

Treatment and Prevention of Posttraumatic Stress Disorder

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Focus Points

- The efficacy of several psychosocial treatments for posttraumatic stress disorder (PTSD) and the prevention of PTSD following trauma are illustrated.
- Studies comparing psychosocial treatments for PTSD are presented.
- Suggestions for future research in the treatment of PTSD are posed.

Abstract

What treatments are effective for chronic posttraumatic stress disorder (PTSD) and the prevention of PTSD following trauma? The current review illustrates the basic efficacy of several psychosocial treatments for PTSD (ie, exposure, stress inoculation training, eye movement desensitization and reprocessing, cognitive therapy); discusses comparative studies of these treatments; examines two preventive interventions for trauma survivors (ie, psychological debriefing, cognitive behavioral programs); and suggests future research directions. Several psychosocial treatments for chronic PTSD have been proven effective. The few randomized, comparative studies do not provide strong evidence for the superiority of one intervention over another. Further, these studies do not support an additive benefit for combined treatments. While evidence does not support the efficacy of psychological debriefing in preventing PTSD following trauma, studies do suggest that brief cognitive-behavioral programs may accelerate recovery and prevent the development of chronic PTSD following trauma.

Introduction

Substantial research has been conducted on psychosocial treatments for posttraumatic stress disorder (PTSD). However, a comprehensive review is beyond the scope of this paper. The goals for this review are to illustrate the efficacy of several psychosocial treatments for PTSD, discuss comparative studies of these treatments, discuss two approaches to early preventive interventions for PTSD, and suggest future research directions. The efficacy studies presented compare an active treatment with control condition such as wait list, supportive counseling, or relaxation. To facilitate integration across studies, a focus on studies that reported the percentage of treatment completers who continued to meet diagnostic criteria for PTSD after

treatment was utilized. The percentage of change in PTSD symptom severity is also reported in order to examine magnitude of change from pre- to post-treatment.

Treatment of Posttraumatic Stress Disorder Exposure Therapy

Exposure therapy (ET) consists of a set of techniques designed to reduce anxiety and avoidance through confrontation with thoughts and objectively safe situations that otherwise elicit fear and avoidance. The principles and procedures involved in conducting ET for PTSD are similar to those successfully used in the treatment of other anxiety disorders (eg, phobias, agoraphobia, and obsessive-compulsive disorder). Most ET programs for PTSD combine imaginal exposure to the trauma

memory with in vivo exposure to situations or other reminders of the traumatic event,^{1,3} although some programs include only imaginal exposure.^{4,5} When in vivo exposure is included in the program, it is usually conducted according to a hierarchy, starting with exposure exercises that cause mild-to-moderate distress, and working up to the most difficult items.

There are several parameters associated with optimal outcome when conducting exposure therapy. The first is emotional engagement during the exposure. Theoretically, the trauma memory must be activated before changes can occur in the client's responses to the trauma memory and trauma reminders. Empirically, people who experience moderately high levels of anxiety during the initial exposures have better outcome than those who experience lower levels of anxiety.^{6,7} The second parameter is duration of the exposure. One therapeutic outcome of exposure to safe but feared stimuli is habituation of physiological responses and subjective anxiety. However, habituation is a gradual process that requires time to occur. Thus, brief exposures may not permit full habituation and thereby reduce the efficacy of treatment. Third, optimal exposure typically involves repetition. Even when habituation occurs within a particular exposure session, it is common for there to be at least some return of anxiety when the same stimulus is again confronted. With repetition, however, there is usually a successive reduction in initial and peak anxiety, and those who show habituation across exposure sessions tend to have better outcome than those who do not.^{6,7}

The basic efficacy of exposure therapy, consisting of a combination of

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imaginal and in vivo exposure without formal cognitive therapy or substantial elements of stress inoculation training, is illustrated by the five studies summarized in Table 1.^{1-3,8,9} The table presents the study samples and treatment outcome, in terms of the percent reduction in PTSD severity scores at posttreatment and percentage of treatment completers who still met criteria for PTSD after treatment and at follow-up (up to 1 year posttreatment). Three of the studies were restricted to adult female assault victims (predominately rape),^{1,2,8} while the remaining two studies utilized general trauma samples that included men and women with PTSD following a range of traumatic events.^{3,9}

