Effective Health Care Program

Comparative Effectiveness Review
Number 107

Child and Adolescent Exposure to Trauma:

Comparative Effectiveness of Interventions Addressing Trauma Other Than Maltreatment or Family Violence

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Child and Adolescent Exposure to Trauma: Comparative Effectiveness of Interventions Addressing Trauma Other Than Maltreatment or Family Violence

Prepared for:
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The information in this report is intended to help health care decisionmakers—patients and clinicians, health system leaders, and policymakers, among others—make well-informed decisions and thereby improve the quality of health care services. This report is not intended to be a substitute for the application of clinical judgment. Anyone who makes decisions concerning the provision of clinical care should consider this report in the same way as any medical reference and in conjunction with all other pertinent information, i.e., in the context of available resources and circumstances presented by individual patients.

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None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of systematic reviews to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. These reviews provide comprehensive, science-based information on common, costly medical conditions, and new health care technologies and strategies.

Systematic reviews are the building blocks underlying evidence-based practice; they focus attention on the strength and limits of evidence from research studies about the effectiveness and safety of a clinical intervention. In the context of developing recommendations for practice, systematic reviews can help clarify whether assertions about the value of the intervention are based on strong evidence from clinical studies. For more information about AHRQ EPC systematic reviews, see www.effectivehealthcare.ahrq.gov/reference/purpose.cfm.

AHRQ expects that these systematic reviews will be helpful to health plans, providers, purchasers, government programs, and the health care system as a whole. Transparency and stakeholder input are essential to the Effective Health Care Program. Please visit the Web site (www.effectivehealthcare.ahrq.gov) to see draft research questions and reports or to join an e-mail list to learn about new program products and opportunities for input.

We welcome comments on this systematic review. They may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, or by email to epc@ahrq.hhs.gov.

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The investigators deeply appreciate the considerable support, commitment, and contributions of the EPC team staff at RTI-UNC EPC. We express our gratitude to the following individuals for their contributions to this project: Carol Woodell, EPC Project Manager; Sharon Barrell, Justin Faerber, Laura Small, and Jennifer Drolet, editors; and Loraine Monroe and Judy Cannada, documentation preparation specialists.

Key Informants

In designing the study questions, the EPC consulted several Key Informants who represent the end-users of research. The EPC sought the Key Informant input on the priority areas for research and synthesis. Key Informants are not involved in the analysis of the evidence or the writing of the report. Therefore, in the end, study questions, design, methodological approaches, and/or conclusions do not necessarily represent the views of individual Key Informants.

Key Informants must disclose any financial conflicts of interest greater than $10,000 and any other relevant business or professional conflicts of interest. Because of their role as end-users, individuals with potential conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any conflicts of interest.

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In designing the study questions and methodology at the outset of this report, the EPC consulted several technical and content experts. Broad expertise and perspectives were sought. Divergent and conflicted opinions are common and perceived as health scientific discourse that results in a thoughtful, relevant systematic review. Therefore, in the end, study questions, design, methodologic approaches, and/or conclusions do not necessarily represent the views of individual technical and content experts.

Technical Experts must disclose any financial conflicts of interest greater than $10,000 and any other relevant business or professional conflicts of interest. Because of their unique clinical or content expertise, individuals with potential conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any potential conflicts of interest identified.

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Peer Reviewers

Prior to publication of the final evidence report, EPCs sought input from independent Peer Reviewers without financial conflicts of interest. However, the conclusions and synthesis of the scientific literature presented in this report does not necessarily represent the views of individual reviewers.

Peer Reviewers must disclose any financial conflicts of interest greater than $10,000 and any other relevant business or professional conflicts of interest. Because of their unique clinical or content expertise, individuals with potential nonfinancial conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any potential nonfinancial conflicts of interest identified**.**

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Child and Adolescent Exposure to Trauma: Comparative Effectiveness of Interventions Addressing Trauma Other Than Maltreatment or Family Violence

Structured Abstract

Objectives. To assess the effectiveness of interventions that target traumatic stress symptoms and syndromes among children exposed to trauma other than maltreatment or family violence (Key Question 1 [KQ 1]), or children exposed to trauma other than maltreatment or family violence who already have symptoms (KQ 2); to identify subgroup characteristics that moderate the effect of an intervention on outcomes (KQ 3); and to assess harms associated with interventions (KQ 4).

Data sources. MEDLINE®, The Cochrane Library, Embase, PsycINFO, Cumulative Index to Nursing and Allied Health Literature, International Pharmaceutical Abstracts, and Web of Science. Additional studies were identified from reference lists and technical experts.

Review methods. Two trained reviewers independently selected, extracted data from, and rated the risk of bias of relevant trials and systematic reviews. We did not quantitatively analyze our data because of statistical heterogeneity, insufficient numbers of similar studies, or variation in outcome reporting; thus, we synthesized the data qualitatively. KQ 1, KQ 2, and KQ 4 present outcomes categorized by intervention type. KQ 3 presents outcomes of interventions categorized by child characteristics.

Results. We found a total of 21 trials and 1 cohort study (reported in 25 articles) of either medium or low risk of bias from our review of 6,647 unduplicated abstracts. We did not find studies that attempted to replicate findings of effective interventions; rather, studies tested unique interventions. No pharmacotherapy intervention demonstrated effectiveness. Studies demonstrating improvement in outcomes generally compared results of interventions with waitlist controls. With a single exception, studies comparing interventions with active controls did not show benefit. Some psychotherapy interventions targeting children exposed to trauma appear promising based on the magnitude and precision of effects found. These interventions were school-based treatments with elements of cognitive behavioral therapy (CBT). We found less compelling evidence regarding potentially promising interventions targeting already existing symptoms, each of which also had elements of CBT.

Authors typically evaluated short-term outcomes. The body of evidence provides no insight into how interventions targeting children exposed to trauma, some of whom already have symptoms, might influence healthy long-term development. We found little evidence on how effectiveness might vary by child characteristics and no evidence on how effectiveness might vary by treatment characteristics or setting. We also found almost no evidence on harms associated with psychological treatments. Only pharmacological interventions attempted to assess harms in this vulnerable population.

Conclusions. Our findings may be interpreted as a call to action. Psychotherapeutic intervention may be beneficial relative to no treatment, but far more research is required to produce definitive guidance on the comparative effectiveness of psychotherapeutic or pharmacological interventions targeting children exposed to trauma, some of whom already have symptoms.

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Executive Summary

Background

Approximately two-thirds of children and adolescents will experience at least one traumatic event, creating a critical need to identify effective child trauma interventions. While most children exposed to trauma do not experience long-term negative sequelae in terms of psychological and social functioning, some go on to develop traumatic stress syndromes, including post-traumatic stress disorder (PTSD).[1-3] Studies have indicated that childhood traumatic stress syndromes are associated with a high degree of impairment that can carry into adolescence and adulthood. For example, childhood PTSD increases the risk for developing comorbid mental disorders, such as depression, substance abuse, and conduct disorder.[4] Suicidality is a particular concern for children with PTSD.[4,5] Decreased social, home, school (lower academic achievement[6]), and relational functioning have also been observed in children and adolescents with PTSD. Although several guidelines on the treatment of PTSD during childhood and adolescence exist, the recommendations have not been largely based on evidence resulting from Comparative Effectiveness Reviews. Furthermore, the guidelines offer inconsistent recommendations for interventions.

Scope

The current review is the second in a two-part series focusing on interventions that address child trauma. The first in the series focuses on the comparative effectiveness of interventions that address child exposure to trauma in the form of maltreatment (physical, sexual, and emotional/psychological abuse, and neglect).[7] This review, the second in the series, addresses the treatment of children exposed to traumatic events other than child maltreatment or family violence, some of whom are already experiencing symptoms. Interventions for children exposed to family violence (i.e., intimate partner violence and other forms of violence exposure in the home) are not covered by either review given the heterogeneity in this population and the interventions used to treat family violence exposure. That is, children who witness but do not directly experience interpersonal violence represent different clinical populations in terms of the nature of the relationship disturbance and implications for treatment. For the sake of brevity, we refer to children and adolescents as “children” for the remainder of this report.The review also seeks to understand whether evidence exists for differences in the efficacy of interventions by specific child or treatment characteristics or by setting of the delivered intervention. Finally, the review attempts to identify adverse events associated with the interventions reviewed.

An overarching goal of this review is to identify gaps in the current scientific literature, and to highlight important areas for future research, to help build the evidence base for interventions targeting traumatic stress symptoms or syndromes with children exposed to trauma other than maltreatment or family violence.

Our population, intervention, comparator, outcome, timing, and setting (PICOTS) framework presented in the Methods section defines the populations, interventions, comparators, outcomes, and settings of interest for the review. The results presented in this review, therefore, only apply to this specific set of PICOTS. We note several other differences across studies, such as type or severity of trauma experienced by children included in each tested intervention, as limitations to the applicability of findings.

Key Questions

Key Question 1: What is the comparative effectiveness of different types of pharmacotherapy, psychotherapy, complementary and alternative therapy, or other therapy, such as combined, for children ages 0 to 17 years exposed to trauma other than maltreatment? Traumatic stress symptoms and syndromes, as well as other specific outcomes examined, are detailed in Figure A.

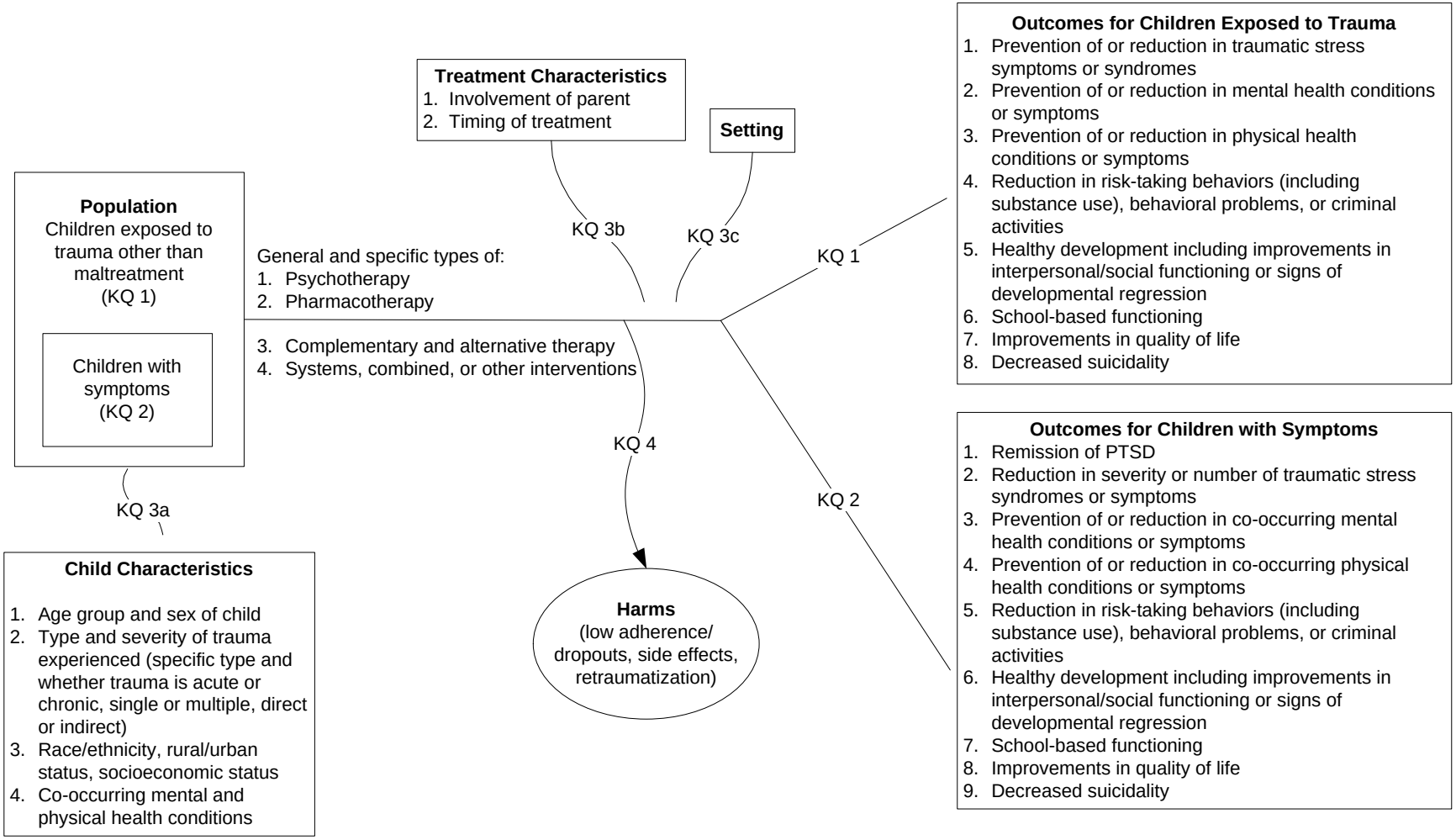
Key Question 2: What is the comparative effectiveness of different types of pharmacotherapy, psychotherapy, complementary and alternative therapy, or other therapy, such as combined, for children ages 0 to 17 years with traumatic stress symptoms from trauma other than maltreatment who are already experiencing symptoms? Traumatic stress symptoms and syndromes, as well as other specific outcomes examined, are detailed in Figure A.

Key Question 3: Do interventions targeting children who were exposed to trauma and are already experiencing symptoms vary in their effectiveness by characteristics of the child, treatment, or setting?

Key Question 4: What are the harms (e.g., low adherence/dropouts, side effects, retraumatization) associated with specific types of therapies targeting children exposed to trauma or targeting children who were exposed to trauma and are already experiencing symptoms?

Figure A depicts the analytic framework that presents the Key Questions (KQs) within the context of PICOTS. KQ 1 addresses the efficacy of interventions for children exposed to trauma other than maltreatment and family violence. KQ 2 examines the efficacy of interventions for children exposed to trauma other than maltreatment and family violence who are already experiencing symptoms. KQ 3 evaluates the efficacy of interventions in different subpopulations, varying by child, treatment characteristics, or setting. KQ 4 illustrates the harms associated with specific interventions, including retraumatization, side effects, low adherence, and dropout.

Figure A. Analytic framework



KQ = Key Question; PTSD = post-traumatic stress disorder

Methods

Topic Refinement

The topic nomination resulted from a public process. With Key Informant input, the RTI International-University of North Carolina at Chapel Hill (RTI-UNC) Evidence-based Practice Center (EPC) worked on clarifying the scope of the project. After we generated an analytic framework, preliminary KQs, and preliminary inclusion and exclusion criteria in the form of PICOTS, AHRQ posted KQs for public comment from November 15, 2011, to December 13, 2011. We incorporated public commenton the KQs and clinical and methodological input from a Technical Expert Panel into the final research protocol, which was also posted on the AHRQ Web site on March 26, 2012.

Literature Search and Review Strategy

We systematically searched, reviewed, and analyzed the scientific evidence for each KQ. We began with a focused PubMed search on traumatic stress disorders and psychological and pharmacological therapies using a variety of terms, medical subject headings (MeSH®), and major headings. We limited results to children and human-only studies published from 1990 onward. We selected this time range to ensure therapeutic modalities were currently applicable. Because of limited resources, we also limited the search to studies published in English; however, this may bias the report because more studies from English-speaking countries were included.

We searched the Cochrane Library, Embase®, PsycINFO®, CINAHL, International Pharmaceutical Abstracts (IPA), and Web of Science using analogous search terms. We conducted quality checks to ensure that known studies were identified by the search. If they were not, we revised and reran our searches. Further, AHRQ requested Scientific Information Packets (SIPs) from the developers and distributors of the interventions identified in the literature review. SIPs allow an opportunity for the intervention developers and distributors to provide us with both published and unpublished data that they believe should be considered for the review. We included studies from the SIPs that meet our review criteria.

Two trained members of the research team independently reviewed each of the titles and abstracts against the inclusion and exclusion criteria listed in Table A. We applied the same criteria to systematic reviews and primary studies. For each article that either or both reviewers chose to include, both members of the research team reviewed the full text for eligibility against the inclusion and exclusion criteria. During full-text review, if both reviewers agreed that a study did not meet the eligibility criteria (including designation of high risk of bias), we excluded the study. Reviewers resolved conflicts by discussion and consensus or by consulting a third member of the review team.

For studies that met our inclusion criteria, a trained reviewer abstracted information into structured evidence tables; a second senior member of the team reviewed all data abstractions for completeness and accuracy. Reviewers resolved conflicts by discussion and consensus or by consulting a third member of the review team.

Table A. Population, intervention, comparator, outcome, timing, and setting

Domain	Description
Population	• Children ages 0–17 years who have been exposed to a trauma other than maltreatment, neglect, or family violence. Specific types of trauma include terrorism, community violence, war, school violence, natural disasters, medical trauma, and death of loved ones[a] • Children ages 0–17 years who have been exposed to a trauma other than maltreatment, neglect, or family violence who already are experiencing symptoms[a]
Intervention	**Interventions for children exposed to trauma** • Psychotherapy (e.g., cognitive behavioral therapy, hypnotherapy, psychodynamic therapy, community- or classroom-based interventions) • Pharmacotherapy (e.g., SSRIs, TCAs, benzodiazepines, beta blockers, alpha blockers, mood stabilizers, antipsychotics, combined therapy, other therapy) **Interventions for children exposed to trauma who already have symptoms** • Psychotherapy, including trauma-focused vs. nontrauma-focused groupings (e.g., cognitive behavioral therapy, parent-child interaction therapy, child-parent psychotherapy, eye movement desensitization and reprocessing, dialectical behavior therapy, complementary and alternative therapies [e.g., equine-assisted therapy], and community- or classroom-based interventions) • Pharmacotherapy (e.g., SSRIs, TCAs, benzodiazepines, beta blockers, alpha blockers, mood stabilizers, antipsychotics, combined therapy, other therapy)
Comparator	The comparison condition as defined in the respective studies, including active controls (such as usual care) and inactive controls (such as wait-list groups)
Outcome	**Outcomes for studies targeting children exposed to trauma[b]** • Prevention of or reduction in traumatic stress symptoms or syndromes (e.g., PTSD, acute stress disorder, developmental trauma disorder) • Prevention of or reduction in mental health conditions or symptoms (e.g., depression, anxiety) • Prevention of or reduction in physical health conditions or symptoms (e.g., sleep disorders, eating disorders, pain, overweight or obesity, asthma, cardiovascular problems, gastrointestinal problems, headaches) • Reduction in risk-taking behaviors (including substance use), behavioral problems (including conduct disorder and ADHD), or criminal activities • Healthy development (including improvements in interpersonal and social functioning), or reductions in the signs of developmental regression • School-based functioning • Improvements in quality of life • Decreased suicidality • Low adherence/dropouts • Side effects • Retraumatization **Outcomes for studies targeting children exposed to trauma who already have symptoms[b]** • Remission of PTSD • Reduction in severity or number of traumatic stress syndromes or symptoms • Prevention of or reduction in co-occurring mental health conditions or symptoms (e.g., depression, anxiety) • Prevention of or reduction in co-occurring physical health conditions or symptoms (e.g., sleep disorders, eating disorders, pain, overweight or obesity, asthma, cardiovascular problems, gastrointestinal problems, headaches) • Reduction in risk-taking behaviors (including substance use), behavioral problems (including conduct disorder and ADHD), or criminal activities • Healthy development (including improvements in interpersonal/social functioning), or signs of developmental regression • School-based functioning • Improvements in quality of life • Decreased suicidality • Low adherence/dropouts • Side effects • Retraumatization
Timing	• All outcomes included, regardless of timing of measurement

Table A. Population, intervention, comparator, outcome, timing, and setting (continued)

Domain	Description
Setting	• Studies conducted in the United States or internationally • Specialty (e.g., outpatient and inpatient primary care or mental health care settings) • Nonspecialty (e.g., schools, community-based providers, shelters) • Home-based settings and out-of-home care (e.g., residential treatment)
Publication type	• Not editorials, letters to the editor
Study design	• Included designs: systematic reviews, randomized controlled trials, nonrandomized controlled trials, prospective cohort studies, and nested case-control studies • Excluded designs: case reports, case series, cross-sectional studies, nonsystematic reviews, retrospective cohort studies, non-nested case-control studies
Sample size	• N ≥10
Time of publication	• 1990 to present
Language of publication	• English
Risk of bias	• Low or medium. We excluded studies with a high risk of bias, as determined by one or more significant flaws that invalidated the findings (e.g., attrition bias of overall attrition ≥20% or differential attrition ≥15% without appropriate handing of missing data, such as the use of intention-to-treat analyses), detection bias, selection bias, performance bias, and/or reporting bias

ADHD = attention deficit hyperactivity disorder; N = number; PTSD = post-traumatic stress disorder; SSRI = selective serotonin reuptake inhibitors; TCA = tricyclic antidepressants

[a]At least 95% of the sample was required to be between 0 and 17 years of age.

[b]At least one outcome had to relate to the assessment of trauma for the study to be included. For each study, we also included findings that showed nonbeneficial outcomes associated with the intervention (e.g., no significant changes in outcomes between groups or significantly worse outcomes in the intervention group).

Risk-of-Bias Assessment

Two independent reviewers assessed risk of bias (internal validity) for each study using predefined criteria described in the AHRQ "Methods Guide for Effectiveness and Comparative Effectiveness Reviews,"[8] using questions specified in the RTI Item Bank[9] and the Cochrane Risk of Bias tool.[10] We resolved disagreements between the two reviewers by consulting an experienced member of the team. We selected items based on relevance to the topic and anticipated sources of bias. We assessed the potential for selection bias, performance bias, attrition bias, detection bias, and reporting bias. We then rated each study as having a low, medium, or high risk of bias for individual outcomes.

A study with a low risk of bias had a strong design, measured outcomes appropriately, used appropriate statistical and analytical methods, reported low attrition, and reported methods and outcomes clearly and precisely. Studies with a medium risk of bias did not meet all criteria required for low risk of bias. These studies had flaws in design or execution (e.g., imbalanced recruitment, high attrition) but they provided information (e.g., through sensitivity analysis) to allow the reader the ability to evaluate and determine that those flaws did not likely cause major bias. Missing information often led to a medium risk of bias rating (as opposed to low).

Studies with a high risk of bias had at least one or more major flaws that likely caused significant bias, and, thus, invalidated the results. Major flaws precluded the ability to draw causal inferences between the intervention and the outcome. Examples of flaws likely to result in a high risk of bias rating include poorly randomized studies that failed to account for imbalances at baseline; observational studies that failed to account for potential confounders; and studies of any design with overall attrition of 20 or more or differential attrition of 15 percent or more without appropriate handling of missing data, such as the use of intention-to-treat analyses.

Data Synthesis

We report results from direct comparisons of different interventions. Quantitative analysis was not appropriate because of heterogeneity, insufficient numbers of similar studies, or insufficiency or variation in outcome reporting; thus, we synthesized the data qualitatively. We report magnitude of effect data provided by authors in the studies reviewed. We did not perform additional effect size calculations with the exception of one study that provided the effect size without the significance level. We did not attempt indirect comparisons given the heterogeneity of usual care comparators. KQ 1, KQ 2, and KQ 4 present outcomes categorized by intervention type. KQ 3 presents outcomes of interventions categorized by child characteristics. Because the intent of KQ 3 was to evaluate whether characteristics of the child moderated the effect of the interventions, we included only those studies that tested whether the effect of an intervention on outcome differed by subgroup characteristics via an interaction term. We did not synthesize the evidence for KQ 3 from studies that met our overall inclusion criteria for KQ 1 and KQ 2 but did not compare effects between subgroups. We elected not to summarize findings that presented results stratified by subgroups because of the risk of over-interpreting results from underpowered subsamples.

Strength of Evidence Grading

We graded the strength of evidence (SOE) for all available outcomes in our prespecified list based on the guidance established for the EPC program.[11] This approach incorporates four key domains: risk of bias (including study design and aggregate quality), consistency, directness, and precision of the evidence. We used the SOE grades defined by Owens and colleagues.[11] The SOE grades are:

- **High—High confidence that the evidence reflects the true effect.** Further research is very unlikely to change our confidence in the estimate of effect.
- **Moderate—Moderate confidence that the evidence reflects the true effect.** Further research may change our confidence in the estimate of the effect and may change the estimate.
- **Low—Low confidence that the evidence reflects the true effect.** Further research is likely to change our confidence in the estimate of the effect and is likely to change the estimate.
- **Insufficient—Evidence either is unavailable or does not permit estimation of an effect**.

At a minimum, two reviewers assessed each domain for each key outcome and resolved any differences by consensus. We used a qualitative process, considering each of the domains, to determine the overall SOE grade for each relevant outcome. Our team discussed differences in overall SOE grades to reach consensus.

For outcomes having only a single study to provide evidence, we evaluated consistency as not applicable. When a study had estimates of effects with confidence intervals that permitted clinically distinct conclusions, we rated that domain as imprecise. When studies provided sufficient information (i.e., standard deviation or standard error) to calculate confidence intervals around between-group changes without making assumptions about the correlation between available measures of variance, we calculated confidence intervals for the difference in the change in outcomes for the study groups. For studies that did not provide estimates of variance for between-group differences in outcomes, we relied on either measures of statistical

significance from between-group adjusted analyses (where available) or unadjusted analyses if no other data were available. We did not rely solely on measures of statistical significance to evaluate precision for differences in post-test assessment that failed to account for pretest differences. We also considered whether studies were adequately powered.

For outcomes with a single study with imprecise results and for which power was not ensured, we considered this to be insufficient evidence that the estimate from the single study was robust enough to have any confidence in the finding. For a single study with precise results, we graded it as low. Therefore, although effectiveness is synonymous with neither precision nor SOE, individual studies that showed an effect generally merited a rating of low SOE.

Applicability

We assessed the applicability of the evidence following guidance from Atkins and colleagues.[12] We used the PICOTS framework to explore factors that affect or limit applicability.

Results

We provide a summary of results by KQ. Detailed descriptions of included studies, key points, detailed synthesis, summary tables, and expanded SOE tables that include the magnitude of effect can be found in the full report. Our summary of results presents the SOE grades.

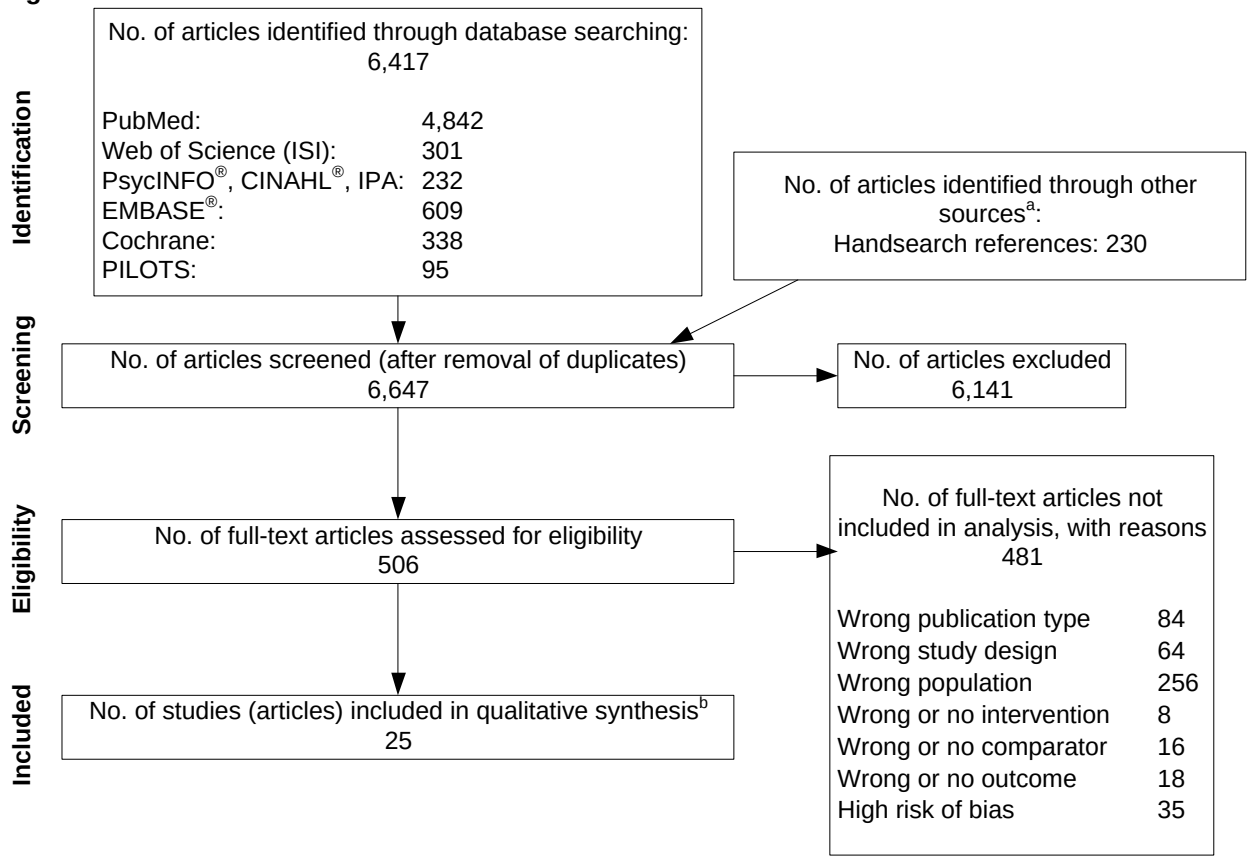
Results of Literature Searches

Figure B presents our literature search results. Literature searches through August 3, 2012, for the current report identified 6,647 unduplicated citations. We excluded 6,141 at the title and abstract review stage. For the 506 articles reviewed at the full-text stage, we eliminated 446 for a variety of reasons before risk-of-bias review. We recorded the reason for excluding full-text publications and provide a table of all excluded studies in Appendix C of the full report, organized by reason for exclusion. The most common reasons for exclusion at the full-text stage were wrong population or wrong publication type. After assessing risk of bias for all included studies (before data abstraction), we eliminated 35 studies that we rated high risk of bias (described in detail below).

The 25 articles included in this review represent 23 studies testing 20 interventions. Of the 25 included articles, 16 were RCTs, 6 were cluster RCTs, 2 were prospective cohort studies, and 1 was a systematic review. We assessed 19 included articles as medium risk of bias and 5 as low risk of bias. We did not assess the risk of bias for the single systematic review that met our criteria because tools such as AMSTAR cannot easily be applied to systematic reviews with no included studies. No other systematic reviews could be used in our review in their entirety because their inclusion/exclusion criteria did not match ours, although we evaluated the citation lists for several systematic reviews for additional studies.

We reviewed 58 unduplicated articles, obtained through SIPs, 43 of which we excluded during the abstract review stage and 13 of which we excluded during the full-text review stage. From the remaining two articles, we eliminated one study[13] because of high risk of bias and included the other study[14] in this report. Of the 58 articles we examined, 5 were unpublished; 4 of these studies were excluded during the abstract review stage, and 1 was excluded during the full-text review stage.

Figure B. Literature search results



NO = number

[a]Additional articles were identified through grey literature searches, scientific information packet searches, peer and public review comments, and by means of manual entry or Medline, ProQuest, and Worldcat Online Computer Library Center search engines.

[b]We identified one systematic review[15] for inclusion in this report. The review found no eligible studies.

Our search of the grey literature yielded six articles, two of which we excluded during the abstract review stage and one of which we excluded during the full-text review stage. After assessing risk of bias for the remaining three studies, we eliminated one study[16] for high risk of bias and included the other two studies[17,18] in this report. Of the six studies we examined, only one was unpublished; however, it was eliminated at the risk-of-bias review stage.

Overall, the evidence from 21 trials and 1 observational study (25 articles) evaluated 6 types of interventions targeting children with trauma exposure (7 studies, 8 articles)[18-25] and 13 types of interventions targeting children with trauma exposure already experiencing traumatic stress symptoms (15 studies, 16 articles).[15,17,26-39] These interventions were marked by substantial heterogeneity in components, dose, frequency, involvement of family members, and mode and method of delivery. The wide variety of approaches presented challenged our attempts to combine or categorize interventions as we had anticipated. We kept our main framework of organization by psychotherapy and pharmacotherapy approaches. For the psychotherapy approaches, we described cognitive-based therapies first, followed by other types of psychotherapies. For the cluster of school-based therapies, we first reported on specific individualized approaches and school-based approaches identified in our protocol (e.g., Cognitive Behavioral Intervention for Trauma in Schools [CBITS]) that have both individual and

group components. Following these interventions, we described school-based psychotherapies with mixed components.

Although we identified numerous potential interventions in our protocol, few studies met our inclusion criteria, likely because the interventions had not been implemented among children with trauma from sources other than maltreatment or family violence. For example, we did not find any evidence on child-parent psychotherapy, an intervention primarily used for maltreated children.

We also dropped 35 studies for high risk of bias. We most commonly eliminated studies with high risk of bias because of selection bias (n=30), including poor randomization, lack of allocation concealment for trials, and failure to control for confounding factors for observational studies (see Appendix E in the full report for more details). Other common reasons for the removal of studies with high risk of bias included attrition bias or differential attrition bias (n=12; e.g., loss to followup of ≥20% or differential loss to followup of ≥15% without appropriate handling of missing data), detection bias (n=11; e.g., bias in outcome assessment), and performance bias (n=9; e.g., not controlling for concurrently occurring or unintended interventions). Of these, we dropped 34 of 35 for multiple reasons; we dropped only 1 study with a single reason for the high risk-of-bias rating that invalidated all findings: a 77% drop-out rate (see Appendix E in the full report for more details).

Having a study design less rigorous than a controlled trial did not drive our decision to drop a study for high risk of bias; we excluded only 4 of the 35 studies that had observational (prospective cohort) study designs. Most of the dropped studies tested interventions similar to those included in our review (e.g., psychotherapeutic interventions, such as cognitive behavioral therapy [CBT] and eye movement desensitization and reprocessing [EMDR]; exposure therapies; school-based interventions, such as CBITS; and pharmacotherapeutic interventions, such as sertraline and other SSRIs). Although high risk-of-bias studies may have added to some of the sparse evidence in this literature, their inclusion would not have materially altered SOE because they would not have increased our confidence in the estimate of effect.

Key Question 1: Treatment Based on Exposure

We sought evidence on the effectiveness of interventions targeting children exposed to trauma according to traumatic stress, mental health, physical health, and other outcomes. These outcomes included the following:

- Prevention of traumatic stress symptoms or syndromes (e.g., PTSD, acute stress disorder, developmental trauma disorder [DTD])
- Prevention of or reduction in mental health conditions or symptoms (e.g., depression, anxiety)
- Prevention of or reduction in physical health conditions or symptoms (e.g., sleep disorders, eating disorders, pain, overweight or obesity, asthma, cardiovascular problems, gastrointestinal problems, headaches)
- Reduction in risk-taking behaviors, including substance use; reduction in behavioral problems, including conduct disorder and attention deficit hyperactivity disorder (ADHD); or reduction in criminal activities
- Healthy development, including improvements in interpersonal and social functioning or reductions in developmental regression
- School-based functioning
- Improvements in quality of life

- Decreased suicidality

At least one outcome from each included study had to relate to the assessment of trauma symptoms or syndromes. We also included findings that showed nonbeneficial outcomes associated with the intervention (e.g., no significant changes in outcomes between groups or significantly worse outcomes in the intervention group).

Summary of Findings by Intervention

Seven studies (in eight articles) on six different interventions provided information on a subset of these outcomes.[19-25] Five interventions evaluated a variety of psychotherapeutic approaches compared with wait-list controls,[22-24] no treatment,[19,20] usual care,[18] or supportive therapy;[21] the sixth intervention evaluated the efficacy of propranolol compared with placebo.[25] The propranolol study[25] and the early psychological intervention study[18] found no improvement in any outcomes. All other interventions reported some improvement in one or more outcomes.[19-24]

Three of four interventions showing evidence of benefit (trauma-focused cognitive behavioral therapy [TF-CBT] and both mixed school group interventions--ERASE Stress and Overshadowing the Threat of Terrorism) compared outcomes from interventions with outcomes from wait-list controls or no intervention.[19,20,22-24] The Child and Family Traumatic Stress Intervention (CFTSI) trial was the only study showing evidence of benefit with an active group comparator.[21]

Summary of Findings Across Interventions

Table B presents a summary of the SOE across all evaluated outcomes for interventions targeting children exposed to trauma. All studies evaluated traumatic stress symptoms, although the specific measure varied by study.

