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Review

# Long-term efficacy of psychotherapy for posttraumatic stress disorder: A meta-analysis of randomized controlled trials☆

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## HIGHLIGHTS

- We conducted a meta-analysis of psychotherapy for adults with PTSD.
- Long-term treatment efficacy and follow-up outcomes in RCTs were examined.
- All treatments demonstrated long-term efficacy.
- Attrition and analytic method of RCTs significantly impacted effect size estimates.
- Methodological design must be considered when interpreting RCTs.

## ARTICLE INFO

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## ABSTRACT

Psychotherapies are well established as efficacious acute interventions for posttraumatic stress disorder (PTSD). However, the long-term efficacy of such interventions and the maintenance of gains following termination is less understood. This meta-analysis evaluated enduring effects of psychotherapy for PTSD in randomized controlled trials (RCTs) with long-term follow-ups (LTFUs) of at least six months duration. Analyses included 32 PTSD trials involving 72 treatment conditions ($N$ = 2935). Effect sizes were significantly larger for active psychotherapy conditions relative to control conditions for the period from pretreatment to LTFU, but not posttreatment to LTFU. All active interventions demonstrated long-term efficacy. Pretreatment to LTFU effect sizes did not significantly differ among treatment types. Exposure-based treatments demonstrated stronger effects in the posttreatment to LTFU period ($d$ = 0.27) compared to other interventions ($p$ = 0.005). Among active conditions, LTFU effect sizes were not significantly linked to trauma type, population type, or intended duration of treatment, but were strongly tied to acute dropout as well as whether studies included all randomized patients in follow-up analyses. Findings provide encouraging implications regarding the long-term efficacy of interventions and the durability of symptom reduction, but must be interpreted in parallel with methodological considerations and study characteristics of RCTs.

## 1. Introduction

PTSD is a prevalent, debilitating, and typically chronic disorder associated with significant distress and functional impairment in a number of domains, as well as considerable public health and economic ramifications (e.g., Kessler, Chiu, Demler, & Walters, 2005; Tanielian & Jaycox, 2008). Fortunately, across a range of populations, settings, and trauma types, effective psychotherapy options exist for PTSD. Numerous systematic and meta-analytic reviews (e.g., Bradley, Greene, Russ, Dutra, & Westen, 2005; Cusack et al., 2016; Haagen, Smid, Knipscheer, & Kleber, 2015; Lee et al., 2016; Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010; Watts et al., 2013) demonstrate the efficacy of psychotherapeutic interventions for both civilian and military populations. In particular, a number of trauma-focused cognitive behavioral treatments, including cognitive processing therapy (CPT; Resick & Schnicke, 1993), cognitive therapy (CT; Ehlers, Clark,

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Hackmann, McManus, & Fennell, 2005), and exposure-based treatments such as prolonged exposure (PE; Foa, Hembree, & Dancu, 2002), have consistently exhibited strong efficacy in the acute phase of treatment and are recommended as first-line treatment options (e.g., Forbes et al., 2010; Institute of Medicine, 2007). Differences among these treatments generally relate to the targeting of key mechanisms of change and the implementation of the cognitive-behavioral techniques specified within the protocol (e.g., stress management and relaxation, psychoeducation, cognitive restructuring, and in-session exposures). In brief, exposure-based therapies (e.g., PE) are defined by the inclusion of some form of repeated exposure to trauma reminders such as the trauma memory aimed at promoting extinction of fear, reduction of avoidance, and changing trauma-related thinking. Cognitive-based interventions, such as CPT and CT, tend to focus more explicitly on identification and modification of dysfunctional beliefs and cognitive patterns following trauma that maintain conditioned fear and patterns of avoidance.

While the efficacy of trauma-focused psychotherapy options has been established in the acute phase, our understanding of the long-term impact of such interventions is more limited. Prior PTSD treatment meta-analyses have primarily focused on acute, immediate outcomes following treatment, with effect sizes calculated using scores from a posttreatment assessment typically conducted shortly after the conclusion of treatment. Additionally, while there is excellent research on spontaneous remission among individuals with PTSD independent of treatment (Morina, Wicherts, Lobbrecht, & Priebe, 2014), there is substantially less literature regarding the long-term impact of interventions for PTSD. Despite robust and well-established support for the efficacy of various psychotherapies in the acute phase of PTSD treatment, no meta-analytic reviews have evaluated the long-term efficacy of these interventions.