As shown in Table 1, ET was associated with reductions in PTSD symptom severity of 40% to 67%, compared to 26% to 42% for active control treatments and 1% to 20% for wait list. In addition, between 45% and 100% of individuals in control conditions met criteria for PTSD after treatment and approximately 50% met criteria for

PTSD at follow-up. By comparison, between 13% and 60% of individuals receiving ET met criteria for PTSD following treatment, and between 13% and 45% at follow-up. Thus, most gains with ET were maintained through the follow-up period. The efficacy of imaginal exposure therapy has also been investigated with some limited success in male veteran samples.^{4,10,11} While greater improvement occurred for treatment than control conditions, these studies did not report posttreatment incidence of PTSD.

Stress-Inoculation Training

Stress-inoculation training (SIT) is an anxiety management program developed by Meichenbaum¹² that was modified for use with sexual assault survivors. SIT focuses on training in general anxiety management techniques for three channels of fear and anxiety (ie, physical, behavioral, and cognitive) and their application in general and in response to PTSD symptoms. The treatment rationale is that through learning these techniques, the

client becomes better able to manage anxiety and PTSD symptoms are therefore reduced. There are several components to SIT programs. First, psychoeducation focuses on the nature of fear/anxiety, the three channels of fear/anxiety, rationale for treatment, and common reactions to sexual assault. Following psychoeducation, the remaining components may vary based upon the design of the SIT program and needs of the client. The remaining components may include relaxation training, breathing retraining, role-playing, covert modeling, guided self-dialogue, and thought stopping.¹³

Controlled studies examining the effectiveness of SIT demonstrate larger reductions in PTSD for SIT than wait-list¹ and supportive counseling² (Table 2).^{1,2} At follow-up assessments done up to 1 year posttreatment, these reductions have largely been maintained. Given the evidence for its efficacy, SIT is a viable option for the treatment of PTSD. However, all of the studies examining the efficacy of SIT have focused on female assault survivors.

Table 1
Rates of PTSD Posttreatment and at Follow-up in ET RCTs

Study	Sample (N)	ET			SC or RLX			WL		
		%*	Post†	FU‡	%*	Post†	FU‡	%*	Post†	FU‡
Foa et al (1991) ¹	Female sexual assault (45)	40§	60†	45%	26§	90%	55%	20§	100%	ND
Foa et al (1999) ²	Female sexual and physical assault (96)	60§	35%	35%	ND	ND	ND	18§	100%	ND
Marks et al (1998) ³	Male and female, general trauma (87)	42#	25%	ND	37#	45%	ND	ND	ND	ND
Resick et al (2002) ⁸	Female sexual assault (171)	67#	18%	15%	ND	ND	ND	1#	98%	ND
Taylor et al (2003) ⁹	Male and female, general trauma (45)	65#	13%	13%	41#	60%	53%	ND	ND	ND

* Percent reduction in PTSD severity scores. Derived using the following formula: (pre PTSD severity–post PTSD severity)/pre PTSD severityx100%.

† Percentage of treatment completers who still met criteria for PTSD after treatment.

‡ Percentage of treatment completers who still met criteria for PTSD up to 1 year posttreatment.

§ Based upon PTSD Interview scores.

Based upon Clinician Administered PTSD Scale scores.

PTSD=posttraumatic stress disorder; ET=exposure therapy; RCTs=randomized controlled trials; N=number of completers; SC=supportive counseling;

RLX=relaxation; WL=wait list; Post=posttreatment; FU=follow-up; ND=no data.

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Table 2
Rates of PTSD Posttreatment and at Follow-up in SIT RCTs

Study	Sample (N)	SIT			SC			WL		
		%*	Post†	FU‡	%*	Post†	FU‡	%*	Post†	FU‡
Foa et al (1991) ¹	Female sexual assault (45)	55§	50%	45%	26§	90%	55%	20§	100%	ND
Foa et al (1999) ²	Female physical/sexual assault (96)	56§	42%	32%	ND	ND	ND	18§	100%	ND

* Percent reduction in PTSD severity scores. Derived using the following formula: (pre PTSD severity–post PTSD severity)/pre PTSD severityx100%.

