Review

EMPIRICALLY SUPPORTED PSYCHOLOGICAL TREATMENTS FOR ADULT ACUTE STRESS DISORDER AND POSTTRAUMATIC STRESS DISORDER: A REVIEW

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Background: *Acute stress disorder (ASD) predicts the development of posttraumatic stress disorder (PTSD), which in some sufferers can persist for years and lead to significant disability. We carried out a review of randomized controlled trials to give an update on which psychological treatments are empirically supported for these disorders, and used the criteria set out by Chambless and Hollon [1998: J Consult Clin Psychol 66:7–18] to draw conclusions about efficacy, first irrespective of trauma type and second with regard to particular populations.* **Methods:** *The PsycINFO and PubMed databases were searched electronically to identify suitable articles published up to the end of 2008. Fifty-seven studies satisfied our inclusion criteria.* **Results:** *Looking at the literature undifferentiated by trauma type, there was evidence that trauma-focused cognitive behavioral therapy (CBT) and eye movement desensitization and reprocessing (EMDR) are efficacious and specific for PTSD, stress inoculation training, hypnotherapy, interpersonal psychotherapy, and psychodynamic therapy are possibly efficacious for PTSD and trauma-focused CBT is possibly efficacious for ASD. Not one of these treatments has been tested with the full range of trauma groups, though there is evidence that trauma-focused CBT is established in efficacy for assault- and road traffic accident-related PTSD.* **Conclusions:** *Trauma-focused CBT and to a lesser extent EMDR (due to fewer studies having been conducted and many having had a mixed trauma sample) are the psychological treatments of choice for PTSD, but further research of these and other therapies with different populations is needed. Depression and Anxiety 26:1086–1109, 2009.* © *2009 Wiley-Liss, Inc.*

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INTRODUCTION

Re-experiencing symptoms such as repeated intrusive upsetting memories of the trauma, avoidance and numbing symptoms such as trying to stay away from reminders of what happened and feeling detached from others, and hyper-arousal symptoms such as being overly vigilant characterize posttraumatic stress disorder (PTSD).[1] The disorder is associated with substantial work and social impairment as well as increased use of healthcare services.[2] The lifetime prevalence rates of PTSD reported by community-based studies range from 1 to 14%.[1] In the National Comorbidity Survey, although a significant minority of PTSD sufferers were found to recover in the initial 12

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months following symptom onset, in over one third of people, the disorder did not remit even many years later and this was the case regardless of whether or not they had received professional treatment.[3]

Over the last 20 years or so, a considerable amount of research has been published on the conceptualization and treatment of PTSD, and reviews of the literature have been conducted to determine, which interventions are empirically supported [e.g.[4–13]]. The National Collaborating Centre for Mental Health[10] recommended that trauma-focused psychological therapy, in particular, trauma-focused cognitive behavior therapy (CBT) or eye movement desensitization and reprocessing (EMDR), should be offered to all patients with PTSD, nevertheless pharmacological treatments should be considered for particular cases such as those who have declined or not benefited from a course of trauma-focused therapy, those under serious continuing threat of additional trauma, or those who may need medication as an adjunct to therapy for severe symptoms or co-morbid disorders that interfere with their ability to benefit from psychological input.[10] Bisson and Andrew[12] similarly concluded that trauma-focused CBT and EMDR are effective psychological treatments for PTSD, and stress management is effective, though to a lesser extent.[12]

Trauma-focused CBT involves repeated exposure to the trauma memory in imagination or through the writing of a narrative, in vivo exposure to situations associated with the traumatic event that are objectively safe yet cause anxiety or are avoided,[14–16] and/or challenging maladaptive trauma-related appraisals such as "I will never be able to trust anyone again" or "No place is safe" using techniques such as Socratic questioning and behavioral experiments.[10,17,18] EMDR,[19] alternatively, utilizes dual attention tasks to help the patient process the traumatic event and involves him or her focusing on negative trauma-related memories, emotions, and thoughts while engaging in a task involving some form of bilateral stimulation such as eye movements, hand tapping, or tones until distress has reduced and belief in more positive trauma-related thoughts has increased.[20–23] Unlike trauma-focused CBT and EMDR, stress management does not focus mainly on the trauma, and involves patients learning skills such as slow, abdominal breathing, relaxation, positive statements and self-talk, distraction, and assertiveness to help them manage their anxiety.[10]

Since the field is progressing rapidly, there is a need for regular systematic reviews of the literature to ascertain the latest empirically supported treatments for PTSD.[24] The purpose of this article is to review randomized controlled trials (RCTs) of psychological therapies for PTSD in adults and use the criteria set out by Chambless and Hollon[25] to determine which of these therapies are empirically supported. Although these criteria have recently been used to find out which

psychosocial treatments are established in efficacy for children and adolescents who have experienced traumatic events,[26] to our knowledge they have not recently been applied to the literature concerning the psychological treatment of adult PTSD. They last were in 1998 by DeRubeis and Crits-Christoph.[5] Although different reviews use different criteria, the basic strength of the Chambless and Hollon[25] criteria is that they essentially replicate and extend the standards applied by the United States Food and Drug Administration agency (FDA) to determine whether a new medication can be put on the market or not. In essence, the FDA requires that any new medication be shown to be significantly superior to a nonspecific control (pill–placebo) in at least two RCTs by separate research groups. Thus, if the FDA passed judgments on psychotherapies, it would only allow the sale of those treatments that met criteria as being efficacious and specific.

One limitation of the majority of the aforementioned PTSD reviews is that they have not drawn conclusions about whether a particular psychological treatment is established in efficacy for PTSD related to a specific type of trauma. One cannot assume that findings based on one type of traumatic event generalize to others.[8] In addition to applying the Chambless and Hollon[25] criteria to the larger literature in an undifferentiated fashion with respect to type of trauma, we therefore also discuss the efficacy of different treatments for different kinds of trauma. Since a diagnosis of acute stress disorder (ASD) has been shown in some studies[27] to predict the development of PTSD, RCTs of psychological treatments for ASD will also be evaluated with a focus on PTSD prevention.

METHOD

The method of this review closely follows that of an earlier review we conducted to establish which psychological therapies for social phobia in adults are empirically supported.[28] A literature search for RCTs of psychological treatments for PTSD or ASD published up to the end of 2008 was carried out by the first author and completed in January 2009. The PsycINFO and PubMed databases were searched electronically to identify appropriate articles. The search strategy used for the PsychINFO database included the following key words and combinations: (PTSD or ASD) and (random, randomly, randomise, randomize, randomised, or randomized). The PubMed database was searched for (PTSD or ASD) and this search was limited by the type of article, namely RCT. Searches of both databases were limited to articles written in English.

Studies had to meet the following criteria to be included in the review: (1) they investigated the treatment of adults with a diagnosis of ASD or PTSD; (2) randomized patients to psychological treatment or a waiting list or an alternative control or treatment condition (e.g. psychological or pill placebo, psychological treatment, or pharmacotherapy); (3) clearly described the treatment method; (4) the focus of the treatment was primarily on ASD or PTSD (therefore treatment that addressed for example both PTSD and panic was not included); and (5) therapeutic outcome in terms of change in ASD or PTSD symptoms and/or diagnosis was assessed and reported in the article.

Psychological treatments evaluated in the studies included in our review were classified using the system employed by the National

Collaborating Centre for Mental Health.[10] Bisson and Andrew[12] categorized interventions similarly in their review. We therefore made a distinction between psychological therapies that mainly focus on the trauma and those that do not, and three main categories of interventions were used: (1) CBT, which was divided into (a) individual CBT focusing predominantly on the trauma, (b) individual stress management, which does not have such a focus, and (c) group CBT, which may or may not have a main focus on the trauma; (2) individual EMDR, which focuses primarily on the trauma; and (3) other therapies such as family therapy, hypnotherapy, interpersonal therapy (IPT), psychodynamic therapy, and supportive counseling. Family therapy for PTSD involves anger management, communication training, and problem-solving training.[29] Hypnotherapy entails connecting patients with the reality of the trauma and trying to reduce conditioned responses triggered by it.[30] IPT involves looking at associations between PTSD symptoms and interpersonal problems, and working on relationship disputes and losses, role transitions, and social deficits.[31] Psychodynamic therapy entails working on the intra-psychic conflicts that have arisen from the trauma.[30] In supportive counseling, the therapist provides nondirective and unconditional support to the patient, encourages a focus on current problems rather than the trauma, and teaches the patient general problem-solving strategies.[14,32]

Unlike the National Collaborating Centre for Mental Health[10] and Cochrane[12] reviews, we further attempted to classify all the individual trauma-focused CBTs evaluated in the RCTs we included in our review into treatments that mainly involve exposure, treatments that involve a combination of cognitive restructuring and exposure, and treatments that involve cognitive restructuring alone, without exposure. We included studies that conducted component analyses or compared different types of individual trauma-focused CBT in the absence of other treatment or control conditions. We divided stress management into interventions that involved a mixture of techniques and those that involved predominantly relaxation training.

