60–120)		100	42	62	55	30	54.5	
Scheck 1998	EMDR	Y	EMDR	2 (90)	67	100	-	62	34	30	88.2	3
		N	TAU	2 (90)		100	-	62	33	30	90.9	
Schnurr 2007	PE	Y	PE	10 (90)	284	100	37.6	56	141	88	62.4	6
		N	Present-centered	10 (90)		100	39.2	53	143	113	79	
Stenmark 2013	NET	Y	NET	10 (90)	81	33.3	100	0	51	33	64.7	6
		N	TAU	10 (90)		26.7	100	0	30	21	70	
Sullivan 1999	advocacy	N	Advocacy	20 (120)	278	100	59	42	143	135	94.4	24
			Control			100	59	42	135	130	96.3	
Suris 2013	CPT	Y	CPT	9.7	86	82.7	35	44	52	34	65.4	6
		N	Present-centered	10.5		88.2	41	44	34	28	82.4	
Taft 2011	Mentoring	N	Mentor+clinician_care		174	100	75.2	67.3	113	90	79.6	12
			Usual clinician care			100	70.5	60.7	61	43	70.5	
Talbot 2011	IPT	N	IPT	12.9	70	100	59	62	37	31	83.8	9
		N	TAU	6.3		100	58	55	33	22	66.7	
ter Heide 2011	EMDR	Y	EMDR	11 (90)	20	50	70	0	10	5	50	3
			Stabilization	11 (60)		30	70	0	10	5	50	
Tiwari 2010	Advocacy	N	Advocacy+usual service	12 (30)	200	100	30	0	100	100	100	9
			Usual service			100	32	0	100	100	100	
Vitriol 2009	Psychodynamic	N	Psychodynamic	12	87	100	-	0	44	33	75	6
		N	Standard treatment			100	-	0	43	23	53.5	
Weiss 2015	Common elements treatment approach (CETA)	Y	CETA	9.94 (50–60)	149	32.3	61.7	0	99	97	98	4
			WL			28	50	0	50	50	100	
		Y	CPT	12	193	32.6	57.3	0	129	107	82.9	5
	CPT		WL			37.5	54.7	0	64	64	100	

Note. BA = behavioral activation treatment; CBT = cognitive behavioral therapy; CETA = common elements treatment approach; COPE = Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure; CPT = cognitive processing therapy; CPT-C = Cognitive processing therapy-cognitive therapy only; CRIM = Cognitive restructuring and imagery modification; CT = cognitive therapy; DBT = dialectical behavior therapy; DBT-PTSD = dialectical behavior therapy for posttraumatic stress disorder; EMDR = eye movement desensitization and reprocessing; EF w/o imaginal confrontation = emotion focused without imaginal confrontation; Emotion-focused(IC) = emotion-focused (Imaginal Confrontation); HOPE = Helping to Overcome PTSD through Empowerment; IPT = interpersonal psychotherapy; NET = narrative exposure therapy; PE = prolonged exposure; STAIR-PE = skills training in affect and interpersonal regulation-prolonged exposure; STAIR = skills training in affect and interpersonal regulation; TAU = treatment as usual; TBE = Treatment by Experts for Borderline Personality Disorder; TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; WA = written accounts; WL = waiting list.

Appendix II. *Study Characteristics and Risk of Bias Assessment of Selected Studies*

Study	Main intervention	Outcome	Instrument	Trauma type	Study location	Setting	Phase-oriented	Intent-to-treat	Risk of bias
Adenauer 2011	NET	Depression	HAM-D	Organized violence (conflict/torture/detention/persecution)	Germany	Outpatient	N	N	Low
Bichescu 2007	NET	Depression	BDI	Organized violence (conflict/torture/detention/persecution)	Romania	Outpatient	N	Y	Moderate
Bohus 2013	DBT-PTSD	BPD Depression Dissociation PTSD	BSL BDI-II DES CAPS	Child abuse (under the age 18)	Germany	Residential	Y	Y	Low
Bolton 2014a	BA CPT	Anxiety Depression PTSD	HSCL-25 HSCL-25 HTQ	Organized violence (conflict/torture/detention/persecution)	Kurdistan	Outpatient	N	Y	Moderate
Bolton 2014b	Common elements treatment approach (CETA)	Anxiety Depression PTSD	HSCL-25 HSCL-25 HTQ	Organized violence (conflict/torture/detention/persecution)	Thailand	Outpatient	N	Y	Low
Chard 2005	CPT	Depression Dissociation PTSD	BDI-II DES-II CAPS-SX	Child abuse (average age of onset = 6.4 years)	USA	Outpatient	N	N	High
Cloitre 2002	STAIR-PE	Anxiety Depression Dissociation Emotion regulation Interpersonal = problem PTSD	STAI-S BDI DISS NMR IIP CAPS	Child abuse (under the age 18)	USA	Outpatient	Y	N	Moderate
Cloitre 2010	STAIR-PE	Anxiety Depression Emotion regulation Interpersonal = problem PTSD	STAI-S BDI NMR IIP CAPS	Child abuse (under the age 18)	USA	Outpatient	Y	Y	Low
Duffy 2007	CBT	Depression PTSD	BDI PDS	Organized violence (conflict/torture/detention/persecution)	Ireland	Outpatient	N	Y	High
Edmond 1999	EMDR	Anxiety Depression PTSD	STAI BDI IES	Child abuse (average age of onset = 6.5 years)	USA	Outpatient	N	N	High
Foa 2005	PE PE/cognitive restructuring	Depression PTSD	BDI PSS-I	Multiple interpersonal trauma	USA	Outpatient	N	Y	Low
Galovski 2012	CPT	Depression PTSD	BDI-II CAPS	Multiple interpersonal trauma	USA	Outpatient	N	Y	Low
Ghafoori 2016	psychoeducation	Anxiety Depression PTSD	BSI-18 BSI-18 PCL-C	Multiple interpersonal trauma	USA	Outpatient	N	N	High
Ghafoori 2017	PE	Anxiety Depression PTSD	BSI-18 BSI-18 PCL-5	Multiple interpersonal trauma	USA	Outpatient	N	Y	High
Harkness 2012	CBT IPT	Depression	HAM-D	Child abuse (under the age 17)	Canada	Outpatient	N	Y	Low