Furthermore, though the majority of patients respond to evidence-based treatments for PTSD, some do not. In line with an emerging emphasis on predictors of acute response in clinical research on PTSD (e.g., Schneider, Arch, & Wolitzky-Taylor, 2015), further study of potential predictors impacting long-term treatment response and maintenance of gains following treatment is necessary. Prior meta-analyses have examined a variety of factors in attempts to identify predictors of acute treatment response, which have included baseline sample characteristics (e.g., population, gender, trauma type Bradley et al., 2005; Watts et al., 2013) and variables tied to treatment components and processes (e.g., intended sessions per protocol, whether interventions are trauma-focused Haagen et al., 2015). However, reliable predictors of response remain elusive (e.g., Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012; Taylor, Abramowitz, & McKay, 2012). Thus, despite the evidence base of several treatments for PTSD, there remains a need to further explore patient-related and treatment-related variables that may predict enduring treatment response.

The goal of the current study was to characterize the long-term outcomes of psychotherapies for PTSD and identify predictors of long-term treatment response. Examining the long-term impact of interventions should provide a more comprehensive understanding of their efficacy beyond short-term, acute-phase symptom reduction. Additionally, understanding long-term outcomes for specific types of interventions may better inform treatment directives and clinical decision making. Indeed, the extent to which brief interventions can effectively and efficiently reduce PTSD severity and maintain gains holds significant public health and economic implications. The current study included a methodologically rigorous, systematic review of randomized controlled psychotherapy trials (RCTs) for PTSD, examining treatment outcomes at minimum six months posttreatment. We also examined potential predictors of long-term outcomes, including sample characteristics and treatment-related factors, with emphasis on clinically and empirically salient factors in psychotherapy research. Further, we also closely examined methodological factors and study characteristics that may impact estimates of effect size (Bradley et al., 2005; Watts et al., 2013), such as rates of attrition in study conditions and analytic methods of studies (e.g., completer vs. intent to treat). As described below, we also took steps to optimize the precision of effect size estimates, excluding studies on the basis of sample size (e.g., Hedges & Pigott, 2001) and risk of bias (e.g., Cuijpers, Straten, Bohlmeijer, Hollon, & Andersson, 2010).

## 2. Method

### 2.1. Search strategy

The search process was conducted in two phases. First, the PsycINFO database was searched for articles published from 1980 through 2015, using the search terms “PTSD” OR “post traumatic stress disorder” OR “posttraumatic stress disorder” OR “post-traumatic stress disorder” AND “psychotherapy” or “therapy” AND “treatment” OR “trial” OR “randomized”. Limiters applied in the search were publication year (1980–2015), language (English only), and age group (adulthood, defined as 18 years and older). Following the initial search, reference lists of prior comprehensive meta-analyses of RCTs for PTSD (e.g., Bradley et al., 2005; Cusack et al., 2016; Ehring et al., 2014; Imel, Laska, Jakupcak, & Simpson, 2013; Watts et al., 2013) were closely examined. Any discrepancies between search results and reference lists were recorded and additional studies potentially suitable for inclusion were also closely reviewed.

### 2.2. Inclusion criteria

The current manuscript focuses exclusively on in-person psychotherapies for PTSD, with pharmacological treatments for PTSD excluded for several salient reasons. While follow-up assessment and long-term outcomes are clearly defined in psychotherapy conditions given the explicit starting and ending times of treatment, “dose” is more difficult to temporally assess in pharmacotherapy interventions, where patients often remain on medications even after the initial phase of assessment is completed. Pill placebo conditions were also therefore excluded as potential control comparisons to active psychotherapies given that pill placebo is a more relevant, representative control to pharmacotherapy interventions. While pill placebo does reflect an inert control condition, this is not a typical psychotherapy control, such as non-directive counseling, relaxation, treatment as usual, or even wait-list control. Telehealth conditions were also excluded in the current meta-analysis given the contrast in therapy modality compared to conventional, face-to-face psychotherapy. Difficulties in interpreting and comparing dropout rates in telehealth conditions relative to in-person psychotherapy are also relevant, with recent meta-analytic evidence suggesting significantly higher rates in teletherapy conditions (Fernandez, Salem, Swift, & Ramtahal, 2015), including studies of PE (Franklin, Cuccurullo, Walton, Arseneau, & Petersen, 2017). For these reasons, we chose to exclusively focus on in-person psychotherapies for PTSD.

Studies were eligible for inclusion if they met the following criteria: (a) the study consisted of adult patients; (b) patients were formally assessed and diagnosed with full PTSD (i.e., not subsyndromal or subthreshold PTSD); (c) patients received in-person psychotherapy with a duration of at least three sessions primarily targeting PTSD severity (i.e., not targeting a specific sub-symptom or comorbid condition), (d) data from a reliable, valid assessment measure (i.e., measures supported by published, peer-reviewed work detailing the construction and psychometrics of the assessment) were available for PTSD severity at pretreatment, posttreatment, and at follow-up assessments at least six months posttreatment, (e) and the study was reported in English. Our follow-up time cutoff of six months was based on criteria established by a recent meta-analysis of long-term outcomes for depression treatments (Karyotaki et al., 2016).

Final inclusion criteria pertained to (f) total sample size of the study, where the randomized *N* was required to consist of at least 30 patients,