† Percent of treatment completers who still met criteria for PTSD after treatment.

‡ Percent of treatment completers who still met criteria for PTSD up to 1 year posttreatment.

§ Based on Posttraumatic Stress Symptom Interview scores.

PTSD=posttraumatic stress disorder; SIT=stress-inoculation training; RCTs=randomized controlled trials; N=number of completers; SC=supportive counseling; WL=wait list; Post=posttreatment; FU=follow-up; ND=no data.

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While researchers may expect that these results would generalize to other trauma populations, this is not known.

Cognitive Therapy

Cognitive therapy (CT) focuses on the interpretation of events rather than the events themselves as the source of emotional reactions.¹⁴ Therefore, in CT, anxiety and other PTSD symptoms are thought to result from negative and unhelpful interpretations of events that fall into common patterns, such as overgeneralization when a person reacts to a new situation based upon a previous experience. For example, a woman raped by a man with a beard may develop the belief that men with beards are dangerous and experience anxiety and fear whenever she sees such a man. In CT, these problematic thoughts are identified and challenged (eg, collecting evidence, looking for alternative interpretations, etc.), leading to development of more helpful alternative thoughts.

Cognitive processing therapy (CPT)⁸ includes exposure but emphasizes CT techniques. The exposure component involves writing a detailed account of the trauma, which is then read to the therapist. Difficult points in the narrative are identified and cognitive techniques are used to closely examine these

points. In addition, trauma-related cognitions are identified with sessions focusing on beliefs about safety, trust, power/control, esteem, and intimacy.

As can be seen in Table 3, randomized controlled trials have demonstrated that CT and CPT reduced the incidence of PTSD following a variety of traumas more than wait list³ and relaxation.⁸ While rates of PTSD at follow-up were not available in one of these studies, rates of PTSD for the CPT condition were similar at follow-up, suggesting maintenance of gains. Importantly, CPT was specifically designed for use with sexual assault survivors. Use in other trauma populations has not been empirically examined.

Eye Movement Desensitization and Reprocessing

Eye movement desensitization and reprocessing (EMDR), a relatively new treatment, first appeared in professional literature in 1989.¹⁵ EMDR has eight treatment phases,¹⁶ which involve a combination of general clinical practice (history and treatment planning, client education, and ongoing re-assessment); brief imaginal exposure to trauma-related memories, thoughts, and feelings; and a form of cognitive restructuring called "installation."

The most unique feature of EMDR is therapist-induced rapid eye movements in the client during the desensitization (ie, imaginal exposure) and installation phases. Most commonly, eye movements are induced by instructing the client to follow the therapists' fingers as they are moved rapidly back and forth across the client's visual field. Other forms of laterally alternating stimuli (eg, tones) or activities (eg, hand tapping) are sometimes used instead of eye movements.

The basic efficacy of EMDR is demonstrated by two studies summarized in Table 4.^{9,17} As shown in the table, rates of PTSD following treatment with EMDR were lower than obtained in control conditions. However, posttreatment rates of PTSD following treatment in the recent study by Taylor and colleagues⁹ were substantially larger than in the earlier, and smaller study by Rothbaum,¹⁷ despite the fact that the former study included a larger number of sessions. Assessment of treatment fidelity in each study indicated excellent adherence to the treatment protocol, suggesting the differences in outcome may reflect differences in study population rather than differences in the quality of administering EMDR. EMDR has also been studied in veteran samples

Table 3
Rates of PTSD Posttreatment and at Follow-up in CT and CPT RCTs

Study	Sample (N)	CT or CPT			RLX			WL		
		%*	Post†	FU‡	%*	Post†	FU‡	%*	Post†	FU‡
Marks et al (1998) ³	Male and female general trauma (87)	50§	35%	ND	37§	45%§	ND	ND	ND	ND
Resick et al (2002) ⁸	Female sexual assault (171)	72§	20%	19%	ND	ND	ND	13	98%§	ND

* Percent reduction in PTSD severity scores. Derived using the following formula: (pre PTSD severity–post PTSD severity)/pre PTSD severityx100%.