We used Chambless and Hollon's[25] criteria to draw conclusions regarding the efficacy of each psychological treatment. Interventions were therefore classified as either (1) efficacious and specific, if there was evidence of superiority to a placebo or alternative treatment in two or more independent research settings; (2) efficacious, if there was evidence of superiority to no treatment in two or more settings; (3) possibly efficacious, pending replication, if there was just one study providing evidence of efficacy or if all the research had been carried out in one setting; or (4) lacking evidence of efficacy. These criteria were applied to the literature in an undifferentiated manner with regard to trauma type initially. We then discussed the efficacy of each treatment for particular trauma groups using and expanding on the categories provided by Harvey et al.[8] Studies that recruited mixed trauma type patients were not included in this secondary analysis. The evidence concerning treatments for PTSD related to childhood abuse and assault was looked at separately to begin with since the former might "interfere with development and be qualitatively different in its effects compared with trauma experienced in adult life"[33] [p. 14]. Nonetheless, since some studies in the assault category included people who had been assaulted in adulthood or childhood, and other studies recruited mixed abuse and assault samples, we additionally collapsed the abuse and assault categories and included studies that had recruited people who had been either assaulted or abused as well, so we could consider the evidence pertaining to treatments for PTSD related to either abuse or assault.

RESULTS

We identified a total of 57 RCTs that satisfied our inclusion criteria, 55 relating to the treatment of PTSD, and 2 relating to the treatment of ASD. A summary of the psychological treatments evaluated and the trauma populations under study are given in Table 1. Details of each RCT are provided in Tables 2 and 3, for PTSD and ASD respectively.

COGNITIVE BEHAVIORAL THERAPIES FOR PTSD

Individual trauma-focused CBT

Exposure. Psychological treatments with a predominant emphasis on exposure were compared to no treatment monitoring, repeated assessments, waiting list, minimal attention, psycho-education, treatment as usual, supportive counseling, stress management, trauma counseling, trauma-focused cognitive restructuring alone or in combination with exposure, EMDR, psychodynamic therapy, and hypnotherapy in the studies that met our inclusion criteria.[14–16,30,32,33,37–55] The duration of exposure therapy in these trials ranged from 1 to 20 sessions.

Repeated exposure to the trauma memory and/or in vivo exposure to situations avoided since the traumatic event was shown to lead to markedly greater improvements in PTSD symptoms than no treatment monitoring,[54] repeated assessments,[49] waiting list,[15,30,37,46–48] minimal attention,[44] psycho-education,[16,50] and treatment as usual.[53] The trauma groups in these trials included combat veterans, earthquake victims, former political detainees, survivors of assault or abuse, refugees, and mixed trauma patients. In studies that had diagnosis as an outcome measure, between 40 and 100% of exposure patients no longer met diagnostic criteria for PTSD at the end of treatment, in completer analyses.[14,15,32,33,38,43,51,52] Treatment gains were largely maintained over follow-up periods of up to 1 year post-treatment[14,15,33,37–39,41,44,47] and one study reported a lack of deterioration at 5-year follow-up.[56]

Cognitive restructuring. Cognitive restructuring of maladaptive trauma-related beliefs alone, without exposure, was compared to treatment as usual, stress management, trauma-focused CBT with a predominant emphasis on exposure, and combined exposure and cognitive restructuring in the studies that met our inclusion criteria.[33,39,55,57] The duration of cognitive restructuring in these trials ranged from 10 to 16 sessions.

Two studies showed that cognitive restructuring reduced PTSD symptoms in mixed trauma patients to a similar extent as exposure over the course of treatment,[33,39] with gains largely maintained at 6-month,[33,39] 1-year,[58] and 5-year follow-up assessments.[56] In addition, it was found to be superior to treatment as usual in reducing symptoms of posttraumatic stress in mixed trauma patients with a major mood or psychotic disorder.[57] In the Tarrier et al.[33] study, 42% of cognitive restructuring completers no longer had a PTSD diagnosis at post-treatment.[33] Interestingly, at 5-year follow-up, Tarrier and

TABLE 1. Psychological treatments evaluated in randomized controlled trials by trauma type

| | | Type of trauma (number of studies) | | | | | | | | | | | | |
| | | Assault and/or abuse | | | | | | | | | | | | |
Disorder	Psychological treatment (number of studies)	Assault (N=7)	Childhood abuse (N=4)	Partner abuse (N=2)	Mixed (assault or abuse) (N=3)	Combat veterans (N=6)	Mixed (N=24)	Natural disaster (N=2)	Police officers (N=1)	Political detainees (N=1)	Refugees (N=4)	Road traffic accidents (N=2)	Terrorism (N=1)
Posttraumatic stress disorder	Individual trauma-focused CBT involving exposure (N=25)	6	0	0	1	2	10	2	0	1	3	0	0
	Individual trauma-focused CBT involving cognitive restructuring (N=4)	1	0	0	0	0	3	0	0	0	0	0	0
	Individual trauma-focused CBT involving exposure and cognitive restructuring (N=25)	2	2	2	2	1	11	0	1	0	1	2	1
	Individual stress management involving relaxation training (N=4)	0	0	0	1	1	2	0	0	0	0	0	0
	Individual stress management involving a mixture of techniques (N=2)	2	0	0	0	0	0	0	0	0	0	0	0
	Group CBT (N=4)	0	2	0	0	1	0	0	0	0	1	0	0
	Individual EMDR (N=13)	2	0	0	0	3	8	0	0	0	0	0	0
	Individual family therapy (N=1)	0	0	0	0	1	0	0	0	0	0	0	0
	Individual hypnotherapy (N=1)	0	0	0	0	0	1	0	0	0	0	0	0
	Group IPT (N=1)	0	0	0	1	0	0	0	0	0	0	0	0
	Individual psychodynamic therapy (N=1)	0	0	0	0	0	1	1	0	0	0	0	0
	Supportive counseling (N=8)	1	1	0	0	1	4	0	0	0	1	0	0
Acute stress disorder	Individual trauma-focused CBT involving exposure (N=1)	0	0	0	0	0	1	0	0	0	0	0	0
	Individual trauma-focused CBT involving cognitive restructuring (N=1)	0	0	0	0	0	1	0	0	0	0	0	0
	Individual trauma-focused CBT involving exposure and cognitive restructuring (N=1)	0	0	0	0	0	1	0	0	0	0	0	0
	Individual trauma-focused CBT plus hypnosis (N=1)	0	0	0	0	0	1	0	0	0	0	0	0
	Individual supportive counseling (N=1)	0	0	0	0	0	1	0	0	0	0	0	0

TABLE 2. Randomized controlled trials of psychological treatments for adults with posttraumatic stress disorder

Study	Treatment and control conditions	Number of sessions	Sample size (gender)	Diagnosis (method if known)	Time since trauma	Type of trauma	Therapists' qualifications	Results[a]
Brom et al.[30]	Psychodynamic therapy (PDT), Hypnotherapy (H), Trauma desensitization (TD), Waiting-list (WL)	Mean in PDT 18.8 (SD 2.6) H 14.4 (SD 1.4) TD 15.0 (SD 2.9)	112 but 12 discontinued treatment (Mixed)	DSM-III PTSD	Not more than 5 years	Mixed but for most a loss of a significant other due to illness, murder, suicide, or traffic accident	No information on therapists' credentials	PTSD symptoms improved significantly more in TD, H, and PDT than WL
Keane et al.[37]	Implosive therapy (IT), Waiting-list (WL)	14–16	24 (Male)	DSM-III PTSD (Comprehensive diagnostic evaluation and meeting to reach consensus)	Lack of information on time since trauma	Combat	No information on therapists' credentials	Re-experiencing but not avoidance and numbing symptoms reduced significantly more in IT than in WL. Gain maintained at 6-month follow-up
Foa et al.[14]	Stress inoculation training (SIT), Prolonged exposure (PE), Supportive counseling (SC), Waiting-list (WL)	9	55 but 45 completed (Female)	DSM-III-R PTSD	3 months to 12 years	Rape or attempted rape	Master's or doctoral level psychologists and clinical social workers	PTSD symptom severity improved significantly but SIT better than SC and WL at post-treatment, and PE patients tended to improve further over follow-up of about 3 months. 50% SIT, 40% PE, 10% SC, and 0% WL no longer had PTSD diagnosis at post-treatment
Jensen[20]	Eye movement desensitization and reprocessing (EMDR), Waiting-list (WL)	3	29 but 4 did not complete study (Male)	DSM-III-R PTSD (Structured Interview for PTSD)	Lack of information on time since trauma	Combat	Veterans Affairs psychology interns	EMDR better than WL in reducing anxiety on exposure to trauma cues but not on PTSD symptom severity
Richards et al.[38]	Imaginal exposure followed by live exposure (IE-LE), Live exposure followed by imaginal exposure (LE-IE)	8	14 but 13 completed treatment (Mixed)	DSM-III-R PTSD	6 months to 8 years	Mixed but for most a cruise liner sinking	No information on therapist credentials	LE reduced behavioral avoidance significantly more than IE whether first or second, but no significant differences on other PTSD measures. Gains maintained at 12-month follow-up. 100% no longer had PTSD diagnosis at post-treatment
Echeburua et al.[59]	Self-exposure and cognitive restructuring (CBT)	6	20 (Female)	DSM-III-R PTSD (Anxiety Disorders)	6 months to 20 years	Rape in adulthood or childhood sexual abuse	Clinical psychologist	CBT better than PRT in reducing re-experiencing, avoidance and arousal symptoms at post-