Five studies (four treatment types) evaluated PTSD diagnosis[21-25]; of these, three studies (two treatment types, CFTSI and mixed school group ERASE Stress) found evidence of improvement favoring intervention arms.[21-23] Four studies (three treatment types) evaluated severity of PTSD symptoms;[22-25] three studies representing two treatments found evidence of improvement favoring intervention arms (both school-based interventions).[22-24] Three studies (one study presented in two publications) evaluating PTSD symptoms found evidence of improvement[19-21,24]; the early intervention study found no benefit (early psychological intervention).[18]

Six studies evaluated mental health outcomes, specifically anxiety, depression, and dissociative symptoms.[19-23,24] Both studies evaluating anxiety[21,24] reported improvement in anxiety; three studies (four publications) evaluating depression[19,20,22,23] reported improvement in depression; the early psychological intervention found no improvement in depressives symptoms;[18] and one study found no improvement in dissociative symptoms.[21]

Four studies evaluated physical health outcomes.[22-25] All three studies that evaluated somatic complaints found evidence of benefit favoring the intervention arm.[22-24] A single study evaluating physiological reactivity found no evidence of benefit.[25]

Regarding other outcomes, all three studies that evaluated functional impairment found evidence of benefit.[22-24] The single study that evaluated behavior problems found no evidence of benefit.[18]

Table B. Summary of strength of evidence grades for interventions targeting children exposed to trauma (Key Question 1)

Intervention	Comparator	Number of Studies	PTSD Diagnosis	PTSD Severity	PTSD Symptoms	Anxiety	Depression	Dissociative Symptoms	Somatic Complaints	Physiological Reactivity	Functional Impairment	Behavioral Problems
Trauma-focused cognitive behavioral therapy (school group and individual)	No treatment	1[19,20]	NE	NE	L (+)	NE	L (+)	NE	NE	NE	NE	NE
Child and Family Traumatic Stress Intervention	Supportive therapy	1[21]	L (+)	NE	L (+)	L (+)	NE	I	NE	NE	NE	NE
Mixed (psychoeducational material, cognitive behavioral skills, meditative practices, bioenergetic exercises, art therapy, narrative techniques, and home assignments), ERASE Stress (school groups)	Wait-list control that received religious classes	2[22,23]	L (+)	L (+)	NE	NE	L (+)	NE	L (+)	NE	L (+)	NE
Mixed (psychoeducational material and skills training with meditative practices, bioenergetic exercises, art therapy, and narrative techniques for reprocessing traumatic experiences), Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1[24]	I	L (+)	L (+)	L (+)	NE	NE	L (+)	NE	L (+)	NE
Early psychological intervention	Usual care	1[18]	NE	NE	I	NE	I	NE	NE	NE	NE	I
Propranolol	Placebo	1[25]	I	NE	I	NE	NE	NE	NE	I	NE	NE

I = insufficient strength of evidence because of lack of evidence of effect; L (+) = low strength of evidence of benefit; NE = not evaluated by study authors; PTSD = post-traumatic stress disorder

Summary of Findings by Outcome

Table C presents detailed findings by outcome for interventions with some evidence of benefit. We rated the evidence as low for all of these outcomes, based on the limited number of studies (generally no more than one study per intervention) and small sample sizes.

Key Question 2: Treatment of Traumatic Stress Symptoms

As in KQ 1, we sought evidence of the effectiveness of interventions designed to treat traumatic stress symptoms in children on a variety of traumatic stress, mental health, physical health, and other outcomes. Specifically, these included:

- Remission of PTSD
- Reduction in severity or number of traumatic stress syndromes or symptoms
- Prevention of or reduction in co-occurring mental health conditions or symptoms (e.g., depression, anxiety)
- Prevention of or reduction in co-occurring physical health conditions or symptoms (e.g., sleep disorders, eating disorders, pain, overweight or obesity, asthma, cardiovascular problems, gastrointestinal problems, headaches)
- Reduction in risk-taking behaviors, including substance use; reduction in behavioral problems, including conduct disorder and ADHD; or reduction in criminal activities
- Healthy development, including improvements in interpersonal/social functioning, or reductions in signs of developmental regression
- School-based functioning

- Improvements in quality of life
- Decreased suicidality

As with KQ 1, at least one outcome from each included study had to relate to the assessment of trauma symptoms or syndromes. We also included findings that showed nonbeneficial outcomes associated with the intervention (e.g., no significant changes in outcomes between groups or significantly worse outcomes in the intervention group).

Table C. Summary of results for interventions targeting children exposed to trauma (Key Question 1)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence, Magnitude of Effect	Type of Exposure
PTSD diagnosis	CFTSI	Supportive therapy	1,[21] 106	Low; difference of 4.54 points on the UCLA PTSD-RI Index favoring CFTSI	Mixed (MVA, sexual abuse, witnessing violence, physical assaults, injuries, threats of violence)
	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[22,23] 273	Low; significantly greater decrease in PTSD diagnosis on the UCLA PTSD-I in one study (24.7% greater decrease in proportion); second study significance not reported (11.3% greater decrease in proportion)	Natural disaster (tsunami), war/terror attacks
PTSD symptoms/severity	TF-CBT	No treatment	1,[19,20] 65	Low; difference of 19.2 points on the child PTSD reaction index at 18 months favoring TF-CBT	Natural disaster (earthquake)
	CFTSI	Supportive therapy	1,[21] 106	Low; difference of 4.71 points on the TSCC PTSD Index favoring CFTSI	Mixed (MVA, sexual abuse, witnessing violence, physical assaults, injuries, threats of violence)
	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[22,23] 273	Low; significantly greater decrease in PTSD symptom severity on the UCLA PTSD-I in both studies (mean differences of 7.21, 9.0)	Natural disaster (tsunami), war/terror attacks
	Mixed Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1,[24] 142	Low; significantly greater decrease in PTSD symptoms on the UCLA PTSD-I (mean difference of 4.6) and significantly greater decrease in PTSD severity (mean difference of 12.1)	War/terror attacks

Table C. Summary of results for interventions targeting children exposed to trauma (Key Question 1) (continued)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence, Magnitude of Effect	Type of Exposure
Depression symptoms	TF-CBT	No treatment	1,[19,20] 65	Low; difference of 5.7 points on Depression Rating Scale at 18 months favoring TF-CBT	Natural disaster (earthquake)
	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[22,23] 273	Low; significantly greater decrease in depression symptoms in both studies on the Brief Beck Depression Inventory (mean differences of 1.55, 1.8)	Natural disaster (tsunami), war/terror attacks
Anxiety symptoms	CFTSI	Supportive therapy	1,[21] 106	Low; difference of 5.52 points on the TSCC Anxiety Index favoring CFTSI	Mixed (MVA, sexual abuse, witnessing violence, physical assaults, injuries, threats of violence)
	Mixed Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1,[24] 142	Low; significantly greater decrease in generalized anxiety symptoms (mean difference of 2.8) and significantly greater decrease in separation anxiety symptoms on the SCARED (mean difference of 2.4)	War/terror attacks
Somatic complaints	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[22,23] 273	Low; significantly greater decrease in somatic complaints in both studies on the DPS (mean differences of 1.01, unknown magnitude in second study)	Natural disaster (tsunami), war/terror attacks
	Mixed Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1,[24] 142	Low; significantly greater decrease in somatic complaints on the DPS (mean difference of 1.1)	War/terror attacks

Table C. Summary of results for interventions targeting children exposed to trauma (Key Question 1) (continued)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence, Magnitude of Effect	Type of Exposure
Functional impairment	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[22,23] 273	Low; significantly greater decrease in functional impairment in both studies on the DPS (mean differences of 2.45, 2.0)	Natural disaster (tsunami); war/terror attacks
	Mixed Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1,[24] 142	Low; significantly greater decrease in functional impairment on four items from the Childhood Diagnostic Interview Schedule (mean difference of 1.8)	War/terror attacks

CFTSI = Child and Family Traumatic Stress Intervention; DPS = DISC predictive scales; ERASE Stress = Enhancing Resiliency Among Students Experiencing Stress; MVA = motor vehicle accident; PTSD = post-traumatic stress disorder; SCARED = Screen for Child Anxiety Related Emotional Disorders; TF-CBT = trauma-focused cognitive behavioral therapy; TSCC = Trauma Symptom Checklist for Children; UCLA PTSD-I = University of California, Los Angeles Posttraumatic Stress Disorder–Index for DSM-IV; UCLA PTSD-RI = University of California, Los Angeles Posttraumatic Stress Disorder Reaction Index, Revised

Summary of Findings by Intervention

Fifteen studies reported on a subset of outcomes for 13 different interventions.[14,17,26-33,35-39] Ten of 13 interventions (presented in 12 studies[14,17,26-33,38,39]) evaluated a variety of psychotherapeutic approaches; of these interventions, 5 (reported in 7 studies) compared outcomes with wait-list controls,[14,26,27,30,31,33,39] and 2 with usual care.[17,32]

Three interventions used active comparators: one compared outcomes for narrative exposure therapy with meditation-relaxation therapy outcomes;[28] one grief- and trauma-focused intervention (GTFI) compared group therapy with individual therapy;[29] and a third compared outcomes for GTFI with coping skills and narrative processing with GTFI with coping skills only.[38] Three of 13 interventions focused on medications: one compared imipramine to chloral hydrate;[35] a second compared imipramine to fluoxetine and placebo;[36] and a third compared sertraline to placebo.[37]

As in the cluster of studies reporting on interventions targeting children exposed to trauma, no pharmacological interventions found evidence of benefit for any outcome, and the sertraline study suggested that the intervention arm fared worse than the control arm.[35-37] Three studies with active arms (Narrative Exposure Therapy and both GTFI treatments) did not report evidence of benefit for any outcome.[28,29,38] All of the other interventions that compared outcomes to wait-list controls found some evidence of benefit for one or more outcomes.[26,27,30,31,33]

Summary of Findings Across Interventions

Table D presents a summary of the SOE across all evaluated outcomes for interventions targeting children exposed to trauma. All studies evaluated traumatic stress symptoms, although the specific measure varied by study.[14,17,26-33,35-39] Four studies evaluated PTSD diagnosis;[26,28-30,38] of these, two found evidence of improvement favoring intervention arms (TF-CBT, EMDR).[26,30] Fifteen studies evaluated PTSD symptoms, but only four interventions were graded as having low SOE of improvement.[26,27,30,32] One study suggested evidence of worse outcomes for the sertraline intervention arm, compared with the placebo arm, for parent-rated PTSD symptoms and clinician-rated PTSD severity.[37]

Twelve studies representing 10 interventions evaluated mental health outcomes, specifically anxiety, depression, and internalizing symptoms.[14,17,26,27,29-33,37-39] Six studies reported no improvement in one or all outcomes evaluated.[17,29,30,33,37,38] One[26] of 5 interventions reported in 6 studies[17,26,30,33,38,39] evaluating anxiety symptoms reported improvements; 4 interventions reported in 5 studies[14,26,27,31,33] out of 10 interventions reported in 12 studies[14,17,26,27,29-33,37-39] reported improvement in depression; and 2 studies found no improvement in internalizing behaviors.[30,38]

Two studies evaluated physical symptoms or general health outcomes; neither found evidence of benefit.[28,30]

Seven studies evaluated[28,30,31,33,37-39] a range of other outcomes, including functional symptoms, psychosocial dysfunction, acting out or aggression, shyness/anxiety, learning problems, quality of life, externalizing/conduct problem behaviors, global distress, anger, and supernatural complaints. One study suggested evidence of no benefit for quality of life for the intervention arm, sertraline, compared with the placebo arm.[37] Two[28,30] of three studies evaluating general functioning did not find evidence of benefit. A third study found mixed results.[33] One study found evidence of benefit for the intervention arm on psychosocial

Table D. Summary of strength of evidence grades for interventions to treat traumatic stress symptoms (Key Question 2)

Intervention	Comparator	Number of Studies	PTSD Diagnosis/Criteria	PTSD Severity	PTSD Symptoms	Anxiety	Depression	Internalizing Behavior	Physical Symptoms	General Functioning	Psychosocial Dysfunction	Acting OutAggression	Shyness/Anxiety	Learning	Quality of Life	Externalizing /Conduct Problem Behavior	Global Distress	Anger	Supernatural Complaints
Trauma-focused cognitive behavioral therapy	Wait-list control	1[26]	L (+)	NE	L (+)	L (+)	L (+)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Cognitive processing therapy	Wait-list control	1[27]	NE	NE	L (+)	NE	L (+)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Narrative exposure therapy	Meditation-relaxation therapy	1[28]	I	NE	I	NE	NE	NE	I	I	NE	NE	NE	NE	NE	NE	NE	NE	NE
Group grief- and trauma-focused intervention	Individual grief- and trauma-focused Intervention	1[29]	NE	NE	I	NE	I	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Grief-and trauma-focused intervention with coping skills and narrative processing	Grief-and trauma-focused intervention with coping skills only	1[38]	I	NE	I	I	I	I	NE	NE	NE	NE	NE	NE	NE	I	I	NE	NE
Emotion regulation therapy	Relational supportive therapy	1[17]	NE	NE	I	I	I	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	I	NE
Eye movement desensitization and reprocessing	Wait-list control	1[30]	L (+)	NE	L (+)	I	I	I	I	I	NE	NE	NE	NE	NE	I	NE	NE	NE

Table D. Summary of strength of evidence grades for interventions to treat traumatic stress symptoms (Key Question 2) (continued)

Intervention	Comparator	Number of Studies	PTSD Diagnosis/Criteria	PTSD Severity	PTSD Symptoms	Anxiety	Depression	Internalizing Behavior	Physical Symptoms	General Functioning	Psychosocial Dysfunction	Acting OutAggression	Shyness/Anxiety	Learning	Quality of Life	Externalizing /Conduct Problem Behavior	Global Distress	Anger	Supernatural Complaints
Cognitive Behavioral Intervention for Trauma in Schools	Wait-list control	2[14,31]	NE	NE	I	NE	L (+)	NE	NE	NE	L (+)	I	I	I	I	NE	NE	NE	NE
Trauma and grief component therapy, (school groups)	Usual care	1[32]	NE	NE	L (+)	NE	L (+)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Mixed (cognitive behavioral therapy techniques and creative expressive elements), school groups	Wait-list control	2[33,39]	NE	NE	I	I	I	NE	NE	I	I	I	NE	NE	NE	L (+)	NE	NE	I
Imipramine	Chloral hydrate or placebo	2[35,36]	NE	NE	I	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Fluoxetine	Placebo	1[36]	NE	NE	I	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Sertraline	Placebo	1[37]	NE	L (−)	L (−)	NE	I	NE	NE	NE	NE	NE	NE	NE	L (−)	NE	NE	NE	NE

I = insufficient strength of evidence because of lack of evidence of effect; L (+) = low strength of evidence of benefit; L (−) = low strength of evidence of no benefit;
NE = not evaluated by study authors; PTSD = post-traumatic stress disorder

dysfunction.[31] One[39] of three studies[33,38,39] found evidence of benefit for the intervention arm on externalizing/conduct problem behavior. No studies found any evidence of benefit for acting out or aggression, shyness, learning problems, quality of life, externalizing/conduct problem behaviors, global distress, anger, and supernatural complaints.

Summary of Findings by Outcome

Table E presents detailed findings by outcome for interventions with some evidence of benefit. We rated the evidence as low for all of the outcomes, based on the limited number of studies (generally no more than one study per intervention and no intervention having more than two studies combined) and small sample sizes.

Key Question 3: Treatment Subgroup Comparisons for Interventions Targeting Children Exposed to Trauma, Some of Whom Already Have Symptoms

Our review found only two studies that examined subgroup characteristics that moderated the effect of the intervention tested by an interaction term. We elected not to summarize findings that merely presented results stratified by subgroups because of the risk of over interpreting results from underpowered subsamples.

Both studies that examined subgroup characteristics that moderated the effect of an intervention on an outcome were school based. The first intervention examined the effect of trauma-focused cognitive behavioral therapy (TF-CBT) targeting children exposed to trauma.[20] The second intervention examined the effect of CBT targeting children exposed to trauma who already have symptoms.[34] Both studies examined sex subgroups; in addition, one study evaluated age group and exposure to violence.[34]

The TF-CBT study did not find any differences in relationship between intervention and PTSD symptoms or depression.[20] The CBT study found no significant differences by age group or exposure to violence with respect to PTSD symptoms or functional impairment. The study did, however, find significant differences by sex, suggesting that the intervention effect on PTSD symptoms and functional impairment were greater for girls than boys.[34] Table F presents the findings of the single trial with evidence of subgroup differences with respect to intervention efficacy.

Table E. Summary of results for child post-traumatic stress disorder treatment interventions (Key Question 2)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence, Magnitude of Effect	Type of Exposure
PTSD diagnosis	TF-CBT	Wait-list control	1,[26] 24	Low; Cohen effect size 2.20 on the C-RIES scale favoring TF-CBT and Cohen effect size 1.59 on the CAPS-CA scale favoring TF-CBT	Mixed (MVA, assault, witnessed violence)
	EMDR	Wait-list control	1,[30] 27	Low; 75% decrease in the EMDR group versus 0% change in the wait-list control group in number of children with 2 or more DSM-IV criteria	MVA
PTSD symptoms/severity	TF-CBT	Wait-list control	1,[26] 24	Low; Cohen effect size 2.48 on CPSS scale favoring TF-CBT	Mixed (MVA, assault, witnessed violence)
	CBITS	Wait-list control	1,[31] 126	Low; difference of 7 points on CPSS favoring CBITS	Community violence
	CPT	Wait-list control	1,[27] 38	Low; difference of 10.09 points on PSS-SR scale favoring CPT and difference of 14.19 on Impact of Events Scale favoring CPT	Mixed
	EMDR	Wait-list control	1,[30] 27	Low; magnitude of effect not reported by intervention type	MVA
	TGCT (school groups)	Wait-list control	1,[32] 159	Low; reduction in PTSD symptoms of 6.18 favoring TGCT group	War-exposed in Bosnia
	Sertraline	Placebo	1,[37] 129	Low for no benefit; placebo with greater decrease in parent-rated PTSD symptoms over sertraline (LS mean difference 95% CI of -9.1, -0.6 with CSDC); placebo with greater decrease in clinician-rated PTSD severity via CGI-S (LS mean difference 95% CI of -0.8, 0)	Mixed

Table E. Summary of results for child post-traumatic stress disorder treatment interventions (Key Question 2) (continued)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence, Magnitude of Effect	Type of Exposure
Depression symptoms	TF-CBT	Wait-list control	1,[26] 24	Low; difference of 12.6 points on the RCMAS favoring TF-CBT	Mixed (MVA, assault, witnessed violence)
	CBITS	Wait-list control	1,[31] 126	Low; difference of 3.4 points on CDI favoring CBITS	Community violence
	CPT	Wait-list control	1,[27] 38	Low; difference of 7.8 points on BDI scale favoring CPT	Mixed
	TGCT (school groups)	Wait-list control	1,[32] 159	Low; calculated mean between group difference of 2.78 points favoring TGCT	War-exposed in Bosnia
Anxiety symptoms	TF-CBT	Wait-list control	1,[26] 24	Low; difference of 9.7 points on the DSRS favoring TF-CBT	Mixed (MVA, assault, witnessed violence)
Functional impairment	Mixed school group	Wait-list control	1,[33] 403	Low; significantly greater decrease in functional impairment on a 10-item child-reported checklist in treatment group at 1 week (effect size 0.42) and 6 months postintervention (effect size 0.26)	Poverty and political violence/instability
Psychosocial dysfunction	CBITS	Wait-list control	1,[31] 126	Low; difference of 6.4 points on PSC favoring CBITS	Community violence
Conduct problems	Mixed school group	Wait-list control	1,[39] 397	Low; significantly greater reduction in conduct problems in treatment group than in wait-list group (LGCM estimate, SE: -0.132, 0.045; p<0.01)	War and political violence/instability
Quality of life	Sertraline	Placebo	1,[37] 129	Low for no benefit; placebo with greater improvement in quality of life than sertraline (LS mean difference 95% CI: 0.2, 6.8)	Mixed

BDI = Beck Depression Inventory; CAPS-CA = Clinician-Administered Post-Traumatic Stress Disorder scale for children and adolescents; CBITS = Cognitive Behavioral Intervention for Trauma in Schools; CDI = Child Depression Inventory; CGI-S = Clinical Global Impressions-Severity Scale; CI = confidence interval; CPSS = Child Post-Traumatic Stress Disorder Symptom Scale; CPT = cognitive processing therapy; C-RIES = Children's Revised Impact of Event Scale; CSDC = Child Stress Disorder Checklist; DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders-IV"; DSRS = Depression Self-Rating Scale; EMDR = Eye movement desensitization and reprocessing; LGCM = Latent Growth Curve Modeling: LS = least-squares; MVA = motor vehicle accident; PSC = Pediatric Symptom Checklist; PSS-SR = Posttraumatic Stress Disorder Symptom Scale Self Report; PTSD = post-traumatic stress disorder; RCMAS = Revised Children's Manifest Anxiety Scale; SE = standard error; TF-CBT = trauma-focused cognitive behavioral therapy; TGCT = Trauma and Grief Component Therapy

Table F. Summary of results for child post-traumatic stress disorder treatment subgroup comparisons (Key Question 3)

Subgroup	Intervention	Comparator	Number of Trials, Number of Participants	Outcome	Strength of Evidence, Magnitude of Effect	Type of Exposure
Sex	Mixed school group	Wait-list control	1,[33] 403	PTSD symptoms	Low; intervention effect on reducing PTSD symptoms significantly greater for female than male students (Group 1: -0.090 [-0.161 to -0.019] vs. Group 2: 0.060 [-0.011 to 0.131])	Poverty and political violence/instability
				Functional impairment	Low; intervention effect on reducing functional impairment significantly greater for female than male students (Group 1: -0.120 [-0.179 to -0.061] vs. Group 2: 0.012 [-0.047 to 0.071])	Poverty and political violence/instability

PTSD = post-traumatic stress disorder

Key Question 4: Harms Associated With Targeting Children Exposed to Trauma, Some of Whom Already Have Symptoms

Five studies reported harms associated with interventions.[26,32,35,36] One study examined harms of TF-CBT versus wait-list control and found no adverse events in either group.[26] No mention was made of how harms were assessed or evaluated.

A second study examined harms of trauma and grief component therapy (TGCT) for adolescents with classroom-based psychoeducation and skills training versus classroom-based psychoeducation and skills training alone.[32] The study used a Reliable Change Index (RCI) for post-traumatic stress, depression, traumatic grief, and existential grief in order to quantify the number of reliably deteriorated cases. The authors found no significant differences in reliable deterioration for post-traumatic stress, depression, traumatic grief, and existential grief by study arm at post-treatment or at the 4-month followup.

Three studies evaluated the harms of medications.[35-37] Two studies found no adverse events for imipramine compared with chloral hydrate[35] or placebo,[36] or imipramine compared with fluoxetine.[36] These studies did not, however, report how adverse events or harms were assessed.

One study found no increase in several types of adverse events associated with sertraline compared with placebo, including disturbed sleep, agitation, headache, abdominal pain, nausea, pharyngitis, vomiting, accidental injury, respiratory tract infections, diarrhea, dizziness, hyperkinesis, and rhinitis. However, the study reported some incidents of other types of serious adverse events (undefined), dry mouth, and dysmenorrhea among patients taking sertraline compared with none for patients in the placebo arm. The study reported higher incidents of dropouts because of adverse events, increased suicidality ratings, and active suicidality in the sertraline arm compared with the placebo arm but did not report the results of statistical significance tests.[37]

Discussion

Key Findings

We found a total of 21 trials and 1 cohort study (reported in 25 articles) of either medium or low risk of bias from our review of 6,647 unduplicated abstracts. We did not find studies that attempted to replicate findings of effective interventions; rather, studies tested unique interventions. No pharmacotherapy intervention demonstrated effectiveness. Studies demonstrating improvement in outcomes generally compared results of interventions with waitlist controls. With a single exception, studies comparing interventions with active controls did not show benefit. Some psychotherapy interventions targeting children exposed to trauma appeared promising based on the magnitude and precision of effects found. These interventions were school-based treatments with elements of CBT. There was less compelling evidence regarding potentially promising interventions targeting already existing symptoms; each also had elements of CBT.

The study authors typically evaluated short-term outcomes. The body of available evidence provided no insight into how interventions targeting children exposed to trauma, some of whom already have symptoms, might influence healthy long-term development. We found little evidence on how effectiveness might vary by child characteristics; and we found no evidence on how effectiveness might vary by treatment characteristics or setting. We also found little

evidence addressing possible harms associated with psychological treatments. Only pharmacological interventions attempted to assess harms in this vulnerable population.

Applicability

Population

The evidence base of interventions for children exposed to trauma other than sexual trauma and family violence is limited. Although age groups represented by individual studies ranged from 7 to 17 years old and, in some cases, older (up to 19 years old), only two studies included children younger than age 7.[35,36] No studies that addressed KQ1 and recruited children exposed to a traumatic event included children younger than age 7.

In addition, the type of exposure varied widely across studies. The studies targeting children exposed to trauma that addressed KQ 1 included two studies of children exposed to a natural disaster, two studies of children exposed to war/terrorism, three studies of children exposed to accidents, and one study with mixed trauma types.

The treatment studies that addressed KQ 2 included children who exhibited some level of symptoms, but trauma type also differed across studies. Three of the four pharmacotherapy studies[25,35,36] included children treated in an emergency department who had already experienced accidents (motor vehicle, thermal injuries, or mixed), two of which included children experiencing acute stress symptoms.[35,36] The applicability of these findings is unknown in children exposed to mixed traumas, natural disasters, war or political violence, or other types of traumas. Thus, the applicability of the evidence is somewhat limited to characteristics of children included in each specific study.

Intervention

The evidence base reflects the diverse range of intervention approaches in the field. Several interventions noted in the evidence base were not found in this review. Only four trials (two ERASE Stress school-based mixed intervention trials and two CBITS trials) addressing KQ 2 were able to be combined in the evidence table.

Most interventions varied in intensity, with delivery ranging from 4 to 20 sessions for the psychotherapeutic interventions, and from 1 to 10 weeks for medication administration in the pharmacotherapeutic interventions. Most were low intensity (up to 12 weekly sessions or approximately 3 months in duration); and only one intervention[32] was of medium intensity (13 to 24 weekly sessions or approximately 6 months in duration).

The majority of studies delivered the intervention under more ideal than real-world conditions, such as by staff with specialized training and/or under close supervision of a highly specialized clinician (often the intervention developer). As noted, the interventions analyzed in the results all indicated the use of a manual. However, the interventions varied considerably by degree of dissemination readiness; and the studies offered minimal discussion of fidelity. Thus, the studies did not provide clarity on whether children received interventions as manualized or adapted interventions fit to the target population; the potential for translation of these interventions into real-world settings is, therefore, unclear.

Comparators

The evidence was primarily composed of studies that used inactive controls, usual care, or wait-list[40-42] controls. For treatment studies addressing KQ 2, only two psychotherapies were

head-to-head comparisons;[29,38] and only one pharmacotherapy was a head-to-head comparison of two different types of antidepressants[36] versus a third (control) group. The other interventions targeting children exposed to trauma addressing KQ 1 consisted of two inactive control comparisons,[19,20] two usual care comparators,[18,21] and three wait-list controls,[22-24] and, for the single pharmacotherapy trial, one placebo comparator. Most of the remaining KQ 2 psychotherapy trials[14,26-28,30,31,33,39] used wait-list control comparators; two trials had usual care comparators.[17,32] The KQ 2 pharmacotherapy trials used more rigorous sets of comparators including a usual care comparator (chloral hydrate)[35] and a placebo comparator.[37]

Outcomes

Of the many outcomes searched for in the literature, few were found in the studies included in this review. For example, no studies examined decreased suicidality, risk-taking behaviors such as substance use, conduct disorders, criminal activities, or individual physical health conditions such as obesity, cardiovascular disease, or sleep problems as a study outcome. Thus, the applicability of these types of outcomes that concern clinicians is unknown.

In addition, no studies relied on clinician diagnosis of PTSD either during the baseline period or during followup. Studies that did examine PTSD diagnosis as an outcome[21-24,26,28,30] used a self-reported diagnostic instrument such as the University of California, Los Angeles (UCLA) PTSD Index and Child PTSD Symptom Scale (CPSS). None of the mental health outcomes examined were assessed via clinician diagnosis. The evidence base for the efficacy or effectiveness of interventions in improving trauma symptoms or syndromes, mental health outcomes, physical health outcomes, and other outcomes, such as functional impairment and quality of life, were mostly based on child self-report, with few relying on parent[14,30,31,33,38] or teacher reports[14,31] of impairment or behaviors.

Most of the outcomes were measured at baseline and at the end of the interventions. Few followups were completed at multiple end points, and the long-term effects of the interventions are largely unknown. These limitations on outcome measures reduce the applicability for clinicians needing to choose a treatment based on these findings.

Setting

Nearly half of the studies were conducted outside the United States (Armenia,[19,20] Sri Lanka,[22,28,39] Israel,[23,24] the United Kingdom,[26] Bosnia,[32] Switzerland,[18] and Indonesia[33]). Several studies conducted in the Middle East and Asia that were delivered in school settings [22-24,39] may not be applicable to school settings in the United States.

A majority of the pharmacotherapies recruited subjects via the emergency department,[25,35,36] with followup either in the hospital during an inpatient stay or in an outpatient setting.

Limitations of the Review Process

The applicability of our systematic review was limited by the population, outcomes, and setting limits we placed on our included studies. Our exclusions, described in the Methods section, served to focus the review (particularly in relation to its companion on interventions to address child maltreatment) and to control for sources of heterogeneity. Nonetheless, these exclusions necessarily limited the scope of this review. We describe important limitations below.

First, several of our population criteria limited the review. We focused our review on children only ages 0 to 17 because of the differences in intervention types, outcomes of interest, and developmental aspects of how adults and children process traumatic events. Effectiveness of

adult treatments for trauma exposures are covered in a separate AHRQ review.[43] We also excluded studies that examined children exposed to maltreatment or family violence, also described in a separate AHRQ review,[7] because of the critical differences in these types of trauma exposures and the associated impact on type and delivery of the intervention.

Our outcome criteria also limited our review. We required that studies report change in traumatic stress symptoms or syndromes as an outcome to align with our primary objective of examining intervention effectiveness on these outcomes. The criterion requiring traumatic stress symptoms or syndromes as a study outcome resulted in the exclusion of 16 articles that were identified through our search strings.

The nature of trauma interventions targeting other mental health conditions and functioning, such as suicide or conduct problems, may differ in objectives, design, and delivery from trauma interventions targeting traumatic stress symptoms or syndromes. We included these other types of outcomes as secondary outcomes of interest for studies that examined traumatic stress symptoms or syndromes as an outcome because of the importance of identifying other potential benefits that result from a single intervention.

Additional criteria served to focus our review further. We required a publication date of 1990 or later to focus on supportive evidence from currently relevant treatments because of the evolving nature of the field. We also required a sample size of 10 or more to ensure that we focused on hypothesis-testing studies rather than descriptive accounts from case series or case reports. We excluded cross-sectional, nonsystematic reviews, retrospective cohort studies, and non-nested case control studies because these types of study designs make isolating the effect of an intervention difficult to validly assess. Finally, we excluded studies that were not written in English, thus decreasing the applicability to countries where researchers publish in other languages.

Finally, as noted, we limited the synthesis to trials and observational studies with low and medium risk of bias. Given the limitations of the included studies and their applicability to other contexts, however, including high risk-of-bias studies would likely have increased the pool of evidence without resulting in more actionable evidence.

Limitations of the Evidence

This Comparative Effectiveness Review finds that the field of interventions targeting children exposed to trauma other than maltreatment or family violence is still in its infancy. We did not find evidence of publication bias from our review of SIPs and grey literature; we found few trials that addressed each of the KQs of intervention efficacy, and, especially, whether efficacy differed by subgroups or whether the interventions were associated with harms. Most were unique interventions; thus, combining the findings across studies or replicating significant findings was not permitted from the evidence base. Furthermore, several of the known types of interventions used to treat child traumatic stress (noted in the introduction section) were not found in any study included in this review. Therefore, the efficacy of these types of interventions (e.g., child-parent psychotherapy, Skills Training in Affective and Interpersonal Regulation/Narrative Story-Telling, dialectical behavior therapy, structured psychotherapy for adolescents responding to chronic stress, parent-child interaction therapy, trauma systems therapy, particular antidepressants, stimulants, antipsychotics, benzodiazepines, equine-assisted psychotherapy) to treat children exposed to trauma other than maltreatment or family violence was not evaluated in this review.

Data on pharmacological interventions are sparse and marked by methodological limitations. Only one trial targeted children exposed to trauma, and three trials focused on treatment trials for children already experiencing symptoms. These pharmacologic interventions were small trials and none had findings of benefit. Two trials administered medications for only 7 days; this duration is inadequate because antidepressants typically take 1-4 weeks to become effective.[44] Reaching steady-state for serum concentrations for a medication such as fluoxetine typically takes longer than 7 days.[45] None of the included studies determined the actual efficacy of fluoxetine administered for longer durations in accordance with usual practices. Finally, many other types of medications routinely used to treat traumatic stress in adults and children exposed to maltreatment and family violence have not been adequately tested in this population.

In addition, the heterogeneity in samples, particularly with respect to child characteristics and type of trauma, makes synthesis of the findings difficult.

Most studies did not note or study the important clinical distinctions of whether each child had experienced a single trauma or multiple traumas, or whether each child had comorbid mental health conditions that can affect the efficacy of interventions on outcomes.

Few studies included young children (ages 5 or younger), and only one[34] compared efficacy of an intervention across child age. These child characteristics important to clinical decisions have not been accounted for in the evidence base of interventions targeting children exposed to trauma other than maltreatment or family violence, some of whom already have symptoms.

Another limitation of the evidence base results from outcome assessment methods. The outcomes studied were mostly based on child self-reports. Few studies used a clinical interview to assess PTSD diagnosis or other mental health outcomes. Although controversy exists regarding whether PTSD is an appropriate diagnosis for children, determining whether an intervention can affect clinically meaningful syndromes of traumatic stress symptoms requires future research. As noted, few included studies assessed long-term outcomes.

Finally, the applicability of the findings is limited by setting and type of trauma exposure. Nearly half of the included studies (11 of 23) were conducted outside the United States. In addition, the findings of individual studies are only applicable to children with similar characteristics and exposure to the same types of trauma. The types of trauma experienced by children in the included studies varied widely. For example, of the seven PTSD studies targeting exposure to trauma that addressed KQ 1, two studies included children exposed to a natural disaster, two studies included children exposed to war/terrorism, two studies included children exposed to accidents, and one study included children with mixed trauma types. The treatment studies that addressed KQ 2 included children with similar heterogeneity. Findings may not translate across setting, culture, economic conditions, and trauma type.

Research Gaps

Future studies on interventions targeting children exposed to trauma other than maltreatment and family violence, some of whom already have symptoms, are warranted for several reasons. First, the evidence base for well-designed interventions that lack sufficient bias addressing child trauma other than maltreatment and family violence is small. The heterogeneity in types of interventions prevented combining the results of more than two studies per intervention, thus precluding examination of the consistency of associations. No evidence was found for several interventions commonly used to treat children with trauma exposures. Although most psychotherapy interventions were manualized for delivery, several did not assess treatment fidelity. In addition, only four pharmacotherapy trials were included in this review, and those

trials did not study many types of commonly prescribed medications for children exposed to trauma.

Second, the sample sizes of the studies included in this review were small to medium. Identifying children with trauma exposure and obtaining informed consent limits the feasibility of recruiting large sample sizes for randomized controlled trials. Insufficient funding also may contribute to small sample sizes. The small sample sizes created several problems with the reliability of the analyses, and rendered subgroup analysis all but impossible. Thus, several analyses were likely underpowered to detect significant associations. The lack of power becomes even more problematic when attempting to adjust analyses for important covariates that may confound the relationship between the intervention and outcomes. Loss of subjects to followup makes the issues related to sample size even more pronounced. Subgroup analyses become difficult as well with small sample sizes, evidenced by the review finding only two studies that examined the intervention-outcome link across varying subgroup characteristics. This is especially problematic given that the efficacy of particular interventions is thought anecdotally to differ across factors such as developmental age of the child, and type, severity, or experience of single versus multiple traumas. Whether this hypothesis holds true in research trials remains unknown. The difficulty of conducting studies in this population suggests that future research may require focus on observational studies, including heightened attention to research involving registry data.

Third, the outcomes reported were largely based on self-report symptomatology instead of clinical interview diagnosis. Although there is controversy surrounding the appropriateness of the PTSD diagnosis in children, the use of a standardized interview to qualify clinical syndromes rather than changes in symptoms is needed. Demonstrating that a statistically significant change in symptoms is clinically relevant is difficult. The current shift to a more inclusive diagnostic system in DSM-V focused on DTD might inform future research efforts that target and treat children based on already occurring DTD and targeting prevention of DTD among exposed children. Only one study[32] used the RCI to quantify whether symptom changes over time were differentially significant, although RCI was used to study harms (i.e., deterioration in symptoms over time) rather than improvements in outcomes. Few studies reported actual effect sizes, but there were many outcomes for which intervention may provide benefits to children exposed to trauma (e.g., suicidality, conduct problems), but they were not tested in any included trial.

Finally, few studies assessed harms associated with participating in a particular intervention. Although study dropouts could be quantified based on reported numbers of participants at baseline and at each follow-up assessment, adherence to the protocol was not assessed in any study. Future studies of child trauma interventions require formal testing for harms, especially for risk of retraumatization.

Conclusions

Our findings may be interpreted as a call to action: psychotherapeutic intervention may be beneficial relative to no treatment, but far more research is required to produce definitive guidance on the comparative effectiveness of psychotherapeutic or pharmacological interventions targeting children exposed to trauma, some of whom already have symptoms.