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Appendix II. *Continued*

Study	Main intervention	Outcome	Instrument	Trauma type	Study location	Setting	Phase-oriented	Intent-to-treat	Risk of bias
Harned 2014	DBT-PE DBT	Anxiety Depression Dissociation NSSI PTSD Suicidality	HRSA HRSD DES-T SASII PSS-I SASII	Multiple interpersonal trauma	USA	Outpatient	Y	Y	Low
Hensel-Dittmann 2011	NET	Depression PTSD	HAM-D CAPS	Organized violence (conflict/torture/detention/persecution)	Germany	Outpatient	N	N	Moderate
Hijazi 2014	NET	Depression PTSD	BDI-II HTQ	Organized violence (conflict/torture/detention/persecution)	Germany	Outpatient	N	Y	Moderate
Johnson 2011	Stabilization	Depression PTSD	BDI CAPS	Multiple interpersonal trauma	USA	Residential	N	Y	High
Jung 2013	CRIM (CT)	Depression PTSD Self	BDI-II CAPS Rosenberg SES	Child abuse (average age of onset = 7.7 years)	Germany	Outpatient	N	N	High
Katz 2014	PE Holographic reprocessing	Anxiety Depression PTSD Self	BSI-18 BSI-18 PCL PTCI	Military trauma	USA	Outpatient	N	N	High
Korte 2017	TF-CBT	Depression PTSD Substance	BDI-II PCL-M MINI/ TLFB	Military trauma	USA	Outpatient	N	Y	High
Kubany 2003	CT	Depression PTSD Self	BDI CAPS Rosenberg SES	Multiple interpersonal trauma	USA	Outpatient	N	N	Moderate
McDonagh 2005	PE Present-centered	Anxiety Depression Dissociation PTSD Self	STAI BDI DES CAPS TSI	Child abuse (under the age 16)	USA	Outpatient	N	Y	High
Neuner 2010	NET	Depression PTSD	HSCL-25 PDS	Organized violence (conflict/torture/detention/persecution)	Germany	Outpatient	N	N	Low
Nixon 2016	CPT	Depression PTSD Self	BDI-II CAPS PTCI	Multiple interpersonal trauma	Australia	Outpatient	N	Y	Low
Pabst 2014	NET	BPD Depression Dissociation PTSD	BSL-23 HAM-D FDS PDS	Multiple interpersonal trauma	Germany	Outpatient	N	Y	High
Paivio 2010	Emotion-focused (Imaginal Confrontation)	Anxiety Depression Interpersonal = problem PTSD Self	STAI BDI-II IIP IES Rosenberg SES	Child abuse (under the age 18)	Canada	Outpatient	N	N	High
Pigeon 2009	IPT	Depression	HAM-D	Child abuse (onset age not clear)	USA	Outpatient	N	Y	High

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Appendix II. *Continued*

Study	Main intervention	Outcome	Instrument	Trauma type	Study location	Setting	Phase-oriented	Intent-to-treat	Risk of bias
Resick 2002	CPT PE	Depression PTSD	BDI CAPS	Multiple interpersonal trauma	USA	Outpatient	N	Y	Moderate
Resick 2008	CPT CPT without WA written accounts	Depression PTSD Depression	BDI PDS BDI	Multiple interpersonal trauma	USA	Outpatient	N	Y	Low
Scheck 1998	EMDR	Anxiety Depression PTSD Self	STAI BDI IES TSCS	Child abuse (onset age not clear)	USA	Outpatient	N	N	High
Schnurr 2007	PE	Anxiety Depression PTSD	STAI BDI CAPS	Military trauma	USA	Outpatient	N	Y	Low
Stenmark 2013	NET	PTSD Depression	CAPS HAM-D	Organized violence (conflict/torture/detention/persecution)	Germany	Outpatient	N	N	Low
Sullivan 1999	Advocacy	Depression	CES-D	Multiple interpersonal trauma	USA	Shelter	N	N	Moderate
Suris 2013	CPT	Depression PTSD	QIDS CAPS	Military trauma	USA	Outpatient	N	N	Low
Taft 2011	Mentoring	Depression	EPDS	Multiple interpersonal trauma	Australia	Outpatient	N	N	High
Talbot 2011	IPT	Depression PTSD	HAM-D PSS	Child abuse (under the age 18)	USA	Outpatient	N	N	High
ter Heide 2011	EMDR	Anxiety Depression PTSD	HSCL-25 HSCL-25 HTQ	Organized violence (conflict/torture/detention/persecution)	Germany	Outpatient	N	N	Low
Tiwari 2010	Advocacy	Depression	BDI-II	Multiple interpersonal trauma	China	Outpatient	N	Y	Low
Vitriol 2009	Psychodynamic	Depression PTSD Interpersonal=problem	HAM-D PTO8 Lambert's-OQ-IR	Child abuse (under the age of 15)	Chile	Outpatient	N	Y	High
Weiss 2015	Common elements treatment approach (CETA) CPT	Anxiety Depression PTSD	HSCL-25 HSCL-25 HTQ	Organized violence (conflict/torture/detention/persecution)	Iraq	Outpatient	N	Y	Low