Study	Treatments	N	No. of sessions	Diagnostic measure	Time since trauma	Trauma type	Therapist	Outcome
	Progressive relaxation training (PRT)			Interview Schedule—Revised)				treatment and all 1–12 month follow-up assessments. 90% CBT and 10% PRT no longer had PTSD diagnosis at post-treatment
Marcus et al.[76]	Eye movement desensitization and reprocessing (EMDR) / Standard care (SC)	67 (Mixed)	Sessions continued until patients no longer had PTSD diagnosis or study finished	DSM-III-R PTSD	Lack of information on time since trauma	Mixed	Psychologists	PTSD symptoms improved significantly more in EMDR than in SC. 77% EMDR and 50% SC no longer had PTSD diagnosis at post-treatment
Rothbaum[81]	Eye movement desensitization and reprocessing (EMDR) / Waiting-list (WL)	21 but 18 completed study (Female)	4	DSM-III-R PTSD (PTSD Symptom Scale—Interview)	Mean 62.2 months (SD 53.3) in EMDR and 155.8 (SD 106.6) in WL	Completed rape	Psychologist	PTSD symptoms reduced significantly more in EMDR than in WL. 90% EMDR and 12% WL no longer had PTSD diagnosis at post-treatment
Zlotnick et al.[77]	Affect management (AM) group / Waiting-list (WL)	48 but 33 completed (Female)	15	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Childhood sexual abuse	No information on therapists' credentials	At post-treatment, PTSD symptoms were significantly reduced in AM relative to WL
Carlson et al.[75]	Eye movement desensitization and reprocessing (EMDR) / Biofeedback-assisted relaxation (BR) / Waiting list (WL)	35 but 1 dropped out (Male)	12	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Combat	Psychologists and a psychiatric nurse	EMDR patients had a better outcome on PTSD symptoms than BR and WL at post-treatment and BR at 3- and 9-month follow-up. 22.2% BR and 77.8% EMDR no longer had PTSD diagnosis at 3-month follow-up
Marks et al.[39]	Prolonged exposure (PE) / Cognitive restructuring (CR) / Combined PE and CR (PE-CR) / Relaxation (R)	87 but 77 completed treatment (Mixed)	10	DSM-III-R PTSD (Structured Clinical Interview for DSM-III-R)	Mean 4 years (SD 5)	Mixed	Nurse therapist and clinical psychologist	PTSD symptoms were significantly more improved in PE, CR, and PE-CR than R at post-treatment and gains were maintained at 6-month follow-up
Devilly and Spence[60]	Eye movement desensitization and reprocessing (EMDR) / Cognitive behavior therapy (CBT)	32 but 23 completed (Mixed)	9	DSM-IV PTSD (Clinician-Administered PTSD Interview and PTSD Symptom Scale—Self-Report)	More than 4 weeks. Mean duration of symptoms 112.44 months (SD 147.49)	Mixed	No information on therapists' credentials	PTSD symptoms improved significantly more in CBT than in EMDR and these gains were maintained at 3-month follow-up

TABLE 2. Continued

Study	Treatment and control conditions	Number of sessions	Sample size (gender)	Diagnosis (method if known)	Time since trauma	Type of trauma	Therapists' qualifications	Results[a]
Fecteau and Nicki[61]	Cognitive behavioral therapy (CBT) Waiting-list (WL)	4	20 (Mixed)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	3 to 95 months	Motor vehicle accident	Psychologist	At post-treatment, intrusion and avoidance symptoms were significantly reduced in CBT compared to WL. Improvements were maintained at 6-month follow-up. 50% CBT and 0% WL no longer had PTSD at post-treatment
Foa et al.[15]	Prolonged exposure (PE) Stress inoculation training (SIT) Combined treatment (PE-SIT) Waiting-list (WL)	9	96 but 17 dropped out (Female)	DSM-III-R PTSD (PTSD Symptom Scale—Interview)	Lack of information on time since trauma	Sexual or nonsexual assault	PhD-level clinical psychologists	Drop out greater from SIT and PE-SIT. Compared with WL, PE, SIT, and PE-SIT significantly reduced PTSD severity and PE tended to be better than SIT and PE-SIT in intent to treat analyses. Gains maintained at 12-month follow-up. 65% PE, 58% SIT, 54% PE-SIT, and 0% WL no longer had PTSD diagnosis at post-treatment
Glynn et al.[29]	Exposure therapy (ET) ET followed by behavioral family therapy (BFT) Waiting-list (WL)	ET 18 ET-BFT 34	42 but post-treatment data available on 36 (Male)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Combat	PhD-level clinical psychologists	Positive but not negative PTSD symptoms were significantly reduced in ET and ET-BFT relative to WL and to a similar extent. Gains were maintained at 6-month follow-up
Rogers et al.[40]	Eye movement desensitization and reprocessing (EMDR) Exposure (E)	1	12 (Lack of information on gender)	DSM-III-R PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Combat	No information on therapists' credentials	Self-monitored intensity of intrusions improved markedly more in EMDR than E
Tarrier et al.[33]	Imaginal exposure (IE) Cognitive therapy (CT)	16	72 but 62 completed treatment (Mixed)	DSM-III-R PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Mixed	Clinical psychologists	PTSD severity reduced significantly and similarly over IE and CT with gains maintained at 6-month follow-up. 42% CT and 59% IE no longer had

Study	Treatment	Sessions	N completed	Diagnosis/measure	Time since trauma	Trauma type	Therapist	Results
Tarrier et al.[58]	See Tarrier et al.[33] for information on method		54 completed 12-month follow-up					PTSD symptoms significantly improved from pretreatment to 12-month follow-up and comparably in IE and CT
Gersons et al.[62]	Brief eclectic psychotherapy (BEP); Waiting-list (WL)	16	42 (Mixed)	DSM-III-R PTSD (Structured Interview-PTSD)	Mean 3 years (SD 3) in BEP and 5 years (SD 7) in WL	Exposure to trauma during police work, no further information	Clinical psychologists	91% BEP and 50% WL no longer had PTSD at post-treatment. Difference significant
Paunovic and Öst[41]	Exposure therapy (E); Cognitive behavior therapy (CBT)	16–20	20 but 16 completed (Mixed)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma but duration of PTSD 1 to 25 years	Refugee population, type of trauma mixed	Doctoral clinical psychology student	In both E and CBT PTSD symptoms improved significantly and similarly from pre- to post-treatment, and changes were maintained over 6-month follow-up
Cloitre et al.[63]	Skills training in affect and interpersonal regulation followed by modified prolonged exposure (STAIR-PE); Waiting-list (WL)	16	58 but 12 dropped out (Female)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Childhood sexual and/or physical abuse	Doctoral-level clinical psychologists	PTSD symptoms significantly reduced over treatment in STAIR-modified PE compared with WL. Gains maintained over 9-month follow-up. 77% STAIR-PE and 25% WL no longer had PTSD diagnosis at post-treatment
Ironson et al.[42]	Eye movement desensitization and reprocessing (EMDR); Prolonged exposure (PE)	6–9	22 but 6 dropped out (Mixed)	DSM-III-R PTSD (Intake interview and PTSD Symptom Scale)	Lack of information on time since trauma	Mixed	Doctoral students in clinical psychology and postdoctoral psychology students	More PE than EMDR patients dropped out from active treatment. A significantly greater proportion of EMDR than PE patients had a 70% reduction in PTSD symptoms by session 6
Lee et al.[43]	Eye movement desensitization and reprocessing (EMDR); Stress inoculation training with prolonged exposure (SIT-PE)	7	27 but 24 completed treatment (Mixed)	DSM-III-R PTSD (Structured Interview for PTSD)	2 to 71 months	Mixed	Psychologists and a post-graduate psychologist in training	Intrusive but not avoidance symptoms were significantly more reduced in EMDR than SIT-PE. 83% EMDR and 75% SIT-PE no longer had PTSD diagnosis at post-treatment
Power et al.[64]	Eye movement desensitization and reprocessing (EMDR); Exposure plus cognitive	Up to 10	105 but 72 completed (Mixed)	DSM-IV PTSD	Mean 180.0 weeks (SD 321.4) in EMDR, 155.4 weeks (SD 286.9) in ECR and 259.5	Mixed	A behavioral psychotherapist and a psychiatric	PTSD symptoms reduced significantly over EMDR and ECR compared to WL and to a similar extent. EMDR patients