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Introduction

Background

Approximately two-thirds of children and adolescents will experience at least one traumatic event, creating a critical need to identify effective child trauma interventions. While most children exposed to trauma do not experience long-term negative sequelae in terms of psychological and social functioning, some go on to develop traumatic stress syndromes, including post-traumatic stress disorder (PTSD).[1-3] Studies have indicated that childhood traumatic stress syndromes are associated with a high degree of impairment during childhood that can carry into adolescence and adulthood. For example, childhood PTSD increases the risk of several comorbid mental disorders such as depression, substance abuse, and conduct disorder.[4] Suicidality is a particularly grave concern for children with PTSD.[4,5] Decreased functioning in several domains (social, home, school, relational) by children and adolescents with PTSD also has been observed (e.g., lower academic achievement[6]). Although several guidelines on the treatment of PTSD during childhood and adolescence exist, the recommendations are not largely based on evidence resulting from Comparative Effectiveness Reviews. Furthermore, the guidelines offer inconsistent recommendations for some interventions.

The current review is the second in a two-part series focusing on interventions that address child trauma. The first in the series focuses on the comparative effectiveness of interventions that address child exposure to trauma in the form of maltreatment (physical, sexual, and emotional/psychological abuse, and neglect). This review, the second in the series, addresses the treatment of children exposed to traumatic events other than child maltreatment or family violence, some of whom are already experiencing symptoms. Interventions for children exposed to family violence (i.e., intimate partner violence and other forms of violence exposure in the home) are not covered by either review given the heterogeneity in this population and the interventions used to treat family violence exposure. That is, children who witness but do not directly experience interpersonal violence represent different clinical populations in terms of the nature of the relationship disturbance and implications for treatment. Although the background and discussion below provide a comprehensive overview of the prevalence and types of trauma, sexual trauma and maltreatment are addressed by the child maltreatment review.

Definitions

Given the high occurrence rate of psychological trauma among children and adolescents,[1] traumatic stress in childhood has attracted considerable clinical and research interest. For the sake of brevity, we refer to children and adolescents as "children" for the remainder of the report. Although there is little doubt that symptoms of traumatic stress alone can cause impairment in children, there is considerable controversy surrounding the diagnosis of syndromes of child traumatic stress symptoms. PTSD is an anxiety disorder that can be diagnosed in children at least 1 month after exposure to a traumatic event. The "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition" (DSM-IV) diagnosis of childhood PTSD is the same as that for an adult; however, several exceptions are noted within some of the symptom cluster criteria.[7] A child with PTSD may express recurrent and intrusive distressing recollections of the event through repetitive play in which themes or aspects of the trauma are expressed, recurrent distressing dreams of the event may be experienced as frightening dreams without recognizable content, and in young children, expression of acting or feeling as if the traumatic event were recurring, which

can include flashbacks episodes, may be expressed through trauma-specific reenactment. Children with PTSD may also show symptoms such as loss of interest in daily activities; headaches, stomachaches, or other physical symptoms; excessive worry; and sleep or concentration problems[7] and may develop repeated physical and emotional symptoms when reminded of the event.

Prevalence

Traumatic events are common in childhood. In one longitudinal study of more than 1,400 children 9 to 16 years of age, 68 percent of children reported at least one traumatic event (with 37 percent experiencing more than one event); 13.4 percent of those experiencing trauma developed some post-traumatic symptoms. However, only 0.5 percent of these trauma-exposed children met the full criteria for PTSD.[1] In a survey of adolescents 12 to 17 years of age, the 6-month prevalence for PTSD was 6.3 percent in girls and 3.7 percent in boys.[8] The prevalence of PTSD in younger children is largely unknown; however, several studies have assessed the prevalence of PTSD in young children exposed to various types of violence (abuse, car crashes, and natural disasters) with high reported rates of PTSD. The rates of PTSD vary considerably in such studies and may be related to the severity, chronicity, and type of trauma.

Types of Trauma

Children can be exposed to many types of trauma, including inflicted trauma, unintentional trauma, natural disasters, war, and neighborhood violence. One longitudinal study reported that 25 percent of its sample was exposed to or victimized by violence (excluding sexual trauma), 11 percent was exposed to sexual trauma, and 32 percent was exposed to other types of trauma (diagnosed with a physical illness, 11%; serious accident, 11.6%; natural disaster, 11.1%; fire, 5.9%).[1] The Adverse Childhood Experiences Study showed high rates of childhood trauma exposure in a large adult population.[9] In this population, 65 percent recalled adverse childhood experiences, many of which could be defined as traumatic events. These experiences included emotional abuse (11%), physical abuse (28%), sexual abuse (21%), battered mother (13%), household drug/alcohol abuse (27%), household mental illness (17%), parent separation or divorce (23%), and incarcerated household member (5%).[9] PTSD rates vary by type of traumatic exposure, with 35 percent of children exposed to community violence[10] and half of those affected by interpersonal violence.[11] Road crashes, another common form of childhood trauma, were associated with rates of PTSD ranging from 13 to 25 percent between 4 and 12 months after a road crash.[12] Children with agency-reported abuse had much higher rates of PTSD when compared with children without reported abuse.[13] Trauma from natural disasters frequently leads to PTSD; for example, one study reported a PTSD rate of 35 percent for children surviving an earthquake.

Risk and Protective Factors of Traumatic Stress in Children

Not all trauma-exposed children develop traumatic stress syndromes. Several risk and protective factors play a role in the development of syndromes such as PTSD. In one study of terrorism exposure, children more directly affected by terrorism were more likely to report PTSD. Likewise, those with more frequent reminders of traumatic experiences were more likely to experience PTSD, and those with support-seeking behavior were less likely to report PTSD.[14] The severity of injuries resulting from motor vehicle accidents has been shown to be associated

with the development of PTSD. Previous trauma and preexisting anxiety disorders increase the risk of PTSD.[1] A variety of genetic and neurobiological factors play a role in the development of PTSD.[15] The developmental age, number of trauma exposures, family systems, and neighborhood factors may play a role in the development of PTSD after trauma.

Clinical Presentation of Post-Traumatic Stress Disorder and Associated Impairment

Clinicians often face several challenges in recognizing and diagnosing PTSD in children.[16] Because misdiagnosis of PTSD as other psychiatric conditions such as bipolar disorder is common, clinicians need to be careful in assessing children for several key features of PTSD. To establish the diagnosis, a clinician needs to establish that a traumatic event preceded onset of the disorder, which he or she can determine either through compelling evidence or by reports given by the child or the child's caregiver. This conclusion might be difficult given that avoidance of the trauma is a core feature of PTSD in children, and a parent might deny the trauma if he or she is the perpetrator, is ashamed or embarrassed about the trauma, or is unaware of it. In some instances, referral of the child for a forensic evaluation might be necessary.

Clinical diagnosis of PTSD in children also requires the presence of three distinct symptom clusters: (1) symptoms of re-experiencing the trauma, (2) emotional numbing and persistent avoidance of trauma reminders, and (3) persistent symptoms of hyperarousal. Young children might exhibit different behaviors, such as oppositionalism, fears unrelated to the traumatic event itself, and separation anxiety. Although acute stress disorder (ASD) can be diagnosed in children as soon as 2 days after the traumatic event, at least 1 month is required to make a PTSD diagnosis in children.

Diagnostic Issues

Much debate has surrounded the validity of the DSM-IV diagnostic criteria for PTSD in children.[16,17] Part of the debate stems from the number of symptoms required within each symptom cluster to make a formal diagnosis. This is particularly so with the emotional numbing/avoidance symptom criteria, in that young children often are not developmentally able to report on these emotions nor do their parents have awareness of their children's internal states.[18-20]

Currently, several experts in the field of child PTSD are considering possible age-related subtypes of PTSD in preschool or school-aged children for inclusion in the forthcoming DSM-V, particularly given that the DSM-IV criteria were developed and tested on adults and only adolescents ages 15 years or older.[21] Although it is known, for example, that preschool children can experience traumatic events, community studies have found PTSD prevalence rates much lower than expected. One possible explanation for the low rates involves the strict DSM-IV diagnostic criteria that might not be developmentally appropriate for this age group.[17] Thus, an alternative algorithm for PTSD in young children has been proposed and refined[22-24] and endorsed by field experts.[25] This alternative algorithm might also apply to school-aged children, who have exhibited lower-than-expected prevalence of PTSD based on DSM-IV criteria. Because few studies have empirically tested the proposed algorithm on school-aged children, however, it is not known whether the DSM-V should incorporate alternative criteria for PTSD diagnosis in this age group.

Alternatively, several experts in the field of childhood traumatic stress believe that a diagnosis of developmental trauma disorder (DTD) more adequately captures the reality of clinical presentations of children and adolescents exposed to chronic interpersonal trauma and faulty caregiver systems. These experts believe that children suffering from DTD have disrupted affect regulation, attention, cognition, perception, and interpersonal relationships and may not meet criteria for the traditional diagnosis of PTSD. The proposed criteria for DTD include exposure to multiple or prolonged adverse events and experiences of affective and physiological dysregulation with attention and behavioral dysregulation and self and relational dysregulation, in addition to experiencing these post-traumatic spectrum symptoms for at least 6 months at levels severe enough to cause functional impairment in at least two areas of functioning (scholastic, familial, peer group, legal, health, or vocational).

Intervention Strategies

The continued uncertainties of trauma identification and PTSD diagnosis increase the clinical challenges of addressing this population appropriately. Interventions designed to prevent or treat traumatic stress symptoms exist within the domains of psychotherapy, pharmacotherapy, complementary and alternative treatments, and other therapies such as systems or combination therapies. To provide a comprehensive review, we include all intervention domains for questions of treatments targeting children exposed to trauma, some of whom are already experiencing symptoms. Some of the intervention examples specified below focus solely on interventions for children exposed to trauma without requiring the presence of any traumatic syndromes (treatment based on exposure), and others focus on interventions for children exposed to trauma and already experiencing traumatic symptoms or syndromes that exceed a predetermined threshold (treatment based on symptoms). For children who have been exposed to trauma but have not yet developed symptoms or syndromes, interventions are intended to prevent the onset of traumatic stress syndromes or PTSD. For children already experiencing such symptoms, treatments are intended to result in remission of PTSD, a reduction of symptoms, and improved functioning.

We also note settings when relevant. Interventions other than pharmacotherapy may be carried out at an individual, family, or group level. They may be carried out in various settings (including the outpatient versus inpatient setting) or in communities, schools, or classrooms. Many programs attempt to bring one of a variety of psychotherapeutic techniques into the home. In these circumstances, the training that parents and children receive differs very little from general psychotherapeutic techniques. The goal of these interventions, rather, is to improve access and outcomes in populations that are traditionally harder to reach such as ethnic minorities, rural populations, or people of low socioeconomic status.[26] In addition to attempting to prevent PTSD or traumatic stress symptoms, these interventions are often directed at associated symptoms such as aggression or delinquency.

Psychotherapy: Interventions for Preventing or Treating Post-Traumatic Stress Disorder or Traumatic Stress Symptoms in Children Following a Potentially Traumatic Event

Several different psychotherapeutic interventions have been designed to prevent or treat PTSD or traumatic stress symptoms in children. Most of the approaches incorporate elements of cognitive behavioral interventions, and many include the caregiver(s) as an important component

of the treatment. School-based interventions are unlikely to involve the primary caregivers in the treatment but have the advantage of intervening with larger numbers of children through group treatment. Cognitive behavioral components of these treatments may include psychoeducation, cognitive restructuring, relaxation training, and exposure therapy/desensitization (often through development of a trauma narrative).

Interventions also vary in degree of structure, with the intervention manualized with specific concepts or techniques reviewed or taught during specific sessions. These manualized interventions may have the advantage of easier replication and may offer more guidance to the clinician. These time-limited approaches may be especially advantageous when used in groups (e.g., school-based interventions); at an individual level, more flexibility in the number of sessions and material covered in each session may be beneficial.

The following interventions have cognitive behavioral components and are used in both the prevention and treatment of traumatic stress symptoms: cognitive behavioral therapy (CBT), trauma-focused cognitive behavioral therapy (TF-CBT), cognitive processing therapy (CPT), child-parent psychotherapy (CPP), Skills Training in Affective and Interpersonal Regulation/Narrative Story-Telling (STAIR/NST), trauma and grief component therapy (TGCT), and Cognitive Behavioral Intervention for Trauma in Schools (CBITS).

CBT is a form of psychotherapy used to treat many psychiatric problems, including depression, anxiety, and PTSD. CBT combines elements of cognitive therapy and behavioral therapy. In CBT, maladaptive thought patterns are identified and targeted through cognitive restructuring, and maladaptive behaviors are targeted through behavioral techniques that may include exposure/desensitization, relaxation skills, and stress inoculation training or teaching an individual how to reduce anxiety. In addition to the more traditional use of CBT with individuals who are experiencing symptoms of traumatic stress, its components may be appropriate for use with children exposed to traumatic events.

TF-CBT is a psychotherapeutic technique that has specifically adapted CBT for use with children exposed to trauma and those presenting symptoms of traumatic stress. In TF-CBT, children and parents learn skills to help process thoughts and feelings related to traumatic life events and to manage and resolve distressing thoughts, feelings, and behaviors also related to those same events. Components of treatment include psychoeducation about trauma; parenting skills; relaxation skills; coping skills to deal with trauma-related thoughts, feelings, and behaviors; and child exposure tasks via narratives, drawings, or other imaginal methods. Safety and social skills training may also be a component of treatment.[27]

CPT is a manualized 12-session cognitive behavioral treatment for PTSD that has a primary focus on challenging and modifying maladaptive beliefs related to the trauma but also includes a written exposure component. Clients are asked to write about the impact and content of the traumatic event. Associated problems such as depression, guilt, and anger are also addressed in CPT.

CPP is a relationship-based treatment that integrates modalities derived from psychodynamic, attachment, trauma, cognitive behavioral, and social learning theories. The child-parent relationship is used to target the child's improvement in emotional, cognitive, and social domains of functioning. The interventions focus on promoting affect regulation in the child and parent; changing maladaptive behaviors in the child, the mother, and their interaction; supporting and encouraging developmentally appropriate interactions and activities; and assisting the child and the mother in creating a joint trauma narrative.[28] CPP has more traditionally been implemented with populations in which there were clinical concerns about the

child's behavior or the mother's parenting after the child witnessed or overheard marital violence and also with maltreating families. However, this intervention may also be appropriate for children soon after exposure to other traumatic events.

STAIR/NST is a two-module treatment focused on reducing symptoms of PTSD and other trauma-related symptoms (including depression and dissociation) and on building and enhancing specific social and emotional competencies that are frequently disturbed in youths who have experienced multiple traumas and/or sustained trauma. This intervention might also be used to prevent the development of traumatic stress symptoms when implemented after exposure to a traumatic event. STAIR/NST includes 10 treatment sessions conducted in group or individual format that target social and emotional competency building. The sessions focus on developing emotional regulation and social skills, positive self-definition exercises, and goal setting and achievement. The NST phase of treatment is conducted in 6 individual sessions that focus on the emotional processing of traumas in detail while developing a positive life narrative and future plan.

TGCT is a group treatment program for traumatically bereaved older school-aged children and adolescents. The target population includes youths affected by community violence, school violence, gang violence, war/ethnic cleansing, and natural and manmade disasters. TGCT has several areas of focus, including the processing of traumatic experiences, coping with reminders of trauma and loss, coping with post-traumatic adversities, managing traumatic grief, and resuming developmental progression. This intervention may be appropriate for children exposed to traumatic events and for those experiencing traumatic stress symptoms.

Psychotherapeutic interventions have also been developed specifically for use in schools.

CBITS is a skills-based, group intervention for children exposed to trauma who are typically between the ages of 10 and 15 years; it may be appropriate not only for intervening early after exposure to a traumatic event but also for treating traumatic stress symptoms. The CBITS program consists of 10 group sessions designed to provide education about reactions to trauma, teach relaxation skills, provide cognitive therapy to challenge upsetting thoughts, teach social problem solving, and work on processing traumatic memories and grief. These skills are learned through the use of drawings and by talking in both individual and group settings. Between sessions, children complete assignments and participate in activities that reinforce the skills they have learned. Parent and teacher education sessions are also included.

Cognitive behavioral approaches are less applicable when working with younger children because of developmental issues, though the caregiver may benefit from cognitive behavioral treatment. For this population, intervention approaches tend to be relationship based, and the primary focus of the intervention is centered around supporting the caregiver-child relationship as a strategy for treating traumatic stress in the young child.

In addition, psychotherapy treatment is sought traditionally when an individual is already experiencing symptoms of distress. However, professionals recognize that an effective strategy for reducing traumatic stress symptoms and disorders in children can be to intervene soon after an exposure to a potentially traumatic event but prior to the development of symptoms or a traumatic stress disorder. One intervention developed specifically to treat children exposed to a potentially traumatic event is the Child and Family Traumatic Stress Intervention (CFTSI). CFTSI is a four-session caregiver-child early intervention and secondary prevention model that focuses on increasing communication between children and their caregivers about feelings, symptoms, and behaviors with the goal of increasing the caregivers' support of the child and teaching specific behavioral skills to both caregiver and child to assist the child in coping with

symptoms. CFTSI's focus is informed by findings that indicate the role of family support as a primary protective factor for children exposed to a potentially traumatic event.

Other psychotherapy approaches that may be beneficial in the treatment of children presenting with traumatic stress symptoms and disorders include dialectical behavior therapy (DBT), Structured Psychotherapy for Adolescents Responding to Chronic Stress (SPARCS), parent-child interaction therapy (PCIT), eye movement desensitization and reprocessing (EMDR), and trauma systems therapy (TST).

DBT is a psychotherapeutic approach that helps clients learn to both regulate and tolerate their emotions and may be appropriate for treating traumatic stress symptoms. Concrete skills are taught and practiced, including mindfulness practices from Eastern medicine. DBT combines standard cognitive behavioral techniques for emotion regulation with concepts of distress tolerance, acceptance, and mindfulness.[29]

SPARCS is based on DBT. SPARCS is a group intervention designed to address the needs of chronically traumatized adolescents who may be living with ongoing stress and is intended to take place in a variety of settings, including schools, agencies, and residential treatment centers; it has been shown to decrease PTSD symptoms.[30] These adolescents may experience problems in several areas of functioning, including difficulties with affect regulation and impulsivity, self-perception, relationships, somatization, dissociation, numbing, and avoidance. SPARCS is predominantly cognitive behavioral; key components of the program include mindfulness, problem solving, relationship building/communication skills, and distress tolerance.

PCIT is a treatment that targets improvement in the quality of the parent-child relationship. Parents are taught skills that facilitate the establishment of a nurturing and secure relationship with their child while increasing the child's prosocial behavior and decreasing negative behavior. The treatment includes a child-directed interaction that is similar to play therapy, with the goal of strengthening the parent-child relationship, and a parent-directed interaction, in which parents learn to use behavior management techniques as they play with their child. PCIT has been adapted for children who have experienced trauma[31,32] and is most appropriate as a treatment of traumatic stress symptoms rather than as prevention of traumatic stress symptoms after exposure to a traumatic event.

EMDR is a psychotherapeutic approach in which the patient attends to past memories, present triggers, or anticipated future experiences while simultaneously moving his or her eyes back and forth following the therapist's fingers as they move across the patient's field of vision. Graduated imaginal exposure to the traumatic event(s) is combined with having the child visually track the therapist's hand movements. The theoretical basis for EMDR is that PTSD symptoms result from insufficient processing or integration of sensory, cognitive, and affective components of the traumatic memory, and the eye movements are proposed to facilitate information processing and integration, thereby allowing patients to fully process traumatic memories.[33] EMDR is an intervention that targets individuals who experience symptoms of traumatic stress.

TST is targeted toward children and adolescents who are having difficulty regulating their emotions as a result of the interaction between the traumatic experience and stressors in the social environment. TST is appropriate for individuals who are experiencing traumatic stress symptoms, but it might also be relevant for preventing traumatic stress symptoms when implemented after exposure to a traumatic event. Interventions include a focus on both the emotional regulation capacities of the traumatized child and the ability of the child's social environment and system of care to help the child manage his or her emotions or to protect the

child from threat. Treatment modules include home and community-based services, services advocacy, emotional regulation skills training, cognitive processing, and psychopharmacology.

Pharmacotherapy: Interventions for Preventing Post-Traumatic Stress Disorder or Traumatic Stress Symptoms in Children

Medication use in children who have experienced acute trauma or during their exposure to trauma to prevent the development of PTSD is intended to target memory consolidation and physiologic hyperarousal. A similar rationale supports use of the opioid analgesic morphine in the acute care setting in the prevention of PTSD, especially in the pediatric intensive care setting. In addition to treating the pain from invasive medical procedures, morphine diminishes the memory consolidation that may accompany this pain. In addition, other medications, such as the alpha-agonist clonidine, are intended to diminish the physiologic symptoms of hyperarousal immediately following or during a traumatic event. Other medications that target physiologic hyperarousal and memory consolidation may also be used to prevent PTSD in exposed children.

Pharmacotherapy: Interventions for Treating Post-Traumatic Stress Disorder or Traumatic Stress Symptoms in Children

Selective serotonin-reuptake inhibitors, or SSRIs, are a class of antidepressants that are among the most studied medications for PTSD treatment in children. SSRIs work by inhibiting the reuptake of serotonin and, therefore, increase the amount of serotonin in the synaptic cleft available to receptors on the postsynaptic neuron. Because they are the first-line treatments for PTSD in adults, they are some of the most common medications used to treat PTSD in children as well. However, there has been no clear indication established for SSRI use as monotherapy (i.e., without psychotherapy) in children with PTSD.

Some studies conducted with the SSRIs sertraline and citalopram have indicated some therapeutic benefit in children and adolescents. In contrast, there have been few studies of fluoxetine or other SSRIs aimed at improving PTSD in children.

Other Antidepressants

Atypical antidepressants, such as bupropion, venlafaxine, and mirtazapine, are also commonly used to treat PTSD symptoms or PTSD-associated symptoms. Imipramine is a tricyclic antidepressant that has shown promise as a PTSD treatment and was used frequently before the development of the SSRIs; however, cardiac side effects have significantly limited its use. In addition, the restricted diet that patients on monoamine oxidase inhibitors (MAOIs) must follow has also limited the use of MAOIs as a PTSD treatment.

Other Medications

Because childhood PTSD is so often associated with other comorbid mental conditions, numerous other medications are used to treat PTSD and have been studied. These medications are thought to work through various mechanisms.

- *Stimulants* such as methylphenidate and its derivatives and amphetamine preparations are used to treat PTSD-related symptoms of inattention and externalizing behaviors that are often confused with or misdiagnosed as attention deficit hyperactivity disorder (ADHD). Because PTSD often causes hyperarousal and associated physiologic changes, medications that treat these physiologic effects have also been studied in patients with

PTSD. As mentioned earlier, the alpha agonist clonidine is thought to mainly target hyperarousal symptoms in PTSD. Propranolol, a beta-adrenergic blocking agent, has also had promising results as a treatment for PTSD in childhood.

- *Antipsychotics* have also been studied as a PTSD treatment because of their effects on comorbid aggression or psychotic symptoms. These medications include risperidone and quetiapine. In addition, clozapine has been shown to reduce both hallucinations and flashbacks to a traumatic event while reducing the number of medications required to treat children with PTSD. Because PTSD can often be accompanied by severe behavior problems and mood fluctuations, the mood stabilizers valproic acid, carbamazepine, and lithium have been studied in children with PTSD and are frequently used clinically.
- *Benzodiazepines*, another class of medication, have also been used to treat the severe anxiety that often accompanies PTSD. Medications in this class include clonazepam, diazepam, alprazolam, and lorazepam. The American Association of Child and Adolescent Psychiatry (AACAP) has advocated that these medications not be used to treat PTSD in children because of the risk for long-term cognitive effects, sedation, and the potential for tolerance and addiction.

Complementary and Alternative Interventions for Preventing or Treating Post-Traumatic Stress Disorder or Traumatic Stress Symptoms in Children

Equine-assisted psychotherapy is a specialized experiential approach to psychotherapy that uses a horse as a therapeutic tool. The goal is to encourage client insight through horse examples, addressing self-esteem and personal confidence; communication and interpersonal effectiveness; trust, boundaries, and limit setting; and group cohesion. Work is performed through the horse and supports and encourages the identification and expression of emotions.[34]

Other Interventions for Preventing Post-Traumatic Stress Disorder and Traumatic Stress Symptoms in Children

Given that many traumatic events such as natural disasters or acts of terrorism can affect whole communities, community-based approaches have been developed to combat PTSD at its source or where chronic harm may be occurring. These approaches are outside of the traditional clinic setting and often allow clinicians an inside view of the context of the problem, which the patient is often unable to express during a clinic visit. These can be home- or school-based intervention programs or programs that partner with first responders or law enforcement to attempt to prevent or improve PTSD. Interventions may also encompass system-level, multicomponent, or other approaches (e.g., Web based). Two interventions designed to intervene early after exposure to traumatic events are critical incident stress debriefing (CISD) and Child Development-Community Policing (CD-CP). CISD is an intervention that targets individuals who have recently been exposed to a traumatic event. CISD is one of the first interventions created for police officers, first responders, and emergency medical technicians to use in the field with a survivor of a traumatic event during the first 72 hours. The CD-CP program is a collaborative early intervention program that targets individuals exposed to violence and is the product of a partnership between mental health professionals at the Yale University Child Study

Center and the New Haven Police Department. The goals of the program are to help children cope with traumatic events and prevent the development of traumatic stress symptoms.[35]

Current Child Traumatic Stress Guidelines

Although there are no existing guidelines for other syndromes of childhood traumatic stress, three organizations—the AACAP, the International Society for Traumatic Stress Studies (ISTSS), and the National Institute for Health and Clinical Excellence (NICE)—have published guidelines on the treatment of PTSD during childhood and adolescence. These guidelines largely stem from expert consensus based on existing evidence and clinical practice rather than on formal Comparative Effectiveness Reviews. These guidelines use different categories of interventions to summarize evidence and offer inconsistent recommendations for some treatment categories or interventions. For instance, the AACAP notes that SSRIs can be considered as a treatment for children with PTSD; NICE concludes that there is insufficient evidence to recommend the use of any medication in young people with PTSD. Similarly, ISTSS considers the evidence on EMDR to be insufficient to make a definitive recommendation for the acute period; NICE suggests that EMDR shows promise despite the lack of rigorous testing in randomized controlled trials. The guidelines do suggest agreement on some issues. For example, both AACAP and ISTSS agree on the importance of considering comorbid psychiatric conditions and school-based treatment approaches. These guidelines are summarized below.

American Academy of Child and Adolescent Psychiatry

The 2010 Practice Parameter for the Assessment and Treatment of Children and Adolescents with Post-Traumatic Stress Disorder recommends early identification of PTSD, stresses the importance of gathering information from both children and parents to make valid diagnostic decisions, and highlights the importance of assessing and treating comorbid conditions of PTSD in children. Based on published randomized controlled trials (RCTs) conducted on children with PTSD from 1996 to 2006, AACAP made seven recommendations regarding best treatment practices in accordance with the strength of the empirical evidence or clinical support for each treatment type. Recommendations based on rigorous empirical evidence and/or overwhelming clinical consensus (minimum standard) are as follows:

- Treatment planning should consider a comprehensive treatment approach that includes consideration of the severity and degree of impairment of the child's PTSD symptoms.
- Treatment planning should incorporate appropriate interventions for comorbid psychiatric disorders.
- Trauma-focused psychotherapies should be considered first-line treatments for children and adolescents with PTSD.

Recommendations that are acceptable based on emerging empirical evidence or clinical opinion but lack strong empirical evidence and/or strong clinical consensus (option) are as follows:

- SSRIs can be considered for the treatment of children and adolescents with PTSD.
- Medications other than SSRIs may be considered for children and adolescents with PTSD.

The recommendation based on strong empirical evidence and/or strong clinical consensus (clinical guideline) is as follows:

- Treatment planning may consider school-based accommodations.

The recommendation known to be ineffective or contraindicated (not endorsed) is as follows:

- The use of restrictive rebirthing therapies and other techniques that bind, restrict, withhold food or water, or are otherwise coercive is not endorsed.

International Society for Trauamtic Stress Studies

Six guidelines for the treatment of PTSD in children and adolescents were published in 2009 in "Effective Treatments for PTSD, Second Edition":

- Acute interventions: Current evidence is insufficient to make a definitive recommendation regarding intervention selection or timing for systemic approaches, art and massage therapies, EMDR, debriefing, or cognitive behavioral approaches in the acute period.
- CBT: Several effective forms of CBT are available for clinicians to use with traumatized children and adolescents of diverse cultures. Trauma-focused forms of CBT effectively decrease PTSD symptoms and improvements with comorbid mental problems (e.g., depression and anxiety), behavioral problems, shame, grief, and adaptive functioning.
- Psychopharmacology: No medications are currently Food and Drug Administration (FDA)-approved for PTSD treatment in children. Studies testing the effectiveness of psychopharmacologic agents on children lag behind studies of adults; however, medication use in children has become the standard of care. Some evidence suggests that medication can help reduce PTSD symptoms. SSRIs appear to be a good first choice of agent. Severe comorbid psychiatric conditions might improve with the selection of an agent that can treat both PTSD and the comorbid condition.
- School-based treatment: A handful of trauma-focused school-based interventions have been empirically tested and shown to reduce corresponding PTSD symptoms and improve behavior. These programs are particularly helpful for children with limited access to clinic-based treatment.
- Psychodynamic therapy: There is growing evidence for psychodynamic, relationship-based therapy involving caregivers in treating childhood PTSD. Studies have indicated associated reduction in PTSD symptoms as well as improved developmental trajectories over time.
- Creative arts therapies: These therapies are currently under development and empirical testing has not occurred to enable a definitive recommendation. Despite this limitation, however, arts therapies appear to be promising.

National Institute for Health and Clinical Excellence

These guidelines (2005) make the following recommendations for psychological interventions for children with PTSD:

- Among children and young people who have been sexually abused, psychological interventions (specifically trauma-focused cognitive–behavioral psychotherapy) can be effective for the treatment of PTSD symptoms.
- There is very little evidence from RCTs for the efficacy of any psychological interventions for children or young people who suffer from PTSD arising from other forms of trauma.
- EMDR shows promise despite lack of rigorous testing in RCTs.

- Evidence examining the effectiveness and efficacy of PTSD treatment in children less than 7 years of age is weak, and conclusions about best practices cannot be made.
- Single-session debriefing is not recommended.

With respect to pharmacological interventions for childhood PTSD, the NICE guidelines conclude that there is insufficient evidence to recommend the use of any medication in young people.

Need for Comparative Effectiveness Reviews

The limitations of existing guidelines underscore other clinical dilemmas. Clinicians require better guidance on the comparative benefits of pharmacotherapy and nonmanualized treatment modalities such as psychodynamic or play therapy. Similarly, clinicians require better guidance on whether specific therapies could cause retraumatization or more harm. This review evaluates the comparative effectiveness of a broad array of interventions for benefits and harms.

The challenges of the diagnostic criteria for PTSD signal the need for a comprehensive review of interventions for children with traumatic stress symptoms or PTSD. Because the diagnostic criteria for PTSD were created for adults and tested only in adolescents ages 15 years or older, they may not be entirely relevant for younger children. Often, younger children are unable to express signs and symptoms in words and are more likely to externalize or express themes during play or in drawings. In addition, many children who do not meet criteria for a diagnosis of PTSD will have symptoms that significantly impair daily functioning. Our systematic review addresses the question of whether children without a formal diagnosis of PTSD but with traumatic stress symptoms may benefit from treatment. Another clinical concern is whether outcomes of interventions vary by the presence of comorbid diagnoses such as depression, disruptive behavior disorders, ADHD, other anxieties, learning disabilities, and psychosis. Our review evaluates evidence of effectiveness for subgroups that have such comorbidities.

Another treatment dilemma is access to services for PTSD. In areas without large academic medical centers or large population centers, the treatment approach is limited to what resources are available in the immediate vicinity. Often providers are trained in only one modality of therapy or were trained many years before and have not kept abreast of recent advances in treatment. Access to school-based and community-based resources is often lacking in rural or underserved areas and often depends on the political and sociocultural climate of the area. In addition, financial factors such as price of medication, insurance coverage, and other issues of access come into play when choosing a treatment modality. In patients and families with limited resources and with limited psychological mindedness, acceptance and participation may be a challenge for proven therapies.

A comprehensive review helps identify a broad range of modalities, including those with limited dissemination, and may contribute to better uptake of effective interventions in areas with limited access to services for PTSD.

Scope

This review examines the efficacy of interventions that target traumatic stress symptoms and syndromes among (1) children and adolescents exposed to trauma other than maltreatment or family violence and (2) children and adolescents already experiencing symptoms after exposure to trauma other than maltreatment or family violence. We exclude maltreatment and family

violence from this review because a companion AHRQ-funded review examined interventions for children exposed to maltreatment.[36] For the sake of brevity, we refer to children and adolescents as "children" for the remainder of the report. The review also seeks to understand whether evidence exists for differences in the efficacy of these interventions by specific child or treatment characteristics or by setting of the delivered intervention. Finally, the review attempts to identify adverse events associated with the interventions reviewed. In addition, an overarching goal of this review seeks to identify gaps in the current scientific literature and highlight important areas for future research to build the evidence base for interventions targeting traumatic stress symptoms or syndromes with children exposed to trauma other than maltreatment or family violence.

Our population, intervention, comparators, outcomes, timing, and setting (PICOTS) framework presented in the Methods section defined the population, interventions, comparators, outcomes, and settings of interest for the review. The results presented in this review, therefore, only apply to this specific set of PICOTS. We note several other differences across studies such as type or severity of trauma experienced by children included in each tested intervention as limitations to the applicability of findings.

Key Questions

Key Question 1: What is the comparative effectiveness of different types of pharmacotherapy, psychotherapy, complementary and alternative therapy, or other therapy, such as combined, for children ages 0 to 17 years exposed to trauma other than maltreatment? Traumatic stress symptoms and syndromes, as well as other specific outcomes examined, are detailed in Figure A.

Key Question 2: What is the comparative effectiveness of different types of pharmacotherapy, psychotherapy, complementary and alternative therapy, or other therapy, such as combined, for children ages 0 to 17 years with traumatic stress symptoms from trauma other than maltreatment who are already experiencing symptoms? Traumatic stress symptoms and syndromes, as well as other specific outcomes examined, are detailed in Figure A.

Key Question 3: Do interventions targeting children who were exposed to trauma and are already experiencing symptoms vary in their effectiveness by characteristics of the child, treatment, or setting?

Key Question 4: What are the harms (e.g., low adherence/dropouts, side effects, retraumatization) associated with specific types of therapies targeting children exposed to trauma or targeting children who were exposed to trauma and are already experiencing symptoms?

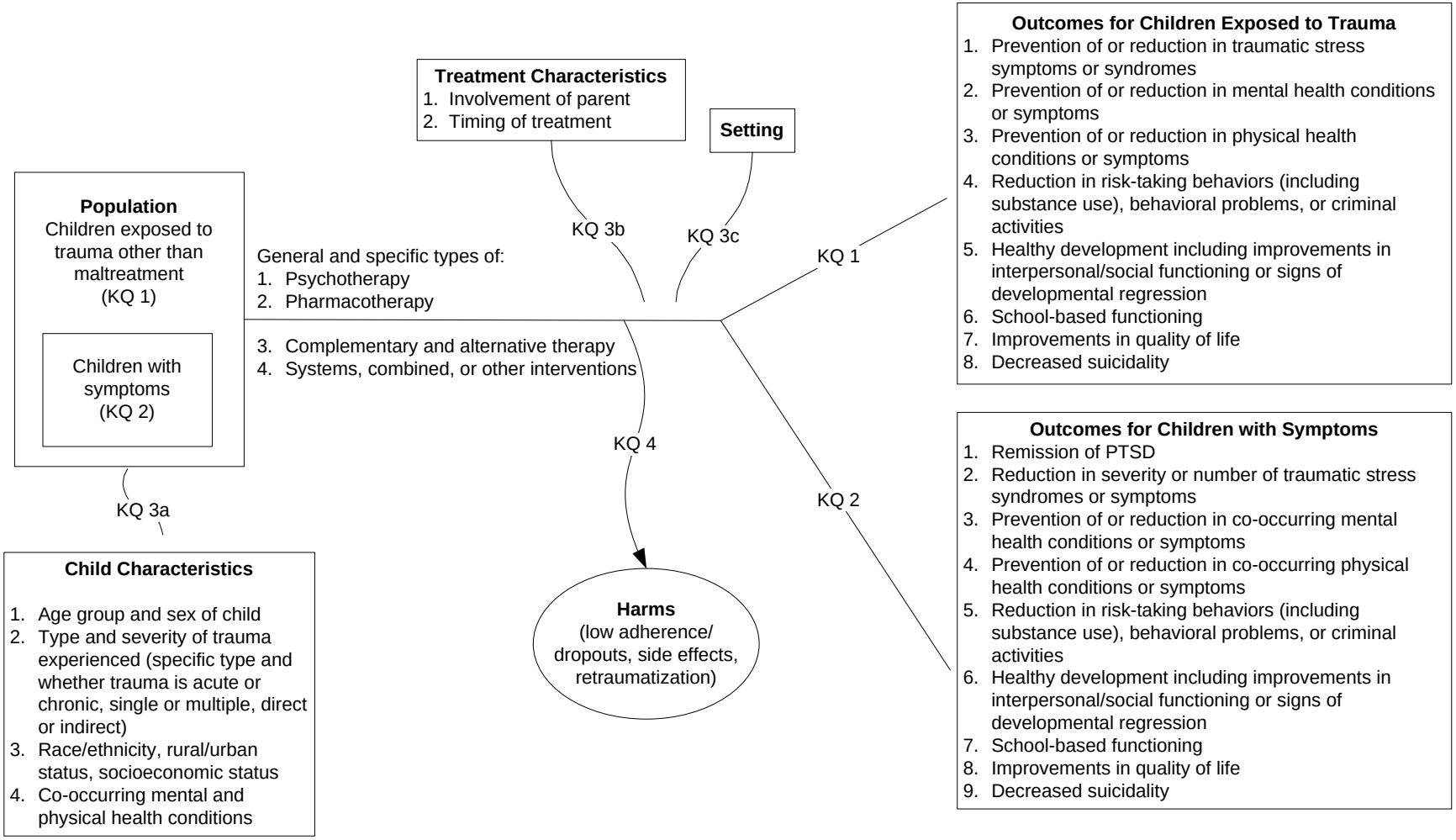
Analytic Framework

Figure 1 depicts the analytic framework that presents the KQs within the context of the PICOTS described in the previous section. KQ 1 addresses the efficacy of interventions for children exposed to trauma other than maltreatment and family violence. KQ 2 examines the efficacy of interventions for children exposed to trauma other than maltreatment and family who already have symptoms. KQ 3 evaluates the efficacy of interventions in different subpopulations, varying by child or treatment characteristics or setting. KQ 4 illustrates the harms associated with specific interventions, which include retraumatization, side effects, low adherence, and dropouts.