Note. BA = behavioral activation treatment; BDI = Beck Depression Inventory; BDI-II = Beck Depression Inventory-II; BSI-18 = Brief Symptom Inventory 18; BSL-23 = The short version of the Borderline Symptom List; CAPS = Clinician-Administered PTSD Scale; CAPS-SX = the 17-item Clinician-Administered PTSD Scale; CBT = cognitive behavioral therapy; CPT = cognitive processing therapy; CES-D = Center for Epidemiologic Studies-Depression Scale; CIDI = Composite International Diagnostic Interview; DBT-PTSD = dialectical behavior therapy for posttraumatic stress disorder; DES = dissociative experiences scale; DES-II = dissociative experiences scale - II; DES-T = dissociative experiences scale scale taxon; DISS = the 14-item Dissociation Scale; EMDR = eye movement desensitization and reprocessing; EPDS = Edinburgh Postnatal Depression Scale; FDS = Fragebogen für dissoziative symptome; HAM-D = Hamilton Depression Rating Scale; HRSA = Hamilton Rating Scale for Anxiety; HRSD = Hamilton Rating Scale for Depression; HSCL-25 = Hopkins Symptom Checklist-25; HTQ = Harvard Trauma Questionnaire; IES = Impact of Event Scale; IIP = Inventory of Interpersonal Problems; IPT = interpersonal psychotherapy; Lambert's-OQ-IR = Lambert's Outcome Questionnaire(OQ-45.2); MINI = Mini International Neuropsychiatric Interview; TLFB = Timeline Follow-Back; NET = narrative exposure therapy; NMR = Negative Mood Regulation Scale; PCL-C = PTSD CheckList – Civilian Version; PCL-5 = PTSD Checklist for DSM-5; PCL-M = PTSD CheckList - Military Version; PDS = Posttraumatic Diagnostic Scale; PE = prolonged exposure; PTSD = posttraumatic stress disorder; PSS = PTSD Symptom Scale; PSS-I = PTSD Symptom Scale - Interview; PTCI = Posttraumatic Cognitions Inventory; PTO8 = Post-traumatic Stress Treatment Outcome scale; QIDS = Quick Inventory of Depressive Symptomatology; Rosenberg SES = Rosenberg Self-Esteem Scale; SASII = Suicide Attempt Self Injury Interview; STAI = State-Trait Anxiety Inventory; STAI-S = State subscale of the State–Trait Anxiety Inventory; STAIR-PE = skills training in affect and interpersonal regulation- prolonged exposure; TSCS = Tennessee Self-Concept Scale; TSI = Trauma Symptom Inventory.

Appendix III.

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Supplementary Table 1. *Effect Size and Heterogeneity Statistics of Each Comparison on PTSD and Depression*

Treatment	Study name	Comparison	Outcome PTSD Hedges's g	95% CI Lower limit	95% CI Upper limit	Heterogeneity Q-value	df(Q)	I²	Tau²	Outcome Depression Hedges's g	95% CI Lower limit	95% CI Upper limit	Heterogeneity Q-value	df(Q)	I²	Tau²
CPT/CT	Bolton 2014a	CPT vs. WL	0.511	0.197	0.824	71.999	8.000	88.889	0.436	0.429	0.116	0.741	86.504	8.000	90.752	0.540
	Chard 2005	CPT vs. WL	2.687	1.963	3.410					2.317	1.639	2.994				
	Galovski 2012	CPT vs. WL	1.290	0.861	1.719					0.993	0.580	1.407				
	Jung 2013	Cognitive modification+ imagery vs. WL	0.857	0.103	1.610					0.421	-0.306	1.149				
	Kubany 2003	CT vs. WL	3.039	2.030	4.048					2.539	1.617	3.461				
	Nixon 2016	CPT vs. TAU	0.078	-0.491	0.647					0.421	-0.154	0.996				
	Resick 2002	CPT vs. WL	1.296	0.882	1.710					0.871	0.476	1.266				
	Suris 2013	CPT vs. present-centered	0.991	0.538	1.444					2.613	2.034	3.193				
	Weiss 2015	CPT vs. WL	0.409	0.116	0.702					0.399	0.106	0.691				
	Random effects		1.155	0.684	1.625					1.172	0.657	1.688				
NET	Adenauer 2011	NET vs. WL	2.939	1.662	4.216	22.568	7.000	68.983	0.352	1.583	0.578	2.588	6.142	7.000	0.000	0.000
	Bichescu 2007	NET vs. psychoeducation	1.667	0.632	2.701					0.900	-0.028	1.827				
	Hensel-Dittmann 2011	NET vs. stress innoculation	1.045	0.274	1.817					0.653	-0.099	1.406				
	Hijazi 2014	Brief NET vs. WL	0.230	-0.283	0.743					0.231	-0.282	0.744				
	Neuner 2010	NET vs. TAU	1.276	0.531	2.020					0.568	-0.122	1.258				
	Pabst 2014	NET vs. TBE	0.205	-0.601	1.011					0.609	-0.215	1.432				
	Stenmark 2013 (refugee)	NET vs. TAU	0.752	0.068	1.436					0.508	-0.163	1.179				
	Stenmark 2013 (asylumseeker)	NET vs. TAU	0.554	-0.354	1.462					0.564	-0.345	1.472				
	Random effects		0.969	0.464	1.474					0.580	0.320	0.841				
PE	Foa 2005	PE vs. WL	0.811	0.358	1.264	15.666	6.000	61.700	0.077	0.739	0.259	1.218	8.217	6.000	26.976	0.018
	Foa 2005	PE+cognitive restructuring vs. WL	0.715	0.261	1.169					0.614	0.133	1.096				
	Ghafoori 2017	PE vs. person-centered	0.502	0.009	0.995					0.701	0.201	1.201				
	Katz 2014	PE vs. person centered	0.741	-0.111	1.593					0.571	-0.269	1.411				
	McDonagh 2005	PE+cognitive restructuring vs. WL	0.455	-0.091	1.002					0.375	-0.169	0.919				
	Resick 2002	PE vs. WL	1.134	0.729	1.539					0.720	0.330	1.109				
	Schnurr 2007	PE vs. present-centered	0.269	0.036	0.502					0.229	-0.003	0.462				
	Random effects		0.643	0.371	0.915					0.514	0.319	0.708				

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Supplementary Table 1. *Continued*