† Percent of treatment completers who still met criteria for PTSD after treatment.

‡ Percent of treatment completers who still met criteria for PTSD up to 1 year posttreatment.

§ Based upon Clinician Administered PTSD scale severity scores.

PTSD=posttraumatic stress disorder; CT=cognitive therapy; CPT=cognitive-processing therapy; RCTs=randomized controlled trials; RLX=relaxation; WL=wait list; N=number of completers; Post=posttreatment; FU=follow-up; ND=no data.

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Table 4
Rates of PTSD Posttreatment and at Follow-up in EMDR RCTs

Study	Sample (N)	EMDR			RLX			WL		
		%*	Post†	FU‡	%*	Post†	FU‡	%*	Post†	FU‡
Rothbaum (1997) ¹⁷	Female sexual assault (18)	57§	10%	ND	ND	ND	ND	10§	88%	ND
Taylor et al (2003) ⁹	Male and female general trauma (45)	48§	40%	33%	41§	60%	53%	ND	ND	ND

* Percent reduction in PTSD severity scores. Derived using the following formula: (pre PTSD severity–post PTSD severity)/pre PTSD severityx100%.

† Percent of treatment completers who still met criteria for PTSD after treatment.

‡ Percent of treatment completers who still met criteria for PTSD up to 1 year posttreatment.

§ Based upon Clinician Administered PTSD scale severity scores

PTSD=posttraumatic stress disorder; EMDR=Eye movement desensitization and reprocessing; RCTs=randomized controlled trials; RLX=relaxation; WL=wait list; N=number of completers; Post=posttreatment; FU=follow-up; ND=no data.

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with mixed results.¹⁸⁻²² Several studies²⁴ investigating the role of eye movements and other laterally alternating stimuli have generally failed to find evidence of a specific effect on treatment outcome.^{18,19,24} Cusak and Spatos²⁵ compared EMDR with a condition that replaced the installation trials with additional desensitization trials and found no differences between the two conditions. Thus, despite evidence for the basic efficacy of EMDR, there are no data supporting the unique features in EMDR.

Comparisons Among Treatments

In a comparison of ET (including imaginal and in vivo exposure), CT, ET/CT, and relaxation with a mixed trauma sample with PTSD, Marks and colleagues³ found that the three treatments resulted in significant reductions in anxiety, PTSD symptoms, and depression, compared to relaxation. Few differences were found among the treatments, including no benefit for the combined treatment compared to either CT or ET. Similarly, Paunovic and Ost²⁶ found that both ET and ET/CT resulted in significant improvements in PTSD, general anxiety, and depression in a sample of refugees with PTSD, with no differences in outcome between the treatments.

In a study comparing SIT, ET, and ET/SIT in a female assault sample with PTSD, there was a trend for more clients in ET (52%) to obtain good end-state functioning (a composite of PTSD, depressive, and general anxiety symptoms) than SIT (31%) or ET/SIT (27%).² However, the only significant difference in outcome between treatments for completers was lower general anxiety in ET compared to ET/SIT. Again, the combination did not add to the benefit of the components alone.

Finally, Resick and colleagues⁸ compared CPT, ET, and minimal attention control in sexual assault survivors with PTSD. Both CPT and ET resulted in significant reductions in PTSD and depression that were superior to control. Again, no differences in PTSD or depression were detected between treatments.

Early Intervention and Prevention of Chronic Posttraumatic Stress Disorder

While the majority of trauma survivors recover without intervention,

a significant minority develops chronic PTSD.²⁷ As a result, many researchers have examined how to prevent the development of PTSD following trauma. The two approaches to facilitating recovery following a traumatic event that have received the most research are psychological debriefing and abbreviated cognitive-behavioral packages.