Organization of ThisReport

The remainder of this review describes our methods in detail, documents our results, and provides a discussion of our findings and recommendations for filling important research gaps. Appendixes provide details of the search strategy (Appendix A), forms used for review and abstraction (Appendix B), studies excluded at the full-text review stage (Appendix C), comprehensive evidence tables (Appendix D), risk-of-bias ratings (Appendix E), and the summary of results (Appendix F).

Figure 1. Analytic framework



KQ = Key Question; PTSD = post-traumatic stress disorder.

Methods

We conducted this review using the research methods described in the Agency for Healthcare Research and Quality (AHRQ) "Methods Guide for Effectiveness and Comparative Effectiveness Reviews."[37] Further, we used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement[38] as a guide to ensure transparent reporting.

Topic Refinement and Protocol Review

The topic nomination resulted from a public process. With Key Informant input, the RTI International-University of North Carolina at Chapel Hill (RTI-UNC) Evidence-based Practice Center (EPC) worked on clarifying the scope of the project. After we generated an analytic framework, preliminary KQs, and preliminary inclusion/exclusion criteria in the form of population, intervention, comparators, outcomes, timing, and settings (PICOTS), AHRQ posted KQs for public comment November 15, 2011, to December 13, 2011. The RTI-UNC EPC incorporated public comments on the KQs and clinical and methodological input from a Technical Expert Panel into the final research protocol, which was also posted on the AHRQ Web site on March 26, 2012.

Literature Search Strategy

Search Strategy

We systematically searched, reviewed, and analyzed the scientific evidence for each KQ (Appendix A). The steps taken to accomplish the literature review are described below. To identify articles relevant to each KQ, we began with a focused PubMed search on traumatic stress disorders and psychological and pharmacological therapies using a variety of terms, medical subject headings (MeSH®), and major headings. We limited results to children and human-only studies published from 1990 onward. We selected this time range to ensure therapeutic modalities were currently applicable. Because of limited resources, we also limited the search to studies published in English; however, this may bias the report because more studies from English-speaking countries were included. We also searched the Cochrane Library, EMBASE®, PsycINFO®, CINAHL, International Pharmaceutical Abstracts (IPA), and Web of Science (ISI) using analogous search terms. We conducted quality checks to ensure that known studies were identified by the search. If they were not, we revised and reran our searches.

AHRQ requested Scientific Information Packets (SIPs) from the developers or distributors of the interventions identified in the literature review. SIPs allow an opportunity for the intervention developers and distributors to provide the RTI-UNC EPC with both published and unpublished data that they believe should be considered for the review. The RTI-UNC EPC reviewed the information provided in the SIPs and grey literature and included studies that met all inclusion criteria and contained enough information on the research methods used for our risk-of-bias assessment.

Inclusion and Exclusion Criteria

In Table 1, we outline the PICOTS that define the major inclusion criteria for studies in this review. In the sections below, we provide additional detail related to each of these domains as needed. At least one outcome from each included study had to relate to the assessment of trauma

symptoms or syndromes. We also included findings that showed nonbeneficial outcomes associated with the intervention (e.g., no significant changes in outcomes between groups or significantly worse outcomes in the intervention group).

Table 1. Population, intervention, comparator, outcome, timing, and setting

Domain	Description
Population	Children ages 0–17 years who have been exposed to a trauma other than maltreatment, neglect, or family violence. Specific types of trauma include terrorism, community violence, war, school violence, natural disasters, medical trauma, and death of loved ones[a] Children ages 0–17 years who have been exposed to a trauma other than maltreatment, neglect, or family violence who already are experiencing symptoms[a]
Intervention	**Interventions for children exposed to trauma** • Psychotherapy (e.g., cognitive behavioral therapy, hypnotherapy, psychodynamic therapy, community- or classroom-based interventions) • Pharmacotherapy (e.g., SSRIs, TCAs, benzodiazepines, beta blockers, alpha blockers, mood stabilizers, antipsychotics, combined therapy, other therapy) **Interventions for children exposed to trauma who already have symptoms** • Psychotherapy, including trauma-focused vs. nontrauma-focused groupings (e.g., cognitive behavioral therapy, parent-child interaction therapy, child-parent psychotherapy, eye movement desensitization and reprocessing, dialectical behavior therapy, complementary and alternative therapies [e.g., equine-assisted therapy], and community- or classroom-based interventions) • Pharmacotherapy (e.g., SSRIs, TCAs, benzodiazepines, beta blockers, alpha blockers, mood stabilizers, antipsychotics, combined therapy, other therapy)
Comparator	The comparison condition as defined in the respective studies, including active controls (such as usual care) and inactive controls (such as wait-list groups)
Outcome	**Outcomes for studies targeting children exposed to trauma[b]** • Prevention of or reduction in traumatic stress symptoms or syndromes (e.g., PTSD, acute stress disorder, developmental trauma disorder) • Prevention of or reduction in mental health conditions or symptoms (e.g., depression, anxiety) • Prevention of or reduction in physical health conditions or symptoms (e.g., sleep disorders, eating disorders, pain, overweight or obesity, asthma, cardiovascular problems, gastrointestinal problems, headaches) • Reduction in risk-taking behaviors (including substance use), behavioral problems (including conduct disorder and ADHD), or criminal activities • Healthy development (including improvements in interpersonal and social functioning), or reductions in the signs of developmental regression • School-based functioning • Improvements in quality of life • Decreased suicidality • Low adherence/dropouts • Side effects Retraumatization

Table 1. Population, intervention, comparator, outcome, timing, and setting (continued)

Domain	Description
Outcome (continued)	**Outcomes for studies targeting children exposed to trauma who already have symptoms[b]** • Remission of PTSD • Reduction in severity or number of traumatic stress syndromes or symptoms • Prevention of or reduction in co-occurring mental health conditions or symptoms (e.g., depression, anxiety) • Prevention of or reduction in co-occurring physical health conditions or symptoms (e.g., sleep disorders, eating disorders, pain, overweight or obesity, asthma, cardiovascular problems, gastrointestinal problems, headaches) • Reduction in risk-taking behaviors (including substance use), behavioral problems (including conduct disorder and ADHD), or criminal activities • Healthy development (including improvements in interpersonal/social functioning), or signs of developmental regression • School-based functioning • Improvements in quality of life
Timing	• All outcomes included, regardless of timing of measurement
Setting	• Studies conducted in the United States or internationally • Specialty (e.g., outpatient and inpatient primary care or mental health care settings) • Nonspecialty (e.g., schools, community-based providers, shelters) • Home-based settings and out-of-home care (e.g., residential treatment)
Publication type	• Not editorials, letters to the editor
Study design	• Included designs: systematic reviews, randomized controlled trials, nonrandomized controlled trials, prospective cohort studies, and nested case-control studies • Excluded designs: case reports, case series, cross-sectional studies, nonsystematic reviews, retrospective cohort studies, non-nested case-control studies
Sample size	• N ≥10
Time of publication	• 1990 to present
Language of publication	• English

ADHD = attention deficit hyperactivity disorder; N = number; PTSD = post-traumatic stress disorder; SSRI = selective serotonin reuptake inhibitors; TCA = tricyclic antidepressants

[a]At least 95% of the sample was required to be between 0 and 17 years of age.

[b]At least one outcome had to relate to the assessment of trauma for the study to be included. For each study, we also included findings that showed nonbeneficial outcomes associated with the intervention (e.g., no significant changes in outcomes between groups or significantly worse outcomes in the intervention group).

Study Design

To identify appropriate study designs, the research team used the algorithm developed by the Alberta Evidence-based Practice Center.[39] Table 2 describes the study design inclusion criteria developed for this report.

Table 2. Study inclusion criteria

Category	Criteria for Inclusion	Criteria for Exclusion
Publication type	Original research	Editorials, letters to the editor
Study design	Systematic reviews, RCTs, nonrandomized controlled trials, prospective cohort studies, and nested case-control studies	Case reports, case series, cross-sectional studies, nonsystematic reviews, retrospective cohort studies, nonnested case-control studies
Study duration	No limits	NA
Sample size	N ≥ 10	N < 10
Geography	United States and international	NA
Time of publication	1990 to present	< 1990
Language of publication	English	All other
Risk of bias	Low or medium	High (one or more significant flaws that invalidated the findings (e.g., attrition bias of overall attrition ≥ 20% or differential attrition ≥ 15% without appropriate handing of missing data such as the use of intention-to-treat analyses), detection bias, selection bias, performance bias, an/or reporting bias)
PICOTS	All PICOTS listed in Table 1	Having more than 5% of study participants older than 17 years old, having outcomes listed in the PICOTS but not having at least one outcome focused on traumatic stress symptoms or syndromes

N = number; NA = not applicable: PICOTS = population, intervention, comparators, outcomes, timing, and setting; RCT = randomized controlled trial

Study Selection

All titles and abstracts identified through our literature searches were independently reviewed for eligibility against our inclusion/exclusion criteria by two trained members of the research team. Studies marked for possible inclusion by either reviewer underwent a full-text review. For studies without adequate information to determine inclusion or exclusion, we retrieved the full text and then made the determination. We tracked all results in an EndNote® database.

We retrieved and reviewed the full text of all articles included during the title/abstract review phase. Each full-text article was independently reviewed by two trained members of the research team for inclusion or exclusion on the basis of the eligibility criteria described earlier. If both reviewers agreed that a study did not meet the eligibility criteria, the study was excluded. If the reviewers disagreed, conflicts were resolved by discussion and consensus or by consulting a third member of the review team. We recorded the reason that each excluded full-text publication did not satisfy the eligibility criteria so that we could later compile a comprehensive list of such studies.

Data Extraction

For studies that met inclusion criteria, we abstracted relevant information into evidence tables. We designed data abstraction forms to gather pertinent information from each article,

including characteristics of study populations, settings, interventions, comparators, study designs, methods, and results, as specified in the PICOTS. Trained reviewers extracted the relevant data from each included article into the evidence tables. All data abstractions were reviewed for completeness and accuracy by a second member of the team.

KQ 3 presents outcomes of interventions categorized by child characteristics. Because the intent of KQ 3 was to evaluate whether characteristics of the child moderated the effect of the interventions, we included only those studies that tested whether the effect of an intervention on outcome differed by subgroup characteristics via an interaction term. We did not synthesize the evidence for KQ 3 from studies that met our overall inclusion criteria for KQs 1 and 2 but did not compare effects between subgroups. We elected not to summarize findings that merely presented results stratified by subgroups because of the risk of overinterpreting results from underpowered subsamples.

Risk-of-Bias Assessment

Two independent reviewers assessed risk of bias (internal validity) for each study using predefined criteria described in the AHRQ "Methods Guide for Effectiveness and Comparative Effectiveness Reviews,"[40] using questions specified in the RTI Item Bank[41] and the Cochrane Risk of Bias tool.[42] We resolved disagreements between the two reviewers by consulting an experienced member of the team. We selected items based on relevance to the topic and anticipated sources of bias. We assessed the potential for selection bias, performance bias, attrition bias, detection bias, and reporting bias. We then rated each study as having low, medium, or high risk of bias for individual outcomes. In general, a study with a low risk of bias had a strong design, measured outcomes appropriately, used appropriate statistical and analytical methods, reported low attrition, and reported methods and outcomes clearly and precisely. Studies with a medium risk of bias did not meet all criteria required for low risk of bias. These studies had some flaws in design or execution (e.g., imbalanced recruitment, high attrition) but they provide information (say, through sensitivity analysis) to allow the reader the ability to evaluate and determine that those flaws did not likely cause major bias. Missing information often led to ratings of medium as opposed to low risk of bias. Studies with a high risk of bias had at least one or more major flaw that likely caused significant bias, and, thus, invalidated the results. Major flaws precluded the ability to draw causal inferences between the intervention and the outcome. Examples of flaws likely to result in a high risk of bias rating include poorly randomized studies that failed to account for imbalances at baseline; observational studies that failed to account for potential confounders; and studies of any design with overall attrition of 20 or more or differential attrition of 15% or more without appropriate handling of missing data, such as the use of intention-to-treat analyses.

Data Synthesis

To determine whether quantitative analyses were appropriate, we assessed the clinical heterogeneity of the population in studies under consideration following established guidance.[43] We did this by qualitatively assessing the PICOTS of the included studies, looking for similarities and differences.

We did not find quantitative analyses appropriate because of heterogeneity, insufficient numbers of similar studies, or insufficiency or variation in reporting. Thus, we synthesized the data qualitatively.

Given the complexity of our analyses, we adopted some conventions for presenting comparative data (Table 3). We present baseline values and standard deviations (if reported) for each group, followed by within-group change scores (for continuous outcomes) or within-group difference in proportions (for dichotomous outcomes) and, if reported, standard deviations of the differences. We then present between-group change scores (for continuous outcomes) or between-group change in proportions (for dichotomous outcomes). Values calculated by us are noted in parentheses next to each value as "(calculated)." Statistically *between-group* differences in the change of a specific outcome over time are indicated by reporting the actual p value of the comparison and associated test statistics. If a study found no between-group differences in change over time, we report the actual p value (if reported) or "p=ns" if unspecified. Adjusted analyses are reported if conducted and noted appropriately. Separate columns indicate trauma, mental health (e.g., depressive and anxiety symptoms), and physical health (e.g., somatic complaints) outcomes, as well as other outcomes (e.g., functional impairment, aggression).

Table 3 (an example based on hypothetical data) shows that, in Jones, et al. (2010), the cognitive behavioral therapy (CBT) group had significantly greater reduction in PTSD symptoms (mean -10.3 in intervention arm versus -3.6 in control arm, ANOVA treatment*time interaction $p<0.05$). The between-group differences in depressive symptoms over time, however, were not significantly different between study arms (-4.8 in the CBT intervention group versus -4.3 in the wait-list control group, p=0.42).

Table 3. Intervention A versus wait list control: results

First Author et al., Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Jones, et al., 2010	G1: Cognitive behavioral therapy G2: Wait list control	Greater reduction in PTSD symptoms (UCLA PTSD Index for DSM-IV PTSD, range 0–80) Pretreatment G1: 50.1 (SD=11.0) G2: 49.6 (SD=9.0) Within group change at post-treatment: G1: -10.3 (calculated) G2: -3.6 (calculated) Between group change at post-treatment: -6.7 (calculated) Adjusted between group ANOVA treatment*time interaction: F=4.68, df=1,35, p<0.05	No between-group differences in changes in depressive symptoms (Brief Beck Depression Inventory, range 0–21) Pretreatment G1: 12.4 (SD=4.2) G2: 11.9 (SD=4.3) Within group change at post-treatment: G1: -4.8 (calculated) G2: -4.3 (calculated) Between group change at post-treatment: 0.5 (calculated) Adjusted between group ANOVA treatment*time interaction: F=1.39, df=1,35, p=0.42	NR	NR

ANOVA = analysis of variance; df = degrees of freedom; DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition"; G = group; NR = not reported; PTSD = post-traumatic stress disorder; SD = standard deviation

Strength of Body of Evidence

We graded the strength of evidence (SOE) on the basis of guidance established for the EPC Program.[37,44] Developed to grade the overall strength of a body of evidence, this approach incorporates four key domains: risk of bias (including study design and aggregate quality), consistency, directness, and precision of the evidence. The grades of evidence that were assigned are described in Table 4. Grades reflect the strength of the body of evidence to answer the KQs on the comparative effectiveness and harms of the interventions in this review. Two reviewers assessed each domain for each key outcome listed in the framework, and conflicts were resolved by consensus.

Table 4. Grade definitions for overall strength of evidence

Grade	Definition
High	High confidence that the evidence reflects the true effect: further research is very unlikely to change our confidence in the estimate of effect.
Moderate	Moderate confidence that the evidence reflects the true effect: further research may change our confidence in the estimate of the effect and may change the estimate.
Low	Low confidence that the evidence reflects the true effect: further research is likely to change our confidence in the estimate of the effect and is likely to change the estimate.
Insufficient	Evidence either is unavailable or does not permit estimation of an effect.

Source: Owens, et al., 2010[44]

At a minimum, two reviewers assessed each domain for each key outcome and resolved any differences by consensus. We used a qualitative process, considering each of the domains, to determine the overall SOE grade for each relevant outcome. The team discussed differences in overall SOE grades to reach consensus. For outcomes had only a single study to provide evidence, we evaluated consistency as not applicable. When a study having estimates of effects with confidence intervals that permitted clinically distinct conclusions, we rated that domain as imprecise. When studies provided sufficient information (i.e., standard deviation or standard error) to calculate confidence intervals around between-group changes without making assumptions about the correlation between available measures of variance, we calculated confidence intervals for the difference in the change in outcomes for the study groups. For studies that did not provide estimates of variance for between-group differences in outcomes, we relied on measures of statistical significance from between-group adjusted analyses where available or unadjusted analyses if no other data were available. We did not rely solely on measures of statistical significance to evaluate precision for differences in post-test assessment that failed to account for pretest differences. We also considered whether studies were adequately powered. For outcomes with a single study with imprecise results and for which power was not ensured, we considered this to be insufficient evidence that the estimate from the single study was robust enough to have any confidence in the finding. For a single study with precise results, we graded it as low. Therefore, although effectiveness is synonymous with neither precision nor SOE, individual studies that showed an effect generally merited a rating of low SOE.

Applicability

We assessed the applicability both of individual studies and of the body of evidence.[37] For individual studies, we examined conditions that may limit applicability based on the PICOTS structure. Such conditions may be associated with heterogeneity of treatment effect and the

ability to generalize the effectiveness of an intervention to use in everyday practice. Examples include the following:

- Population: narrow eligibility criteria
- Intervention: intensity and delivery of the interventions
- Comparator: use of substandard comparators
- Outcomes: use of composite outcomes that mix outcomes of different significance to patients
- Timing: studies of different duration that may have various implications for applicability

We abstracted and reported key characteristics that may affect applicability into evidence tables. To assess the applicability of a body of evidence, we considered the consistency of results across studies that represent an array of different populations.

Peer Review and Public Commentary

An external peer review was performed on this report. Peer Reviewers were charged with commenting on the content, structure, and format of the evidence report; providing additional relevant citations; and pointing out issues related to how we conceptualized the topic and analyzed the evidence. Our Peer Reviewers (listed in the front matter) gave us permission to acknowledge their review of the draft. We compiled all comments and addressed each one individually, revising the text as appropriate. AHRQ also provided review from its own staff. In addition, the Scientific Resource Center placed the draft report on the AHRQ Web site (www.effectivehealthcare.ahrq.gov) for public review.

Results

This section presents the results of the literature searches, followed by results for each Key Question (KQ). KQ 1 presents evidence on interventions targeting children exposed to trauma. KQ 2 presents similar evidence for interventions targeting children exposed to trauma who already have symptoms. KQ 3 provides a summary of the evidence by child characteristics, treatment characteristics, and the setting of the intervention. KQ 4 summarizes evidence on harms.

Results of Literature Searches

Figure 2 presents our literature search results. Literature searches through August 3, 2012, for the current report identified 6,647 unduplicated citations. Appendix A provides a list of all search terms used and the results of each literature search.

After applying our eligibility and exclusion criteria to titles and abstracts of all identified citations, we excluded 6,141 articles. Thus, we obtained full-text copies of 506 published articles. We reapplied our inclusion criteria and excluded 446 of these articles from further review before the risk-of-bias assessment. Appendix C provides a list of excluded studies and reasons for exclusion at the full-text stage.

Of the 60 articles included after full-text review, we dropped 35 articles from further analysis because of their high risk of bias (described in detail below). Thus, we included a total of 25 articles for qualitative synthesis. Evidence tables for these 25 articles are provided in Appendix D; risk-of-bias assessments for all 60 articles included after full-text review can be found in Appendix E.

The 25 articles included in this review represent 23 studies. Of the 25 included articles, 16 were randomized controlled trials (RCTs), 6 were cluster RCTs, 2 were prospective cohort studies, and 1 was a systematic review. We assessed 19 included articles as medium risk of bias and 5 as low risk of bias. We did not assess the risk of bias for the single systematic review[45] that met our criteria because tools such as AMSTAR cannot be applied easily to systematic reviews with no included studies. No other systematic reviews could be used in our review in their entirety because their inclusion/exclusion criteria did not match ours, although we evaluated the citation lists for several systematic reviews for additional studies.

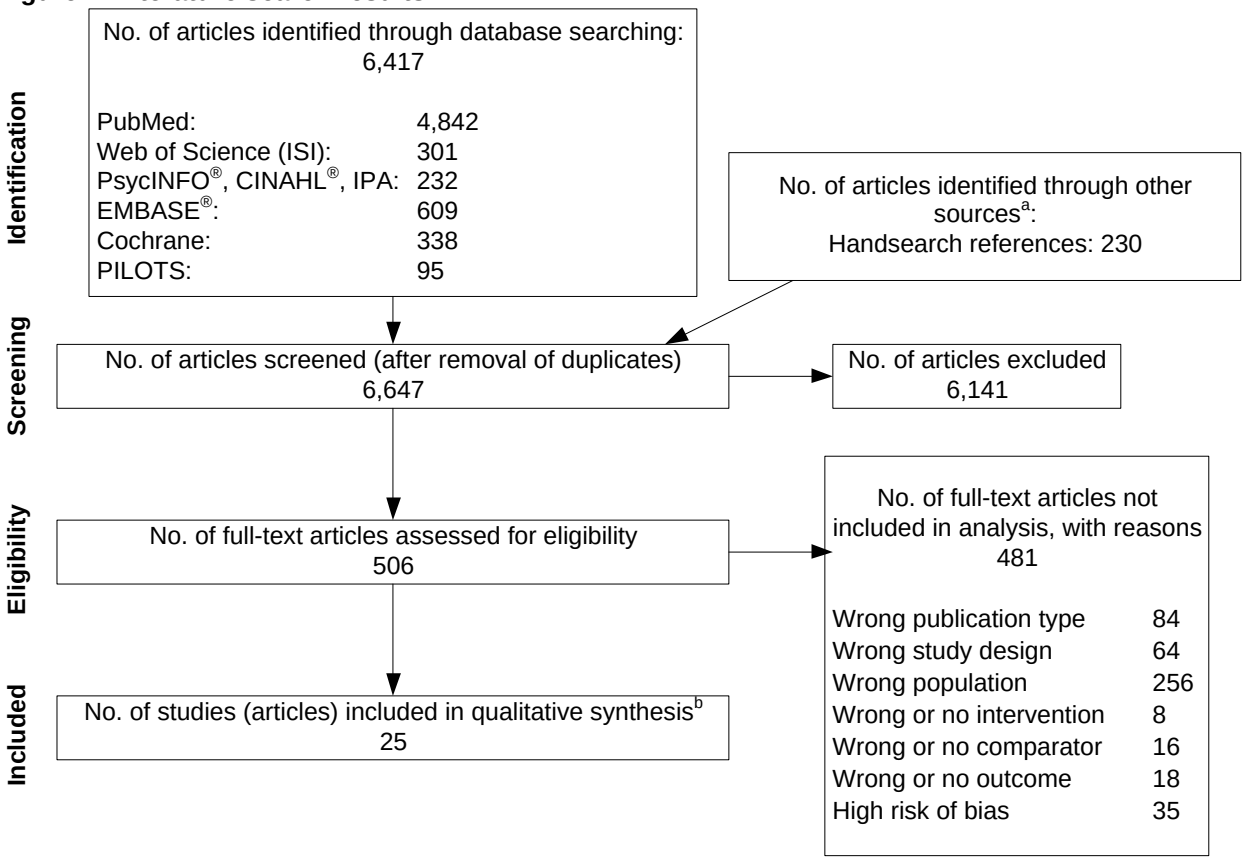
We reviewed 58 unduplicated articles, obtained through scientific information packets, of which we excluded 43 during the abstract review stage and 13 during the full-text review stage. From the remaining 2 articles, we eliminated 1 study[46] because of high risk of bias and included the other study[47] in this report. Of the 58 articles we examined, 5 were unpublished; 4 of these studies were excluded during the abstract review stage, and 1 was excluded during the full-text review stage.

Our search of the grey literature yielded six articles, of which we excluded two during the abstract review stage and one during the full-text review stage. After assessing risk of bias for the remaining three studies, we eliminated one study[48] for high risk of bias and included the other two studies[49,50] in this report. Of the six studies we examined, only one of these studies was unpublished, and it was eliminated at the risk-of-bias review stage.

We also dropped 35 studies for high risk of bias. We most commonly eliminated studies with high risk of bias owing to selection bias (n=30), including poor randomization and lack of allocation concealment for trials and failure to control for confounding factors for observational studies (see Appendix E for further details). Other common reasons for the removal of studies

with high risk of bias included attrition bias or differential attrition bias (n=12; e.g., loss to followup of ≥ 20% or differential loss to followup of ≥15% without appropriate handling of missing data), detection bias (n=11; e.g., bias in outcome assessment), and performance bias (n=9; e.g., not controlling for concurrently occurring or unintended interventions). Of these, we dropped 34 of 35 for multiple reasons; we dropped only one study with a single reason for the high risk-of-bias rating that invalidated all findings: a 77% drop-out rate (see Appendix E for more details). Having a study design less rigorous than a controlled trial did not drive our decision to drop the study for high risk of bias; we excluded only four of these 35 studies that had observational (prospective cohort) study designs. Most of these studies dropped for high risk of bias tested interventions similar to those included in our review (e.g., psychotherapeutic interventions such as cognitive behavioral therapy [CBT], eye movement desensitization and reprocessing (EMDR), exposure therapies, school-based interventions including Cognitive Behavioral Intervention for Trauma in Schools [CBITS] and pharmacotherapeutic interventions such as sertraline and other selective serotonin reuptake inhibitors [SSRIs]). Although high risk of bias studies may have added to some of the sparse evidence in this literature, their inclusion would not have materially altered strength of evidence (SOE) because they would not have increased our confidence in the estimate of effect.

Figure 2. Literature search results



No. = number

[a]Additional articles were identified through grey literature searches (SIP searches, peer, and public review comments) and by means of manual entry or Medline, ProQuest, and Worldcat OCLC search engines.

[b]We identified one systematic review[45] for inclusion in this report. The review found no eligible studies.

Descriptions of Included Studies

Overall, the evidence from 21 trials and 1 observational study (25 articles) evaluated 6 types of KQ 1 interventions targeting children with trauma exposure (7 studies, 8 articles) and 13 types of KQ 2 interventions targeting children with trauma exposure and already experiencing traumatic stress symptoms (15 studies, 16 articles). We also found 2 studies that addressed KQ 3 and 5 studies that addressed KQ 4. Although we identified numerous potential interventions in our protocol, very few studies examining these interventions met our inclusion criteria, likely because the interventions have not been implemented among children with trauma from sources other than maltreatment or family violence. For example, we did not find any evidence on child-parent psychotherapy, an intervention primarily used for maltreated children. The interventions included in our review had substantial heterogeneity in components, dose, frequency, involvement of family members, and mode and method of delivery. The wide variety of approaches presented challenges to attempts to combine or categorize interventions as we had anticipated. In four instances did we combine treatments for presentation and discussion: two mixed school-based interventions addressing KQ 1, two mixed school-based interventions addressing KQ 2, two CBITS trials addressing KQ 2, and two chloral hydrate pharmacotherapeutic trials addressing KQ 2. The remainder of this section describes the characteristics of studies, notes key points, and gives a detailed synthesis for each intervention in the order listed in Table 5 through Table 8. We support the analysis for each intervention with a summary table under key points showing overall findings. The detailed synthesis subsection for each intervention includes one table describing the characteristics of the study, a second table on results, and a third on SOE for each intervention type. Entries in summary tables are presented by intervention type first and then by the last name of the first author of the trial.

We kept our main framework of organization by psychotherapy and pharmacotherapy approaches. For the psychotherapy approaches, we followed the organization of interventions in the introduction by describing cognitive-based therapies first, followed by other types of psychotherapies. For the cluster of school-based therapies, we first reported on specific individualized approaches and school-based approaches we had identified in our protocol (e.g., CBITS) that have both individual and group components. Following these interventions, we described school-based psychotherapies with mixed components.

Table 5. Number of included studies by intervention, comparator, and outcome for Key Question 1: interventions targeting children exposed to trauma

Intervention	Comparator	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes	Number of Studies
TF-CBT (school group and individual)	No treatment	X	X			1[51,52]
CFTSI	Supportive therapy	X	X			1[53]
Mixed (psychoeducational material, cognitive behavioral skills, meditative practices, bio-energetic exercises, art therapy, narrative techniques, and home assignments), ERASE Stress (school groups)	Wait-list control that received religious classes	X	X	X	X	2[54,55]
Mixed (psychoeducational material and skills training with meditative practices, bio-energy exercises, art therapy, and narrative techniques for reprocessing traumatic experiences), Overshadowing the Threat of Terrorism (school groups)	Wait-list control	X	X	X	X	1[56]
Early psychological intervention	Usual care	X	X			1[50]
Propranolol	Placebo	X		X		1[57]

CFTSI = Child and Family Traumatic Stress Intervention; ERASE Stress = Enhancing Resiliency Among Students Experiencing Stress; TF-CBT = trauma-focused cognitive behavioral therapy; X = evidence available on outcomes

Table 6. Number of included studies by intervention, comparator, and outcome for Key Question 2: interventions targeting children exposed to trauma already experiencing symptoms

Intervention	Comparator	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes	Numberof Studies
Trauma-focused cognitive behavioral therapy	Wait-list control	X	X			1[58]
Cognitive processing therapy	Wait-list control	X	X			1[59]
Narrative Exposure Therapy	Meditation-relaxation therapy	X		X	X	1[60]
Grief- and trauma-focused intervention-group	Grief- and trauma-focused intervention-individual	X	X			1[61]
Grief-and trauma-focused intervention with coping skills and trauma loss narrative	Grief- and trauma-focused intervention with coping skills only	X	X		X	1[62]
Emotion Regulation Therapy	Relational supportive therapy	X	X			1[49]
Eye movement desensitization and reprocessing	Wait-list control	X	X	X	X	1[63]
Cognitive Behavioral Intervention for Trauma in Schools	Wait-list control	X	X		X	2[47,64]
Trauma and grief component therapy (school groups)	Usual care	X	X			1[65]
Mixed (CBT techniques, trauma-processing activities, cooperative play, and creative expressive elements) (school groups)	Wait list	X	X		X	2[66,67]
Imipramine	Chloral hydrate Placebo	X				2[68,69]
Fluoxetine	Placebo	X				1[69]
Sertraline	Placebo	X	X		X	1[70]

X = evidence available on outcomes

Table 7. Number of included studies by intervention, comparator, and subgroup comparisons for Key Question 3: subgroup differences in efficacy of interventions targeting children exposed to trauma, some of whom already have symptoms

Intervention	Comparator	Treatment Based on Exposure	Treatment Based on Symptoms	Subgroups Examined	Outcomes Compared	Number of Studies
TF-CBT (school group and individual)	No treatment		X	Sex	Trauma symptom, mental health (depression)	1[51]
Mixed (CBT techniques, trauma-processing activities, cooperative play, and creative expressive elements) (school groups)	Wait list		X	Age group, exposure to violence, sex	Trauma symptom, other (functional impairment)	1[71]

CBT = cognitive behavioral therapy; TF-CBT = trauma-focused cognitive behavioral therapy; X = evidence available on outcomes

Table 8. Number of included studies by intervention, comparator, and harms comparisons for Key Question 4: harms in interventions targeting children exposed and/or already experiencing traumatic stress symptoms

Intervention	Comparator	Mental Health Harms	Physical Health Harms	Other Harms	Number of Studies
TF-CBT	Wait-list control	X	X	X	1[58]
TGCT	Wait-list control	X			1[65]
Sertraline	Placebo	X	X	X	1[70]
Imipramine	Fluoxetine, placebo	X	X	X	1[69]
Imipramine	Chloral hydrate	X	X	X	1[68]

TF-CBT = trauma-focused cognitive behavioral therapy; TGCT = trauma and grief component therapy (school groups); X = evidence available on outcomes

For each subsection on characteristics of the trial, we present an overview, followed by details on population, intervention, comparator, outcome, and setting (i.e., PICOTS) and applicability. The key points distinguish "insufficient" grades for bodies of evidence in which some research exists on the outcomes but is insufficient to make a call on the SOE.

Key Question 1: Interventions Targeting Children Exposed to Trauma

Key Question 1: Trauma-Focused Cognitive Behavioral Therapy

Description of Included Studies

We found one prospective cohort study comprising two articles,[51,52] rated medium risk of bias, addressing trauma-focused cognitive behavioral therapy (TF-CBT).

This study identified four schools in a single city severely affected by an earthquake. Children in the sixth and seventh grades were selected for therapy 1.5 years after the earthquake. The method of selecting children was not reported. The mean age was 13.2 years. All children were exposed to serious direct threats to life, including witnessing mutilating injuries, agonizing screams of distress, and cries for help. Children were selected based on exposure to therapy, not

on diagnosis or symptom score. No children were on psychotropic medicine or other mental health treatment. For the 1.5-year ollow-up study, two schools closest to the study staff's clinics were chosen for treatment, and two other schools served as the control condition. Children participated in four group sessions (30 minutes) and two individual sessions (60 minutes) of TF-CBT over 3 weeks. Outcome measures included traumatic stress symptoms (University of California-Los Angeles [UCLA] Post-Traumatic Stress Disorder Index [PTSD-RI scores] and depressive symptoms [Children's Depression Scale]). See Table 9 for study characteristics.

Table 9. Trauma-focused cognitive behavioral therapy versus usual care: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Number	Risk of Bias
Goenjian, et al., 1997[51] and Goenjian, et al., 2005[52]	Male and female students in grades 6 and 7 from four schools in Gumri, Armenia	Natural disasters	Prospective cohort 12 weekly sessions of 1.5 hours (18 hours total)	G1: Trauma-focused cognitive behavioral therapy G2: Comparison schools	Pretreatment G1: 38 G2: 29 Analyzed G1: 35 G2: 29 1.5-year followup: G1: 35 G2:25 for PTSD; 20 for depression 3.5-year followup: G1: 36 G2: 27	Medium

G = group; PTSD = post-traumatic stress disorder

This study does not report funding source. This study is applicable to children in resource-poor settings suffering from severe natural disasters who may not have significant post-traumatic stress symptoms but are at high risk for developing these symptoms.

Key Points

- *PTSD symptoms*: Participants in TF-CBT had greater decreases in PTSD symptoms than those in usual care in a single prospective cohort study[51,52] (low SOE).
- *Depression symptoms*: Participants in TF-CBT had greater decreases in depression symptoms than those in usual care in a single prospective cohort study[51,52] (low SOE).

Detailed Synthesis

One prospective cohort study[51,52] found a significant difference in changes in PTSD symptoms scores and depressive symptom scores pretreatment to post-treatment among children receiving the intervention compared with those in the control schools (Table 10). We graded the SOE as low because of the presence of only one small prospective cohort study (Table 11).