Treatment	Study name	Comparison	Outcome: PTSD — Hedges's g	95% CI Lower limit	95% CI Upper limit	Q-value	df(Q)	I^2	Tau²	Outcome: Depression — Hedges's g	95% CI Lower limit	95% CI Upper limit	Q-value	df(Q)	I^2	Tau²
Phased TF-CBT	Bohus 2013	DBT-PTSD vs. TAU	1.343	0.843	1.843					0.598	0.137	1.059				
	Cloitre 2002	STAIR-PE vs. WL	1.436	0.796	2.076					1.377	0.743	2.011				
	Random effects		1.378	0.984	1.772	0.050	1.000	0.000	0.000	0.956	0.195	1.717	3.789	1.000	73.609	0.223
Single TF-CBT	Bolton 2014b	common elements treatment approach vs. WL	1.134	1.360	9.811											
	Duffy 2007	CBT vs. WL	0.825	1.355	3.055					0.751	0.225	1.277				
	Korte 2017	Exposure (COPE) vs. CBT for substance	0.704	1.174	2.933					0.515	0.050	0.979				
	Weiss 2015	Common elements treatment approach vs. WL	2.388	2.821	10.795					1.811	1.415	2.207				
	Random effects		1.268	1.944	3.674	35.115	3.000	91.457	0.429	1.035	0.194	1.876	20.101	2.000	90.050	0.497
EMDR	Edmond 1999	EMDR vs. TAU	0.250	-0.360	0.860					0.089	-0.519	0.696				
	Edmond 1999	EMDR vs. WL	1.065	0.406	1.724					0.382	-0.239	1.003				
	Scheck 1998	EMDR vs. TAU	0.997	0.453	1.541					0.526	0.017	1.034				
	ter Heide 2011	EMDR vs. stabilization	0.718	-0.445	1.881					0.592	-0.557	1.741				
	Random effects		0.767	0.361	1.173	4.239	3.000	29.236	0.050	0.374	0.057	0.691	1.327	3.000	0.000	0.000
Non-TF CBT	Bolton 2014a	behavior activation vs. WL	0.284	-0.020	0.587					0.321	0.017	0.624				
	Johnson 2011	Stabilization (HOPE) vs. usual case management	0.058	-0.405	0.522					0.664	0.187	1.140				
	Random effects		0.216	-0.038	0.470	0.636	1.000	0.000	0.000	0.441	0.120	0.762	1.418	1.000	29.466	0.017
Present-centered	Katz 2014	holographic reprocessing vs. person centered	1.128	0.325	1.931					0.942	0.156	1.728				
	McDonagh 2005	present-centered vs. WL	0.728	0.134	1.321					0.449	-0.133	1.030				
	Paivio 2010	Emotion-focused (imaginal confrontation) vs. EF w/o imaginal confrontation	0.455	-0.204	1.113					0.129	-0.521	0.780				
	Pigeon 2009	IPT vs. TAU	0.749	0.192	1.306					0.381	-0.087	0.850				
	Talbot 2011	IPT vs. TAU								0.335	-0.207	0.877				
	Vitriol 2009	psychodynamic vs. TAU	0.085	-0.332	0.502					0.555	0.131	0.980				
	Random effects		0.562	0.203	0.921	7.510	4.000	46.736	0.077	0.446	0.225	0.667	2.929	5.000	0.000	0.000

Note. COPE = Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure; CPT = Cognitive Processing Therapy; CT = Cognitive Therapy; DBT-PTSD = Dialectical Behavior Therapy for Posttraumatic Stress Disorder; EF = emotion-focused; HOPE = Helping to Overcome PTSD through Empowerment IPT = Interpersonal Psychotherapy; NET = Narrative Exposure Therapy; PE = Prolonged Exposure; PTSD = Posttraumatic Stress Disorder; STAIR-PE = skills training in affect and interpersonal regulation and prolonged exposure; TAU = treatment as usual; TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; WL = wait list; TBE = Treatment by Experts for Borderline Personality Disorder.

Supplementary Table 2. *Effect Size and Heterogeneity Statistics of Each Comparison on Anxiety and Dissociation*

Treatment	Study name	Comparison	Outcome Anxiety Hedges's g	95% CI Lower limit	95% CI Upper limit	Heterogeneity Q-value	df (Q)	I²	Tau²	Outcome Dissociation Hedges's g	95% CI Lower limit	95% CI Upper limit	Heterogeneity Q-value	df (Q)	I²	Tau²
CPT/CT	Bolton 2014a	CPT vs. WL	0.525	0.211	0.839	1.375	1.000	27.282	0.009							
	Chard 2005	CPT vs. WL								1.352	0.773	1.932				
	Galovski 2012	CPT vs. WL														
	Jung 2013	Cognitive modification+ imagery vs. WL														
	Kubany 2003	CT vs. WL														
	Nixon 2016	CPT vs. TAU														
	Resick 2002	CPT vs. WL														
	Suris 2013	CPT vs. present-centered														
	Weiss 2015	CPT vs. WL	0.269	-0.023	0.561											
	Random effects		0.390	0.140	0.641											
NET	Adenauer 2011	NET vs. WL														
	Bichescu 2007	NET vs. psychoeducation														
	Hensel-Dittmann 2011	NET vs. stress innoculation														
	Hijazi 2014	Brief NET vs. WL														
	Neuner 2010	NET vs. TAU														
	Pabst 2014	NET vs. TBE								0.181	-0.625	0.986				
	Stenmark 2013 (refugee)	NET vs. TAU														
	Stenmark 2013 (asylumseeker)	NET vs. TAU														
	Random effects															

Supplementary Table 2. *Continued*

Treatment	Study name	Comparison	Outcome: Anxiety	Hedges's g	95% CI Lower limit	95% CI Upper limit	Het. Q-value	df(Q)	I²	Tau²	Outcome: Dissociation	Hedges's g	95% CI Lower limit	95% CI Upper limit	Het. Q-value	df(Q)	I²	Tau²
PE	Foa 2005	PE vs. WL					2.594	3.000	0.000	0.000								
	Foa 2005	PE+cognitive restructuring vs. WL																
	Ghafoori 2017	PE vs. person-centered		0.287	-0.202	0.775												
	Katz 2014	PE vs. person centered		0.864	0.001	1.726												
	McDonagh 2005	PE + cognitive restructuring vs. WL		0.365	-0.179	0.908												
	Resick 2002	PE vs. WL																
	Schnurr 2007	PE vs. present-centered		0.170	-0.063	0.402												
	Random effects			0.245	0.055	0.436												
Phased TF-CBT	Bohus 2013	DBT-PTSD vs. TAU										0.486	0.028	0.944				
	Cloitre 2002	STAIR-PE vs. WL										1.025	0.419	1.631				
	Random effects											0.718	0.195	1.241	1.936	1.000	48.350	0.070
Single TF-CBT	Bolton 2014b	Common elements treatment approach vs. WL		0.750	0.968	6.759	13.998	1.000	92.856	0.329								
	Duffy 2007	CBT vs. WL																
	Korte 2017	Exposure (COPE) vs. CBT for substance																
	Weiss 2015	Common elements treatment approach vs. WL		1.592	1.975	8.134												
	Random effects			1.156	1.980	2.748												
EMDR	Edmond 1999	EMDR vs. TAU		0.382	-0.231	0.995	5.615	3.000	46.569	0.108								
	Edmond 1999	EMDR vs. WL		1.369	0.683	2.056												
	Scheck 1998	EMDR vs. TAU		0.622	0.106	1.138												
	ter Heide 2011	EMDR vs. TAU		1.359	0.091	2.628												
	Random effects			0.830	0.351	1.309												