Psychological Debriefing

We use the term psychological debriefing to refer to very brief (one or a few session) interventions that share a number of components and are applied shortly after a traumatic event (frequently within 48–72 hours).²⁸ These common components include discussion of the facts of the traumatic event as well as the survivors' beliefs about what happened; an opportunity to express thoughts, impressions, and emotional reactions; normalization of the survivors' reactions; and planning for coping with the trauma and its sequelae. For a detailed description of critical incident stress management, one form of psychological debriefing, see Everly and colleagues.²⁹

Much of the research examining psychological debriefing has had methodological weaknesses (ie, nonrandom assignment, no standardized measures of PTSD symptom severity, etc.).²⁸ Randomized controlled trials of psychological debriefing in a variety of trauma populations have not supported its effectiveness in preventing PTSD.³⁰⁻³² For instance, Lee and colleagues³⁰ randomly assigned women to receive either psychological debriefing or assessment control at 2 weeks postmiscarriage. At 4 months postmiscarriage there was no difference in anxiety or depression between psychological debriefing and the assessment control groups. In a sample of physical and sexual assault survivors, Rose and colleagues³¹ assigned participants to education, debriefing plus education, or assessment. There were no differences in rates of PTSD at 6 months posttrauma (26% assessment, 11% education, and 23% debriefing). Similarly, there were no differences in PTSD symptom severity with psychological debriefing compared to an assessment control in a sample of motor vehicle accident (MVA) survivors at 3 months post-MVA.³² In a sample of British military peacekeeping troops,

Deahl and colleagues³³ gave the troops a pre-deployment stress training followed by randomly assigning some soldiers to receive post-operational psychological debriefing. No differences were found in PTSD symptoms at 3-, 16-, or 12-month follow-up.

Indeed, some trials have found long-term detrimental effects for psychological debriefing.^{34,35,36} Hobbs and colleagues³⁶ found few differences between psychological debriefing and an assessment control group with MVA survivors at 4 months post-MVA. However, the psychological debriefing group resulted in worse outcome when differences were demonstrated. In a follow-up with this sample at 3-years post-MVA, the psychological debriefing group showed worse outcome in general psychiatric symptoms, travel anxiety, pain, physical functioning, overall functioning, and financial problems.³⁵ Importantly, among those who were initially most distressed (ie, high intrusion and avoidance symptoms), soldiers who received psychological debriefing remained symptomatic while those who did not receive psychological debriefing recovered. These studies do not support the effectiveness of general, acute, implementation of psychological debriefing with trauma survivors. However, proponents of psychological debriefing have suggested that research has not included appropriate outcome measures to capture the changes that occur with psychological debriefing and that psychological debriefing has been inappropriately administered (see Everly and colleagues²⁹).

Cognitive Behavioral Therapy

Cognitive-behavioral therapy (CBT) programs that combine elements of psychoeducation and prolonged imaginal and in vivo exposure with SIT and CT have been found to be helpful in speeding recovery and preventing the development of chronic PTSD. Table 5³⁷⁻⁴⁰ summarizes all four published studies that have investigated the efficacy of brief CBT programs (4–5 sessions) administered beginning approximately 2 weeks after the traumatic event. This approach to preventing chronic PTSD was pioneered by Foa and colleagues,⁴⁰ who treated female sexual assault survivors that met symptom criteria, but not yet duration criteria, for PTSD. The results suggested that, compared to a

no-treatment control group, the treatment program hastened recovery but did not significantly reduce the incidence of PTSD at follow-up. However, survivors were not randomly assigned to treatment, thereby raising the possibility that differences between groups were due to some third variable that happened to be correlated with study condition.

Building on the work of Foa and colleagues,⁴⁰ Bryant and colleagues³⁷⁻³⁹ published three studies of brief CBT in the treatment of acute stress disorder (ASD) following motor vehicle and industrial accidents. ASD has been the focus of these preventive interventions since prospective data support that people with ASD posttrauma are more likely to develop chronic PTSD.⁴¹

As with the Foa and colleagues study,⁴⁰ the studies by Bryant and colleagues³⁷⁻³⁹ show that brief treatment with CBT hastened recovery. More importantly, cognitive behavior therapy was also found to reduce the incidence of PTSD at follow-up. As shown in Table 5, brief CBT and ET alone were associated with reductions in PTSD symptom severity of 57% to 73%, compared to 12% to 38% in comparison groups. In addition, only 8% to 20% of individuals receiving CBT met criteria for PTSD following treatment, and between 17% and 23% met criteria for PTSD 6 months later. In contrast, between 46% and 83% of individuals receiving supportive counseling met criteria for PTSD after treatment and between 58% and 67% met criteria for PTSD 6 months later.