Table 10. Trauma-focused cognitive behavioral therapy versus usual care: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Goenjian et al. 1997[51] and Goenjian et al., 2005[52]	G1: School-based TF-CBT G2: Comparison schools	Greater reduction of PTSD symptoms (child PTSD Reaction Index, score range 0–80) Pretreatment G1: 45.3 (SD=11.0) G2: 41.1 (SD=9.0) Within-group change at 1.5 years: G1: -13.1 (calculated) G2: 6.1 (calculated) Between-group change at 1.5 years: -19.2 (calculated) Adjusted between group MANOVA treatment*time: F=31.16, df=1,56, p<0.05 Within-group change at 3.5 years: G1: -16.3 (SD=13.0) G2: -5.4 (SD=11.0) Between-group change at 3.5 years: -10.9 (calculated) Reported t-test between group difference: t=3.5, df=61, p<0.001	Greater reduction of depression symptoms (Depression Rating Scale; scale range 0–63) Pretreatment G1: 16.8 (SD=5.9) G2: 15.3 (SD=5.5) Within-group change at 1.5 years: G1: -0.8 (calculated) G2: 4.9 (calculated) Between-group change at 1.5 years G1 vs. G2: -5.7 (calculated) Between-group difference p value not reported Within-group change at 3.5 years: G1: -1.7 (SD=5.4) G2: 2.7 (SD=6.7) Between-group change at 3.5 years: -4.4 (calculated) Reported t-test between group difference: t=2.9, df=61, p<0.01	NR	NR

df = degrees of freedom; G = group; MANOVA = multivariate analysis of variance; NR = not reported; PTSD = post-traumatic stress disorder; SD = standard deviation; TF-CBT = trauma-focused cognitive behavioral therapy

Table 11. Trauma-focused cognitive behavioral therapy: strength of evidence

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
TF-CBT	1; 65 (65)	PTSD symptoms	Prospective cohort Medium	Unknown	Direct	Precise	Difference of 19.2 points on child PTSD reaction index at 1.5 years favoring TF-CBT Low
	1; 65 (55)	Depression symptoms	Prospective cohort Medium	Unknown	Direct	Precise	Difference of 5.7 points on Depression Rating Scale at 1.5 years favoring TF-CBT Low

PTSD = post-traumatic stress disorder; TF-CBT = trauma-focused cognitive behavioral therapy

Key Question 1: Child and Family Traumatic Stress Interventions

Description of Included Studies

We found one RCT, rated medium risk of bias, testing the efficacy of the Child and Family Traumatic Stress Intervention (CFTSI) with a population of children exposed to a potentially traumatic event for KQ 1.[53]

CFTSI is a four-session caregiver-child early intervention and secondary prevention model developed for children ages 7 to 17 years. CFTSI focuses on two key risk factors of poor social or familial support and poor coping skills in its effort to prevent chronic PTSD. CFTSI attempts to (1) increase communication between children and their caregivers about feelings, symptoms, and behaviors with the goal of increasing the caregivers' support of the child and (2) providing specific behavioral skills that are taught both to the caregiver and child to assist the child in coping with symptoms. CFTSI's focus is informed by findings that indicate the role of family support as a primary protective factor for children exposed to a potentially traumatic event. Fidelity to protocol was maintained through weekly group supervision, and progress notes were developed for each condition to help supervisors ensure fidelity.

Children ages 7 to 17 years who were exposed to a potentially traumatic event, including motor vehicle accidents, sexual abuse, witnessing of violence, physical assaults, injuries, animal bites, and threats of violence, were randomly assigned to a four-session CFTSI intervention (N=53) or a four-session supportive intervention (N=53).[53] The intervention, designed to prevent the development of chronic PTSD, was provided within 30 days of exposure to the potentially traumatic event; treatment was provided in a mental health clinic. The study outcomes were trauma symptoms as measured by the University of California-Los Angeles (UCLA) Post-Traumatic Stress Disorder Index (PTSD-RI) and the Trauma Symptom Checklist for Children (TSCC). The study was funded by a clinical and treatment and service development grant to design early intervention models for youth exposed to a potentially traumatic event. See Table 12 for study characteristics.

Table 12. Child and Family Traumatic Stress Intervention versus wait-list control: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Berkowitz, et al., 2011[53]	Males and females ages 7–17 exposed to potentially traumatic event	Mixed trauma (MVA, sexual abuse, witnessing violence, physical assaults, injuries, threats of violence)	Parallel RCT Four weekly sessions (1–1.5 hours) psychotherapy sessions of CFTSI	Four sessions supportive intervention	Randomized: G1: 53 G2: 53 Analyzed: G1: 53 G2: 53 3-month followup: n=83	Medium

CFTSI=Child and Family Traumatic Stress Intervention; G = group; MVA=motor vehicle accident; RCT = randomized controlled trial

The applicability of this intervention is limited to the specific populations recruited for this study: English-speaking male and female youth ages 7 to 17 years without developmental delay, having psychosis or bipolar disorder who were exposed to a potentially traumatic event including motor vehicle accidents, witnessing of violence, physical assaults, injuries, animal bites, threats of violence, and sexual abuse.

Key Points

We identified one RCT comparing the efficacy of CFTSI to a supportive comparison condition.[53]

- *PTSD symptoms:* Participants in the CFTSI group had significantly greater reductions in PTSD symptomatology than participants receiving a supportive intervention at 3 months following intervention (low SOE).
- *PTSD diagnosis:* Participants in the CFTSI group had a greater decrease in the proportion of those with full and partial PTSD diagnosis at the 3-month followup (low SOE).

Detailed Synthesis

In one RCT[53] CFTSI participants demonstrated a greater decrease in full and partial PTSD diagnoses than the comparison group (Table 13). The children in the CFTSI group also demonstrated a greater reduction in PTSD and anxiety symptom scores than the comparison group. We found insufficient evidence of CFTSI having an effect on dissociation given that only one study met study criteria and the significance of the effect size was not reported; thus, we graded the SOE as insufficient (Table 14). For all other outcomes (PTSD diagnoses and symptoms and anxiety symptoms), we graded the SOE of CFTSI as low given that significant effects were found in only a single study.

Table 13. Child and Family Traumatic Stress Intervention versus supportive comparison: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Berkowitz, et al., 2011[53]	G1: CFTSI G2: Supportive intervention	Greater reduction of full and partial PTSD diagnoses and PTSD symptoms after trauma exposure PTSD symptoms TSCC Post-Traumatic Stress Index (range NR) Pretreatment G1: 53.30 (SD=1.34) G2: 51.74 (SD=1.29) Within-group change at post-treatment assessment: G1: -10.33 (calculated) G2: -5.62 (calculated) Within-group change at 3 months: G1: -13.56 (calculated) G2: -9.52 (calculated) Between-group change at post-treatment assessment: -4.71 (calculated) Between-group change at 3-month assessment: -4.04 (calculated)	Greater reduction in anxiety symptoms but no difference in between-group change in dissociation symptoms TSCC-Dissociation Index (range NR) Pretreatment G1: 47.64 (SD=1.12) G2: 48.23(SD=1.07) Within-group change at post-treatment assessment: G1: -5.38 (calculated) G2: -3.11 (calculated) Within-group change at 3 months: G1: -6.62 (calculated) G2: -4.69 (calculated) Between-group change at post-treatment assessment: -2.27(calculated)	NR	NR

Table 13. Child and Family Traumatic Stress Intervention versus supportive comparison: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Berkowitz, et al., 2011[53] (continued)		Repeated measures with mixed effect models: F=3.25, df=163, p=0.04 UCLA PTSD-RI Index for DSM-IV diagnosis at 3-month followup (range NR) Logistic regression model for full or partial diagnosis: Treatment variable OR (95% CI): 0.268 (0.10, 0.71), p<0.01	Between-group change at 3-month assessment: -1.95 (calculated) Repeated measures with mixed effect models: F=1.28, df=163, p=0.28 TSCC Anxiety Index (range not reported): Pretreatment G1: 51.34 (SD=1.33) G2: 50.45 (SD=1.29) Within-group change at post-treatment assessment: G1: -10.48 (calculated) G2: -4.96 (calculated) Within-group change at 3 months: G1: -11.70 (calculated) G2: -8.63 (calculated) Between-group change at post-treatment assessment: -5.52 (calculated) Between-group change at 3-month assessment: -3.07 (calculated) Repeated measures with mixed effect models: F=4.89, df=163, p=0.009		

CFTSI = Child and Family Traumatic Stress Intervention; CI = confidence interval; df = degrees of freedom; DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition"; G = group; NR = not reported; OR = odds ratio; PTSD = post-traumatic stress disorder; SD = standard deviation; TSCC = Trauma Symptom Checklist for Children; UCLA PTSD-RI = University of California, Los Angeles Post-Traumatic Stress Disorder Reaction Index

Table 14. Strength of evidence for Key Question 1: Child and Family Traumatic Stress Intervention

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
CFTSI vs. supportive comparison[53]	1; 106 (106)	Full or partial PTSD diagnoses (PTSD-RI)	RCT Medium	Unknown	Direct	Precise	Treatment variable odds ratio (95% CI) of 0.268 (0.10, 0.71) for full or partial PTSD diagnosis (using PTSD-RI) at 3 months post-treatment Low
	1; 106 (106)	Post-Traumatic stress symptoms (TSCC PTSD Index)	RCT Medium	Unknown	Direct	Precise	Difference of 4.71 points on the TSCC PTSD Index at post-treatment favoring CFTSI Low
	1; 106 (106)	Dissociative symptoms (TSCC Dissociation Index)	RCT Medium	Unknown	Direct	Imprecise	No between-group difference in change in dissociative symptoms Insufficient
	1; 106 (106)	Anxiety symptoms (TSCC Anxiety Index)	RCT Medium	Unknown	Direct	Precise	Difference of 5.52 points on the TSCC Anxiety Index at post-treatment favoring CFTSI Low

CFTSI = Child and Family Traumatic Stress Intervention; CI = confidence interval; PTSD = post-traumatic stress disorder; PTSD-RI = University of California, Los Angeles Posttraumatic Stress Disorder Reaction Index, Revised; RCT = randomized controlled trial; TSCC = Trauma Symptom Checklist for Children

Key Question 1: School-Based Interventions

Description of Included Studies

We found three RCTs, each rated medium risk of bias, addressing two distinct school-based interventions for KQ 1. Two studies tested the efficacy of the ERASE (Enhancing Resiliency among Students Experiencing) Stress intervention,[54,55] and the other tested the efficacy of the Overshadowing the Threat of Terrorism (OTT) intervention.[56] Tables 15 and 16 present study characteristics, Tables 17 and 18 present results, and Table 19 presents SOE grades.

The first two trials focused on comparing participants in the ERASE Stress program and wait-list controls (Table 14).[54,55] ERASE Stress is a classroom-based program that incorporates psychoeducational material, cognitive behavioral skills, meditative practices, bio-energetic exercises, art therapy, narrative techniques, and home assignments completed with a caregiver (Table 15). Participants in the first study[54] included 166 male and female students ages 9 to 15 years from 12 homeroom classes at a single school in Sri Lanka who had been exposed to a tsunami. All 12 teachers received three 8-hour training sessions on administering the ERASE Stress program. Six teachers delivered the intervention immediately, while the other six teachers delivered religious classes to the wait-list control group participants first, followed by the intervention. Teachers received weekly supervision by two local mental health professionals previously trained by the researchers to ensure program fidelity. Participants in the second study[55] included 107 male seventh- and eighth-grade students (mean age=13.09 years) at an all-male school in a conflicted region of Israel who had been exposed to war and terror attacks. In

this study, three teachers who delivered the intervention had three 90-minute supervision sessions with the author of the treatment manual to ensure consistency in applying the intervention. In addition, trainers who were familiar with the ERASE Stress program observed the teachers during the application phase and rated adherence to the manual in five areas using a 6-point Likert scale. Both ERASE Stress trials consisted of 12 sessions lasting 90 minutes each. The comparison group in both studies consisted of wait-list controls who received the intervention after the study concluded. Assessed outcomes included PTSD symptom severity via the UCLA PTSD Index for DSM-IV, depression symptoms via the Brief Beck Depression Inventory, somatic complaints via five items from the DISC Predictive Scales (DPS), and functional impairment via seven items from the DPS in both studies.[54,55] The first trial[54] also assessed changes in PTSD diagnosis from baseline to followup using the UCLA PTSD Index for DSM-IV. A categorical measure of probable PTSD was constructed by assessing whether the reported symptoms met the criteria required for a DSM-IV diagnosis. A score of at least 3 was necessary for an item to be considered both as a symptom criterion for probable PTSD and a distinct symptom of traumatic stress.

Table 15. ERASE Stress versus wait-list control*:* study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Berger, et al., 2009[54]	Male and females students ages 9–15 years at a selected school in Sri Lanka whose parents/caregivers gave consent	Natural disasters (tsunami exposure in Sri Lanka)	Cluster RCT w/wait-list control 12 weekly sessions of 1.5 hours (18 hours total)	G1: Structured ERASE Stress Sri Lanka classroom-based program that incorporates psychoeducational material, cognitive behavioral skills, meditative practices, bio-energetic exercises, art therapy, narrative techniques, and home assignments completed with a caregiver G2: Wait-list control that received religious classes	Randomized: G1: 84 G2: 82 Analyzed: G1: 84 G2: 82	Medium
Gelkopf, et al., 2009[55]	Male seventh- and eighth-grade students (mean age=13.09 years) at an all-male school in conflicted region of Israel whose parents signed a consent form	War/terror attacks in Israel	Cluster RCT w/wait-list control 12 weekly sessions of 1.5 hours	G1: Structured ERASE Stress classroom-based program that incorporates psychoeducational material, cognitive behavioral skills, meditative practices, bio-energetic exercises, art therapy, narrative techniques, and home assignments completed with a caregiver G2: Wait-list control that received religious classes	Randomized: G1: 58 G2: 49 Analyzed: G1: 58 G2: 49	Medium

ERASE Stress = Enhancing Resiliency Among Students Experiencing Stress; G = group; RCT = randomized controlled trial

The third trial tested the efficacy of the OTT program (Table 16).[56] OTT is a classroom-based program that combines psychoeducational material and skills training with meditative practices, bio-energy exercises, art therapy, and narrative techniques for reprocessing traumatic experiences. Participants included 142 male and female students in 10 classrooms of grades two through six in an area with high levels of terrorism in Israel. All 10 teachers participated in five 4-hour training sessions of the OTT course. Five teachers delivered the intervention, while the other five teachers had wait-list controls as students and thus did not apply the intervention during the study period. The five teachers immediately delivering the OTT program participated in three 3-hour supervisory sessions delivered by trainers to ensure fidelity of the protocol and monitor adherence. The trial consisted of eight sessions lasting 90 minutes each. The comparison group consisted of wait-list controls who received the intervention after the study concluded. The

baseline and follow-up assessments occurred 1 week prior to the start of the intervention and 2 months after the end of the intervention, respectively. Assessments included PTSD symptoms, severity, and diagnosis after the study concluded. Assessed outcomes included PTSD symptom severity via the UCLA PTSD Index for DSM-IV, generalized anxiety and separation anxiety symptoms via the SCARED (Screen for Child Anxiety Related Emotional Disorders), somatic complaints via six items from the DPS, and functional impairment via four items from the Childhood Diagnostic Interview Schedule.

Table 16. Overshadowing the Threat of Terrorism program versus wait-list control: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Berger, et al., 2007[56]	Male and female Israeli students in grades 2–6 in an area with high levels of terrorism-related trauma exposure whose parents signed consent forms	War/terror attacks in Israel	Cluster RCT with wait-list control 8 sessions lasting 90 minutes each	G1: Overshadowing the Threat of Terrorism classroom-based program that combines psychoeducational material and skills training with meditative practices, bio-energy exercises, art therapy, and narrative techniques for reprocessing traumatic experiences. G2: Wait-list control	Randomized: G1: 70 G2: 72 Analyzed: G1: 70 G2: 72	Medium

G = group; RCT = randomized controlled trial

No study reported funding source.

The applicability of these interventions is limited to the specific populations recruited for each study. Although both ERASE Stress trials were conducted on approximately same-aged children, the first study findings[54] apply only to students exposed to a tsunami in Sri Lanka, and the second study findings[55] apply only to male students exposed to war/terror in Israel. The OTT trial[56] findings apply only to male and female students in grades two through six exposed to war/terror in Israel.

Key Points

We found three studies that tested two school-based interventions that addressed KQ 1.

ERASE Stress Versus Wait-List Control

- *PTSD severity*: Participants in the ERASE Stress group had significantly greater decreases in PTSD symptom severity than wait-list group participants between baseline and follow-up assessments in both studies (low SOE[54,55]).
- *PTSD diagnosis*: Participants in the ERASE Stress group had significantly greater decreases in PTSD diagnosis in one study[54] than wait-list group participants. The statistical significance of the comparison between ERASE Stress group participants and wait-list control participants was unknown in the second study[55] (low SOE).
- *Depression symptoms*: Participants in the ERASE Stress group had significantly greater decreases in depression symptoms than wait-list controls between baseline and follow-up assessments in both studies[54,55] (low SOE).
- *Somatic complaints*: Participants in the ERASE Stress group had significantly greater decreases in somatic complaints than wait-list controls in one study.[54] The differences in

the second study are reported as significant, but the magnitude of the difference is unknown because of a data reporting error in the publication[55] (low SOE).

- *Functional impairment*: Participants in the ERASE Stress group had significantly greater decreases in functional impairment than wait-list controls between baseline and follow-up assessments in both studies (low SOE).

Overshadowing the Threat of Terrorism Versus Wait-List Control, Study Characteristics

- *PTSD symptoms:* Participants in the OTT group had significantly greater reduction in PTSD symptoms between baseline and followup than wait-list control participants (low SOE).
- *PTSD severity:* Participants in the OTT group had significantly greater reduction in PTSD severity between baseline and followup than wait-list control participants (low SOE).
- *PTSD diagnosis:* The statistical significance of the comparison of reduction in PTSD diagnosis between OTT and wait-list group participants is not reported (insufficient SOE).
- *Generalized anxiety symptoms:* Participants in the OTT group had significantly greater reduction in generalized anxiety symptoms between baseline and followup than wait-list control participants (low SOE).
- *Separation anxiety symptoms:* Participants in the OTT group had significantly greater reduction in separation anxiety between baseline and followup than wait-list control participants (low SOE).
- *Somatic complaints:* Participants in the OTT group had significantly greater reduction in somatic complaints between baseline and followup than wait-list control participants (low SOE).
- *Functional impairment:* Participants in the OTT group had significantly greater reduction in functional impairment between baseline and followup than wait-list control participants (low SOE).

Detailed Synthesis

ERASE Stress Versus Wait-List Control

Both ERASE trials found that the ERASE Stress arm had significantly greater decreases in PTSD symptom severity (Table 17), significantly greater decreases in depressive symptoms, significantly greater decreases in somatic complaints, and significantly greater decreases in functional impairment. The proportion of participants who lost their PTSD diagnosis between baseline and follow-up assessments was significantly greater in the ERASE Stress group than the wait-list control group in the first study,[54] while the significance was not reported in the second study.[55] We graded the SOE as low for PTSD severity, depressive symptoms, somatic complaints, and functional impairment given that only two studies met inclusion criteria and both reported imprecise estimates (Table 17).

Table 17. ERASE Stress versus wait-list control: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Berger, et al., 2009[54]	G1: Structured ERASE Stress Sri Lanka classroom-based program that incorporated psychoeducational material, cognitive behavioral skills, meditative practices, bio-energetic exercises, art therapy, narrative techniques, and home assignments completed with a caregiver G2: Wait-list control that received religious classes	Greater reduction in PTSD probable DSM-IV diagnosis and PTSD severity (UCLA PTSD Index for DSM-IV PTSD, range=0–68) Diagnosis: Pretreatment G1: 28% (SD=33.3%) G2: 26% (SD=31.7%) Within-group change at post-treatment: G1: -27.3% (calculated) G2: -2.6% (calculated) Between-group change at post-treatment: -24.7% (calculated) Between-group chi-square: X2=14.02, df=2, p=0.001 Severity: Pretreatment G1: 44.94 (SD=8.7) G2: 47.23 (SD=7.2) Within-group change at post-treatment: G1: -8.73 (calculated) G2: -1.52 (calculated) Between-group change at post-treatment: -7.21 (calculated) Between-group ANOVA: F=53.52, df=1,164, p<0.001	Greater reduction in depressive symptoms (Brief Beck Depression Inventory, range=0–21) Pretreatment G1: 4.44 (SD=3.2) G2: 4.04 (SD=3.3) Within-group change at post-treatment: G1: -1.89 (calculated) G2: -0.34 (calculated) Between-group change at post-treatment: -1.55 (calculated) Between-group ANOVA: F=22.55, df=1,164, p<0.001	Greater reduction of somatic complaints (DPS), range=0–5) Pretreatment G1: 1.46 (SD=1.0) G2: 1.26 (SD=1.0) Within-group change at post-treatment: G1: -0.82 (calculated) G2: 0.19 (calculated) Between-group change at post-treatment: -1.01 (calculated) Between-group ANOVA: F=44.80, df=1,164, p<0.001	Greater reduction in functional impairment (Seven items measuring school performance, social relationships, family relationships, and after-school activities from DPS), range=7–35) Pretreatment G1: 11.29 (SD=3.9) G2: 12.05 (SD=4.7) Within-group change at post-treatment: G1: -2.71 (calculated) G2: -0.26 (calculated) Between-group change at post-treatment: -2.45 (calculated) Between-group ANOVA: F=40.73, df=1,164, p<0.001

Table 17. ERASE Stress versus wait-list control: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Gelkopf, et al., 2009[55]	G1: Structured ERASE Stress classroom-based program that incorporated psychoeducational material, cognitive behavioral skills, meditative practices, bio-energetic exercises, art therapy, narrative techniques, and home assignments completed with a caregiver G2: Wait-list control that received religious classes	Greater reduction of PTSD severity (UCLA PTSD Index for DSM-IV (Child version), range=0–68) Diagnosis: Pretreatment G1: 5.2% (calculated) G2: 0% (calculated) Within-group change at post-treatment: G1: -5.2% (calculated) G2: 6.1% (calculated) Between-group change at post-treatment: -11.3% (calculated) p not reported Severity: Pretreatment G1: 23.6 (SD=9.3) G2: 20.4 (SD=10.3) Within-group change at post-treatment: G1: -10.9 (calculated) G2: -1.9 (calculated) Between-group change at post-treatment: -9.0 (calculated) Between group ANOVA: F=49.42, df=1,106, p<0.001	Greater reduction of depression symptoms (Brief Beck Depression Inventory, range=0–21) Pretreatment G1: 3.1 (SD=2.9) G2: 2.3 (SD=2.9) Within-group change at post-treatment: G1: -1.6 (calculated) G2: 0.2 (calculated) Between-group change at post-treatment: -1.8 (calculated) Between-group ANOVA: F=18.66, df=1,106, p<0.001	Greater reduction of somatic complaints (Five items from DPS), range=0–5) Pretreatment G1: 2.1 (SD=1.3) G2: 1.9 (SD=1.2) Within-group change at post-treatment: G1: -1.0 (calculated) G2: Unknown based on data reporting error Between-group change at post-treatment: unknown based on data reporting error Between-group ANOVA: F=24.07, df=1,106, p<0.001	Greater reduction in functional impairment (Seven items measuring school performance, social relationships, family relationships, and after-school activities from DPS), range=7–35) Pretreatment G1: 12.6 (SD=3.7) G2: 12.7 (SD=4.2) Within-group change at post-treatment: G1: -2.3 (calculated) G2: -0.3 (calculated) Between-group change at post-treatment: -2.0 (calculated) Between-group ANOVA: F=15.50, df=1,106, p<0.001

ANOVA = analysis of variance; df = degrees of freedom; DPS = DISC Predictive Scales; DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition"; ERASE Stress – Enhancing Resilience among Students Experiencing Stress; G = group; PTSD = post-traumatic stress disorder; SD = standard deviation; UCLA PTSD-Symptom Severity = University of California, Los Angeles Posttraumatic Stress Disorder-Symptom Severity

Overshadowing the Threat of Terrorism Versus Wait-List Control, Study Characteristics

The OTT arm had significantly greater decreases in PTSD symptoms, significantly greater decreases in PTSD severity, significantly greater decreases in generalized anxiety symptoms, significantly greater decreases in separation anxiety symptoms, significantly greater decreases in somatic complaints, and significantly greater decreases in functional impairment than wait-list controls (Table 18). The significance in the decrease in the proportion of participants with PTSD diagnosis at baseline versus followup is not reported. We found insufficient evidence of OTT having an effect on PTSD diagnosis given that only one study met study criteria and the significance of the effect size was not reported; thus, we graded the SOE as insufficient (Table 19). For all other outcomes (PTSD symptoms and severity, separation anxiety and generalized anxiety symptoms, somatic complaints, and functional impairment), we graded the SOE of OTT as low, given that significant effects were found in only a single study.

Table 18. Overshadowing the Threat of Terrorism program versus wait-list control: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Berger, et al., 2007[56]	G1: Overshadowing the Threat of Terrorism classroom-based program that combined psychoeducational material and skills training with meditative practices, bio-energy exercises, art therapy, and narrative techniques for reprocessing traumatic experiences. G2: Wait-list control	Greater reduction in PTSD symptoms and severity and unknown difference in between-group difference in change in proportion with PTSD diagnosis. (UCLA PTSD Index for DSM-IV PTSD Symptoms (range=0–17) and Severity (range=0–68)) Unknown between group difference in change in PTSD diagnosis (significance not reported) Diagnosis: Pretreatment G1: 8.6% (calculated) G2: 6.9% (calculated)	Greater reduction in generalized and separation anxiety (SCARED Generalized Anxiety range=8–24, Separation Anxiety range=7–-21) Generalized anxiety: Pretreatment G1: 12.5 (SD=2.9) G2: 12.4 (SD=3.1) Within-group change at post-treatment: G1: -2.3 (calculated) G2: 0.5 (calculated) Between-group change at post-treatment: -2.8 (calculated) Between-group ANOVA: F=59.25, df=1,140, p<0.001 Separation anxiety: Pretreatment G1: 14.8 (SD=4.3) G2: 14.3 (SD=3.7)	Greater reduction of somatic complaints (DPS), range=0–6) Pretreatment G1: 2.1 (SD=1.7) G2: 1.9 (SD=1.6) Within-group change at post-treatment: G1: -1.0 (calculated) G2: 0.1 (calculated) Between-group change at post-treatment: -1.1 (calculated) Between-group ANOVA: F=40.44, df=1,140, p<0.001	Greater reduction in functional impairment (Four items measuring school performance, social relationships, family relationships, and after-school activities from Childhood Diagnostic Interview Schedule, range=0–16) Pretreatment G1: 8.5 (SD=2.3) G2: 8.2 (SD=2.2) Within-group change at post-treatment: G1: -1.7 (calculated) G2: 0.1 (calculated) Between-group change at post-treatment: -1.8 (calculated) Between-group ANOVA: F=132.62, df=1,140, p<0.001

Table 18. Overshadowing the Threat of Terrorism program versus wait-list control: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Berger, et al., 2007[56] (continued)		Within-group change in proportion with PTSD at post-treatment G1: -8.6% (calculated) G2: 0% Between-group change in PTSD diagnosis proportion at post-treatment: -8.6% Significance not reported Severity: Pretreatment G1: 25.6 (SD=12.3) G2: 23.5 (SD=11.2) Within-group change at post-treatment: G1: -11.7 (calculated) G2: 0.4 (calculated) Between-group change at post-treatment: -12.1 (calculated) Between-group ANOVA: F=129.33, df=1,140, p<0.001 Symptoms: Pretreatment G1: 7.6 (SD=3.9) G2: 6.7 (SD=3.8) Within-group change at post-treatment: G1: -3.7 (calculated) G2: 0.9 (calculated) Between-group change at post-treatment: -4.6 (calculated) Between-group ANOVA: F=132.62, df=1,140, p<0.001	Within-group change at post-treatment: G1: -2.6 (calculated) G2: -0.2 (calculated) Between-group change at post-treatment: -2.4 (calculated) Between-group ANOVA: F=29.24, df=1,140, p<0.001		

ANOVA = analysis of variance; df = degrees of freedom; DPS = DISC Predictive Scales; DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition"; G = group; PTSD = post-traumatic stress disorder; SCARED = Screen for Child Anxiety Related Emotional Disorders; SD = standard deviation; UCLA PTSD-Symptom Severity = University of California, Los Angeles Posttraumatic Stress Disorder-Symptom Severity

Table 19. Strength of evidence for Key Question 1: school-based interventions

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
ERASE Stress vs. wait-list control	2; 273 (273)	PTSD diagnosis	RCT Medium	Unknown	Direct	Precise	Significantly greater decrease in proportion with PTSD diagnosis in ERASE Stress group in one study (24.7% greater decrease); second study significance not reported (11.3% greater decrease in proportion in ERASE Stress group) Low
	2; 273 (273)	PTSD severity	RCT Medium	Unknown	Direct	Precise	Significantly greater decrease in PTSD symptom severity in both studies (mean differences of 7.21, 9.0) Low
	2; 273 (273)	Depression symptoms	RCT Medium	Consistent	Direct	Precise	Significantly greater decrease in depression symptoms in both studies (mean differences of 1.55,1.8) Low
	2; 273 (273)	Somatic complaints	RCT Medium	Consistent	Direct	Precise	Significantly greater decrease in somatic complaints in both studies (mean differences of 1.01, unknown magnitude in second study) Low
	2; 273 (273)	Functional impairment	RCT Medium	Consistent	Direct	Precise	Significantly greater decrease in functional impairment in both studies (mean differences of 2.45, 2.0) Low
Over-shadowing the Threat of Terrorism vs. wait-list control	1; 142 (142)	PTSD symptoms	RCT Medium	Unknown	Direct	Precise	Significantly greater decrease in PTSD symptoms (mean difference of 4.6) Low
	1; 142 (142)	PTSD severity	RCT Medium	Unknown	Direct	Precise	Significantly greater decrease in PTSD severity (mean difference of 12.1) Low

Table 19. Strength of evidence for Key Question 1: school-based interventions (continued)

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Over-shadowing the Threat of Terrorism vs. wait-list control (continued)	1; 142 (142)	PTSD diagnosis	RCT Medium	Unknown	Direct	Imprecise	Unknown difference in PTSD diagnosis reduction between baseline and followup between groups (difference in proportions of 8.6% favoring treatment group) Insufficient
	1; 142 (142)	General-ized anxiety symptoms	RCT Medium	Unknown	Direct	Precise	Significantly greater decrease in generalized anxiety symptoms (mean difference of 2.8) Low
	1; 142 (142)	Separation anxiety symptoms	RCT Medium	Unknown	Direct	Precise	Significantly greater decrease in separation anxiety symptoms (mean difference of 2.4) Low
	1; 142 (142)	Somatic complaints	RCT Medium	Unknown	Direct	Precise	Significantly greater decrease in somatic complaints (mean difference of 1.1) Low
	1; 142 (142)	Functional impairment	RCT Medium	Unknown	Direct	Precise	Significantly greater decrease in functional impairment (mean difference of 1.8) Low

ERASE Stress = Enhancing Resiliency among Students Experiencing Stress; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

Key Question 1: Early Psychological Intervention

Description of Included Studies

We found one RCT[50] rated medium risk of bias, testing an early psychological intervention.

This study recruited children ages 7 to 16 years from a university hospital in Switzerland who received medical treatment after a road traffic accident (collision). Children and at least one of their parents were contacted within a week after the accident to participate. Inclusion criteria additionally necessitated German fluency, no severe head injury, and no previous evidence of intellectual impairment according to medical records. No children were on psychotropic medicine or other mental health treatment. The program was delivered around 10 days following the collision. The manualized intervention included reconstruction of the accident using drawings and accident-related toys, and psychoeducation. The brief intervention itself consisted

of four steps, lasting a total of about 30 minutes, and was delivered to the child and at least one parent.

Follow-up data were collected at 2 months and 6 months after the accident. Assessments were done using a standardized, 30- to 45-minute interview conducted by trained psychologists at the hospital or in the child's home. Mothers completed questionnaire assessments at the same time. Medical variables were obtained from medical records and responsible physicians.

Standardized instruments were used to assess acute stress disorder (ASD), PTSD (the German version of the CAPS-CA), depressive symptoms (using the German version of the Child Depression Inventory [CDI]) and behavioral problems.

See Table 20 for study characteristics.

Table 20. Early psychological intervention versus usual care: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Number	Risk of Bias
Zehnder, 2010[50]	Children ages 6–17 from Switzerland	Injury (road traffic accidents)	RCT One 30-minute session	G1: Early psychological intervention G2: Usual care	Randomized: G1: 51 G2: 50 Analyzed: 2 months: G1: 50 G2: 50 6 months: G1: 49 G2: 50	Medium

G = group; RCT = randomized controlled trial

This study was funded by grants from the Foundation Mercator (Switzerland).

This study is applicable to school-aged children who received treatment in a hospital for a road traffic accident (collision).

Key Points

- *PTSD symptoms*: Participants in early psychological intervention group had no difference in changes in PTSD symptoms pre- to post-treatment than those in usual care in a single RCT[50] (insufficient SOE).
- *Depression symptoms*: Participants in early psychological intervention group had no difference in changes in depressive symptoms pre- to post-treatment than those in usual care in a single RCT[50] (insufficient SOE).
- *Behavioral problems*: Participants in early psychological intervention group had no difference in changes in behavioral problems pre- to post-treatment than those in usual care in a single RCT[50] (insufficient SOE).

Detailed Synthesis

One RCT[50] found no significant differences in changes in PTSD symptoms, depressive symptoms, or behavioral problems between pretreatment and post-treatment among children receiving the intervention compared with those receiving usual care (Table 21). We graded the SOE as insufficient because of imprecise evidence from a single study (Table 22).

Table 21. Early psychological intervention versus usual care: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Zehnder, 2010[50]	G1: Early psychological intervention G2: Usual care	No between-group difference in changes in PTSD symptoms (IBS-K: range not reported) Pretreatment: G1: 29.3 (SD=23.7) G2: 26.3 (SD=23.0) Within-group change at Time 1: G1: -7.7 (calculated) G2: -7.8 (calculated) Between-group change at Time 1: 0.1 (calculated) Within-group change at Time 2: G1: -5.7 (calculated) G2: -4.4; (calculated) Between-group change at Time 2: -1.3 (calculated) Repeated measures ANOVA treatment by time interaction: F=0.10, p=NS	No between-group difference in anxiety, depression, or anger symptoms (DIKJ: range not reported) Pretreatment: G1: 10.1 (SD=6.0) G2: 9.6 (SD=6.5) Within-group change at Time 1: G1: -1.9 (calculated) G2: -1.0 (calculated) Between-group change at Time 1: -0.9 (calculated) Within-group change at Time 2: G1: -1.0 (calculated) G2: -0.9 (calculated) Between-group change at Time 2: -0.1 (calculated) Repeated measures ANOVA treatment*time interaction: F=0.01, p=NS	NR	No between-group difference in behavioral problems (CBCL: range not reported) CBCL-German version, Mean Pretreatment: G1: 53.4 (SD=9.3) G2: 50.6 (SD=9.1) Within-group change at Time 1: G1: -3.4 (calculated) G2: -0.6 (calculated) Between-group change at Time 1: -2.8 (calculated) Within-group change at Time 2: G1: -2.6 (calculated) G2: -1.8 (calculated) Between-group change at Time 2: -0.8 (calculated) Repeated measures ANOVA treatment*time interaction: F=0.01, p=NS

ANOVA = analysis of variance; CBCL = Child Behavior Checklist; DIKJ = German Version of Child Depression Inventory; G = group; IBS-K = German Version of Clinician-Administered Post-Traumatic Stress Disorder Scale for children and adolescents; NR = not reported; NS = not sufficient; PTSD = post-traumatic stress disorder; SD = standard deviation

Table 22. Early psychological intervention versus usual care: strength of evidence

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Early psychological intervention	1; 101 (99)	PTSD symptoms	RCT Medium	Unknown	Direct	Imprecise	No statistically significant difference in change in PTSD symptoms Insufficient
	1; 101 (99)	Depression symptoms	RCT Medium	Unknown	Direct	Imprecise	No statistically significant change in depression symptoms Insufficient
	1; 101 (99)	Behavioral problems	RCT Medium	Unknown	Direct	Imprecise	No statistically significant change in behavioral problems Insufficient

PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

Key Question 1: Beta-Blocker Medication

Description of Included Studies

Authors found one study conducted to evaluate beta-blocker medication's effect targeting children exposed to trauma. We rated this study as having a low risk of bias.

The study recruited children ages 10 to 18 years who had been involved in multiple types of accidents, presented to an emergency room with injury in the United States, and were screened to have a high risk of developing PTSD. The population was recruited based on exposure to trauma but were all found to be "at risk" of developing PTSD at screening. Study participants were screened and enrolled in an emergency department in the midwestern United States. Medication was administered during admissions and as outpatients for 10 days. Children were excluded if they had a Glasgow Coma Scale less than 14 or if medical conditions contraindicated propranolol. The study evaluated the intervention of 10 days of propranolol medication after an accident with followups 2 and 6 weeks after the accident to assess for PTSD symptoms and physiologic variables. Propranolol is a central-acting beta-blocker that has been shown to decrease memory consolidation in emotionally distressing situation and physiologic reactivity after trauma. Ten days of propranolol was chosen because previous studies[72] had shown efficacy with 10 days of propranolol in adults immediately following trauma. The study used 10 days of liquid placebo as a comparator so that participants and providers could both be blinded to study condition. Other aspects of medical treatment and evaluation were no different between groups. The study did comment on recruitment and adherence to the study protocol and followup. Investigators assessed participants and administered the intervention within 12 hours postadmission for 10 days following the accident. Subjects, providers, and evaluators were blinded to experimental or control status. Study characteristics are presented in Table 23.