Supplementary Table 2. *Continued*

Treatment	Study name	Comparison	Outcome Anxiety	Hedges's g	95% CI Lower limit	95% CI Upper limit	Q-value	df(Q)	I²	Tau²	Outcome Dissociation	Hedges's g	95% CI Lower limit	95% CI Upper limit	Q-value	df(Q)	I²	Tau²
Non-TF CBT	Bolton 2014a	Behavior activation vs. WL		0.513	0.207	0.820												
	Johnson 2011	Stabilization (HOPE) vs. usual case management																
	Random effects																	
Present-centered	Katz 2014	Holographic reprocessing vs. person centered		1.091	0.292	1.890	2.188	2.000	8.609	0.011								
	McDonagh 2005	present-centered vs. WL		0.475	-0.107	1.058						1.081	0.465	1.698				
	Paivio 2010	Emotion-focused (imaginal confrontation) vs. EF w/o imaginal confrontation		0.345	-0.310	1.000												
	Pigeon 2009	IPT vs. TAU																
	Talbot 2011	IPT vs. TAU																
	Vitriol 2009	Psychodynamic vs. TAU																
	Random effects			0.576	0.175	0.978												

Note. COPE = Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure; CPT = Cognitive Processing Therapy; CT = Cognitive Therapy; DBT-PTSD = Dialectical Behavior Therapy for Posttraumatic Stress Disorder; EF = emotion-focused; HOPE = Helping to Overcome PTSD through Empowerment; IPT = Interpersonal Psychotherapy; NET = Narrative Exposure Therapy; PE = Prolonged Exposure; PTSD = Posttraumatic Stress Disorder; STAIR-PE = skills training in affect and interpersonal regulation and prolonged exposure; TAU = treatment as usual; TBE = Treatment by Experts for Borderline Personality Disorder; TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; WL = wait list.

Supplementary Table 3. *Effect Size and Heterogeneity Statistics of Each Comparison on Negative self-concept and Emotion Regulation*

Treatment	Study name	Comparison	Outcome Negative self-concept Hedges's g	95% CI Lower limit	95% CI Upper limit	Heterogeneity Q-value	df(Q)	I²	Tau²	Outcome Emotion regulation Hedges's g	95% CI Lower limit	95% CI Upper limit	Heterogeneity Q-value	df(Q)	I²	Tau²
CPT/CT	Bolton 2014a	CPT vs. WL														
	Chard 2005	CPT vs. WL														
	Galovski 2012	CPT vs. WL														
	Jung 2013	Cognitive modification+ imagery vs. WL	0.453	-0.276	1.182											
	Kubany 2003	CT vs. WL	2.409	1.508	3.310											
	Nixon 2016	CPT vs. TAU	0.594	0.012	1.175											
	Resick 2002	CPT vs. WL														
	Suris 2013	CPT vs. present-centered														
	Weiss 2015	CPT vs. WL	1.110	0.027	2.193											
	Random effects					13.280	2.000	84.939	0.773							
NET	Adenauer 2011	NET vs. WL														
	Bichescu 2007	NET vs. psychoeducation														
	Hensel-Ditt-mann 2011	NET vs. stress innoculation														
	Hijazi 2014	brief NET vs. WL														
	Neuner 2010	NET vs. TAU														
	Pabst 2014	NET vs. TBE														
	Stenmark 2013 (refugee)	NET vs. TAU														
	Stenmark 2013 (asylumseeker)	NET vs. TAU														
	Random effects															
PE	Foa 2005	PE vs. WL														
	Foa 2005	PE+cognitive restructuring vs. WL														
	Ghafoori 2017	PE vs. person-centered														
	Katz 2014	PE vs. person centered	1.050	0.169	1.931											
	McDonagh 2005	PE+cognitive restructuring vs. WL	0.441	-0.105	0.986											
	Resick 2002	PE vs. WL														
	Schnurr 2007	PE vs. present-centered														
	Random effects		0.643	0.081	1.205	1.327	1.000	24.662	0.046							

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Supplementary Table 3. *Continued*

Treatment	Study name	Comparison	Outcome Negative self-concept			Heterogeneity				Outcome Emotion regulation			Heterogeneity			
			Hedges's g	95% CI Lower limit	95% CI Upper limit	Q-value	df(Q)	I²	Tau²	Hedges's g	95% CI Lower limit	95% CI Upper limit	Q-value	df(Q)	I²	Tau²
Phased TF-CBT	Bohus 2013	DBT-PTSD vs. TAU														
	Cloitre 2002	STAIR-PE vs. WL								1.305	0.677	1.933				
	Random effects															
Single TF-CBT	Bolton 2014b	Common elements treatment approach vs. WL														
	Duffy 2007	CBT vs. WL														
	Korte 2017	Exposure (COPE) vs. CBT for substance														
	Weiss 2015	Common elements treatment approach vs. WL														
	Random effects															
EMDR	Edmond 1999	EMDR vs. TAU														
	Edmond 1999	EMDR vs. WL														
	Scheck 1998	EMDR vs. TAU	0.457	-0.054	0.967											
	ter Heide 2011	EMDR vs. stabilization														
	Random effects															
Non-TF CBT	Bolton 2014a	Behavior activation vs. WL														
	Johnson 2011	Stabilization (HOPE) vs. usual case management														
	Random effects															
Present-centered	Katz 2014	Holographic reprocessing vs. person centered	0.990	0.200	1.780	2.531	2.000	20.985	0.031							
	McDonagh 2005	Present-centered vs. WL	0.678	0.087	1.269											
	Paivio 2010	Emotion-focused (imaginal confrontation) vs. EF w/o imaginal confrontation	0.188	-0.464	0.839											
	Pigeon 2009	IPT vs. TAU														
	Talbot 2011	IPT vs. TAU														
	Vitriol 2009	Psychodynamic vs. TAU														
	Random effects		0.588	0.154	1.021											

Note. COPE = Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure; CPT = Cognitive Processing Therapy; CT = Cognitive Therapy; DBT-PTSD = Dialectical Behavior Therapy for Posttraumatic Stress Disorder; EF = emotion-focused; HOPE = Helping to Overcome PTSD through Empowerment; IPT = Interpersonal Psychotherapy; NET = Narrative Exposure Therapy; PE = Prolonged Exposure; PTSD = Posttraumatic Stress Disorder; STAIR-PE = skills training in affect and interpersonal regulation and prolonged exposure; TAU = treatment as usual; TBE = Treatment by Experts for Borderline Personality Disorder; TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; WL = wait list.