In one study, Bryant and colleagues³⁹ compared the full CBT program with a simpler program in which most of the SIT and CT interventions were removed, and found no reduction in treatment efficacy. This finding mirrors results from studies of combined treatments for chronic PTSD.

Summary and Future Directions

Research illustrates that several psychosocial approaches can be helpful in the treatment of PTSD, including ET, SIT, CT, EMDR, and CBT treatment packages that combine elements of ET with SIT or CT. These treatments are more effective in reducing the symptoms of PTSD and, although not explicitly reviewed here, associated symptoms of depression and general anxiety.

Studies that have directly compared one active treatment for PTSD with one another have not provided any strong evidence for the clear superiority of one treatment over the others. Moreover, studies directly comparing individual treatments (eg, ET alone or CT alone) with combination treatments (eg, ET plus CT) have also failed to produce any strong evidence for the superiority of combined treatments over individual treatments. Preventive CBT treatments utilizing ET, either alone or in combination with elements of SIT and CT, have been found to speed recovery posttrauma and prevent the development of chronic PTSD. Psychological debriefing, a

second approach to early intervention, although quite popular, has not been found to be efficacious in the prevention of posttrauma psychopathology.

Although advances have been made in the treatment of PTSD, a significant proportion of individuals continue to meet criteria for PTSD after treatment and attempts to improve treatment outcome by combining existing treatments have not been especially successful. Thus, two important avenues for further research are: (1) the identification of client variables to predict who will respond to current treatments for PTSD; and (2) the development of modifications to current treatments or new treatments for partial and nonresponders. In particular, no studies have directly compared any psychosocial treatment with medication in the treatment of PTSD nor have studies yet been conducted to examine whether combining psychosocial treatments with medication may yield better outcome than either treatment alone. Finally, although these treatments have been available for years, consumer accessibility is a problem due to difficulties in establishing and maintaining effective methods of dissemination of these treatment methods to treatment providers. **PP**

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Table 5
Rates of PTSD at Posttreatment and Follow-up in RCTs of Early Intervention/Brief Prevention CBT Studies

Study	Sample (N)	CBT			ET			SC			WL		
		%*	Post†	FU‡	%*	Post†	FU‡	%*	Post†	FU‡	%*	Post†	FU‡
Bryant et al (1998) ³⁷	Male and female accidents (24)	71§	8%#	17%#	ND	ND	ND	26§	83%#	67%#	ND	ND	ND
Bryant et al (2003) ³⁸	Male and female accidents and non-sexual assault (24)	71§	8%#	17%#	ND	ND	ND	12§	58%#	58%#	ND	ND	ND
Bryant et al (1999) ³⁹	Male and female accidents and non-sexual assault (45)	57§	20%#	23%#	64§	14%#	15%#	27§	56%#	67%#	ND	ND	ND
Foa et al (1995) ⁴⁰	Female sexual assault (20)	73	10%	11%	ND	ND	ND	ND	ND	ND	38	70%	22%

* Percent reduction in PTSD severity scores. Derived using the following formula: (pre PTSD severity-post PTSD severity)/pre PTSD severityx100%.

† Percent of treatment completers who still met criteria for PTSD after treatment.

‡ Percent of treatment completers who still met criteria for PTSD up to 1 year posttreatment.

§ Based on Impact of Event Scale scores.

Based upon Clinician Administered PTSD scale severity scores.

|| Based on Posttraumatic Stress Symptom Interview scores.

PTSD=posttraumatic stress disorder; RCTs=randomized controlled trials; CBT=cognitive-behavioral package (ET, stress inoculation training, and cognitive restructuring); ET=exposure therapy; SC=supportive counseling; WL=wait list; N=number of completers; Post=posttreatment; FU=follow-up; ND=no data.

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