Table 23. Beta-blocker medication intervention versus placebo: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Nugent, et al, 2010[57]	Male and female children ages 10–18 at high risk of developing PTSD presenting to an emergency room in the United States with injury	Accidents (multiple types)	Parallel RCT 10 days of medication with 2- and 6-week followup	G1: Propranolol G2: Placebo	Randomized G1: 14 G2: 15 Analyzed G1: 12 G2: 14	Low

G = group; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

The applicability of the study was limited to the participants recruited to the study. Only 2 out of 29 subjects were nonwhite. Accidents included in the study were motor vehicle accidents, bicycle accidents, falls, and miscellaneous. Four participants had had a family member die, 9 had a chronic psychiatric diagnosis, and 8 had had previous trauma. Apart from the racial makeup of patients, the study could be applied to children who had been seen for accidents in the emergency room.

Key Points

We found one study that tested beta-blocker medication that addressed KQ 1.

- *PTSD diagnosis and symptoms*: No differences between groups were found for changes in PTSD diagnosis or symptoms.[57] We rated the SOE as insufficient for the efficacy of beta-blocker medication to decrease PTSD diagnosis and symptoms based on the conclusion of one study with imprecise estimates.
- *Physiologic reactivity*: No differences between groups were found for changes in heart rate reactivity.[57] We rated the SOE as insufficient for the efficacy of propranolol to reduce the physiologic reactivity to trauma triggers based on the results of a single study.

Detailed Synthesis

One RCT[57] found no statistically significant difference in physiologic reactivity by study arms (Table 24). We graded the SOE as insufficient for both PTSD diagnosis, symptoms, and physiologic reactivity outcomes given that only one study met inclusion criteria and owing to lack of precision in the estimates of effect (Table 25).

Table 24. Beta-blocker medication intervention versus placebo: results

Author, Year	Comparison Groups	Traumatic Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Nugent, et al., 2010[57]	G1: Propanolol liquid medication (20 mg/5 mL) at 2.5 mg/kg dosing split twice daily with a 5-day taper and maximum daily dosage of 40 mg twice daily for a total of 10 days. G2: Liquid placebo twice daily for 10 days.	No between-group difference in changes in difference in proportion of those with PTSD diagnosis or changes in PTSD symptoms (CAPS-CA; range not reported) Diagnosis: No data reported for PTSD diagnosis other than x2<1; p=NS for G1 vs. G2 at post-treatment Symptoms: No means reported. Between-group differences at followup not reported. Intent-to-treat linear regression predicting PTSD symptoms at post-treatment, adjusted for sex, age, and prior trauma PTSD severity, showed treatment group OR (95% CI)=1.32 (0.84, 2.08) (calculated*)	NR	No between-group difference in heart rate during or after trauma narrative p=NS. No other data given	NR

CAPS-CA = Clinician-Administered Posttraumatic Stress Disorder Scale for Children and Adolescents; CI = confidence interval; G= group; kg = kilogram; mg = milligram; mL = milliliter; NR = not reported; NS = not sufficient; OR = odds ratio; PTSD = post-traumatic stress disorder

*Calculation is an estimation based on reported unstandardized coefficient and standard error and calculated standard deviation of the treatment group variable, assuming no correlation with other variables in the multivariate model.

Table 25. Strength of evidence for Key Question 1: beta-blocker medication

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Propranolol vs. placebo medication	1; 29 (20)	PTSD diagnosis	RCT Low	Unknown	Direct	Imprecise	No greater difference in proportion with change in PTSD diagnosis at post-treatment. Insufficient
	1; 29 (20)	PTSD symptoms	RCT Low	Unknown	Direct	Imprecise	No greater difference in PTSD symptoms at post-treatment. Insufficient
	1; 29 (20)	Physiologic reactivity	RCT Low	Unknown	Direct	Imprecise	No greater difference in heart rate reactivity to traumatic triggers. Insufficient

PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

Key Question 2: Interventions Targeting Children Exposed to Trauma and Already Having Symptoms

Key Question 2: Trauma-Focused Cognitive Behavioral Therapy

Description of Included Studies

We found one RCT[58] comparing trauma-focused cognitive behavioral therapy (TF-CBT) to wait-list control for the treatment of PTSD in children. This study was rated as having a low risk of bias. In an RCT conducted by Smith,[58] 24 children ages 8 to 18 years and meeting DSM-IV criteria for PTSD after a single-incident traumatic event (motor vehicle accident, interpersonal violence, witnessing of violence) were randomly assigned, after a 4-week symptom-monitoring baseline period, to 10 weeks of TF-CBT (N=12) or placement on a wait list (N=12) for 10 weeks. Participants were recruited from an outpatient mental health trauma clinic in London. The study outcomes were PTSD symptomatology as measured by the self-report Child Post Traumatic Stress Scale (CPSS), the self-report Children's Revised Impact of Event Scale (C-RIES), and the Clinician Administered PTSD Scale (CAPS); anxiety symptoms as measured by the Revised Children's Manifest Anxiety Scale (RCMAS); and depressive symptoms as measured by the Depression Self-Rating Scale (DSRS). The applicability of this intervention is limited to the specific populations recruited. The TF-CBT intervention is applicable to male and female outpatients ages 8 to 18 years presenting for treatment in an outpatient mental health clinic.[58] Study characteristics are presented in Table 26.

Table 26. Trauma-focused cognitive behavioral therapy versus wait-list control: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Smith, 2007[58]	Male and female children ages 8–18, PTSD relating to a single traumatic event, fluent in English	Mixed: MVA, assault, witnessed violence	RCT with wait-list control 10 weekly sessions	G1: CBT G2: Wait-list control	Randomized: G1: 12 G2:12 Analyzed: G1:12 G2:12	Low

CBT = cognitive behavioral therapy; G = group; MVA=motor vehicle accident; PTSD = post-traumatic stress disorder; RCT=randomized clinical trial

Key Points

- *PTSD severity*: Participants in the TF-CBT intervention[58] demonstrated significantly less PTSD symptomatology compared with wait-list control (low SOE).
- *PTSD diagnoses*: At post-treatment, a significantly greater number of TF-CBT participants were free of diagnosis compared with the wait-list control (low SOE).
- *Anxiety*: Participants in the TF-CBT group scored lower than the wait-list control group on anxiety measures (low SOE).
- *Depression*: Participants in the TF-CBT group scored lower than the wait-list control group on depression measures (low SOE).

Detailed Synthesis

One RCT[58] evaluated the efficacy of TF-CBT compared with the wait-list control group in 24 male and female children 8 to 18 years old, presenting to an outpatient community mental health clinic in London (Table 27). Following the TF-CBT intervention, participants rated themselves lower than the wait-list participants on PTSD symptomatology on the CPSS, C-RIES, and CAPS. Participants who participated in the TF-CBT intervention were found to have lower ratings on the CPSS, the C-RIES, and the clinician-administered CAPS score. Participants in the TF-CBT group also scored lower than the wait-list participants on measures of anxiety as assessed by the RCMAS and depression on the DSRS. Eleven of 12 of the children receiving TF-CBT were free of PTSD diagnosis post-treatment, whereas only 5 of 12 children improved in the wait-list group. The first group was reassessed 6 months later. All 12 of the TF-CBT group had lost their PTSD diagnosis at followup and were significantly improved on measures of PTSD (CPSS, RIES, CAPS-CA), and associated depression and anxiety symptoms remained improved. We graded the SOE as low for outcomes with significant differences in outcomes between groups (PTSD diagnosis and symptoms and depression and anxiety symptoms), given that only one study met inclusion criteria (Table 28).

Table 27. Trauma-focused cognitive behavioral therapy versus wait-list control: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Smith, 2007[58]	G1: TF-CBT G2: Inactive control	Greater reduction in proportion with PTSD diagnosis and symptoms of PTSD PTSD diagnosis: ADIS-C/P (range of scale not reported) Pretreatment G1: 100% G2: 100% Within-group change in proportions at post-treatment: G1: -92% G2: -42% Between-group change in proportions at post-treatment: -50% (calculated) X^2=6.8, df=1, 24, p<0.01 PTSD symptoms: CPSS (range of scale not reported) Pretreatment G1: 28.1 (SD=8.8) G2: 28.3 (SD=10.5) Within-group change at post-treatment: G1: -25.1 (calculated) G2: -3.05 (calculated) Between-group change at post-treatment: -22.05 (calculated) MANCOVA F=48.3, df=1,18, p<0.001 C-RIES (range of scale not reported) Pretreatment G1: 47.5 (SD=11.5) G2: 41.6 (SD=11.7) Within-group change at post-treatment: G1: -39.0 (calculated) G2: -6.3 (calculated)	Greater reduction of symptoms of depression DSRS (range of scale not reported) Pretreatment G1: 18.3 (SD=5.2) G2: 13.9 (SD=5.6) Within-group change at post-treatment: G1: -10.3 (calculated) G2: -0.6 (calculated) Between-group change at post-treatment: -9.7 (calculated) MANCOVA F=19.1, df=1,18, p<0.001 Greater reduction of symptoms of anxiety RCMAS (range of scale not reported) Pretreatment G1: 19.8 (SD=5.6) G2: 16.3 (SD=5.7) Within-group change at post-treatment: G1: -12.4 (calculated) G2: 0.2 (calculated) Between-group change at post-treatment: -12.6 (calculated) MANCOVA F=14.3, df=1,18, p<0.005	NR	NR

Table 27. Trauma-focused cognitive behavioral therapy versus wait-list control: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Smith, 2007[58] (continued)		Between-group change at post-treatment: -32.7 (calculated) MANCOVA F=36.8, df=1,18, p<0.001 CAPS-CA (range of scale not reported) Pretreatment G1: 60.9 (SD=9.6) G2: 54.7 (SD=14.6) Within-group change at post-treatment: G1: -48.9 (calculated) G2: -14.4 (calculated) Between-group change at post-treatment: -34.5 (calculated) MANCOVA F=20.2, df=1,18, p<0.005			

ADIS-C/P = Anxiety Disorders Interview Schedule; CAPS-CA = Clinician-Administered PTSD Scale for Children and Adolescents; CPSS = Child Post-Traumatic Stress Disorder Symptom Scale; C-RIES = Children's Revised Impact of Event Scale; df = degrees of freedom; DSRS = Depression Self-Rating Scale; G = group; MANCOVA = multivariate analysis of covariance; NR = not reported; PTSD = post-traumatic stress disorder; RCMAS = Revised Children's Manifest Anxiety Scale; SD = standard deviation; TF-CBT = trauma-focused cognitive behavioral therapy

Table 28. Strength of evidence for Key Question 2: trauma-focused cognitive behavioral therapy

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
TF-CBT vs. wait-list control[58]	1; 38 (38)	PTSD symptoms	RCT Low	Unknown	Direct	Precise	Cohen effect size 2.48 on CPSS scale favoring TF-CBT Low
	1; 38 (38)	PTSD symptoms	RCT Low	Unknown	Direct	Precise	Cohen effect size 2.20 on the C-RIES scale favoring TF-CBT Low
	1:38 (38)	PTSD symptoms	RCT Low	Unknown	Direct	Precise	Cohen effect size 1.59 on the clinician-administered CAPS-CA scale favoring TF-CBT Low
	1; 38 (38)	PTSD diagnosis	RCT Low	Unknown	Direct	Precise	Difference in proportion with PTSD diagnosis of 50% favoring TF-CBT Low
	1; 38 (38)	Anxiety	RCT Low	Unknown	Direct	Precise	Difference of 12.6 points on the RCMAS favoring TF-CBT Low
	1; 38 (38)	Depression	RCT Low	Unknown	Direct	Precise	Difference of 9.7 points on the DSRS favoring TF-CBT Low

CAPS-CA = Clinician-Administered Post-Traumatic Stress Disorder Scale for Children and Adolescents; CPSS = Child Post-Traumatic Stress Disorder Symptom Scale; C-RIES = Children's Revised Impact of Event Scale; DSRS = Depression Self-Rating Scale; PTSD = post-traumatic stress disorder; RCMAS = Revised Children's Manifest Anxiety Scale; RCT = randomized controlled trial; TF-CBT = trauma-focused cognitive behavioral therapy

Key Question 2: Cognitive Behavioral Intervention for Trauma in Schools

Description of Included Studies

We found two RCTs[47,64] comparing Cognitive Behavioral Intervention for Trauma in Schools (CBITS) to wait-list controls for the treatment of children exposed to trauma and already experiencing symptoms, both rated as having a medium risk of bias. One RCT[64] was conducted in the schools with sixth-grade students in Los Angeles exposed to violence and with clinical symptoms of PTSD.[64] Sixty-one 11-year-old students were randomly assigned to a 10-session cognitive behavioral therapy (CBT) early intervention group, and 65 students were assigned to a wait-list delayed intervention comparison group. The study outcomes were child-reported

symptoms of PTSD (CPSS) and depression (CDI), parent-reported psychosocial dysfunction (Pediatric Symptom Checklist [PSC]), and teacher-reported classroom problems using the Teacher-Child Rating Scale. This study was funded by the National Institute of Mental Health, Substance Abuse and Mental Health Services Administration, Centers for Disease Control and Prevention, Robert Wood Johnson Foundation Clinical Scholar Program, and Los Angeles Unified School District.

The second RCT[47] was a small pilot study (n=78) conducted to evaluate the Support for Students Exposed to Trauma (SSET) intervention, which has the same core cognitive behavioral elements as CBITS. The sample included predominantly Latino (88%) and African-American (12%) middle school students (sixth through eighth grades) from Los Angeles (mean age=11.5 years) who experienced violence in the past year and had current PTSD symptoms Thirty-nine middle school students were randomly assigned to 10 45-minute weekly SSET sessions, based on CBITS, and 39 students were assigned to a wait-list delayed intervention comparison group. The study outcomes were child-reported symptoms of PTSD (CPSS) and depression (CDI), and both parent-reported and teacher-reported problem behaviors as indicated by the Strength and Difficulties Questionnaire (SDQ). This study was funded by the National Institute of Mental Health.

The applicability of these interventions is limited to the specific populations recruited. Both trials were limited to male and female sixth-grade inner city, minority children exposed to violence. Study characteristics are presented in Table 29.

Table 29. Cognitive Behavioral Intervention for Trauma in Schools versus wait-list control: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Stein, 2003[64]	Male and female sixth-grade students, average age 11 years	Community violence	RCT with wait-list control 10 weekly sessions	G1: CBITS G2: Wait-list control	Randomized: G1: 61 G2: 65 Analyzed: G1:54 G2:63	Medium
Jaycox, 2009[47]	Male and female sixth to eighth grade students, average age 11.5 years	Community violence	RCT with wait-list control 10 weekly sessions	G1: SSET (CBITS) G2: Wait-list control	Randomized: G1: 39 G2: 39 Analyzed: G1: 39 G2: 37	Medium

CBITS = Cognitive Behavioral Intervention for Trauma in Schools; G = group; RCT = randomized clinical trial; SSET = Support for Students Exposed to Trauma

Key Points

- *PTSD severity*: Participants in the CBITS intervention reported significantly lower symptoms of PTSD following intervention than wait-list control participants in one study and nonsignificant differences in the other study (low SOE).
- *Depression*: Participants in the CBITS intervention reported significantly lower levels of depression following intervention compared with wait-list control participants (low SOE).
- *Psychosocial dysfunction:* Parents of participants in the CBITS intervention group reported significantly less psychosocial dysfunction following intervention compared with parents of students in the wait-list control group (low SOE).

- *Acting out behaviors*: No differences in teacher-reported classroom acting out behavior in participants following CBITS intervention compared with wait-list controls (insufficient SOE).
- *Shyness/anxiousness*: No differences in teacher-reported shyness/anxiety in participants following CBITS intervention compared with wait-list controls (insufficient SOE).
- *Learning problems*: No differences in teacher-reported learning problems in participants following CBITS intervention compared with wait-list controls (insufficient SOE).
- *Problem behaviors (parent-rated)*: No differences in parent-reported problem behaviors in participants following CBITS intervention compared with wait-list controls (insufficient SOE).
- *Problem behaviors (teacher-rated)*: No differences in teacher-reported problem behaviors in participants following CBITS intervention compared with wait-list controls (insufficient SOE).

Detailed Synthesis

Two RCTs[47,64] evaluated a CBITS intervention versus wait-list control in groups of Los Angeles middle school students (Table 30). At the conclusion of the intervention, children had lower scores on symptoms of PTSD as measured by the CPSS in one study but nonsignificant differences in the other. We graded the SOE for CBITS on PTSD symptoms as insufficient given the discrepant findings. We did find that CBITS was associated with greater decreases in depression as measured by the CDI in both studies and psychosocial dysfunction on the PSC in one study. Thus, we graded the SOE as low for depression and psychosocial dysfunction because these studies concluded significant differences between groups. There were no differences found for teacher-reported classroom problems in acting out, shyness/anxiousness, and learning in one study and on parent- and teacher-reported problem behaviors in the other study. For these outcomes with nonsignificant differences between groups, we graded the SOE as insufficient because only one study met inclusion criteria for each of these outcomes (Table 31).

Table 30. Cognitive Behavioral Intervention for Trauma in Schools versus wait-list control: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Stein, 2003[64]	G1: CBITS G2: WL control	Greater reduction in symptoms of PTSD CPSS (range 0–51) Pretreatment G1: 24.5 (6.8) G2: 23.5 (7.2) Within-group change: G1: -15.6 (calculated) G2: -8.0 (calculated) Adjusted between-group change (95% CI): -7.0 (-10.8 to -3.2)	Greater reduction in symptoms of depression CDI (range 0–52) Pretreatment G1: 17.6 (10.8) G2: 16.7 (7.3) Within-group change: G1: -8.2 (calculated) G2: -4.0 (calculated) Adjusted between-group change (95% CI): -3.4 (-6.5 to -0.4)	NR	Greater reduction in (parent-reported) psychosocial dysfunction PSC (range 0–70) Pretreatment G1: 19.1 (9.4) G2: 16.2 (8.1) Within-group change: G1: -6.6 (calculated) G2: 0.3 (calculated) Adjusted between-group change (95% CI): -6.4 (-10.4 to -2.3) No differences between groups in (teacher reported) changes in learning problems, acting out behaviors, or anxiety Learning Problems: TCRS (subscale range 6–30) Learning Problems: Pretreatment G1: 13.8 (7.3) G2: 12.7 (7.0) Within-group change: G1: -1.1 (calculated) G2: 0.6 (calculated) Adjusted between-group change (95% CI): -1.1 (-2.9 to 0.8) Shyness/anxiousness scale: TCRS (subscale range 6–30) Pretreatment G1: 10.2 (4.1) G2: 11.0 (5.1) Within-group change: G1: -0.4 (calculated) G2: -0.4 (calculated) Adjusted between-group change (95% CI): 0.1 (-1.5 to 1.7) Acting out problems scale: TCRS (subscale range 6–30) Pretreatment G1: 11.3 (7.0) G2: 10.6 (5.5)

Table 30. Cognitive Behavioral Intervention for Trauma in Schools versus wait-list control: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Stein, 2003[64] (continued)					Within-group change: G1: -1.9 (calculated) G2: -0.4 (calculated) Adjusted between group change (95% CI): -1.0 (-2.5 to 0.5)
Jaycox, 2009 [47]	G1: SSET (CBITS) G2: WL control	No significant between-group changes in PTSD symptoms CPSS (range=NR) Pretreatment: G1: 17.46 (SD=10.37) G2: 19.41 (SD=10.00) Within-group change at post-treatment: G1: -3.74 (calculated); d=-0.39 G2: -1.09 (calculated); d=-0.16 Between group change at post-treatment: -2.65 (calculated); d (difference)= -0.23; regression estimate for followup controlling for baseline=0.58, t= -1.89, p=0.058; fixed effects model adjusted for school and group leader found that estimates "remained stable"	Greater reduction in symptoms of depression CDI (range=NR) Pretreatment: G1: 13.87 (SD=8.52) G2: 14.32 (SD=9.20) Within-group change at post-treatment: G1: -2.10 (calculated); d=-0.25 G2: 0.60 (calculated); d= 0.07 Between group change at post-treatment: -2.70 (calculated); d (difference)= -0.32; regression estimate of followup controlling for baseline=0.65, t=-1.99, p=0.046; fixed effects model adjusted for school and group leader found that estimates "remained stable"	NR	No significant between-group changes in parent-rated problem behaviors SDQ (range=NR) Pretreatment: G1: 11.64 (SD=5.80) G2: 12.46 (SD=5.90) Within-group change at post-treatment: G1: -1.92 (calculated); d=-0.39 G2: -1.16 (calculated); d=-0.28 Between-group difference at post-treatment: -0.76 (calculated); d (difference)=-0.10; regression estimate for followup controlling for baseline NR, t=-0.19, p=NS No significant between-group changes in teacher-rated problem behaviors SDQ (range=NR) Pretreatment: G1: 11.33 (SD=7.87) G2: 8.59 (SD=7.37) Within-group change at post-treatment: G1: -1.05 (calculated); d=0.006 G2: 0.71 (calculated); d=0.28 Between-group difference at postttreatment assessment: -0.34 (calculated); d (difference)=-0.28; regression estimate for followup controlling for baseline NR, t=-1.22, p=NS

CBITS = Cognitive Behavioral Intervention for Trauma in Schools; CDI = Child Depression Inventory; CI = confidence interval; CPSS = Child Post-Traumatic Stress Disorder Symptom Scale; d = effect size; G = group; NR = not reported; NS = not sufficient; PSC = Pediatric Symptom Checklist; PTSD = post-traumatic stress disorder; SD = standard deviation; SDQ = Strengths and Difficulties Questionnaire; SSET = Support for Students Exposed to Trauma; TCRS = Teacher Child Rating Scale; WL = wait list

Table 31. Strength of evidence for Key Question 2 psychotherapy: Cognitive Behavioral Intervention for Trauma in Schools

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
CBITS vs. wait-list control[64]	2; 204 (202)	PTSD symptoms	RCT Medium	Inconsistent	Direct	Imprecise	Difference of 7 points on CPSS favoring CBITS in one study; no difference in changes in PTSD symptoms in the other study Insufficient
	2; 204 (202)	Depression symptoms	RCT Medium	Consistent	Direct	Precise	Difference of 3.4 and 2.7 points on CDI favoring CBITS in both studies, respectively Low
	1; 126 (126)	Psycho-social dysfunction (parent - reported)	RCT Medium	Unknown	Indirect	Precise	Difference of 6.4 points on parent-rated PSC favoring CBITS Low
	1; 126 (126)	Acting out behaviors in classroom (teacher reported)	RCT Medium	Unknown	Direct	Imprecise	No statistically significant difference in change in acting out behaviors subscale on Teacher Child Rating Scale Insufficient
	1; 126 (126)	Shyness / anxiety (teacher reported)	RCT Medium	Unknown	Direct	Imprecise	No statistically significant difference in change in shyness/anxiety subscale on Teacher Child Rating Scale Insufficient
	1; 126 (126)	Learning problems (teacher reported)	RCT Medium	Unknown	Direct	Imprecise	No statistically significant difference in change in learning problems subscale on Teacher Child Rating Scale
	1; 78 (76)	Problem behaviors (parent reported)	RCT Medium	Unknown	Indirect	Imprecise	No statistically significant difference in change in parent-reported problem behaviors
	1; 78 (76)	Problem behaviors (teacher reported)	RCT Medium	Unknown	Indirect	Imprecise	No statistically significant difference in change in teacher-reported problem behaviors

CBITS = Cognitive Behavioral Intervention for Trauma in Schools; CDI = Child Depression Inventory; CPSS = Child Post-Traumatic Stress Disorder Symptom Scale; PSC = Pediatric Symptom Checklist; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

Key Question 2: Cognitive Processing Therapy

Description of Included Studies

We found one RCT[59] that compared cognitive processing therapy (CPT) to wait-list control. One RCT conducted by Ahrens[59] evaluated the efficacy of CPT on self-reported symptoms of trauma in a population of incarcerated males. Participants were incarcerated males ages 15 to 18 years identified as meeting the DSM-IV criteria for PTSD. They were randomly assigned to 8 sessions of CPT (N=19) or wait-list (N=19) control. The CPT treatment included psychoeducation about PTSD and exposure and cognitive restructuring strategies, including creating a narrative describing the trauma. Eleven of the youth had experienced multiple traumas, and 12 of the youth reported having seen someone they knew die, often in gang violence. Twenty of the youth reported having experienced a head injury that had led to a loss of consciousness. Outcomes were measured using the PTSD Symptom Scale-Self-Report (PSS-SR), the Impact of Events Scale (IES), and the Beck Depression Inventory. The funding source was not reported. The applicability of this intervention is limited to the specific populations recruited. The CPT trial[59] is limited to male incarcerated youth ages 15 to 18 years old. Study characteristics are presented in Table 32.

Table 32. Cognitive processing therapy versus wait-list control: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Ahrens, 2001[59]	Incarcerated males ages 15–18	Mixed	RCT with wait-list control 8 weekly 1-hour sessions	G1: CPT G2: Wait-list control	Randomized: N=38 G1: 19 G2: 19 Analyzed: G1: NR G2: NR	Medium

CPT = Cognitive Processing Therapy; G = group; N = number; NR = not reported; RCT = randomized clinical trial

Key Points

- *PTSD severity*: Incarcerated male youth reported significantly fewer symptoms of PTSD after CPT treatment compared with wait-list controls (low SOE).
- *Depression*: Incarcerated male youth reported significantly lower levels of depression after CPT treatment compared with wait-list controls (low SOE).

Detailed Synthesis

One RCT[59] evaluated the efficacy of CPT on self-reported symptoms of trauma in a population of incarcerated males with PTSD ages 15 to 18 years (Table 33). Following treatment with CPT, the participants reported significantly fewer symptoms of PTSD as measured by the PSS-SR and the IES and lower levels of depression. We graded the SOE as low for outcomes with significant differences in outcomes between groups (PTSD and depression symptoms), given that only one study met the inclusion criteria (Table 34).

Table 33. Cognitive processing therapy versus wait-list control: Results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Ahrens, 2002[59]	G1: CPT G2: WL control	Greater reduction in PTSD symptoms PSS-SR (17 items, range of scale not reported) Pretreatment G1: 16.89 (SD=10.49) G2: 19.36 (SD=10.12) Within-group change: G1: -9.07 (calculated) G2: 1.02 (calculated) Between-group change: -10.09 (calculated) ANOVA (1, 36)=19.44, p=0.0001 IES (15 items, range of scale not reported): Pretreatment G1: 35.52 (SD=11.80) G2: 33.42 (SD=8.70) Within-group change: G1: -12.11 (calculated) G2: 2.08 (calculated) Between-group change: -14.19 (calculated) ANOVA (1, 36)=20.49, p=0.0001	Greater reduction in depression symptoms BDI (21 items, range of scale not reported) Pretreatment G1: 15.26 (SD=12.10) G2: 18.52 (SD=9.97) Within-group change: G1: -8.38 (calculated) G2: -0.58 (calculated) Between-group change (95% CI): -7.80 (calculated) ANOVA (1, 36)=17.95, p=0.02	NR	NR

ANOVA = analysis of variance; BDI = Beck Depression Inventory; CPT = cognitive processing therapy; G = group; IES = Impact of Events Scale; NR = not reported; PTSD = post-traumatic stress disorder; PSS-SR = Post-Traumatic stress disorder Symptom Scale Self-Report; SD = standard deviation; WL = wait list

Table 34. Strength of evidence for Key Question 2: cognitive processing therapy

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
CPT vs. wait-list control[59]	1; 38 (38)	PTSD symptoms	RCT Medium	Unknown	Direct	Precise	Difference of 10.09 points on PSS-SR scale favoring CPT Low Difference of 14.19 on IES favoring CPT Low
	1; 38 (38)	Depression	RCT Medium	Unknown	Direct	Precise	Difference of 7.8 points on BDI scale favoring CPT Low

BDI = Beck Depression Inventory; CPT = cognitive processing therapy; IES = Impact of Events Scale; PSS-SR = Post-Traumatic Stress Disorder Symptom Scale Self-Report; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

Key Question 2: Interventions to Treat Child Post-Traumatic Stress Symptoms: Narrative Exposure Therapy

Description of Included Studies

We found one RCT, rated medium risk of bias,[60] comparing exposure therapy and meditation-relaxation therapy in children exposed to civil war and natural disaster.

This study identified 31 children ages 8 to 14 years old living at a refugee camp in Sri Lanka with a preliminary diagnosis of PTSD. Children were identified with potential PTSD (n=71) from an epidemiologic survey and excluded if they failed to meet diagnostic criteria for PTSD. Other exclusion criteria included mental retardation, neurologic disorder, and psychosis. No children were excluded for these reasons. The study took place 3 weeks after a tsunami that severely affected the region. Interventions included narrative exposure therapy for children (KIDNET) and active comparison of meditation-relaxation therapy (MED-RELAX) with 16 and 15 children in each treatment protocol, respectively. Children in both arms participated in 6 sessions of 60 to 90 minutes each. Outcome interviews were conducted 6 months after treatment. Observed outcomes included the University of California-Los Angeles (UCLA) PTSD Index for DSM-IV (UPID) and 2 project-derived 5-item scales of areas of functional impairment (e.g., social relationships, family life, and general life satisfaction), and physical problems or somatic complains (e.g., headache, stomach ache, fever, vomiting, and diarrhea). All treatment and interviews were conducted in 2 provisional refugee camps. See Table 35 for study characteristics.

Table 35. Narrative exposure therapy versus meditation-relaxation therapy: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Catani, et al., 2009[60]	Male and female refugees ages 8–14 from villages destroyed by tsunami 3 weeks earlier	Natural disasters	RCT with active control Six sessions over 2 weeks 60–90 minutes duration	Meditation-relaxation therapy	Randomized: G1: 16 G2: 15 Analyzed: G1: 16 G2: 14	Low

G = group; RCT = randomized controlled trial

The research was supported by funding from Deutsche Forschungsgemeinschaft (German Research Foundation) and the “Ein Herz für Kinder” foundation.

This study includes two efficient treatment protocols that may be effective in treating PTSD in resource-poor settings affected by natural disaster and/or civil war-related violence.

Key Points

- *PTSD diagnosis*: Participants in the KIDNET (narrative exposure therapy) group did not have significantly different improvements in PTSD diagnoses at 1- or 6-month followups than participants in the MED-RELAX (active comparison) group (insufficient evidence).
- *Post-traumatic stress symptoms*: Participants in the KIDNET (narrative exposure therapy) group did not have significantly different improvements in PTSD symptoms at 1- or 6-month followups than participants in the MED-RELAX (active comparison) group (insufficient evidence).

- *Physical symptoms*: Participants in the KIDNET (narrative exposure therapy) group did not have significantly different improvements in physical symptoms at 1- or 6-month followups than participants in the MED-RELAX (active comparison) group (insufficient evidence).
- *Functioning problems*: Participants in the KIDNET (narrative exposure therapy) group did not have significantly different improvements in functioning problems 1- or 6-month followups than participants in the MED-RELAX (active comparison) group (insufficient evidence).

Detailed Synthesis

One RCT[60] found no statistically significant difference in PTSD symptoms or diagnosis by study arm. Both narrative exposure therapy versus meditation-relaxation therapy treatments demonstrated large reductions in PTSD severity and diagnosis as well as smaller decreases in physical symptoms and functional impairments; however, the comparison between narrative exposure therapy and active control showed no significant differences (Table 36). We graded the SOE as insufficient because of the lack of statistical significance in a single study with few subjects (Table 37).

Table 36. Narrative exposure therapy versus meditation-relaxation therapy: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Catani et al., 2009[60]	G1: Narrative exposure therapy G2: Meditation-relaxation therapy	No between group differences in change in PTSD symptoms UCLA PTSD-I for DSM-IV (score 0–80) Pretreatment G1: 37.94 (SD=14.8) G2: 36.58 (SD=14.9) Within-group change at post-treatment assessment: G1: -25.53 (calculated) G2: -23.99 (calculated) Within-group change at 6 months: G1: -26.63 (calculated) G2: -26.83 (calculated) Between-group change at post-treatment assessment: -1.54 (calculated) Between-group change at 6-month assessment:0.20 (calculated) Repeated measures ANOVA for Time x Treatment interaction p=0.9	NR	No between group differences in change in number of physical symptoms Five questions about specific somatic complaints in last 4 weeks. Pretreatment G1: 1.75 (SD=1.34) G2: 1.80 (SD=1.26) Within-group change at post-treatment assessment: G1: -0.25 (calculated) G2: -1.13 (calculated) Within-group change at 6 months: G1: -0.25 (calculated) G2: -0.51 (calculated) Between-group change at post-treatment assessment:	No between group differences in change in number of functioning problems Five questions related to problems in functioning in different areas of children's life Pretreatment G1: 2.06 (SD=1.34) G2: 2.14 (SD=1.17) Within-group change at post-treatment assessment: G1: -1.56 (calculated) G2: -1.34 (calculated) Within-group change at 6 months: G1: -1.62 (calculated) G2: -1.43 (calculated) Between-group change at post-treatment assessment:

Table 36. Narrative exposure therapy versus meditation-relaxation therapy: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Catani et al., 2009[60] (continued)		No between-group differences in change in proportion with PTSD diagnosis UCLA PTSD-I for DSM-IV Pretreatment G1: 100% G2: 100% Within-group change in proportion at post-treatment assessment: G1: -75% G2: -66.6% Within-group change in proportion at 6 months: G1: -81.3% G2: -71.4% Between-group change at post-treatment assessment: 8.4% (calculated) Chi-square difference p=NS Between-group change at 6 month assessment: -9.9% Chi-square difference p=NS		0.88 (calculated) Repeated measures ANOVA for Time x Treatment interaction p=NS Between-group change at 6-month assessment: 0.26 (calculated) Repeated measures ANOVA for Time x Treatment interaction p=NS	-0.22 (calculated) Repeated measures ANOVA for Time x Treatment interaction p=NS Between-group change at 6-month assessment: -0.19 (calculated) Repeated measures ANOVA for Time x Treatment interaction p=NS

ANOVA = analysis of variance; DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition"; G = group; NR = not reported; NS = not sufficient; PTSD = post-traumatic stress disorder; SD = standard deviation; UCLA = University of California, Los Angeles Post-Traumatic Stress Disorder Index

Table 37. Strength of evidence for narrative exposure therapy

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Narrative exposure therapy	1; 31 (30)	PTSD diagnosis	RCT Low	Unknown	Direct	Imprecise	Insufficient
	1; 31 (30)	PTSD symptoms	RCT Low	Unknown	Direct	Imprecise	Insufficient
	1; 31 (30)	Physical symptoms	RCT Low	Unknown	Direct	Imprecise	Insufficient
	1; 31 (30)	Functional symptoms	RCT Low	Unknown	Direct	Imprecise	Insufficient

PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

Key Question 2: Grief- and Trauma-Focused Interventions

Description of Included Studies

We found one RCT, rated medium risk of bias,[61] addressing grief- and trauma-focused interventions. This study compared group and individual interventions.[61]

This study identified 56 children ages 7 to 12 years 4 months after exposure to Hurricane Katrina enrolled at a single elementary school. The subjects had to be identified from a single school as having experienced loss of home or loved one and experiencing at least moderate levels of post-traumatic stress symptoms. Children were excluded if they were less than 1 month from loss, actively suicidal, or considered inappropriate for group therapy. The study compared individual with group trauma- and grief-focused therapy. The interventions used a manualized approach incorporating CBT and narrative exposure therapy. Each arm was designed with 10 1-hour weekly sessions and one parent meeting. Outcome measures included the PTSD symptom scores (UCLA PTSD Index), depressive symptoms (MFQ-C—Mood & Feelings Questionnaire), traumatic grief (Traumatic Grief Subscale of the UCLA Grief Inventory Revised), and global distress (single project-derived item). These outcomes did not vary by intervention group. The outcomes were assessed at the end of the intervention and at followup, which occurred an average of 20 days post-treatment. The treatment was delivered in the school. See Table 38 for study characteristics.

Table 38. Individual versus group grief- and trauma-focused intervention: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Salloum, et al., 2008[61]	Male and female students ages 7–12 in a New Orleans school, at least 1 month post loss (loved one/home), moderate symptoms	Natural disasters	RCT with active control 10 weekly 1-hour sessions (10 hours total)	G1: Individual grief- and trauma-focused intervention G2: Group grief- and trauma-focused intervention	G1: 23 G2: 22 Analyzed: G1: 18 G2: 16	Medium

G = group; RCT = randomized controlled trial

This study was funded by the Institute of Mental Hygiene, New Orleans, Louisiana.

This study is applicable to children in school settings with loss of loved one or home by natural disaster who are experiencing moderate levels of post-traumatic stress symptoms.