Supplementary Table 4. *Effect Size and Heterogeneity Statistics of Each Comparison on Interpersonal Problem and Borderline Personality*

Treatment	Study name	Comparison	Outcome: Interpersonal problem	Hedges's g	95% CI Lower limit	Upper limit	Heterogeneity Q-value	df(Q)	I²	Tau²	Outcome: Borderline personality	Hedges's g	95% CI Lower limit	Upper limit	Heterogeneity Q-value	df(Q)	I²	Tau²
CPT/CT	Bolton 2014a	CPT vs. WL																
	Chard 2005	CPT vs. WL																
	Galovski 2012	CPT vs. WL																
	Jung 2013	Cognitive modification+imagery vs. WL																
	Kubany 2003	CT vs. WL																
	Nixon 2016	CPT vs. TAU																
	Resick 2002	CPT vs. WL																
	Suris 2013	CPT vs. present-centered																
	Weiss 2015	CPT vs. WL																
	Random effects																	
NET	Adenauer 2011	NET vs. WL																
	Bichescu 2007	NET vs. psychoeducation																
	Hensel-Dittmann 2011	NET vs. stress innoculation																
	Hijazi 2014	brief NET vs. WL																
	Neuner 2010	NET vs. TAU																
	Pabst 2014	NET vs. TBE											0.221	-0.586	1.027				
	Stenmark 2013 (refugee)	NET vs. TAU																	
	Stenmark 2013 (asylumseeker)	NET vs. TAU																	
	Random effects																	
PE	Foa 2005	PE vs. WL																
	Foa 2005	PE+cognitive restructuring vs. WL																
	Ghafoori 2017	PE vs. person-centered																
	Katz 2014	PE vs. person centered																
	McDonagh 2005	PE+cognitive restructuring vs. WL																
	Resick 2002	PE vs. WL																
	Schnurr 2007	PE vs. present-centered																
	Random effects																	
Phased TF-CBT	Bohus 2013	DBT-PTSD vs. TAU											0.440	-0.017	0.896				
	Cloitre 2002	STAIR-PE vs. WL		1.270	0.645	1.895												
	Random effects																	

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Supplementary Table 4. *Continued*

Treatment	Study name	Comparison	Outcome: Interpersonal problem Hedges's g	95% CI Lower limit	95% CI Upper limit	Heterogeneity Q-value	df (Q)	I²	Tau²	Outcome: Borderline personality Hedges's g	95% CI Lower limit	95% CI Upper limit	Heterogeneity Q-value	df (Q)	I²	Tau²
Single TF-CBT	Bolton 2014b	Common elements treatment approach vs. WL														
	Duffy 2007	CBT vs. WL														
	Korte 2017	Exposure (COPE) vs. CBT for substance														
	Weiss 2015	Common elements treatment approach vs. WL														
	Random effects															
EMDR	Edmond 1999	EMDR vs. TAU														
	Edmond 1999	EMDR vs. WL														
	Scheck 1998	EMDR vs. TAU														
	ter Heide 2011	EMDR vs. stabilization														
	Random effects															
Non-TF CBT	Bolton 2014a	Behavior activation vs. WL														
	Johnson 2011	Stabilization (HOPE) vs. usual case management														
	Random effects															
Present-centered	Katz 2014	Holographic reprocessing vs. person centered														
	McDonagh 2005	Present-centered vs. WL														
	Paivio 2010	Emotion-focused (imaginal confrontation) vs. EF w/o imaginal confrontation	0.030	-0.621	0.680											
	Pigeon 2009	IPT vs. TAU														
	Talbot 2011	IPT vs. TAU														
	Vitriol 2009	psychodynamic vs. TAU	0.498	0.075	0.921											
	Random effects		0.332	-0.108	0.771	1.402	1.000	28.675	0.031							

Note. COPE = Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure; CPT = Cognitive Processing Therapy; CT = Cognitive Therapy; DBT-PTSD = Dialectical Behavior Therapy for Posttraumatic Stress Disorder; EF = emotion-focused; HOPE = Helping to Overcome PTSD through Empowerment; IPT = Interpersonal Psychotherapy; NET = Narrative Exposure Therapy; PE = Prolonged Exposure; PTSD = Posttraumatic Stress Disorder; STAIR-PE = skills training in affect and interpersonal regulation and prolonged exposure; TAU = treatment as usual; TBE = Treatment by Experts for Borderline Personality Disorder; TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; WL = wait list.