TABLE 2. Continued

Study	Treatment and control conditions	Number of sessions	Sample size (gender)	Diagnosis (method if known)	Time since trauma	Type of trauma	Therapists' qualifications	Results[a]
	restructuring (ECR) Waiting-list (WL)				weeks (SD 426.0) in WL		research registrar	had fewer sessions. Approx. 25–50% of patients maintained gains without additional treatment over follow-up of about 15 months
Resick et al.[44]	Cognitive-processing therapy (CPT) Prolonged exposure (PE) Minimal attention (MA)	PE 9 CPT 12	171 but 121 completed treatment (Female)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	3 to 33 years	Completed rape in childhood or adulthood (not incest)	Doctoral-level clinical and counseling psychologists	CPT and PE reduced PTSD symptoms comparably and significantly more than MA. Gains were largely maintained at 9-month follow-up. CPT reduced specific trauma-related guilt cognitions more than the other conditions
Bryant et al.[32]	Imaginal exposure (IE) IE with cognitive restructuring (IE-CR) Supportive counseling (SC)	8	58 but 45 completed treatment (Mixed)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Mean 8.13 months (SD 6.65) in IE, 10.22 months (SD 11.39) in IE-CR, and 9.83 months (SD 7.73) in SC	Nonsexual assault or a motor vehicle accident	Master's-level clinical psychologists	PTSD symptoms were significantly more improved in IE and IE-CR than SC at post-treatment and 6-month follow-up, and IE-CR had a better outcome than IE. 40% SC, 87% IE-CR, and 67% IE no longer had PTSD diagnosis at post-treatment
Ehlers et al.[17]	Cognitive therapy (CT) Self-help booklet (SHB) Repeated assessments (RA)	Up to 15	85 but 5 did not complete intervention phase (Mixed)	DSM-IV PTSD (Structured Clinical Interview for DSM-IV)	Less than 6 months	Motor vehicle accident	No information on therapists' credentials	PTSD symptoms were significantly more reduced in CT than in SHB or RA at post-treatment and 6-month follow-up. 78.6% CT, 24.0% SH, and 29.6% RA no longer had PTSD diagnosis at post-treatment
Kubany et al.[65]	Cognitive trauma therapy (CTT) Waiting-list (WL)	7–10	37 but 32 completed (Female)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Partner abuse	Clinical psychologist	PTSD symptoms reduced significantly over CTT and did not over WL. At 3-month follow-up, improvements were maintained. 0% WL and 94% CTT no longer had PTSD diagnosis at post-treatment

Study	Treatment	Sessions	N	Diagnosis	Time since trauma	Trauma type	Therapist credentials	Results
Otto et al.[79]	Sertraline and group cognitive behavior therapy (S-CBT) Sertraline (S)	10	10 (Female)	DSM-IV PTSD (Structured Clinical Interview for DSM-IV)	Lack of information on time since trauma	Refugee population, lack of information on type of trauma	No information on therapists' credentials	S-CBT was superior to S in reducing PTSD symptoms
Schnurr et al.[78]	Trauma-focused group psychotherapy (TFGP) Present-centered group treatment (PCGT)	35	360 but 253 completed (Male)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Combat	Master's- and doctoral-level clinicians	Drop out greater from TFGP. In intent-to-treat analyses PTSD severity reduced significantly and similarly in TFGP and PCGT. In adequate dose analyses, TFGP was superior to PCGT on reducing avoidance/numbing
Taylor et al.[45]	Eye movement desensitization and reprocessing (EMDR) Prolonged exposure (PE) Relaxation training (RT)	8	60 but 45 completed treatment (Mixed)	DSM-IV-TR PTSD (Structured Clinical Interview for DSM-IV)	Lack of information on time since trauma but mean duration of PTSD 8.7 years (SD 10.8)	Mixed	Master's-level psycho-therapist and doctoral-level clinician	PE ameliorated re-experiencing and avoidance symptoms markedly more than EMDR and RT, which did not differ
Fromm-berger et al.[66]	Cognitive-behavioral therapy (CBT) Paroxetine (P)	12	21 but 5 dropped out (Mixed)	DSM-III-R PTSD (Clinician-Administered PTSD Scale)	Mean 34±35 months in P and 34±25 months in CBT	Mixed but for most accidents or sexual or nonsexual violence	Clinical psychologists	PTSD symptoms reduced significantly over treatment in CBT and P, with both conditions having equivalent results
Kubany et al.[67]	Cognitive trauma therapy (CTT) Waiting-list (WL)	8–17	125 but 84 completed (Female)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Physical, sexual and/or psychological abuse by an intimate or romantic partner	Doctoral-level clinical psychologists, master's-level counseling psychologist, and therapists with nursing or baccalaureate degrees	PTSD symptoms reduced significantly over CTT and did not over WL. Gains were maintained over 6-month follow-up. 91% CTT no longer had PTSD diagnosis at post-treatment
Marcus et al.[23]	See Marcus et al.[76] for information on method		44 participated at 3-month follow-up and 36 at 6-month follow-up					At 3- and 6-month follow-up, EMDR patients reported significantly less severe PTSD symptoms than those in SC
Neuner et al.[16]	Narrative exposure therapy (NET) Supportive counseling (SC) Psycho-education (PE)	NET and SC 4 PE 1	43 but 40 completed treatment (Mixed)	DSM-IV PTSD (Composite International Diagnostic Interview)	Lack of information on time since trauma but mean time since worst	Refugees who had experienced various traumas but worst type reported by	Doctoral-level psychologists and graduate students,	Controlling for the number of traumatic events after treatment, NET was markedly more improved on PTSD symptoms than

TABLE 2. Continued

Study	Treatment and control conditions	Number of sessions	Sample size (gender)	Diagnosis (method if known)	Time since trauma	Type of trauma	Therapists' qualifications	Results[a]
					period 7.5 years (SD 3.3)	majority was witnessing people getting severely injured or killed	helped by interpreters	SC and PE at 1-year follow-up. 71% NET, 21% SC, and 20% PE no longer had PTSD diagnosis at 1 year follow-up
Tarrier and Sommerfield[56]	See Tarrier et al.[33] for information on method		32 participated at 5-year follow-up					Gains in PTSD were maintained at 5-year follow-up but CT had a better outcome than IE
Basoglu et al.[46]	Behavioral treatment (BT) Waiting-list (WL)	1	59 (Mixed)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Mean 3 years (SD 0.3)	Earthquake	Psychologists	PTSD symptoms improved significantly in BT relative to WL from pre- to post-test. Gains were maintained at 1–2 year follow-up
Chard[80]	Cognitive processing therapy (CPT) Minimal attention waiting list (MA)	27	71 but 13 dropped out (Female)	DSM-IV PTSD (Structured Clinical Interview for DSM-IV)	Lack of information on time since trauma	Sexual abuse	Principal investigator and psychology graduate students	PTSD symptoms improved significantly more over CPT than MA. Gains maintained at 1-year follow-up. 93% CPT and 26% MA no longer had PTSD diagnosis at post-treatment
Ehlers et al.[18]	Cognitive therapy (CT) Waiting-list (WL)	Up to 15	28 (Mixed)	DSM-IV PTSD (Structured Clinical Interview for DSM-IV)	6–216 months	Mixed but for most accident. Other trauma types included assault and witnessing death	Therapists who developed CT for PTSD	CT resulted in significantly greater reductions in PTSD symptoms than WL. Gains maintained at 6-month follow-up. 0% WL and 71.4% CT no longer had PTSD diagnosis at post-treatment
Foa et al.[47]	Prolonged exposure (PE) PE combined with cognitive restructuring (PE-CR) Waiting-list (WL)	9–12	179 but 121 completed treatment (Female)	DSM-IV PTSD (PTSD Symptom Scale—Interview)	Mean 9 years (SD 11.3)	Sexual or nonsexual assault or childhood sexual abuse	Doctoral-level clinical psychologists and master's-level counselors and social workers	Drop out lower from WL. In intent to treat and completer analyses PTSD symptoms improved similarly over PE and PE-CR and significantly more than WL. Gains were maintained at 1-year follow-up
Lindauer et al.[68]	Brief eclectic psychotherapy	16		DSM-IV PTSD (Structured	Mean 2.7 years (SD 2.5) in BEP and		Psychiatry residents	