Key Points

- *Post-traumatic stress symptoms*: Participants in the individual therapy group did not have significantly different improvements in PTSD symptoms at the 20-day followup than participants in the group intervention (insufficient evidence).
- *Depressive symptoms*: Participants in the individual therapy group did not have significantly different improvements in depressive symptoms at the 20-day followup than participants in the group intervention (insufficient evidence).

Detailed Synthesis

One RCT[61] found no statistically significant difference in PTSD symptoms or depressive symptoms by study arm (Table 39). Both individual and group grief- and trauma-focused

intervention treatments demonstrated large reductions in PTSD severity and depressive symptoms. We graded the SOE as insufficient because of the lack of statistical significance in a single study with few subjects (Table 40).

Table 39. Individual versus group grief- and trauma-focused intervention: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Salloum, 2008[61]	G1: Group grief- and trauma-focused intervention G2: Individual grief- and trauma-focused intervention	No between-group differences in change in PTSD symptom (UCLA PTSD –I for DSM-IV Child version, range 0–80) Pretreatment G1: 44.03 (SD=13.03) G2: 42.32 (SD=9.58) Post-treatment G1: 28.28 (SD=13.61) G2: 31.32 (SD=12.43) Within-group change at post-treatment assessment: G1: -15.75 (calculated) G2: -11.00 (calculated) Within-group change in proportion at 20 day followup: G1: -21.60 (calculated) G2: -20.47 (calculated) Between-group change at post-treatment assessment: -4.75 (calculated) Intent-to-treat analyses effect size: 0.95 Between-group change at 6-month assessment: -1.13 (calculated) Intent-to-treat analyses effect size: 1.34 General linear modeling repeated measure procedure time X treatment interaction p=NS	No between-group differences in change in of depression symptoms (Mood and Feelings Questionnaire) Pretreatment G1: 25.48 (SD=9.17) G2: 23.41 (SD=9.58) Within-group change at post-treatment assessment: G1: -8.57 (calculated) G2: -2.95 (calculated) Within-group change in proportion at 20-day followup: G1: -12.48 (calculated) G2: -9.18 (calculated) Between-group change at post-treatment assessment: -5.62 (calculated) Intent-to-treat analyses effect size: 0.47 Between-group change at 6-month assessment: -3.30 (calculated) Intent-to-treat analyses effect size: 0.92 General linear modeling repeated measure procedure time X treatment interaction p=NS	NR	NR

DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition"; G = group; NR = not reported; NS = not significant; PTSD = post-traumatic stress disorder; SD = standard deviation; UCLA PTSD-I = University of California, Los Angeles Posttraumatic Stress Disorder Index

Table 40. Individual versus group grief- and trauma-focused intervention: strength of evidence

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Individual grief- and trauma-focused intervention	1; 55 (44)	Posttraumatic stress symptoms	RCT Medium	Unknown	Direct	Imprecise	Insufficient
	1; 55 (44)	Depressive symptoms	RCT Medium	Unknown	Direct	Imprecise	Insufficient

RCT = randomized controlled trial

Key Question 2: Grief and Trauma Intervention with Coping Skills and Trauma Narrative Processing

Description of Included Studies

We found one RCT,[62] rated low risk of bias, testing a grief and trauma intervention with trauma narrative processing (GTI-CN) versus a grief and trauma intervention with coping skills only (GTI-C).

This study randomized 72 6- to 12-year-old (mean age=9.6 years) male and female African-American students from 4 schools with exposure to multiple traumas, including Hurricane Katrina 3 years prior and Hurricane Gustav during study recruitment. Inclusion criteria were parental consent and child assent; enrolled in the second through sixth grade; exposure to violence, hurricane-related exposure, or exposure to death; and at least moderate levels of PTSD symptoms as determined by a score of 25 or greater on the UCLA-PTSD-I. Exclusion criteria were suicidal ideation as determined by the MFQ-C and deemed clinically inappropriate for group participation by evaluator. The intervention consisted of 12 50- to 60-minute group sessions of GTI-CN or GTI-C for 10 weeks, one individual session, and one parent session (Table 41).

Follow-up data were collected from assessments of students and parent interviews (for behavioral problems) at post-treatment and at 3 and 12 months postintervention. Outcomes assessed included traumatic stress symptoms and clinically significant PTSD syndrome (at 12 months only) as determined by the UCLA PTSD-I (12 months), depression symptoms and clinically significant syndrome (at 12 months only) as assessed with the MFQ-C, traumatic grief assessed with the Extended Grief Inventory (EGI), distress on the Global Distress (GD) scale, and internalizing and externalizing behavior problems as reported by parents about their children via the CBCL.

Table 41. Grief and trauma intervention with coping skills and trauma narrative processing versus grief and trauma intervention with coping skills: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Number	Risk of Bias
Salloum, 2012[62]	Second–sixth grade male and female African-American students	Mixed, multiple	RCT 12 50-minute weekly sessions	G1: GTI-CN G2: GTI-C	Randomized: G1: 39 G2: 33 Analyzed: Post-treatment: G1: 34 G2: 32 3-month followup: G1: 34 G2: 30 12-month followup: G1: 34 G2: 30	Low

G = group; GTI-C = Grief and Trauma Intervention with coping skills; GTI-CN = Grief and Trauma Intervention with coping skills and trauma narrative processing; RCT = randomized controlled trial

This study was funded by the Institute of Mental Hygiene (New Orleans, LA), Fahs-Beck Fund for Research and Experimentation, and the University of South Florida Internal Awards Program.

This study is applicable to second- through sixth-grade African-American students with multiple trauma exposures (including natural disasters) with at least moderate levels of PTSD symptoms.

Key Points

- *PTSD symptoms and clinically significant PTSD*: Participants in the GTI-CN group had no difference in changes in clinically significant PTSD or in PTSD symptoms pre- to post-treatment than those in the GTI-C group in a single RCT[62] (insufficient SOE).
- *Depression symptoms and clinically significant depression*: Participants in the GTI-CN group had no difference in changes in clinically significant depression or in depressive symptoms pre- to post-treatment than those in the GTI-C group in a single RCT[62] (insufficient SOE).
- *Traumatic grief*: Participants in the GTI-CN group had no difference in changes in traumatic grief symptoms pre- to post-treatment than those in the GTI-C group in a single RCT[62] (insufficient SOE).
- *Global distress*: Participants in the GTI-CN group had no difference in changes in global distress pre- to post-treatment than those in the GTI-C group in a single RCT[62] (insufficient SOE).
- *Internalizing symptoms and clinically significant internalizing behavioral problems*: Participants in the GTI-CN group had no difference in changes in clinically significant parent-reported internalizing problem behaviors or in internalizing symptoms pre- to post-treatment than those in the GTI-C group in a single RCT[62] (insufficient SOE).

- *Externalizing behavioral problems*: The difference in clinically significant parent-reported externalizing problem behavior was not reported, nor was the significance of the between-group comparison of change in pre- to post-treatment externalizing symptoms between those in the GTI-CN and the GTI-C group in a single RCT.[62] Although the intent-to-treat (ITT) between-group comparison showed a greater decrease in symptoms in the GTI-CN group compared with the GTI-C group, the magnitude of the changes was not consistent across follow-up periods. The non-ITT analyses were not reported, yet the ITT analyses were only reported for externalizing symptoms (insufficient SOE).

Detailed Synthesis

One RCT[62] found no significant differences between GTI-CN and GTI-C in changes in PTSD symptoms or clinically significant PTSD, depression symptoms or clinically significant depression, traumatic grief, global distress, parent-reported internalizing symptoms or clinically significant internalizing behavior problems, or parent-reported externalizing symptoms among African-American second through sixth graders from New Orleans who had multiple types of trauma exposures, most of whom had been through Hurricane Katrina (Table 42). We graded the SOE as insufficient because of imprecise evidence from a single study (Table 43).

Table 42. Grief and trauma intervention with coping skills and trauma narrative processing versus grief and trauma intervention with coping skills: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Salloum, 2012[62]		No between-group difference in changes in clinically significant PTSD or PTSD symptoms (UCLA PTSD-I: range not reported) <u>UCLA PTSD-I of 38+ (clinically significant PTSD)</u> Pretreatment: G1: 46.2% G2: 39.4% Within-group change at 12 months: G1: -40.3% G2: -29.4% Between-group change at 12 months: -10.9%, p=NR <u>UCLA PTSD-I, mean</u> Pretreatment: G1: 46.82 (SD=13.00) G2: 42.80 (SD=10.77) Within-group change at post-treatment: G1: -15.64, d=0.92, p=NR	No between-group difference in changes in clinically significant depression or depressive symptoms (MFQ-C: range not reported) <u>MFQ-C of 29+ (clinically significant depression)</u> Pretreatment: G1: 43.6% G2: 27.3% Within-group change at 12 months: G1: -43.6% G2: -20.8% Between-group change at 12 months: -22.8%, p=NR <u>MFQ-C, mean</u> Pretreatment: G1: 27.62 (SD=10.18) G2: 22.83 (SD=8.65) Within-group change at post-treatment: G1: -9.12, d=0.91, p=NR G2: -9.00, d=0.99, p=NR Between-group change at post-treatment: -0.12, p=NR	NR	No between-group difference in changes in clinically significant parent-reported internalizing problem behavior or internalizing symptoms (CBCL: range not reported) <u>CBCL t-score of 63+ (clinically significant parent-reported internalizing problem behavior)</u> Pretreatment: G1: 20.5% G2: 12.1% Within group change at 12 months: G1: -14.6% G2: 1.2%

Table 42. Grief and trauma intervention with coping skills and trauma narrative processing versus grief and trauma intervention with coping skills: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Salloum, 2012[62] (continued)		G2: -15.23, d=0.78, p=NR Between-group change at post-treatment: -0.41, p=NR Within-group change at 3 months: G1: -16.94, d=1.06, p=NR G2: -16.50, d=0.78, p=NR Between-group change at 3 months: -0.44, p=NR Within-group change at 12 months: G1: -22.08, d=1.83, p=NR (RCI, 70.59% improved, 2.94% deteriorated) G2: -17.27, d=1.50, p=NR (RCI, 60% improved, 3.33% deteriorated) Between-group change at 12 months: -4.81, ANOVA time*treatment interaction p=NS; RCI difference p=NS	Within-group change at 3 months: G1: -9.18, d=0.87, p=NR G2: -8.00, d=0.85, p=NR Between-group change at 3 months: -1.18, p=NR Within-group change at 12 months: G1: -13.94, d=1.43, p=NR (RCI, 52.9% improved, 0% deteriorated) G2: -9.00, d=0.97, p=NR (RCI, 43.33% improved, 3.33% deteriorated) Between-group change at 12 months: -4.94, ANOVA time*treatment interaction p=NS; RCI difference p=NS No between-group difference in traumatic grief (EGI, range not reported) Pretreatment: G1: 53.03 (SD=17.75) G2: 46.00 (SD=21.83) Within-group change at post-treatment: G1: -16.90, d=0.92, p=NR G2: -16.69, d=0.78, p=NR Between-group change at post-treatment: -0.39, p=NR Within-group change at 3 months: G1: -19.62, d=0.96, p=NR G2: -16.62, d=1.18, p=NR Between-group change at 3 months: -3.00, p=NR Within-group change at 12 months: G1: -26.72, d=1.61, p=NR (RCI, 68.75% improved, 0% deteriorated) G2: -19.00, d=0.91, p=NR (RCI, 55.17% improved, 3.45% deteriorated)		Between-group change at 12 months: -15.8%, p=NR <u>CBCL, parent-reported internalizing symptoms, mean</u> Pretreatment: G1: 9.50 (SD=7.33) G2: 8.76 (SD=5.69) Within-group change at post-treatment: NR Between-group change at post-treatment: NR Within-group change at 3 months: G1: -2.00, d=0.29, p=NR G2: -1.33, d=0.21, p=NR Between-group change at 3 months: -0.67, p=NR Within-group change at 12 months: G1: -3.61 , d=0.58, p=NR (RCI, 17.86% improved, 0% deteriorated) G2: -1.52, d=0.26, p=NR (RCI, 14.29% improved, 4.76% deteriorated)

Table 42. Grief and trauma intervention with coping skills and trauma narrative processing versus grief and trauma intervention with coping skills: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Salloum, 2012[62] (continued)			Between-group change at 12 months: -7.72, ANOVA time*treatment interaction p=NS; RCI difference p=NS No between-group difference in general distress (GD, range not reported) Pretreatment: G1: 2.71 (SD=1.32) G2: 2.72 (SD=1.13) Within-group change at post-treatment: G1: -0.80, d=0.60, p=NR G2: -1.03, d=0.86, p=NR Between-group change at post-treatment: 0.23, p=NR Within-group change at 3 months: G1: -1.36, d=1.06, p=NR G2: -1.34, d=0.78, p=NR Between-group change at 3 months: -0.02, p=NR Within-group change at 12 months: G1: -1.53, d=1.19, p=NR G2: -1.24, d=1.06, p=NR Between-group change at 12 months: -0.29, ANOVA time*treatment interaction p=NS		Between-group change at 12 months: -2.09, ANOVA time*treatment interaction p=NS; RCI difference p=NS Unknown significance of between-group difference in changes in parent-reported externalizing symptoms; ITT analysis shows significant greater reduction CBCL, parent-reported externalizing symptoms, mean Pretreatment: G1: 12.39 (SD=7.49) G2: 10.05 (SD=8.73) Within-group change at post-treatment: NR Between-group change at post-treatment: NR Within-group change at 3 months: G1: 0.97, d=0.12, p=NR G2: 0.05, d=0.006, p=NR Between-group change at 3 months: 0.92, p=NR

Table 42. Grief and trauma intervention with coping skills and trauma narrative processing versus grief and trauma intervention with coping skills: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Salloum, 2012[62] (continued)					Within-group change at 12 months: G1: -2.78, d=0.35, p=NR G2: 0.57, d=0.06, p=NR Between-group change at 12 months: -2.21, ANOVA time x treatment interaction using ITT analysis: F(2,108)=3.81, p=0.026

ANOVA = analysis of variance; CBCL = Child Behavior Checklist; d = effect size; EGI = Extended Grief Inventory; GD = general distress; GTI-C = Grief and Trauma Intervention with coping skills; GTI-CN = Grief and Trauma Intervention with coping skills and trauma narrative processing; ITT = intent to treat; MFQ-C = Mood and Feelings Questionnaire–Child Version; NR = not reported; NS = not sufficient; PTSD = post-traumatic stress disorder; RCI = Reliable Change Index; SD = standard deviation; UCLA PTSD-I = University of California, Los Angeles Posttraumatic Stress Disorder Index

Table 43. Grief and trauma intervention with coping skills and trauma narrative processing versus grief and trauma intervention with coping skills: strength of evidence

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
GTI-CN	1; 72 (64)	Clinically significant PTSD	RCT Low	Unknown	Direct	Imprecise	No statistically significant difference in change in clinically significant PTSD Insufficient
	1; 72 (64)	PTSD symptoms	RCT Low	Unknown	Direct	Imprecise	No statistically significant difference in change in PTSD symptoms Insufficient
	1; 72 (64)	Clinically significant depression	RCT Low	Unknown	Direct	Imprecise	No statistically significant difference in change in clinically significant depression Insufficient
	1; 72 (64)	Depressive symptoms	RCT Low	Unknown	Direct	Imprecise	No statistically significant difference in change in depressive symptoms Insufficient
	1; 72 (64)	Traumatic grief	RCT Low	Unknown	Direct	Imprecise	No statistically significant difference in change in traumatic grief Insufficient
	1; 72 (64)	Traumatic grief	RCT Low	Unknown	Direct	Imprecise	No statistically significant difference in change in traumatic grief Insufficient
	1; 72 (64)	Global distress	RCT Low	Unknown	Direct	Imprecise	No statistically significant difference in change in global distress Insufficient
	1; 72 (64)	Clinically significant internalizing problem behavior	RCT Low	Unknown	Indirect	Imprecise	No statistically significant difference in change parent-rated clinically significant internalizing problem behaviors
	1; 72 (64)	Internalizing symptoms	RCT Low	Unknown	Indirect	Imprecise	No statistically significant difference in change in parent-rated internalizing symptoms Insufficient
	1; 72 (64)	Externalizing symptoms	RCT Low	Unknown	Indirect	Imprecise	No statistically significant difference in change in parent-rated externalizing symptoms Insufficient

GTI-CN = Grief and Trauma Intervention with coping skills and trauma narrative processing; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

Key Question 2: Emotion Regulation Therapy

Description of Included Studies

We found one RCT[49] rated medium risk of bias, testing an emotion regulation therapy, Trauma Affect Regulation: Guide for Education and Therapy (TARGET), versus an enhanced treatment-as-usual (ETAU) relational supportive therapy.

This study recruited 59 delinquent girls, ages 13 to 17 years, with exposure to multiple trauma types who met criteria for full or partial PTSD. The inclusion criteria were self-reported delinquency determined by National Delinquency Study criteria and full or partial PTSD in past month as determined by CAPS-CA structured diagnostic interview. Exclusion criteria included substantial cognitive impairment determined by scores <16 on Orientation, Attention, and Recall sections of the Mini Mental State Exam; on 1-to-1 suicide watch; under age 13 or over age 18. The intervention consisted of 12 50-minute weekly TARGET sessions or ETAU sessions for the treatment and control groups, respectively.

Follow-up data were collected at post-treatment. Assessments were done using a standardized, interview using the CAPS-CA to assess full (criteria B, C, and D) and partial PTSD diagnosis (criterion B and one but not both of criteria C and D) as well as PTSD symptom severity (total score). The Trauma Symptom Checklist for Children (TSCC) was used to assess depression, anxiety, and anger.

See Table 44 for study characteristics.

Table 44. Emotion regulation therapy versus relational supportive therapy: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Number	Risk of Bias
Ford, 2012[49]	Delinquent females ages 13–17	Mixed, multiple	RCT 12 50-minute weekly sessions	G1: TARGET (emotion regulation therapy) G2: ETAU (relational supportive therapy)	Randomized: G1: 33 G2: 26 Analyzed: G1: 26 G2: 20	Medium

ETAU = enhanced treatment as usual; G = group; RCT = randomized controlled trial; TARGET = Trauma Affect Regulation: Guide for Education and Therapy

This study was funded by the Department of Justice, Office of Juvenile Justice and Delinquency Programs.

This study is applicable to adolescent females ages 13 to 17 living in a residential facility with multiple trauma exposures and full or partial PTSD.

Key Points

- *PTSD symptoms*: Participants in the TARGET (emotion regulation therapy) group had no difference in changes in PTSD symptoms pre- to post-treatment than those in the ETAU (relational supportive therapy) group in a single RCT[49] (insufficient SOE).
- *Anxiety symptoms*: Participants in the TARGET (emotion regulation therapy) group had no difference in changes in anxiety symptoms pre- to post-treatment than those in the ETAU (relational supportive therapy) group in a single RCT[49] (insufficient SOE). Participants in the early psychological intervention group had no difference in changes in

depressive symptoms pre- to post-treatment than those in usual care in a single RCT[49] (insufficient SOE).

- *Depression symptoms*: Participants in the TARGET (emotion regulation therapy) group had no difference in changes in depression symptoms pre- to post-treatment than those in the ETAU (relational supportive therapy) group in a single RCT[49] (insufficient SOE).
- *Anger symptoms*: Participants in the TARGET (emotion regulation therapy) group had no difference in changes in anger symptoms pre- to post-treatment than those in the ETAU (relational supportive therapy) group in a single RCT[49] (insufficient SOE).

Detailed Synthesis

One RCT[49] found no significant differences in changes in PTSD symptoms, anxiety symptoms, depression symptoms, or anger symptoms between pretreatment and post-treatment among adolescent girls ages 13 to 17 living in a residential facility, comparing those who received TARGET (emotion regulation therapy) with those who received ETAU (relational supportive therapy (Table 45). We graded the SOE as insufficient because of imprecise evidence from a single study (Table 46).

Table 45. Emotion regulation therapy versus relational supportive therapy: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Ford, 2012[49]	G1: TARGET G2: ETAU	No between-group difference in changes in PTSD symptoms (CAPS-CA: range not reported) <u>CAPS-CA, subscale B</u> Symptoms, Mean Pretreatment: G1: 19.4 (SD=9.2) G2: 13.3 (SD=3.8) Within-group change at post-treatment: G1: -8.7 (SD=8.6) d=1.01 G2: -4.6 (SD=4.8) d=0.95 Between-group change at post-treatment: -4.1 (SD=6.4); 95% CI (calculated) -0.22, 8.42; d=0.64 <u>CAPS-CA, subscale C</u> Symptoms, Mean Pretreatment: G1: 22.5 (SD=8.0) G2: 18.8 (SD=5.9)	No between-group difference in anxiety, depression, or anger symptoms (TSCC: range not reported) <u>TSCC, Anxiety</u> Mean, Pretreatment: G1: 7.2 (SD=3.6) G2: 6.8 (SD=4.5) Within-group change at post-treatment: G1: -2.4 (SD=3.9) d=0.61 G2: -1.3 (SD=4.7) d=0.27 Between-group change at post-treatment: -1.2 (SD=3.6); 95% CI (calculated) -1.46, 3.66; d=0.32 <u>TSCC, Depression</u> Mean, Pretreatment: G1: 7.4 (SD=3.7) G2: 6.9 (SD=4.1) Within-group change at post-treatment: G1: -2.3 (SD=3.6) d=0.65 G2: -2.6 (SD=4.0) d=0.65	NR	NR

Table 45. Emotion regulation therapy versus relational supportive therapy: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Ford, 2012[49] (continued)		Within-group change at post-treatment: G1: -8.5 (SD=8.2) d=1.04 G2: -4.9 (SD=6.6) d=0.75 Between-group change at post-treatment: -3.5 (SD=8.4); 95% CI (calculated) -0.93, 8.13; d=0.42 <u>CAPS-CA, subscale D</u> Symptoms, Mean Pretreatment: G1: 17.4 (SD=8.2) G2: 15.4 (SD=6.3) Within-group change at post-treatment: G1: -7.4 (SD=7.4) d=0.99 G2: -7.4 (SD=6.1) d=1.23 Between-group change at post-treatment: 0.02 (SD=7.5); 95% CI (calculated) -4.12, 4.12; d=0.00 <u>CAPS-CA, Total</u> Score: Mean Pretreatment: G1: 58.9 (SD=20.7) G2: 47.5 (SD=10.6) Within-group change at post-treatment: G1: -24.4 (SD=19.5) d=1.26 G2: -17.0 (SD=12.6) d=1.35 Between-group change at post-treatment: -7.4 (SD=14.1); 95% CI (calculated) -16.96, 2.16; d=0.53 PTCI, Mean Pretreatment: G1: 108.2 (SD=32) G2: 104.6 (SD=33)	Between-group change at post-treatment: 0.3 (SD=3.6); 95% CI (calculated) -2.56, 1.96; d=-0.10 <u>TSCC, Anger</u> Mean, Pretreatment: G1: 8.8 (SD=7.1) G2: 8.3 (SD=6.0) Within-group change at post-treatment: G1: -1.0 (SD=7.4) d=0.13 G2: -2.5 (SD=5.4) d=0.46 Between-group change at post-treatment: 1.5 (SD=4.9); 95% CI (calculated) -5.46, 2.46; d=-0.30		

Table 45. Emotion regulation therapy versus relational supportive therapy: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Ford, 2012[49] (continued)		Within group change at post-treatment: G1: -17.9 (SD=33.6) d=0.53 G2: -10.6 (SD=33.4) d=0.32 Between group change at post-treatment: 7.2 (SD=34.3); 95% CI (calculated) -12.79, 27.39; d=0.21			

CAPS-CA = Clinician-Administered Posttraumatic Stress Disorder Scale for Children and Adolescents; CI = confidence interval; d = effect size; ETAU= enhanced treatment as usual; G = group; NR = not reported; PTCI = Post-Traumatic Cognitions Inventory; PTSD = post-traumatic stress disorder; SD = standard deviation; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TSCC = Trauma Symptom Checklist for Children

Table 46. Emotion regulation therapy versus relational supportive therapy: strength of evidence

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Early psychological intervention	1; 59 (46)	PTSD symptoms	RCT Medium	Unknown	Direct	Imprecise	No statistically significant difference in change in PTSD symptoms Insufficient
	1; 59 (46)	Anxiety symptoms	RCT Medium	Unknown	Direct	Imprecise	No statistically significant change in anxiety symptoms. Insufficient
	1; 59 (46)	Depression symptoms	RCT Medium	Unknown	Direct	Imprecise	No statistically significant change in depression symptoms. Insufficient
	1; 59 (46)	Anger symptoms	RCT Medium	Unknown	Direct	Imprecise	No statistically significant change in anger symptoms Insufficient

PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

Key Question 2: Eye Movement Desensitization and Reprocessing

Description of Included Studies

We found one study[63] addressing eye movement desensitization and reprocessing (EMDR). This study was a randomized controlled trial (RCT) with wait-list control.[63] We rated this study as having a medium risk of bias.[63]

This study identified 27 children ages 6 to 12 years an average of 8 months after admission to a hospital emergency room after a motor vehicle accident. The children had to have at least

moderate post-traumatic stress symptoms. Children were excluded if they were on psychotropic medicine, had concurrent psychological conditions, a past history of abuse or neglect, or a serious head injury. Children were randomized to active treatment with EMDR or a 6-week wait-list control. Participants participated in four 60-minute sessions of EMDR over 4 weeks. Outcomes measured included traumatic stress symptoms and diagnostic criteria for PTSD (PTSD Revised Index [RI] scores), depressive symptoms (Children's Depression Scale), parent-reported internalizing and externalizing symptoms (Child Behavior Checklist), and parent-reported traumatic stress symptoms (Parent PTS Reaction Index [RI]). See Table 47 for study characteristics.

Table 47. Eye movement and desensitization reprocessing versus wait-list control: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Kemp, et al., 2010[63]	Male and female children ages 6-12 with score of at least 12 on Child PTSD-RI or at least 2 DSM-IV criteria for PTSD	Motor vehicle accident	RCT w/wait-list control Four sessions of 1 hour delivered over 4 weeks	G1: EMDR G2: Wait-list control	Randomized: G1: 13 G2: 14 Analyzed: G1: 12 G2: 12	Medium

DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition"; EMDR = Eye movement and desensitization reprocessing; G = group; PTSD-RI =Post Traumatic Stress Disorder-Revised Index; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

This study does not report funding source.

This study is applicable to children who experienced a motor vehicle accident severe enough to receive evaluation in an emergency department and who display moderate symptoms of post-traumatic stress.

Key Points

- *Children meeting two or more DSM-IV criteria*: Significantly greater reduction in PTSD diagnosis (two or more DSM-IV criteria for PTSD) in the EMDR group than in the wait-list control group (low strength of evidence [SOE]).
- *Reduction in PTSD symptoms*: Participants in the EMDR group had significant reductions in PTSD symptoms reported by the child and parent compared with the wait-list control group[63] (low SOE).

Detailed Synthesis

One RCT[63] showed a significant reduction in the number of children with two or more DSM-IV criteria for PTSD (Table 48). The study also reported a significant reduction in PTSD symptom scores as reported by the child receiving EMDR compared with wait-list control. There were no significant decreases in depressive symptoms, anxiety state, anxiety trait, general health, and general function. We graded the SOE as low for PTSD diagnosis and PTSD symptom scores because of the presence of a single study with few subjects and medium risk of bias (Table 49). For all other outcomes, we graded the SOE as insufficient; the results were not statistically significant.

Table 48. Eye movement desensitization reprocessing versus wait list control: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Kemp, et al., 2009[63]	G1: EMDR school-based psychotherapy G2: Wait-list control	Greater reduction in number of children with 2 or more DSM-IV criteria for PTSD (PTSD [DSM-IV] diagnostic criteria based on systematic clinical assessment) Pretreatment G1: 100% G2: 100% Within-group change in proportion at post-treatment: G1: -75% G2: 0% Between-group change at post-treatment: -75% (calculated) X2 (1, n=24) = 14.40, p<0.001)] Greater reduction of PTSD symptoms (PTSD-RI) Pretreatment G1: 25.92 (SD=12.18) G2: 27.29 (SD=12.58) Magnitude of effect not specified by intervention type MANCOVA controlling for group differences at pretreatment for number of DSM-IV PTSD criteria and Child PTSD-RI scores F(2, 17) = 9.32, p<.01	No between-group differences in change in anxiety symptoms (STAIC, range 20-60) Pretreatment G1: 28.50 (SD=4.68) G2: 32.33 (SD=8.37) Within-group change: G1: 0.33 (calculated) G2: -0.66 (calculated) Between-group change (95% CI): 0.99 (calculated) p=NS No between-group differences in change in anxiety-trait (STAIC, range 20-60) Pretreatment G1: 35.42 (SD=7.51) G2: 39.58 (SD=7.23) Within-group change: G1: -1.92 (calculated) G2: -3.41(calculated) Between-group change (95% CI): 1.49 (calculated) p=NS No between-group differences in change in depression symptoms (Children's Depression Scale, range 66-330) Pretreatment G1: 138.42 (SD=24.72) G2: 137.50 (SD=27.87)	No between-group differences in change in general health (GHQ; range 0-12) Pretreatment G1: 1.09 (SD=1.92) G2: 4.25 (SD=4.11) Within-group change: G1: 0.82 (calculated) G2: -0.42 (calculated) Between-group change (95% CI): 1.24 (calculated) p=NS	No between-group differences in change in behavioral problems (CBCL-parent rating: range 30-100) Pretreatment G1: 36.73 (SD=22.49) G2: 30.10 (SD=34.16) Within-group change: G1: -8.28 (calculated) G2: 13.07 (calculated) Between-group change (95% CI): -21.35 (calculated) p=NS No between-group differences in change in general functioning (General functional scale, range 12-36) Pretreatment G1: 21.00 (SD=4.38) G2: 19.21 (SD=4.55) Within-group change: G1: -1.27 (calculated) G2: -0.13 (calculated) Between-group change (95% CI): -1.14 (calculated) p=NS

Table 48. Eye movement desensitization reprocessing versus wait list control: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Kemp, et al., 2009[63] (continued)		A priori contrasts identified a significant pre- to postreduction in the number of DSM-IV PTSD criteria [*t* (11) = 4.17, p < .01] and Child PTSD-RI scores [*t* (11)=4.26, p=.001] for the EMDR group but not for the wait-list group	Within-group change: G1: -2.67 (calculated) G2: -6.25 (calculated) Between-group change (95% CI): 3.58 (calculated) p=NS		

CBCL = Child Behavior Checklist; CI = confidence interval; DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition"; EMDR = Eye movement and desensitization reprocessing; G = group; GHQ = General Health Questionnaire; MANCOVA = multivariate analysis of covariance; NS = not significant; PTSD = post-traumatic stress disorder; PTSD-RI = Post-Traumatic Stress Reaction Index; SD = standard deviation; STAIC = State Trait Anxiety Inventory for Children

Table 49. Eye movement desensitization reprocessing versus wait list control: strength of evidence

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
EMDR	1; 27 (24)	PTSD criteria	RCT Medium	Unknown	Direct	Precise	Between-group difference in proportion of children with two or more DSM-IV criteria in EMDR group vs. wait-list control group of 75% Low
	1; 27 (24)	PTSD symptoms (child report)	RCT Medium	Unknown	Direct	Precise	Significant greater reduction in PTSD symptoms in EMDR group than wait-list group. Magnitude of effect not reported by intervention type Low
	1; 27 (24)	Depression symptoms	RCT Medium	Unknown	Direct	Imprecise	No statistically significant difference between groups Insufficient
	1, 27 (24)	Anxiety-state	RCT Medium	Unknown	Direct	Imprecise	No difference between groups Insufficient
	1; 27 (24)	Anxiety-trait	RCT Medium	Unknown	Direct	Imprecise	No difference between groups Insufficient

Table 49. Eye movement desensitization reprocessing versus wait list control: strength of evidence (continued)

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
EMDR (continued)	1; 27 (24)	Internalizing behavior	RCT Medium	Unknown	Direct	Imprecise	No difference between groups Insufficient
	1; 27 (24)	Externalizing behavior	RCT Medium	Unknown	Indirect	Imprecise	No difference between groups Insufficient
	1: 27 (24)	General health	RCT Medium	Unknown	Indirect	Imprecise	No difference between groups Insufficient
	1; 27 (24)	General functioning	RCT Medium	Unknown	Indirect	Imprecise	No difference between groups Insufficient

DSM-IV = "Diagnostic and Statistical Manual of Mental Disorders, 4th Edition"; EMDR = Eye movement and desensitization reprocessing; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

Key Question 2: School-Based Interventions

Description of Included Studies

We found three RCTs, each rated medium risk of bias,[65,66] addressing two distinct school-based interventions for KQ 2.

The first trial[65] compared trauma and grief component therapy (TGCT) for adolescents group therapy plus usual care (classroom-based psychoeducation and skills training) to usual care only (Table 50). Participants included 159 male and female adolescents ages 13 to 18 from Bosnia exposed to trauma before, during, or after the war who also had significant traumatic distress and functional impairment. School counselors, who delivered the intervention, received training via four 2-day training seminars led by the authors and mental health professionals. Every 2 to 4 weeks during the intervention, each counselor met with a local supervisor to monitor adherence to protocol. The treated adolescents received 17 to 20 weekly group TGCT sessions at school, lasting 60 to 90 minutes each for the duration of the school year (7 months minus breaks for school holidays and examination week). Outcomes assessed included PTSD symptoms via the UCLA Post-Traumatic Stress Disorder Reaction Index-Revised and depression symptoms via the Depression Self-Rating Scale (DSRS). Funding for this study was provided by UNICEF Bosnia and Herzegovina, the Brigham Young University Family Studies Center, the David M. Kennedy Center for International Studies, the Bing Fund, and Tony Bennett.

Table 50. Trauma and grief component therapy for adolescents plus classroom-based psychoeducation and skills training versus classroom-based psychoeducation and skills training: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Layne, et al., 2008[65]	Male and female adolescents ages 13-18 in Bosnia who had (1) trauma exposure before, during, or after the war; (2) significant current distress; and (3) significant functional impairment	War-exposed in Bosnia	RCT 17-20 weekly group sessions for an entire school year (7 months minus breaks for school holidays and examination week) lasting 60-90 minutes each	G1: TGCT group therapy plus classroom-based psychoeducation and skills training G2: Classroom-based psychoeducation and skills training only	Randomized: G1: 77 G2: 82 Analyzed: G1: 66 G2: 61	Medium

G = group; RCT = randomized controlled trial; TGCT = trauma and grief component therapy for adolescents

The second trial[66] recruited 403 male and female school children in Poso, Indonesia, with mean ages of 10.08 and 9.78 for the treatment and wait-list groups, respectively (Table 51). Each participant had exposure to one or more traumatic events (mainly resulting from poverty and political violence/instability) as well as significant PTSD symptoms (at least 11) and anxiety complaints (at least 5). Interventionists who delivered the treatment had at least a high school education, generally did not have formal mental health training but some experience as volunteers in humanitarian programs, and lived in the local target communities. The interventionists received a 2-week training program prior to program implementation. Multiple independent research assessors judged the fidelity of interventionists to the treatment manual using a structured checklist. The treatment group received 15 sessions over 5 weeks that consisted of trauma-processing activities, cooperative play, and creative expressive elements delivered in groups at school. The comparison group consisted of wait-list controls who received the intervention after the study concluded. Assessments, which occurred 1 week and 6 months postintervention, included child-reported PTSD symptoms (Post-Traumatic Stress Scale), depression symptoms (DSRS), anxiety symptoms (Self Report for Anxiety Related Disorders: SCARED-5), and functional impairment (contextually constructed 10-item checklist), as well as parent-reported functional impairment and aggression (Children's Aggression Scale for Parents). This trial was funded by PLAN Netherlands (an international nongovernmental child-focused development agency) and implemented in collaboration with Church World Services Indonesia.

The third trial[67] recruited 399 male and female school children ages 9 to 12 (mean=11.03 years) from the Jaffna district in northern Sri Lanka (Table 51) and compared an intervention consisting of CBT and creative expressive elements, similar to the treatment described in Tol et al., 2008.[66] Each participant had exposure to trauma resulting from living in a politically violent/unstable/war-torn area and screened positive on the Child Psychosocial Distress Screener (CPDS) for existence of risk factors and lack of protective factors. A small group of children reporting severe mental health problems were provided individual supportive therapy in addition to being enrolled in the study (n=19, treatment-group specific n not reported). Interventionists who delivered the intensive (3 times per week) treatment were nonspecialized personnel with at least a high school education who lived in the area. The interventionists received a year-long training program prior to program implementation. Assessment of the fidelity of interventionists to the treatment manual was not reported. The treatment group received 15 sessions over 5 weeks that consisted of trauma-processing activities, cooperative play, and creative expressive elements

delivered in groups at school. The comparison group consisted of wait-list controls who received the intervention after the study concluded. Assessments, which occurred 1 week and 3 months postintervention, included child-reported PTSD symptoms (CPSS), depression symptoms (DSRS), anxiety symptoms (SCARED-5), psychological difficulties and prosocial behavior (from subscales of the SDQ), conduct problems (investigator-developed scale), supernatural complaints (investigator-developed scale), and functional impairment (contextually constructed 10-item checklist). This trial was funded by PLAN Netherlands.