Study name	Comparison	Statistics for each study		
		Hedges's g	Lower limit	Upper limit
Adenauer 2011	NET vs WL	2.939	1.662	4.216
Bohus 2013	DBT-PTSD vs TAU	1.343	0.843	1.843
Bolton 2014a	behavior activation vs WL	0.284	-0.020	0.587
Bolton 2014a	CPT vs WL	0.511	0.197	0.824
Bolton 2014b	common elements treatment approach vs WL	1.134	0.907	1.360
Chard 2005	CPT vs WL	2.687	1.963	3.410
Cloitre 2002	STAIR/PE vs WL	1.436	0.796	2.076
Duffy 2007	CBT vs WL	0.825	0.296	1.355
Edmond 1999	EMDR vs TAU	0.250	-0.360	0.860
Edmond 1999	EMDR vs WL	1.065	0.406	1.724
Foa 2005	PE vs WL	0.811	0.358	1.264
Foa 2005	PE+cognitive restructuring vs WL	0.715	0.261	1.169
Galowski 2012	CPT vs WL	1.290	0.861	1.719
Ghafoori 2016	psychoeducation vs WL	0.264	-0.214	0.742
Hijazi 2014	brief NET vs WL	0.230	-0.283	0.743
Jung 2013	cognitive modification/imagery vs WL	0.857	0.103	1.610
Kubany 2003	CT vs WL	3.039	2.030	4.048
McDonagh 2005	PE+cognitive restructuring vs WL	0.455	-0.091	1.002
McDonagh 2005	present-centered vs WL	0.728	0.134	1.321
Neuner 2010	NET vs TAU	1.276	0.531	2.020
Nixon 2016	CPT vs TAU	0.078	-0.491	0.647
Pabst 2014	NET vs TBE	0.205	-0.601	1.011
Resick 2002	CPT vs WL	1.296	0.882	1.710
Resick 2002	PE vs WL	1.134	0.729	1.539
Scheck 1998	EMDR vs TAU	0.997	0.453	1.541
Stenmark 2013refugee	NET vs TAU	0.752	0.068	1.436
Stenmark 2013asylumseeker	NET vs TAU	0.554	-0.354	1.462
Talbot 2011	IPT vs TAU	0.749	0.192	1.306
Vitriol 2009	psychodynamic vs TAU	0.085	-0.332	0.502
Weiss 2015	common elements treatment approach vs WL	2.388	1.954	2.821
Weiss 2015	CPT vs WL	0.409	0.116	0.702
		0.936	0.712	1.161

Supplementary Figure 1. *Forest plot of psychological treatment vs TAU/WL comparisons on outcome of PTSD.*

Z-Value	p-Value	Variance	Standard error	Outcome	Study name	Comparison	Hedges's g	Lower limit	Upper limit
3.086	0.002	0.263	0.513	depression	Adenauer 2011	NET vs WL	1.583	0.578	2.588
2.541	0.011	0.055	0.235	depression	Bohus 2013	DBT-PTSD vs TAU	0.598	0.137	1.059
2.069	0.039	0.024	0.155	depression	Bolton 2014a	behavior activation vs WL	0.321	0.017	0.624
2.691	0.007	0.025	0.159	depression	Bolton 2014a	CPT vs WL	0.429	0.116	0.741
6.702	0.000	0.119	0.346	depression	Chard 2005	CPT vs WL	2.317	1.639	2.994
4.254	0.000	0.105	0.324	depression	Cloitre 2002	STAIR:PE vs WL	1.377	0.743	2.011
2.798	0.005	0.072	0.268	depression	Duffy 2007	CBT vs WL	0.751	0.225	1.277
0.286	0.775	0.096	0.310	depression	Edmond 1999	EMDR vs TAU	0.089	-0.519	0.696
1.205	0.228	0.100	0.317	depression	Edmond 1999	EMDR vs WL	0.382	-0.239	1.003
3.017	0.003	0.060	0.245	depression	Foa 2005	PE vs WL	0.739	0.259	1.218
2.499	0.012	0.060	0.246	depression	Foa 2005	PE-cognitive restructuring vs WL	0.614	0.133	1.096
4.711	0.000	0.044	0.211	depression	Galovski 2012	CPT vs WL	0.993	0.580	1.407
0.266	0.790	0.059	0.243	depression	Ghafoeri 2016	psychoeducation vs WL	0.065	-0.411	0.541
0.883	0.377	0.069	0.262	depression	Hijazi 2014	briefNET vs WL	0.231	-0.282	0.744
1.134	0.257	0.138	0.371	depression	Jung 2013	cognitive modification/imagery vs WL	0.421	-0.306	1.149
5.396	0.000	0.221	0.471	depression	Kubany 2003	CT vs WL	2.539	1.617	3.461
1.351	0.177	0.077	0.277	depression	McDonagh 2005	PE-cognitive restructuring vs WL	0.375	-0.169	0.919
1.512	0.131	0.088	0.297	depression	McDonagh 2005	present-centered vs WL	0.449	-0.133	1.030
1.614	0.106	0.124	0.352	depression	Neuner 2010	NET vs TAU	0.568	-0.122	1.258
1.433	0.152	0.086	0.293	depression	Nixon 2016	CPT vs TAU	0.421	-0.154	0.996
1.448	0.148	0.177	0.420	depression	Pabst 2014	NET vs TBE	0.609	-0.215	1.432
1.595	0.111	0.057	0.239	depression	Pigeon 2009	IPT vs TAU	0.381	-0.087	0.850
4.320	0.000	0.041	0.202	depression	Resick 2002	CPT vs WL	0.871	0.476	1.266
3.620	0.000	0.040	0.199	depression	Resick 2002	PE vs WL	0.720	0.330	1.109
2.027	0.043	0.067	0.259	depression	Scheck 1998	EMDR vs TAU	0.526	0.017	1.034
1.483	0.138	0.117	0.343	depression	Stenmark 2013refugee	NET vs TAU	0.508	-0.163	1.179
1.216	0.224	0.215	0.463	depression	Stenmark2013asylumseeker	NET vs TAU	0.564	-0.345	1.472
1.211	0.226	0.076	0.277	depression	Talbot 2011	IPT vs TAU	0.335	-0.207	0.877
2.563	0.010	0.047	0.217	depression	Vitriol 2009	psychodynamic vs TAU	0.555	0.131	0.980
8.965	0.000	0.041	0.202	depression	Weiss 2015	common elements treatment approach vs WL	1.811	1.415	2.207
2.668	0.008	0.022	0.149	depression	Weiss 2015	CPT vs WL	0.399	0.106	0.691
7.646	0.000	0.008	0.090				0.688	0.511	0.864

Meta Analysis

Supplementary Figure 2. *Forest plot of psychological treatment vs TAU/WL comparisons on outcome of depression.*