Study	Treatment	No. sessions	Sample	Assessment	Time since trauma	Trauma type	Therapist	Outcome
	(BEP) Waiting-list (WL)		24 but 18 completed (Mixed)	Interview for PTSD)	6.1 years (SD 9.4) in WL	Mixed but for most interpersonal violence	Psychologists and master's-level social workers	PTSD symptoms improved significantly in BEP relative to WL
McDonagh et al.[69]	Cognitive behavioral therapy (CBT) Present-centered therapy (PCT) Waiting-list (WL)	14	74 but 17 dropped out (Female)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Childhood sexual abuse	Psychologists and master's-level social workers	Drop out greater from CBT. Differences between conditions on PTSD symptom reduction not significant in intent to treat analyses. At post-treatment, 47.1% CBT, 35% PCT, and 20% WL no longer had PTSD diagnosis
Rothbaum et al.[48]	Prolonged exposure (PE) Eye movement desensitization and reprocessing (EMDR) Waiting-list (WL)	9	74 but 60 completed	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Mean 120.9 months (SD 94.1) in PE, 145.9 months (SD 146.8) in EMDR, and 162.9 months (SD 136.9) in WL	Rape in childhood or adulthood	Doctoral-level psychologists	PTSD symptoms improved similarly in PE and EMDR and significantly more in those conditions than WL
Monson et al.[70]	Cognitive processing therapy (CPT) Waiting-list (WL)	12	60 but 50 completed (Mixed)	DSM-IV-TR PTSD (Clinician-Administered PTSD Scale)	Lack of information on time since trauma	Military-related stressors; for most combat, others sexual trauma or physical assault	Licensed psychologists and postdoctoral fellows	PTSD symptom severity decreased significantly in CPT relative to WL. 50% of CPT and 4% of WL completers no longer had PTSD diagnosis at post-treatment
Basoglu et al.[49]	Behavioral treatment (BT) Repeated assessments (RA)	1	31 (Mixed)	DSM-IV PTSD (Clinician-Administered PTSD Scale)	Mean 4.5 years (SD 0.2)	Earthquake	Clinical psychologist	PTSD symptoms reduced significantly more in BT than in RA. Gains were maintained at 1–2 year follow-up
Bichescu et al.[50]	Narrative exposure therapy (NET) Psycho-education (PE)	NET 5 PE 1	18 (Mixed)	ICD-10/DSM-IV PTSD (Composite International Diagnostic Interview)	Mean 42.0 years (SD 6.3)	Political imprisonment	Ph.D. psychology student	PTSD symptoms decreased significantly more in NET than in PE from pretreatment to 6-month follow-up. At 6-month follow-up, 55.6% NET and 11.1% PE no longer had PTSD diagnosis
Duffy et al.[71]	Cognitive therapy (CT) Waiting-list (WL)	Mean 7.8 (SD 5.1)	58 but 12 dropped out (Mixed)	DSM-IV PTSD (Clinician Administered PTSD Scale)	0.2–33 years	Terrorism and other civil conflict	Psychiatrist, social worker and nurse therapists	PTSD symptoms reduced significantly more in CT than in WL and gains were maintained at latest follow-up (1, 4, or 12-month)
Hogberg et al.[82]	Eye movement desensitization and reprocessing	5	24 but 3 dropped out (Mixed)	DSM-IV PTSD (Structured Clinical	Mean 2.5 years (SD 1.8) in EMDR and 2.2 years (SD 1.3) in WL	Person under train incident or assault at work (public transportation)	Psychotherapists	PTSD symptom reduction did not differ markedly between EMDR and WL, but significantly more

TABLE 2. Continued

Study	Treatment and control conditions	Number of sessions	Sample size (gender)	Diagnosis (method if known)	Time since trauma	Type of trauma	Therapists' qualifications	Results[a]
	(EMDR) Waiting-list (WL)			Interview for DSM-IV)				EMDR (67%) than WL (11%) patients no longer had PTSD diagnosis in month after treatment
Litz et al.[72]	Internet-based, therapist-assisted cognitive behavior therapy (CBT) or supportive counseling (SC)	1 plus email and telephone contact	45 but 33 completed (Mixed)	DSM-IV PTSD (PTSD Symptom Scale— Interview)	Lack of information on time since trauma	Pentagon attack or combat	Lack of information on therapists' qualifications	CBT was better than SC on PTSD symptom reduction
Schnurr et al.[51]	Prolonged exposure (PE) Present-centered therapy (PCT)	10	284 but 199 completed (Female)	DSM-IV PTSD (Clinician Administered PTSD Scale)	0 to 58 years	Mixed but mostly sexual trauma in active duty personnel and veterans	Master's and doctoral level clinicians	Drop out greater from PE, but in intent to treat and completer analyses PE was superior to PCT on PTSD symptom reduction. At post-treatment, 47.0% PE and 19.8% PCT no longer had PTSD diagnosis
van der Kolk et al.[83]	Eye movement desensitization and reprocessing (EMDR) Fluoxetine (F) Pill placebo (P)	8	88 but 76 completed (Mixed)	DSM-IV PTSD (Structured Clinical Interview for DSM-IV)	Mean 12.9 years (SD 11.9)	Mixed but for most interpersonal victimization	Clinicians who were master's level or higher	Over treatment, EMDR reduced PTSD symptoms significantly more than P but comparably to F. At 6-month follow-up EMDR was better than F. At post-treatment, 88% EMDR, 81% F, and 65% P no longer had PTSD diagnosis
Bryant et al.[52]	Imaginal exposure (IE) In vivo exposure (IVE) IE plus IVE (IE-IVE) IE-IVE plus cognitive restructuring (IE-IVE-CR)	8	118 but 90 completed (Mixed)	DSM-IV PTSD (Clinician Administered PTSD Scale)	Mean 19.00 months (SD 7.63) in IE, 21.15 months (SD 21.47) in IVE, 19.44 months (SD 27.22) in IE-IVE, and 20.92 months (SD 37.16) in IE-IVE-CR	Motor vehicle accident or nonsexual assault	Master's-level clinical psychologists	PTSD symptoms were significantly more reduced in IE-IVE-CR than the other conditions at post-treatment and 6-month follow-up. At the end of treatment, 79% of IE-IVE-CR, 52% IE-IVE, 48% IE, and 45% IVE no longer had PTSD diagnosis
Cottraux et al.[73]	Cognitive behavior therapy (CBT) Rogerian supportive therapy (ST)	16	60 but 42 completed (Mixed)	DSM-IV PTSD (Clinician Administered PTSD Scale)	Lack of information on time since trauma but PTSD duration was 3	Mixed but mostly car accident or physical assault	Senior psychologists and a psychiatrist with a	Drop out was significantly greater from ST, mostly due to patients worsening or finding therapy ineffective. In intent-to-

Study	Treatment conditions	No. of sessions	Sample	Diagnosis (measure)	Time since trauma	Trauma type	Therapist	Outcomes
					months to 40 years		diploma in CBT	treat but not completer analyses, PTSD symptoms decreased significantly more over CBT than ST
Feske[53]	Prolonged exposure (PE) Treatment as usual (TAU)	9–12	27 but 21 completed (Female)	DSM-IV PTSD (Structured Clinical Interview for DSM-IV)	Lack of information on time since trauma but PTSD duration 1.5 to 40 years	Sexual or physical assault	Registered nurse and master's level social workers	PTSD symptoms improved markedly more in PE than in TAU
Krupnick et al.[31]	Group interpersonal psychotherapy (IPT) Waiting-list (WL)	16	48 but 27 completed (Female)	DSM-IV PTSD (Clinician Administered PTSD Scale)	Lack of information on time since trauma	Physical abuse or assault and for all but one sexual abuse or assault	Doctoral-level clinical psychologists	PTSD symptoms had reduced significantly more in IPT than in WL at post-treatment but not 4-month follow-up. At post-treatment, 70% IPT and 28.6% WL no longer had PTSD but differences between conditions on PTSD rates not significant then or at 4-month follow-up
Mueser et al.[57]	Cognitive-behavioral therapy (CBT) Treatment as usual (TAU)	12–16	108 but 38 of 54 CBT patients completed treatment (Mixed)	DSM-IV PTSD (Clinician Administered PTSD Scale) and major mood or psychotic disorder (Structured Clinical Interview for DSM-IV)	Lack of information on time since trauma	Mixed	Ph.D. and master's level clinicians	PTSD symptoms reduced significantly more in CBT than in TAU
Neuner et al.[54]	Narrative exposure therapy (NET) Trauma counseling (TC) No treatment monitoring group (MG)	6	277 but 26 refused or discontinued treatment and 149 could not be located at 6-month	DSM-IV PTSD (Posttraumatic Stress Diagnostic Scale)	Lack of information on time since trauma	Refugees who had experienced various traumas	Lay counselors who only had 6 weeks of training	Refusal of or drop out from treatment greater in TC than in NET. NET and TC resulted in significantly greater reductions in PTSD symptoms than MG. Nine

TABLE 2. Continued

Study	Treatment and control conditions	Number of sessions	Sample size (gender)	Diagnosis (method if known)	Time since trauma	Type of trauma	Therapists' qualifications	Results[a]
			follow-up (Mixed)					months from baseline, 69.8% NET, 65.2% TC, and 36.8% MG no longer had PTSD diagnosis
Resick et al.[55]	Cognitive processing therapy (CPT) Cognitive therapy alone (CT) Written accounts alone (WA)	CPT and CT 12 WA 7	162 but 86 completed treatment and 40 received some (Female)	DSM-IV PTSD (Clinician Administered PTSD Scale)	3.3 months to 58.3 years	Child or adult physical or sexual assault	Master's or doctoral level clinical psychologists	Assessor-rated PTSD symptom severity reduced significantly and to a similar extent in CPT, CT, and WA. Self-reported PTSD symptoms were markedly less frequent in CT than in WA and in CPT than in WA at the end of treatment but there were no differences between the conditions at 6-month follow-up

[a]Absence of PTSD rates are based on completer analyses.

TABLE 3. Randomized controlled trials of psychological treatments for adults with acute stress disorder

Study	Treatment and control conditions	Number of sessions	Sample size (gender)	Diagnosis (method)	Time since trauma	Type of trauma	Therapists' qualifications	Results[a]
Bryant et al.[34]	Cognitive-behavioral therapy (CBT) CBT combined with hypnosis (CBT-H) Supportive counseling (SC)	5	87 but 69 completed treatment (Mixed)	DSM-IV ASD (Acute Stress Disorder Interview)	Mean 15.75 days (SD 8.79) in CBT, 13.54 days (SD 6.71) in CBT-H, and 14.04 days (SD 8.42) in SC	Nonsexual assault or motor vehicle accident	Master's-level clinical psychologists	PTSD symptoms improved significantly more in CBT and CBT-H compared to SC. 54% SC, 87% CBT, and 91% CBT-H did not have PTSD diagnosis at post-treatment. Rates at 6-month follow-up were 41, 79, and 78%, respectively. Differences significant between SC and both CBT conditions
Bryant et al.[35]	See Bryant et al.[34] for information on method		53 completed 3-year follow-up					89% CBT, 78% CBT-H, and 38% SC did not have PTSD at 3-year follow-up. Differences significant between SC and CBT conditions
Bryant et al.[36]	Imaginal and in vivo exposure (E) Cognitive restructuring (CR) Waiting-list (WL)	5	90 but 69 completed (Mixed)	DSM-IV ASD (Acute Stress Disorder Interview)	Mean 19.4 days (SD 8.9) in E, 20.8 days (SD 7.4) in CR, and 22.4 days (SD 7.4) in WL	Nonsexual assault or motor vehicle accident	Master's-level clinical psychologists	PTSD symptoms reduced significantly more over E than WL, whereas CR and WL did not differ markedly at post-treatment except on one measure in one analysis. At 6-month follow-up, E had a better outcome than CR. 88% E, 48% CR, and 29% WL did not have PTSD at post-treatment. Rates at 6-month follow-up were 86% in E and 53% in CR. Differences significant between E and both WL and CR, but not CR and WL

[a]Absence of PTSD rates are based on completer analyses.

Sommerfield[56] found that cognitive restructuring had a better long-term outcome than exposure.[56] Nevertheless, only 44% of the original randomly allocated sample was available for assessment. Furthermore, in vivo exposure to feared and avoided situations was not included in the exposure intervention and imaginal exposure to the trauma memory was in some cases conducted in a graded manner, using a hierarchy leading up to the most distressing aspect of what happened,[33,56,58] which may have reduced the efficacy of the treatment. In a more recent study, Resick et al.[55] found that self-reported PTSD symptoms were significantly less frequent in survivors of assault assigned to cognitive restructuring than those assigned to exposure at the end of treatment, though this difference was no longer evident at 6-month follow-up.[55] In the exposure condition, patients were required to write accounts of their worst traumatic experiences. Nonetheless, they had reduced therapist contact relative to patients in the cognitive restructuring condition, since this element of the intervention was done alone, with the therapist only returning to the room to have the patient read and discuss the assignment after 45–60 min had elapsed. Furthermore, as in the Tarrier et al.[33] study, in vivo exposure was not included in the intervention.

Cognitive restructuring of maladaptive trauma-related beliefs in combination with exposure was compared to repeated assessments, minimal attention, waiting list, a self-help booklet, stress management, supportive counseling, exposure therapy, EMDR, paroxetine, and trauma-focused CBT followed by behavioral family therapy in the studies that met our inclusion criteria.[17,18,29,32,39,41,44,47,52,55,59–73] The duration of cognitive restructuring with exposure in these trials ranged from 4 to 20 sessions, with the exception of an internet-based intervention that involved 1 face-to-face session with a therapist followed by e-mail and telephone contact.

Trauma-focused CBT, involving cognitive restructuring of maladaptive trauma-related beliefs and exposure, was found to be more efficacious than waiting list,[18,29,47,61–65,67,68,70,71] minimal attention,[44] repeated assessments, and a self-help booklet[17] in reducing PTSD symptoms. Combat veterans, persons affected by terrorism, police officers, road traffic accident victims, survivors of assault or abuse, and mixed trauma patients participated in these studies. Improvements were largely maintained over follow-up periods of up to 12 months.[18,29,39,41,44,47,60,61,63,65,67,71] Furthermore, combined trauma-focused CBT was shown to produce equivalent reductions in PTSD symptoms over treatment to the selective serotonin reuptake inhibitor paroxetine in a mixed trauma sample.[66] Unfortunately, due to the small sample size and lack of treatment-free follow-up for responders to treatment in this pilot study it was not possible to determine whether trauma-focused CBT had any advantage over pharmacological treatment in terms of relapse prevention, however. In studies that had diagnosis as an outcome measure, between 47 and 94% of exposure plus cognitive restructuring patients no longer met diagnostic criteria for PTSD at the end of treatment in completer analyses.[17,18,32,52,59,61–63,65,67,69,70]

The issue of whether trauma-focused CBT involving a combination of cognitive restructuring of maladaptive trauma-related beliefs and exposure is more effective than exposure alone or cognitive restructuring alone has been investigated in several studies. The research team that found the strongest evidence of this matched time spent on components of trauma-focused CBT for mixed trauma patients across conditions, using supportive counseling in those conditions without the full range of techniques.[32,52] Another research team found only limited evidence that combined trauma-focused CBT reduces PTSD symptoms in survivors of assault to a greater extent than exposure alone,[55] though did find that it may be superior for reducing specific trauma-related guilt cognitions.[44] Although other research teams have found that exposure alone and combined trauma-focused CBT produce comparable reductions in PTSD symptoms in refugees, survivors of abuse or assault, and mixed trauma patients, some[39,41] but not others[47] have had a sample size of less than 25–30 patients per condition, which limits the extent to which one can draw firm conclusions from these findings.[25] Since comparisons of active and effective therapies are likely to reveal just small-to-medium effect size differences, further research using larger sample sizes and/or a greater number of assessment points is required to clarify whether the lack of differences between active treatments in some studies is due to methodological factors.[74]

STRESS MANAGEMENT

Stress management was compared to waiting list, supportive counseling, trauma-focused CBT involving exposure and/or cognitive restructuring, and EMDR in the studies that met our inclusion criteria.[14,15,39,45,59,75] The duration of stress management in these trials ranged from 6 to 12 sessions.

There is evidence that stress management involving stress inoculation training reduces PTSD symptoms in assault survivors to a significantly greater extent than waiting list,[14,15] with improvements largely maintained at 12-month follow-up.[15] Although one study found that PTSD symptom reduction did not differ significantly between stress inoculation training alone, exposure alone, and combined exposure and stress inoculation training, drop out was greater from the stress inoculation training conditions and in intent-to-treat analyses there was a trend for exposure alone to perform better on PTSD symptom reduction.[15] Both of these studies by Foa and colleagues included diagnosis as an outcome measure, and found 50%[14] and 58%[15] of stress inoculation completers no longer

met diagnostic criteria for PTSD at the end of treatment.

Stress management involving some form of relaxation training is significantly less efficacious than trauma-focused CBT entailing exposure,[39,45] cognitive restructuring of maladaptive trauma-related beliefs,[39] or a combination of both[39,59] in decreasing PTSD symptoms. Survivors of assault or abuse and mixed trauma patients were recruited in these studies. Although the improvements in PTSD symptoms that are made over relaxation training have been largely maintained at 6-[39] and 12-month[59] follow-ups, in the Echeburua et al.[59] study, only 10% of relaxation training patients had lost their PTSD diagnosis at post-treatment (though this increased to 20% at 1-month follow-up and 40% at 3- to 12-month follow-up assessments) and 22% of relaxation training completers no longer had a diagnosis of PTSD at 3-month follow-up in the Carlson et al. study.[75]

GROUP CBT

In the studies that met our inclusion criteria, group CBT was compared to waiting list[77] and a supportive present-centered group treatment.[78] The addition of group CBT to sertraline was evaluated too.[79] Cognitive processing therapy, involving individual trauma-focused CBT sessions and group treatment, was evaluated against a minimal attention waiting list condition.[80] The duration of group CBT in these first three trials ranged from 10 to 35 sessions, and the Chard study[80] included 10 individual sessions and 17 group sessions.

There is evidence that group CBT, alone or in combination with individual trauma-focused CBT, produces significantly greater reductions in PTSD symptoms than a waiting list or a minimal attention waiting list condition in survivors of childhood abuse.[77,80] Moreover, the addition of group CBT to the selective serotonin reuptake inhibitor sertraline has been shown to substantially improve outcome in refugees who have not responded adequately to medication previously.[79] Zlotnick et al.[77] noted, however, that it is possible that individual treatment variables explain the findings of their study, since all patients received various types of concurrent individual psychological therapy and medication.[77] Moreover, the lack of individual trauma-focused CBT alone and group CBT alone comparison conditions in the Chard study[80] indicates that it is not possible to draw conclusions regarding the benefit of adding group CBT to individual treatment or the efficacy of group CBT per se. Furthermore, based on the findings of Otto et al.[79] it is not clear whether medication is required for group CBT to be effective.