Statistics for each study				Outcome	Study name	Comparison	Statistics for each study			Hedges's g and 95% CI
Z-Value	p-Value	Variance	Standard error				Hedges's g	Lower limit	Upper limit	
3.283	0.001	0.024	0.156	anxiety	Bolton 2014a	behavior activation vs WL	0.513	0.207	0.820	
3.280	0.001	0.026	0.160	anxiety	Bolton 2014a	CPT vs WL	0.525	0.211	0.839	
6.759	0.000	0.012	0.111	anxiety	Bolton 2014b	common elements treatment approach vs WL	0.750	0.533	0.968	
5.165	0.000	0.119	0.344	anxiety	Cloitre 2002	STAIR/PE vs WL	1.778	1.103	2.453	
1.220	0.222	0.098	0.313	anxiety	Edmond 1999	EMDR vs TAU	0.382	-0.231	0.995	
3.912	0.000	0.123	0.350	anxiety	Edmond 1999	EMDR vs WL	1.369	0.683	2.056	
0.287	0.774	0.059	0.243	anxiety	Ghafoori 2016	psychoeducation vs WL	0.070	-0.406	0.546	
1.314	0.189	0.077	0.277	anxiety	McDonagh 2005	PE+cognitive restructuring vs WL	0.365	-0.179	0.908	
1.599	0.110	0.088	0.297	anxiety	McDonagh 2005	present-centered vs WL	0.475	-0.107	1.058	
2.364	0.018	0.069	0.263	anxiety	Scheck 1998	EMDR vs TAU	0.622	0.106	1.138	
8.134	0.000	0.038	0.196	anxiety	Weiss 2015	common elements treatment approach vs WL	1.592	1.208	1.975	
1.809	0.071	0.022	0.149	anxiety	Weiss 2015	CPT vs WL	0.269	-0.023	0.561	
5.189	0.000	0.018	0.135				0.699	0.435	0.963	

Meta Analysis

Supplementary Figure 3. *Forest plot of psychological treatment vs TAU/WL comparisons on outcome of anxiety.*

Study name	Outcome	Comparison	Hedges's g	Lower limit	Upper limit	Z-Value	p-Value	Variance	Standard error
Jung 2013	self	cognitive modification/imagery vs WL	0.453	-0.276	1.182	1.218	0.223	0.138	0.372
Kubany 2003	self	CT vs WL	2.409	1.508	3.310	5.240	0.000	0.211	0.460
McDonagh 2005	self	PE+cognitive restructuring vs WL	0.441	-0.105	0.986	1.583	0.113	0.077	0.278
McDonagh 2005	self	present-centered vs WL	0.678	0.087	1.269	2.249	0.024	0.091	0.302
Nixon 2016	self	CPT vs TAU	0.594	0.012	1.175	2.001	0.045	0.088	0.297
Scheck 1998	self	EMDR vs TAU	0.457	-0.054	0.967	1.753	0.080	0.068	0.260
			0.762	0.306	1.218	3.273	0.001	0.054	0.233

Hedges's g and 95% CI

Favours A   Favours B

Meta Analysis

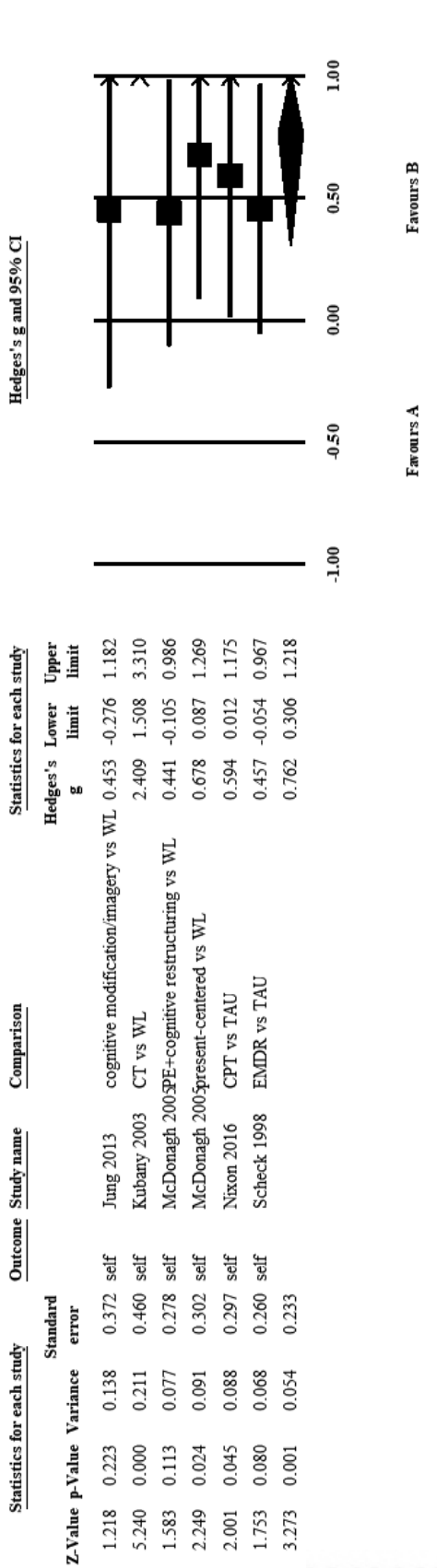**Supplementary Figure 4.** *Forest plot of psychological treatment vs TAU/WL comparisons on outcome of negative self.*

Z-Value	p-Value	Variance	Standard error	Outcome	Study name	Comparison	Hedges's g	Lower limit	Upper limit
2.082	0.037	0.055	0.234	dissociation	Bohus 2013	DBT-PTSD vs TAU	0.486	0.028	0.944
4.577	0.000	0.087	0.296	dissociation	Chard 2005	CPT vs WL	1.352	0.773	1.932
3.317	0.001	0.096	0.309	dissociation	Cloitre 2002	STAIR/PE vs WL	1.025	0.419	1.631
3.136	0.002	0.084	0.289	dissociation	McDonagh 2005	PE+cognitive restructuring vs WL	0.906	0.340	1.473
3.440	0.001	0.099	0.314	dissociation	McDonagh 2005	present-centered vs WL	1.081	0.465	1.698
0.439	0.661	0.169	0.411	dissociation	Pabst 2014	NET vs TBE	0.181	-0.625	0.986
5.227	0.000	0.027	0.164				0.857	0.536	1.179

Statistics for each study

Hedges's g and 95% CI

Favours A   Favours B

Meta Analysis

Supplementary Figure 5. *Forest plot of psychological treatment vs TAU/WL comparisons on outcome of dissociation.*