EMDR FOR PTSD

EMDR was compared to waiting list, standard care, pill placebo, fluoxetine, stress management, and trauma-focused CBT involving exposure alone or in combination with cognitive restructuring in the studies that met our inclusion criteria.[20,40,42,43,45,48,60,64,75,76,81–83] The duration of EMDR in these trials ranged from 1 to 12 sessions, with the exception of the study by Marcus et al.[76] in which sessions continued until patients no longer had a PTSD diagnosis or the study finished.[76]

There is evidence from some studies that EMDR ameliorates PTSD symptoms significantly more than waiting list,[48,64,75,81] standard care,[23,76] and pill placebo.[83] Assault survivors, combat veterans, and mixed trauma patients were recruited in these studies. While PTSD symptom reduction has been shown to be comparable over treatment with EMDR and the selective serotonin reuptake inhibitor fluoxetine in mixed trauma patients, at 6-month follow-up, EMDR had the superior outcome.[83] In studies that had diagnosis as an outcome measure, between 77 and 90% of EMDR patients no longer met diagnostic criteria for PTSD at the end of treatment in the analyses of completers.[43,76,81,83]

Conflicting findings regarding the relative efficacy of EMDR and stress management involving relaxation have been reported. While Carlson et al.[75] found that combat veterans who received EMDR had a better outcome in terms of PTSD symptom reduction than those who received biofeedback-assisted relaxation,[75] Taylor et al.[45] reported that EMDR and relaxation training were equivalent in efficacy in a mixed trauma sample.[45]

Mixed findings have been reported regarding the relative efficacy of EMDR and trauma-focused CBT. While a number of studies found that EMDR was superior to trauma-focused CBT on some measures of PTSD symptoms,[40,42,43] others reported that PTSD symptom reduction was similar over trauma-focused CBT and EMDR[48,64] or that EMDR produced a smaller shift in PTSD symptoms than trauma-focused CBT.[45,60] With the exception of Rogers et al.[40] who recruited combat veterans and Rothbaum et al.[48] who recruited assault survivors, all of these studies had mixed trauma samples.

OTHER PSYCHOLOGICAL TREATMENTS FOR PTSD

Family therapy. One RCT evaluated the addition of behavioral family therapy to trauma-focused CBT for combat-related PTSD but found that it did not improve PTSD outcome.[29]

Hypnotherapy and psychodynamic therapy. One RCT compared the efficacy of hypnotherapy, psychodynamic therapy, and trauma-focused CBT to that of a waiting list control condition in a mixed trauma sample.[36] Symptoms of PTSD decreased to a significantly greater extent in patients who received psychodynamic therapy, hypnotherapy or trauma-focused CBT than those who were placed on the waiting list.

IPT. One RCT compared the effects of group IPT to those of a waiting list in survivors of assault or abuse.[31] Although symptoms of PTSD were markedly reduced in IPT relative to waiting list at the end of treatment, this difference between the conditions was no longer evident at 4-month follow-up. In completer analyses, 70% of IPT patients no longer met diagnostic criteria for PTSD at post-treatment compared to only 28.6% of waiting list patients, and the rates at 4-month follow-up were 77 and 50%, respectively. These differences were not significant, however.

Supportive counseling. Supportive counseling was compared to waiting list, psycho-education, stress management, trauma-focused CBT involving exposure alone or in combination with cognitive restructuring, and group CBT in the studies that met our inclusion criteria.[14,16,32,51,69,72,73,78] The duration of supportive counseling in these trials ranged from 4 to 35 sessions, with the exception of an internet-based intervention, which involved 1 face-to-face session with a therapist followed by e-mail and telephone contact.

One RCT compared the efficacy of a supportive problem-solving intervention to trauma-focused CBT and waiting list in survivors of childhood abuse.[69] Drop out from trauma-focused CBT was higher than that from problem-solving therapy and waiting list, and in intent-to-treat analyses there were no significant differences between conditions on PTSD symptom reduction. Other studies that included waiting list[14] and psycho-education[16] comparison conditions did not report that supportive counseling had a superior outcome on PTSD measures to these control groups. Moreover, Foa et al.[14] found that supportive counseling produced significantly less improvement in assault-related PTSD symptoms over treatment than stress management.[14] This difference between conditions was no longer evident at follow-up, about 3 months after treatment, however. Nonetheless, other studies have found that supportive counseling leads to a markedly smaller reduction in PTSD symptoms than trauma-focused CBT involving exposure alone or in combination with cognitive restructuring from pretest to follow-up at 6-[32] and 12-months.[16] Mixed trauma patients and refugees were recruited in these studies. Similarly, Schnurr et al.[51] found that present-centered therapy, a non-directive supportive intervention, was less efficacious than exposure therapy in improving PTSD symptoms.[51] Furthermore, in another study, drop out largely due to patients worsening or finding therapy ineffective was significantly greater from supportive therapy than trauma-focused CBT.[73] Internet-based, therapist-assisted supportive counseling has been shown to lead to a smaller shift in PTSD symptoms than internet-based, therapist-assisted trauma-focused CBT.[72] These latter three studies recruited mixed trauma patients. Interestingly, in intent-to-treat analyses, PTSD symptoms have been shown to reduce comparably in combat veterans assigned to present-centered *group* treatment and those assigned to trauma-focused *group* CBT.[78] Although patients who received an adequate dose of trauma-focused group CBT in that study had a better outcome on avoidance and numbing symptoms than those who received an adequate dose of present-centered group treatment, drop out was greater from trauma-focused group CBT. In studies that had diagnosis as an outcome measure, between 10 and 40% of supportive counseling patients no longer met diagnostic criteria for PTSD at the end of treatment in completer analyses.[14,32,51,69]

PSYCHOLOGICAL TREATMENTS FOR ASD

Far fewer studies have evaluated the efficacy of psychological treatments for ASD than PTSD. Two studies met our inclusion criteria. In one study, trauma-focused CBT involving exposure and cognitive restructuring was compared to supportive counseling and trauma-focused CBT plus hypnosis.[34] In the other study, trauma-focused imaginal and in vivo exposure was compared to cognitive restructuring of maladaptive trauma-related thoughts and a waiting list condition.[36] The duration of the therapies in these trials was 5 sessions.

Trauma-focused CBT alone or in combination with hypnosis was found to be significantly more efficacious than supportive counseling in preventing PTSD in mixed trauma patients with ASD.[34] In analyses of completers at the end of treatment, 46% of supportive counseling patients compared to 13% of trauma-focused CBT patients and 9% of trauma-focused CBT with hypnosis patients had a diagnosis of PTSD. Furthermore, a 3-year follow-up of these patients revealed that even years after therapy, the rates of PTSD in those who had received trauma-focused CBT with or without hypnosis (22 and 11%, respectively) were still far lower than in those who had received supportive counseling (62%).[35] The addition of hypnosis to trauma-focused CBT did not enhance long-term outcome. More recently, Bryant et al.[36] found that imaginal and in vivo exposure was superior to both waiting list and cognitive restructuring in preventing PTSD in mixed trauma patients with ASD.[36] Interestingly, cognitive restructuring was not more efficacious than waiting list in this regard, though there was some evidence that it was better than waiting list in reducing PTSD symptoms. In analyses of completers at the end of treatment, 12% of exposure patients compared to 52% of cognitive restructuring patients and 71% of waiting list patients had a diagnosis of PTSD.

DISCUSSION

The majority of the studies that satisfied the inclusion criteria of this review evaluated the efficacy of trauma-focused CBT for PTSD. Exposure with or without cognitive restructuring of maladaptive trauma-related beliefs was most investigated and was found by independent investigatory teams to produce greater reductions in

PTSD symptoms than no treatment or minimal intervention conditions[15–18,29,30,37,44,46–50,54,61–65,67,68,70,71] and to be superior to relaxation training[39,45,59] and supportive counseling.[16,32,51,72,73] Only four studies investigated cognitive restructuring alone without exposure. One study showed that it was better than treatment as usual in reducing PTSD symptoms[57] and another found that it produced greater change than relaxation training.[39] The other studies reported that it was at least equivalent if not superior to exposure on PTSD outcome.[33,55,56] Using Chambless and Hollon's[25] criteria for deciding when a therapy may be regarded established in efficacy, one can conclude that trauma-focused CBT involving exposure and/or cognitive restructuring is efficacious and specific for PTSD.

Fewer studies have investigated the efficacy of EMDR. Nevertheless, there is evidence that EMDR reduces PTSD symptoms to a greater extent than waiting list.[48,64,75,81] Moreover, independent investigatory teams have shown that EMDR is more efficacious than pill placebo and more enduring than fluoxetine,[83] and results in greater improvements in symptoms than relaxation training.[75] One study found that EMDR and relaxation training produced comparable changes in symptoms,[45] but the sample size in each condition was relatively small. Some research groups have found some evidence of superiority of EMDR over trauma-focused CBT,[40,42,43] though others have found the converse[45,60] or that PTSD symptom reduction was similar across conditions.[48,64] Although one may conclude that EMDR is efficacious and specific for PTSD, this conclusion is based on less evidence than conclusions concerning trauma-focused CBT.

Far less evidence supports the use of stress management per se for PTSD. One research team showed that stress inoculation training is superior to waiting list[14,15] but less effective than exposure.[15] It may therefore be considered possibly efficacious for PTSD. There is little evidence to back the use of relaxation training alone, group CBT, family therapy, or supportive counseling. One investigatory team found that hypnotherapy and psychodynamic therapy produced more improvement in PTSD symptoms than waiting list,[30] and another research team found that PTSD symptoms reduced to a greater extent over IPT than waiting list.[31] Although the findings from these studies were not that strong or easy to interpret, the threshold for considering a treatment "possibly efficacious" is relatively low, so these interventions may be considered possibly efficacious for PTSD.

Only two studies, conducted by one research team, evaluated the efficacy of psychological treatments for ASD that satisfied the inclusion criteria of this review. Trauma-focused CBT, involving exposure alone or in combination with cognitive restructuring, was found to be more efficacious than waiting list[36] and supportive counseling[34] in preventing PTSD. Although there was some evidence that cognitive restructuring alone was better than waiting list, it was significantly less effective than exposure alone.[36] Trauma-focused CBT may therefore be considered possibly efficacious for ASD. For a summary of psychological treatment classifications derived from looking at the literature in an undifferentiated fashion with respect to type of trauma, please refer to Table 4.

These findings support those of other reviews and provide an update on the empirical status of psychological treatments for PTSD and ASD. Over 10 years ago, DeRubeis and Crits-Christoph[5] used Chambless and Hollon's[25] criteria for deciding when a psychological therapy may be regarded established in efficacy and concluded that exposure is an efficacious therapy for PTSD and stress inoculation therapy and EMDR are possibly efficacious therapies for PTSD. More recently, Roth and Fonagy[11] also conducted a qualitative review of the literature and concluded that

TABLE 4. Empirically supported psychological treatments* for posttraumatic stress disorder and acute stress disorder irrespective of trauma type

Classification	Psychological treatment	Evidence
Efficacious and specific treatments	Trauma-focused CBT involving exposure and/ or cognitive restructuring for PTSD	Echeburua et al.[59] Marks et al.[39] Tarrier et al.[33] Bryant et al.[32] Taylor et al.[45] Neuner et al.[16] Tarrier and Sommerfield,[56] Litz et al.[72] Schnurr et al.[51] Cottraux et al.[73] Resick et al.[55]
	Eye movement desensitization and reprocessing for PTSD	Carlson et al.[75] van der Kolk[83]
Possibly efficacious treatments	Stress management involving stress inoculation training for PTSD	Foa et al.[14,15]
	Other psychological treatments for PTSD, namely hypnotherapy, interpersonal psychotherapy, and psychodynamic therapy	Brom et al.[30] Krupnick et al.[31]
	Trauma-focused CBT for ASD involving exposure in particular	Bryant et al.[34,36]

*Using Chambless and Hollon's[25] scheme for deciding when a psychological treatment for a particular disorder may be regarded established in efficacy or possibly efficacious.

while there is only limited support for the efficacy of structured psychodynamic psychotherapy, there is clear evidence of the efficacy of CBT involving some degree of exposure and EMDR.[11] The National Collaborating Centre for Mental Health[10] and Cochrane[12] reviews conducted in the last several years used meta-analytic methods for evaluating the PTSD psychological treatment literature and found that trauma-focused CBT and EMDR are the psychological therapies with the strongest evidence of efficacy for PTSD. Research on the psychological treatment of ASD is still in its infancy. Other reviews of early interventions for trauma survivors were tentative in their conclusions about the efficacy of trauma-focused CBT for ASD because the studies that found clear evidence that it was beneficial included a supportive counseling condition but not a no treatment control group and it has been shown that psychological interventions provided soon after a traumatic event can have little effect on outcome or even impede recovery.[7,9]

A limitation of many of the aforementioned reviews is that conclusions were not drawn about the efficacy of particular psychological treatments for PTSD related to specific trauma types. It is important to look at the evidence in this way since one cannot assume that just because a particular intervention is effective for one trauma population it will be effective for others.[8] Nearly half of the PTSD studies (22/55) that met the inclusion criteria of the present review and all of the ASD studies (2/2) had mixed trauma type samples, which left only 33 studies that were eligible for a secondary trauma type analysis. The psychological treatment of survivors of assault and/or abuse was most investigated followed by that of combat veterans, refugees, and road traffic accident victims. Other trauma populations, namely earthquake survivors, police officers, former political detainees, and people affected by terrorism, were each investigated in only a single study or two studies by one research group.

For assault-related PTSD, exposure may be considered efficacious since different research groups have shown that it reduces PTSD symptoms to a greater extent than waiting list,[15,48] minimal attention,[44] and treatment as usual.[53] There was not enough evidence of specificity; one investigatory team reported a trend that it was better than stress inoculation training on PTSD severity[15] and that it was superior to supportive counseling on diagnosis,[14] but another team reported that it was inferior on some measures to trauma-focused CBT involving cognitive restructuring.[44,55] A further study found that exposure produced a similar reduction in PTSD symptoms to EMDR.[48] Several psychological treatments may be considered possibly efficacious for assault-related PTSD due to supporting evidence coming from only one study or all the research being carried out by one group. These include cognitive restructuring alone,[55] combined trauma-focused CBT,[44,55] stress inoculation training,[14,15]

and EMDR.[48,81] There is little evidence to support the use of supportive counseling for assault-related PTSD.[14] For child-abuse related PTSD, no psychological treatments could be classified as even possibly efficacious due to conflicting findings being reported about combined trauma-focused CBT,[63,69] methodological limitations of group CBT studies,[77,80] and insufficient evidence of efficacy with regard to supportive counseling.[69] Combined trauma-focused CBT for partner abuse-related PTSD was investigated by only one research team and was shown to be better than waiting list,[65,67] hence may be considered possibly efficacious. If one considers the data relating to the treatment of abuse- and assault-related PTSD collectively and also includes the few studies that recruited participants with PTSD related to either abuse or assault, the classifications of the aforementioned therapies do not change with the exception of trauma-focused CBT involving exposure and cognitive restructuring, which may be reclassified as efficacious and specific. It was shown to reduce abuse- or assault-related PTSD symptoms more than minimal attention or waiting list in most studies[44,47,63,65,67] (the study by McDonagh et al.[69] was an exception) and was found to be superior to relaxation[59] and produce similar[47] or greater[55] reductions in PTSD symptoms than exposure. Although Foa et al.[47] found that combined trauma-focused CBT and exposure produced a similar degree of change in PTSD symptoms,[47] exposure may still only be considered efficacious due to another research group reporting that exposure may have a poorer outcome on some measures.[44,55] IPT for people with PTSD related to abuse or assault is considered possibly efficacious due to evidence of it being better than waiting list in one study.[31] There is not enough evidence to support the use of relaxation for abuse- or assault-related PTSD.[59]

For combat-related PTSD, exposure[37] and combined trauma-focused CBT[29] were shown to result in greater reductions in PTSD symptoms than waiting list, hence may be considered possibly efficacious. EMDR was found to be more effective than relaxation.[75] While Jensen[20] reported that EMDR reduced anxiety on exposure to trauma cues to a greater extent than waiting list, it was not superior on PTSD.[20] Nonetheless, patients only received 3 sessions. Rogers et al.[40] found that EMDR was superior to exposure on intrusions, but patients only received 1 session and it was noted that the use of two different clinicians to provide the interventions could have affected the results.[40] One may therefore only consider EMDR to be possibly efficacious for combat-related PTSD at this stage. There is little support for relaxation,[75] group CBT, supportive counseling,[78] and family therapy.[29]

For refugees with PTSD, exposure may be considered possibly efficacious since there is evidence from one research group that it results in greater reductions in PTSD symptoms than psycho-education, supportive counseling,[16] and no treatment monitoring.[54]

Although another research team found that combined trauma-focused CBT produced similar results to exposure for refugees with PTSD,[41] the small sample size of this study limits the conclusions one can draw from these results. There is little evidence to support the use of group CBT by itself[79] or supportive counseling for PTSD in refugees.[16]

Two studies by different research groups investigated the efficacy of combined trauma-focused CBT for road traffic accident-related PTSD. It was shown to be superior to waiting list by one research group[61] and better than repeated assessments and a self-help booklet by another research group[17] so may therefore be considered efficacious. Single studies have shown that combined trauma-focused CBT is more effective than waiting list for police officers with PTSD[62] and people affected by terrorism with PTSD,[71] and exposure results in a greater change in PTSD symptoms than psycho-education for political imprisonment-related PTSD.[50] One investigatory team found that exposure was better than waiting list[46] and repeated assessments[49] for earthquake-related PTSD. These interventions may therefore be considered possibly efficacious for these trauma types.

When one looks at the efficacy of psychological treatments for particular trauma types one is really slicing and dicing a small literature in a way that chops up a number of different kinds of trauma that have only recently been pulled together into a single unified disorder. Because not all these therapies have been applied to all kinds of trauma, one runs the risk of making errors of omission (many of these interventions, especially trauma-focused approaches, may ultimately be found to be efficacious or specifically efficacious for various types of traumas once more studies have been done). It is important to keep in mind that just because a psychological treatment has not yet been tested with a particular trauma population, it does not mean that it is inadequate for those people.[84] Nevertheless, further research is required not only to determine the relative efficacy of various psychological treatments for the full range of different populations but also to establish the efficacy of trauma-focused CBT and EMDR to a greater extent since these are often cited as the treatments of choice for PTSD and they have not yet been tested with all trauma groups.

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