Table 51. Cognitive behavioral therapy/creative expressive school-based group intervention versus wait-list control: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Tol, et al., 2008[66]	Male and female school children in Poso, Indonesia (mean age 10.08 and 9.78 for treatment and wait-list groups, respectively) who were exposed to ≥1 events, or had significant (≥11) PTSD symptoms and anxiety complaints (≥5)	Poverty and political violence/ instability	Cluster-RCT w/wait-list control 15 sessions over 5 weeks	G1: School-based group intervention including CBT techniques, trauma-processing activities, cooperative play, and creative expressive elements G2: Wait-list control	Randomized: G1: 182 G2: 221 1-week followup G1: 182 G2: 211 6-month followup G1: 177 G2: 191 Analyzed: G1: 182 G2: 221	Medium
Tol, et al., 2012[67]	Male and female school children in Sri Lanka aged 9-12 (mean age=11.03) who screened positive on the CPDS for existence of risk factors and absence of protective factors	War/political violence/instability	Cluster-RCT w/wait-list control 15 sessions over 5 weeks	G1: School-based group intervention including CBT and creative expressive elements G2: Wait-list control	Randomized: 399 G1: 199 G2: 200 1-week followup G1: 199 G2: 200 3-month followup G1: 198 G2: 199 Analyzed: G1: 198 G2: 199	Medium

CBT = cognitive behavioral therapy; CPDS = Child Psychosocial Distress Screener; G = group; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

The applicability of these interventions is limited to the specific populations recruited for each study. Thus, the TGCT study[65] findings apply to adolescents exposed to war with distress and impairment; the second school-based intervention[66] findings apply to younger school-aged students exposed to poverty and political violence/instability with significant PTSD and anxiety symptoms; the third school-based intervention[67] findings apply to school children ages 9 to 12 exposed to war and political violence/instability with significant psychological distress.

Key Points

We found three school-based interventions that addressed KQ 2.

Trauma and Grief Component Therapy for Adolescents Plus Classroom-Based Psychoeducation and Skills Training Versus Classroom-Based Psychoeducation and Skills Training

- *PTSD symptoms:* Participants in the trauma and grief component therapy (TGCT) plus classroom-based psychoeducation and skills training group had significantly greater improvements in PTSD symptoms between baseline and followup than participants in the classroom-based psychoeducation and skills training only group (low SOE).
- *Depression symptoms:* Participants in the TGCT plus classroom-based psychoeducation and skills training group had significantly greater improvements in depression symptoms between baseline and followup than participants in the classroom-based psychoeducation and skills training only group (low SOE).

Cognitive Behavioral Therapy/Creative Expressive School-Based Group Intervention Versus Wait-List Control

- *PTSD symptoms:* Participants in the CBT/creative expressive school-based group had significantly greater reduction in PTSD symptoms between baseline and followup than wait-list control participants in one study and no significant difference in the other study (insufficient SOE).
- *Depression symptoms:* Participants in the CBT/creative expressive school-based group did not have significantly different changes in depression symptoms than wait-list control participants in either study (insufficient SOE).
- *Anxiety symptoms:* Participants in the CBT/creative expressive school-based group did not have significantly different decreases in anxiety symptoms than wait-list control participants in either study (insufficient SOE).
- *Functional impairment:* Participants in the CBT/creative expressive school-based group did not have significantly different changes in child-rated functional impairment than wait-list control participants in either study (insufficient SOE).
- *Functional impairment (parent-rated):* Participants in the CBT/creative expressive school-based group did not have significantly different changes in parent-rated functional impairment than wait-list control participants in one study. We found the evidence insufficient to draw a conclusion about the efficacy of CBT/creative expressive school-based group therapy versus wait-list control (insufficient SOE).
- *Aggression (parent-rated):* Participants in the CBT/creative expressive school-based group did not have significantly different changes in parent-rated aggression than wait-list control participants in one study. We found the evidence insufficient to draw a conclusion about the efficacy of CBT/creative expressive school-based group therapy versus wait-list control (insufficient SOE).
- *Psychological difficulties:* Participants in the CBT/creative expressive school-based group did not have significantly different changes in psychological difficulties than wait-list control participants in a single study (insufficient SOE).
- *Prosocial behaviors:* Participants in the CBT/creative expressive school-based group did not have significantly different changes in prosocial behaviors than wait-list control participants in a single study (insufficient SOE).

- *Supernatural complaints:* Participants in the CBT/creative expressive school-based group did not have significantly different changes in supernatural complaints than wait-list control participants in a single study (insufficient SOE).
- *Conduct problems:* Participants in the CBT/creative expressive school-based group had significantly greater decreases in conduct problems as compared with wait-list control participants in a single study (low SOE).

Detailed Synthesis

Trauma and Grief Component Therapy for Adolescents Plus Classroom-Based Psychoeducation and Skills Training Versus Classroom-Based Psychoeducation and Skills Training

One RCT[65] found a statistically significant difference in change in PTSD symptoms and change in depression symptoms favoring the treatment arm (Table 52). We graded the SOE as low for both PTSD and depression symptom outcomes given that only one study met inclusion criteria and between-group change scores were significant, favoring the TGCT group (Table 52).

Table 52. Trauma and grief component therapy for adolescents plus classroom-based psychoeducation and skills training versus classroom-based psychoeducation and skills training: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Layne et al., 2008[65]	G1: TGCT group therapy plus classroom-based psychoeducation and skills training G2: Classroom-based psychoeducation and skills training only	Greater reduction in PTSD symptoms (UCLA PTSD RI-R, range=0-68) Pretreatment G1: 36.37 (SD=14.27) G2: 33.02 (SD=10.27) Within-group change: G1 (95% CI): -11.85 (-15.28, -8.42) G2 (95% CI): -5.67 (-8.93 to -2.42) Between-group difference: -6.18 (calculated) MANOVA between-group time x treatment group interaction F= 6.77, df=1,125, p=0.01. NS	Greater reduction in depression symptoms (DSRS, range=0-72) Pretreatment G1: 32.61(SD=11.39) G2: 28.61 (SD=9.86) Within-group change: G1 (95% CI): -2.69 (-5.33 to -0.06) G2 (95% CI): 1.91 (-0.68 to 4.51) Between-group difference: -2.78 (calculated) MANOVA between-group time x treatment group interaction F= 6.16, df=1,125, p<0.05.	NR	NR

CI = confidence interval; df = degrees of freedom; DSRS = Depression Self-Rating Scale; G = group; MANOVA = multivariate analysis of variance; NR = not reported; NS = not significant; PTSD = post-traumatic stress disorder; SD = standard deviation; TGCT = trauma and grief component therapy for adolescents; UCLA PTSD RI-R = UCLA Post-Traumatic Stress Disorder Reaction Index-Revised

Cognitive Behavioral Therapy/Creative Expressive School-Based Group Intervention Versus Wait-List Control

Two RCTs[66,67] found no statistically significant difference in change in depression or anxiety symptoms or child-rated functional impairment (Table 53). In addition, one study[66] found no differences between the school-based intervention arm and the wait-list arm on parent-rated functional impairment or parent-rated aggression; the other study[67] found no differences between

the school-based intervention arm and the wait-list arm on psychological difficulties, prosocial behavior, and supernatural complaints. One study[66] found the school-based treatment group had significantly greater decreases in PTSD symptoms than the wait-list control group but the other[67] found no significant differences in changes in PTSD symptoms. One study[67] found the school-based CBT-creative expressive therapy group had greater decreases in conduct problems compared with the wait-list group. Thus, we graded the SOE as low for conduct problems and insufficient for all other outcomes with nonsignificant findings between groups in both studies or mixed findings (e.g., significant PTSD symptoms in one study but not the other) between groups, given that only two studies met inclusion criteria (Table 54).

Table 53. Cognitive behavioral therapy/creative expressive school-based group intervention versus wait-list control: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Tol, et al., 2008[66]	G1: School-based group intervention including CBT techniques, trauma-processing activities, cooperative play, and creative expressive elements G2: Wait-list control	Greater reduction of PTSD symptoms at 6-month followup (Child Post-Traumatic Stress Scale, range=0-68) Pretreatment G1: 20.92 (SD=8.75) G2: 22.35 (SD=8.39) Within-group change at 1 week: G1: -9.10 (SD=9.20) G2: -4.85 (SD=9.49) Within-group change at 6 months: G1: -10.35 (SD=8.89) G2: -6.15 (SD=10.04) Between-group difference at 1 week (95% CI): d=0.55 (0.35 to 0.75) Between-group difference at 6 months: Mixed method regression analysis mean change difference adjusted for school mean (95% CI): 2.78 (1.02 to 4.53); d(95% CI): 0.44 (0.24 to 0.64)	No difference between groups in change in depression symptoms at 6-month followup (DSRS, range=0-36) Pretreatment G1: 12.29 (SD=3.33) G2: 12.55 (SD=3.47) Within-group change at 1 week: G1: -0.80 (SD=3.88) G2: 0.50 (SD=4.33) Within-group change at 6 months: G1: -0.82 (SD=3.82) G2: 0.16 (SD=4.73) Between-group difference at 1 week (95% CI): d=0.31 (0.12 to 0.51) Between-group difference at 6 months: Mixed method regression analysis mean change difference adjusted for school mean (95% CI): -0.70 (-0.08 to 1.49); d (95% CI): 0.24 (0.04 to 0.43)	NR	No difference between groups in change in (child-reported) functional impairment at 6-month followup (child-reported through contextually constructed 10-item checklist, range=10-40) Pretreatment G1: 18.03 (SD=5.61) G2: 17.90 (SD=5.39) Within-group change at 1 week: G1: -3.30 (SD=5.52) G2: -1.11 (SD=4.98) Within-group change at 6 months: G1: -3.48 (SD=5.70) G2: -2.06 (SD=5.07) Between-group difference at 1 week (95% CI): d=0.42 (0.22 to 0.61) Between-group difference at 6 months: Mixed method regression analysis mean change difference adjusted for school mean (95% CI): -0.52 (-0.43 to 1.46); d (95% CI): 0.26 (0.07 to 0.46)

Table 53. Cognitive behavioral therapy/creative expressive school-based group intervention versus wait-list control: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Tol, et al., 2008[66] (continued)			No difference between groups in change in anxiety symptoms at 6-month followup (SCARED-5, range=0-10) Pretreatment G1: 4.38 (SD=1.76) G2: 4.46 (SD=1.87) Within-group change at 1 week: G1: -0.97 (SD=2.16) G2: -0.65 (SD=2.32) Within-group change at 6 months: G1: -1.06 (SD=2.45) G2: -0.96 (SD=2.49) Between-group difference at 1 week (95% CI): d=0.14 (-0.05 to 0.34) Between-group difference at 6 months: Mixed method regression analysis mean change difference adjusted for school mean (95% CI): -0.12 (-0.31 to 0.56); d (95% CI): 0.04 (-0.16 to 0.24)		No between group difference in change in parent-reported functional impairment at 6-month followup (parent-reported through contextually constructed 10-item checklist, range=10-40) Pretreatment G1: 14.04 (SD=4.24) G2: 14.20 (SD=4.43) Within-group change at 1 week: G1: -1.44 (SD=4.72) G2: -1.16 (SD=4.23) Within-group change at 6 months: G1: -2.03 (SD=4.71) G2: -1.48 (SD=4.69) Between-group difference at 1 week (95% CI): d=0.10 (-0.09 to 0.29) Between-group difference at 6 months (95% CI): d=0.07 (-0.12 to 0.26)

Table 53. Cognitive behavioral therapy/creative expressive school-based group intervention versus wait-list control: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Tol et al., 2008[66] (continued)					No between-group differences in change in parent-reported aggression at 6-month followup (parent-reported through Children's Aggression Scale for Parents, range=33-132) Pretreatment G1: 42.18 (SD=9.09) G2: 44.63 (SD=12.08) Within-group change at 1 week: G1: -1.44 (SD=4.72) G2: -1.16 (SD=4.23) Within-group change at 6 months: G1: -2.03 (SD=4.71) G2: -1.48 (SD=4.69) Between-group difference at 1 week: d=0.06 (-0.13 to 0.25) Between-group difference at 6 months (95% CI): d=0.12 (-0.07 to 0.31)
Tol, et al., 2012[67]	G1: School-based group intervention including CBT techniques and creative expressive elements G2: Wait-list control	No between-group differences in change in PTSD symptoms (CPSS, range 0-51) Pretreatment G1: 15.03 (SD=8.89) G2: 15.70 (SD=9.12) Within-group change at post-treatment: G1: NR G2: NR	No between-group differences in change in depressive symptoms (DSRS, range 0-36) Pretreatment G1: 8.39 (SD=4.54) G2: 8.56 (SD=4.37)		Greater reduction in conduct problems (8-item scale, range 0-24) Pretreatment G1: 2.00 (SD=2.84) G2: 1.99 (SD=2.23) Within-group change at post-treatment: G1: NR G2: NR

Table 53. Cognitive behavioral therapy/creative expressive school-based group intervention versus wait-list control: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Tol, et al., 2012[67] (continued)		Between-group change at post-treatment: NR LGCM estimate (SE): 0.281 (0.332); p=NS	Within-group change at post-treatment: G1: NR G2: NR Between-group change at post-treatment: NR LGCM estimate (SE): 0.115 (0.112); p=NS No between-group differences in change in anxiety symptoms (SCARED-5, range 0-10) Pretreatment G1: 3.29 (SD=2.13) G2: 3.17 (SD=2.16) Within-group change at post-treatment: G1: NR G2: NR Between-group change at post-treatment: NR LGCM estimate (SE): -0.037 (0.065); p=NS		Between-group change at post-treatment: NR LGCM estimate (SE): -0.132 (0.045); p<0.01 No between-group differences in change in prosocial behavior (5-item subscale from SDQ, range 0-10) Prosocial behavior: Pretreatment G1: 8.21 (SD=1.82) G2: 8.34 (SD=1.72) Within-group change at post-treatment: G1: NR G2: NR Between-group change at post-treatment: NR LGCM estimate (SE): -0.016 (0.052); p=ns

Table 53. Cognitive behavioral therapy/creative expressive school-based group intervention versus wait-list control: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Tol, et al., 2012[67] (continued)			No between-group differences in change in psychological difficulties (4 subscales consisting of 20 items from SDQ, range 0-40) Pretreatment G1: 10.74 (SD=5.57) G2: 10.29 (SD=5.44) Within-group change at post-treatment: G1: NR G2: NR		No between-group differences in change in functional impairment (10-item scale, range 0-30) Pretreatment G1: 3.64 (SD=4.47) G2: 3.23 (SD=4.37) Within-group change at post-treatment: G1: NR G2: NR
			Between-group change at post-treatment: NR LGCM estimate (SE): -0.198 (0.280); p=NS No between-group differences in change in supernatural complaints (6-item scale, range 0-18) Pretreatment G1: 2.21 (SD=2.59) G2: 1.97 (SD=1.92) Within-group change at post-treatment: G1: NR G2: NR Between-group change at post-treatment: NR LGCM estimate (SE): -0.121 (0.064); p<0.06		Between-group change at post-treatment: NR LGCM estimate (SE): -0.036 (0.143); p=NS

CBT = cognitive behavioral therapy; CI = confidence interval; CPSS = Child PTSD Symptom Scale; d = effect size; DSRS = Depression Self-Rating Scale; G = group; LGCM = latent growth curve modeling; NR = not reported; PTSD = Post-Traumatic stress disorder; SCARED-5 = Self-Report for Anxiety-Related Disorders; SD = standard deviation; SDQ = Strengths and Difficulties Questionnaire; SE = standard error

Table 54. Strength of evidence for Key Question 2: school-based interventions

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
TGCT group therapy plus classroom-based psycho-education and skills training vs. classroom based psycho-education and skills training	1; 159 (127)	PTSD symptoms	RCT Medium	Unknown	Direct	Precise	Greater reduction in PTSD symptoms in treatment group (calculated mean between-group difference= -6.18, MANOVA time x treatment group interaction p=0.01) Low
	1; 159 (127)	Depression symptoms	RCT Medium	Unknown	Direct	Precise	Greater reduction in depression symptoms in treatment group (calculated mean between-group difference= -2.78, MANOVA time x treatment group interaction p<0.05) Low
CBT/creative expressive school-based group intervention vs. wait-list control	2; 802 (800)	PTSD symptoms	RCT Medium	Inconsistent	Direct	Imprecise	Significantly greater decrease in PTSD symptoms for treatment group at 6 months postintervention (mixed method regression analysis mean change difference adjusted for school mean (95% CI): 2.78 (1.02, 4.53) in one study; no difference in change in PTSD symptoms between groups in the second study Insufficient
	2; 802 (800)	Depression symptoms	RCT Medium	Consistent	Direct	Imprecise	No difference in change in depressive symptoms between groups in either study Insufficient
	2; 802 (800)	Anxiety symptoms	RCT Medium	Consistent	Direct	Imprecise	No difference in change in anxiety symptoms between groups in either study Insufficient

Table 54. Strength of evidence for Key Question 2: school-based interventions (continued)

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
CBT/creative expressive school-based group intervention vs. wait-list control	2; 802 (800)	Functional impairment (child-reported)	RCT Medium	Consistent	Direct	Imprecise	No difference in change in (child-reported) functional impairment between groups in either study Insufficient
	1; 403 (403)	Functional impairment (parent-reported)	RCT Medium	Unknown	Indirect	Imprecise	No difference in change in (parent-reported) functional impairment at 6-month followup between groups Insufficient
	1; 403 (403)	Aggression (parent-reported)	RCT Medium	Unknown	Indirect	Imprecise	No difference in change in (parent-reported) aggression at 6-month followup between groups Insufficient
	1; 399 (397)	Psychological difficulties	RCT Medium	Unknown	Direct	Imprecise	No difference in change in psychological difficulties between groups Insufficient
	1; 399 (397)	Supernatural complaints	RCT Medium	Unknown	Direct	Imprecise	No difference in change in supernatural complaints between groups Insufficient
	1; 399 (397)	Conduct problems	RCT Medium	Unknown	Direct	Precise	Significantly greater reduction in conduct problems in treatment group than wait-list group (LGCM estimate, SE: -0.132, 0.045; $p<0.01$) Low
	1; 399 (397)	Prosocial behavior	RCT Medium	Unknown	Direct	Imprecise	No difference in change in prosocial behavior between groups Insufficient

CBT = cognitive behavioral therapy; CI = confidence interval; LGCM = latent growth curve modeling; MANOVA = multivariate analysis of variance; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial; SE = standard error; TGCT = trauma and grief component therapy for adolescents

Key Question 2: Antidepressant Medication

Description of Included Studies

Study authors found three RCT studies evaluating antidepressants for KQ 2. One study[68] tested the tricyclic antidepressant imipramine versus chloral hydrate in PTSD symptoms in thermally injured children. Another study[69] tested imipramine versus the selective serotonin reuptake inhibitor (SSRI) fluoxetine versus placebo medication also in thermally injured children with PTSD symptoms. While both of these studies were undertaken prior to the 30-day period necessary for a diagnosis of PTSD, the symptoms were the same and inclusion was based on having a diagnosis of acute stress disorder rather than on exposure. The final study evaluated the SSRI sertraline against placebo medication in children with PTSD from multiple traumas.[70] The studies on the SSRI medications[69,70] were rated as having low risk of bias whereas the first imipramine study[68] was rated as having a medium risk of bias. Study characteristics are reported in Table 55.

Table 55. Antidepressant medication interventions: study characteristics

Author, Year	Inclusion criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Robert, et al., 1999[68]	Male and female thermally injured children ages 2-19 with acute stress disorder symptoms for at least 2 days	Thermal injury	Parallel RCT 1 week of medication nightly, burn treatment including physical rehabilitation and pain, itching, and anxiety control	G1: Imipramine G2: Chloral hydrate	Randomized G1: 12 G2: 13 Analyzed G1: 12 G2: 13	Medium
Robert, et al., 2008[69]	Male and female thermally injured children ages 4-18 with acute stress symptoms	Thermal injury	Parallel RCT 1 week of medication nightly and standard burn treatment	G1: Imipramine G2: Fluoxetine G3: Placebo	Randomized G1: 21 G2: 19 G3: 22 Analyzed G1: 20 G2: 18 G3: 22	Low
Robb, et al., 2010[70]	Male and female children ages 6-17 with PTSD from multiple traumas	Multiple (sexual abuse, traumatic news, physical abuse, car and other accidents, fire or natural disaster, or witness to violence)	Parallel RCT 10 weeks of medication	G1: Sertraline G2: Placebo	Randomized G1: 67 G2: 62 Analyzed G1: 67 G2: 61	Low

G = group; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

The two studies on imipramine looked at similar populations: thermally injured male and female children with PTSD symptoms in a burn center in the United States. The age ranges of the two studies varied somewhat: the first study looked at 25 children ages 2 to 19 years[68] and the second study looked at 62 children ages 4 to 18.[69] While in the first imipramine study, racial makeup was not reported, the second imipramine study had a predominantly Hispanic racial makeup (88.3% of participants).

The first study evaluated 7 days of imipramine at 1 mg/kg with a maximum dosage of 100 mg versus 7 days of chloral hydrate at 25 mg/kg with a maximum dosage of 500 mg. Imipramine is a tricyclic antidepressant that was hypothesized to treat multiple symptoms of PTSD in children and was used historically to treat depression and anxiety symptoms in adults. This medication was compared with the more traditional treatment chloral hydrate, a sleep aid used mainly to treat sleep disturbance alone in children with PTSD. The second imipramine study evaluated the same dosage and timing of imipramine. However, comparison was made with another experimental group taking fluoxetine at 5 mg, 10 mg, or 20 mg depending on weight and with control placebo medication. Fluoxetine is an SSRI used to treat a variety of anxiety and depressive states in children and adults. In both studies, medication was started within 30 days of the accident and participants were included owing to severity of or number of PTSD symptoms. In both studies, patients were either coded as responders or nonresponders after 1 week of medication and then the study was terminated. Also in both studies, participants and assessors were blinded to study arm.

Applicability for both studies was limited to the population of participants recruited, which were burned children. Limitations of applicability include racial makeup, which was not reported in the first imipramine study[68] and was mainly Hispanic in the second study.[69] While sex of participants was fairly well-distributed in the first study, only 26 percent of recruited participants were female in the second study.

The sertraline study[70] evaluated 129 male and female children ages 6 to 17 with PTSD from multiple traumas treated at 21 outpatient centers within the United States. Sertraline is an SSRI medication used to treat PTSD in adults along with a number of depressive and anxiety states. Traumas experienced in participants recruited included sexual abuse, traumatic news, physical abuse, car and other accidents, fire or natural disaster, and witness to violence. The study did comment on recruitment and adherence to the study protocol and followup. Sertraline was given for 10 weeks and started at 25 mg in week 1 and 50 mg in week 2 and titrated every other week to a maximum dosage of 200 mg as clinically indicated. This regimen was compared with placebo medication. Both participants and evaluators were blinded to the experimental or control group status. Prior to the 10 weeks of medication, there was a 2-week washout/baseline period. Evaluations were undertaken at baseline and at week 10 of medication.

Applicability was limited to the participants recruited. Trauma type, sex, and racial makeup of the study were relatively well-distributed and could be applicable to the outpatient population with PTSD. Limits to applicability related mainly to the adolescent group, which was greater than 75 percent female.

Key Points

We found three studies that tested antidepressant medication that addressed KQ 2.

Imipramine Versus Chloral Hydrate or Placebo

We identified one RCT comparing the efficacy of imipramine versus chloral hydrate and one RCT comparing the efficacy of imipramine versus fluoxetine versus placebo as treatment of PTSD symptoms in traumatized children and adolescents.[68,69] The studies targeted children and adolescents ages 2 to 19 years[68] and children and adolescents ages 4 to 18 years[69] in a burn unit who had suffered thermal injury.

- *PTSD symptom severity:* In the first study, participants in the imipramine medication group had significantly greater proportion of acute stress disorder (ASD) symptom

responders than the chloral hydrate medication group.[68] In the second study, no significant differences were found between groups for changes in ASD symptoms or ASD symptom response.[69]

Fluoxetine Versus Placebo

We identified one RCT comparing the efficacy of fluoxetine versus imipramine versus placebo for treatment of PTSD symptoms in traumatized children and adolescents.[69] The study targeted children and adolescents ages 4 to 18 years[69] in a burn unit who had suffered thermal injury.

- *PTSD symptom severity:* No significant differences in changes in ASD symptoms or ASD symptom response were found by study arm.[69]

Sertraline Versus Placebo

We identified one RCT comparing the efficacy of sertraline versus placebo for treatment of PTSD symptoms in traumatized children and adolescents.[70] The study targeted children and adolescents ages 6 to 17 years in outpatient clinics who had suffered multiple traumas.[70] The study also reports the more conservative estimate of differences based on the last observation carried forward (LOCF).

- *PTSD symptoms:* Participants in the sertraline medication group had no significant differences in interviewer-assessed or clinician-rated PTSD symptom changes compared with participants in the placebo group. The placebo group had greater decreases in parent-rated PTSD symptoms compared with sertraline group. We graded the SOE as low for no benefit since participants in the placebo group had significantly greater decreases in parent-reported PTSD symptoms compared with participants in the sertraline group.
- *PTSD severity:* Participants in the placebo group had greater decreases in clinician-rated PTSD severity compared with sertraline group. We rated the SOE as low for no benefit since participants in the placebo group had significantly greater decreases in clinician-rated PTSD severity compared with participants in the sertraline group.
- *Depressive symptoms:* No significant between-group differences were found for change in depressive symptom scores. We rated the SOE as insufficient for the efficacy of sertraline to improve depressive symptoms in children and adolescents with PTSD based on the results of one study.
- *Quality of life:* Participants in the placebo group had greater improvement in quality of life compared with participants in the sertraline group. We rated the SOE as low for no benefit since participants in the placebo group had significantly greater increases in quality of life as compared with participants in the sertraline group.

Detailed Synthesis

Imipramine Versus Chloral Hydrate or Placebo

One RCT[68] recruited children and adolescents ages 2 to 19 years to imipramine medication treatment or chloral hydrate medication treatment and found statistically significant differences in PTSD symptom response by study arm (Table 56). One RCT[69] recruited children and adolescents ages 4 through 18 years to imipramine medication treatment, fluoxetine medication treatment, or placebo and found no significant differences in PTSD symptom changes between

groups. We graded the SOE as insufficient for PTSD symptoms because of two studies with conflicting data, although the estimates were rated as precise given that the second study was powered to detect significant differences between the imipramine and placebo groups (Table 57).

Table 56. Antidepressant medication interventions: results

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Robert, et al., 1999[68]	G1: 7 days of imipramine medication dosed at 1 mg/kg with max dosage of 100 mg with standard burn treatment including physical rehabilitation and pain, itching, and anxiety control G2: 7 days of chloral hydrate medication dosed at 25 mg/kg with a max dosage of 500 mg with standard burn treatment including physical rehabilitation and pain, itching, and anxiety control	Greater ASD symptom response (via interview, and quantifying number and intensity of symptoms) ASD symptom responders at post-treatment: G1: 83% G2: 38% Between-group difference in relieving ASD symptoms, X^2=5.24, df=1, p=0.04	NR	NR	NA
Robert, et al., 2008[69]	G1: 7 days of imipramine medication dosed at 1 mg/kg with max dosage of 100 mg with standard burn treatment G2: 7 days of fluoxetine medication dosed at 5 mg, 10 mg, or 20 mg based on weight criteria (<40 kg, 40-60 kg, >60 kg) with standard burn treatment G3: 7 days of placebo medication with standard burn treatment	No between-group differences in change in ASD symptoms (Acute Stress Disorder Checklist) Pretreatment mean G1: 42.6 (SD=12.4) G2: 47.6 (SD=15.0) G3: 44.6 (SD=14.0) Within-group % change in mean score post-treatment G1: -62.6% (SD 39.5) G2: -73.6% (SD 40.4) G3: -65.1% (SD 41.5) Between-group difference in % change in mean score post-treatment: p=NS % responders at post-treatment G1: 60.0% G2: 72.2% G3: 54.5% Between-group difference in % responders at post-treatment p=NS	NR	NR	NA

Table 56. Antidepressant medication interventions: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Robb, et al., 2010[70]	G1: 10 weeks of sertraline started at 25 mg daily for week 1, increased to 50 mg for next 2 weeks, then increased as clinically indicated every 2 weeks to max dosage of 200 mg daily G2: 10 weeks of placebo medication	No between-group difference in change in PTSD symptoms (UCLA PTSD-I, range 0-68) Pretreatment G1: 43.8 (SD=8.5) G2: 42.1 (SD=8.8) Within-group LS mean change LOCF: G1: -20.4 (SD=2.1) G2: -22.8 (SD=2.1) Between-group LS mean change score difference LOCF 95% CI,-7.6 to 2.9 p=0.373 Worse improvement in parent-rated PTSD symptom scores (placebo having greater reduction in symptoms) (CSDC, range 0-30) Pretreatment G1: 33.5 (SD=10.5) G2: 34.1 (SD=10.4) Within-group LS mean change LOCF: G1: -12.4 (SD=1.7) G2: -17.3 (SD=1.9) Between-group LS mean change score difference LOCF 95% CI,-9.1 to -0.6 p=0.025 Worse improvement in clinician-rated PTSD severity (placebo having greater reduction in severity) (CGI-S, range 0-7) Pretreatment G1: 4.5 (SD=0.6) G2: 4.4 (SD=0.6) Within-group LS mean change LOCF: G1: -1.4 (SD=0.2) G2: -1.8 (SD=0.2) Between-group LS mean change score difference LOCF 95% CI, -0.8 to 0.0 p=0.031	No between-group difference in change in clinician-rated depression symptoms (CDRS, range 0-17) Pretreatment G1: 40.3 (SD=14.4) G2: 41.2 (SD=14.2) Within-group LS mean change LOCF: G1: -10.0 (SD=1.5) G2: -12.3 (SD=1.6) Between-group LS mean change score difference LOCF 95% CI, -6.0 to 1.3 p=0.210	NR	Worse improvement in change in quality of life scores (placebo having greater improvement) (PQ-LES-Q. range 0-17) Pretreatment G1: 49.6 (SD=9.5) G2: 49.5 (SD=10.4) Within-group LS mean change LOCF: G1: 7.2 (SD=1.3) G2: 10.7 (SD=1.5) Between-group LS mean change score difference LOCF 95% CI, 0.2 to 6.8 p=0.037

Table 56. Antidepressant medication interventions: results (continued)

Author, Year	Comparison Groups	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Robb, et al., 2010[70] (continued)		No between-group difference in change in clinician-rated PTSD symptom improvement (CGI-I, range 0-7) Pretreatment G1: NA G2: NA Within-group LS mean change LOCF: G1: 2.4 (SD=0.2) G2: 2.2 (SD=0.2) Between-group LS mean change score difference LOCF 95% CI, -0.6 to 0.3, p=0.415			

ASD = acute stress disorder; CDRS-R = Children's Depression Rating Scale, Revised; CGI-I = Clinical Global Impressions-Improvement; CGI-S = Clinical Global Impressions-Severity; CI = confidence interval, CSDC = Child Stress Disorder Checklist; df = degrees of freedom; G = group; kg = kilograms; LOCF = last observation carried forward; LS = least squares; mg = milligrams; NA = not applicable; NR = not reported; NS = not significant, PQ-LES-Q = Pediatric Quality of Life Enjoyment and Satisfaction Questionnaire; PTSD = post-Traumatic stress disorder; SD = standard deviation; UCLA PTSD-I = University of California, Los Angeles Post-Traumatic Stress Disorder Reaction Index

Table 57. Strength of evidence for Key Question 2: antidepressant medication interventions

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Imipramine medication vs. chloral hydrate or placebo	2; 87 (85)	PTSD symptoms	RCT Medium	Inconsistent	Indirect	Precise	One study[68] found group treated with imipramine to have significantly greater proportion of ASD symptom responders than group treated with chloral hydrate (p=0.04) in thermally injured children. The other study[69] found no significant differences between groups of imipramine vs. placebo for change in ASD symptoms or ASD symptom response.[a] Insufficient
Fluoxetine medication vs. placebo	1; 62 (60)	PTSD symptoms	RCT Low	Unknown	Indirect	Imprecise	No significant differences between groups for change in ASD symptoms or ASD symptom response. Insufficient

Table 57. Strength of evidence for Key Question 2: antidepressant medication interventions (continued)

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Sertraline medication vs. placebo	1; 129 (128)	PTSD symptoms	RCT Low	Unknown	Direct	Imprecise	No difference between groups for interviewer-assessed PTSD symptoms or clinician-rated PTSD symptom improvement. Placebo group had greater decreases in parent-rated PTSD symptoms compared with sertraline group (between-group LS mean change score difference 95% CI, -9.1 to -0.6, p=0.025). Low for no benefit, as sertraline had worse improvements in parent-reported PTSD symptoms.
	1; 129 (128)	PTSD severity	RCT Low	Unknown	Direct	Imprecise	Placebo group had greater decreases in clinician-rated PTSD severity compared with sertraline group (between-group LS mean change score difference 95% CI, -0.8 to 0, p=0.031). Low for no benefit, as sertraline had worse improvement in clinician-rated PTSD severity.
	1; 129 (128)	Depressive symptoms	RCT Low	Unknown	Direct	Imprecise	No difference between groups. Insufficient
Sertraline medication vs. placebo	1; 129 (128)	Quality of life	RCT Low	Unknown	Direct	Precise	Placebo group had greater improvement compared with sertraline group (between-group LS mean change score difference 95% CI, 0.2 to 6.8 p=0.037). Low for no benefit, as sertraline group had worse improvements in quality of life.

ASD = acute stress disorder; CI = confidence interval; LS = least squares; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

[a]Study powered at 0.85 with alpha error of 0.05

Fluoxetine Versus Placebo

One RCT[69] recruited children and adolescents ages 4 through 18 years to fluoxetine or imipramine medication treatment or placebo and found no significant difference in PTSD symptom severity and response to medication by study arm (Table 56). We graded the SOE as

insufficient for PTSD symptom severity because only one study met the inclusion criteria and because of lack of precision in the estimates of effect (Table 57).

Sertraline Versus Placebo

One RCT[70] recruited children and adolescents ages 6 through 17 years to sertraline medication treatment or placebo and found a statistically significant difference in ASD symptoms and severity by study arm, with placebo being superior to sertraline on ratings of symptoms via the parent-rating and severity via clinician-rating(Table 56). This study also found no significant differences in PTSD symptoms assessed via interview or clinician rating. The study found no statistically significant differences in change in depressive symptoms by study arm. Quality-of-life improvement was significantly greater in the placebo group compared with the sertraline group. We graded the SOE as low for no benefit for parent-rated PTSD symptoms, clinician-rated PTSD severity, and quality-of-life outcomes given that the sertraline participants fared worse than placebo group participants for these outcomes (Table 57).

Key Question 3: Subgroup Differences in Efficacy of Interventions Targeting Children Exposed to Trauma, Some of Whom Already Have Symptoms

Description of Included Studies

We found one study[51] that examined subgroup differences in efficacy of interventions targeting children exposed to trauma and one study[71] that examined subgroup differences in efficacy of interventions targeting children exposed to trauma who already had symptoms. These studies tested the differences in the effect of treatment on outcomes by subgroup via interaction effects. Both studies were rated medium risk of bias.

The first study[51] examined the efficacy of trauma-focused cognitive behavioral therapy (TF-CBT) using a prospective cohort study design (Table 58). This study identified four schools in a single city severely affected by an earthquake. Children in the sixth and seventh grades (mean age=13.2 years) were selected for therapy 1.5 years after the earthquake. All children were exposed to serious direct threats to life, including witnessing mutilating injuries, agonizing screams of distress, and cries for help. Children were selected based on exposure to therapy, not based on diagnosis or symptom score. No children were receiving psychotropic medicine or other mental health treatment. Two schools closest to the study staff's clinics were chosen for treatment and two other schools served as the control condition. Participants participated in four group sessions (30 minutes) and two individual sessions (60 minutes) of TF-CBT over 3 weeks. Subgroup comparisons included comparing the effectiveness of the intervention of both PTSD and depression symptoms for boys versus girls. The follow-up assessment was made 1.5 years after the baseline assessment.

Table 58. Trauma-focused cognitive behavioral therapy versus usual care: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study design and duration	Comparison Groups	Baseline Number	Risk of Bias
Goenjian, et al., 1997[51]	Male and female students in grades 6 and 7 from 4 schools in Gumri, Armenia	Natural disasters Sex	Prospective cohort 12 weekly sessions of 1.5 hours (18 hours total)	G1: Trauma-focused cognitive behavioral therapy G2: Comparison schools	Randomized G1: 35 G2: 29 Analyzed (baseline): G1: 35 G2: 19 Analyzed (1.5-year followup): G1: 34 G2: 29	Medium

G = group

The second trial,[71] also described in the prior publication from the same authors detailed in the KQ 2 section above,[66] recruited 403 male and female school children in Poso, Indonesia, with mean ages of 10.08 and 9.78 for the treatment and wait-list groups, respectively (Table 59). Each participant had exposure to one or more traumatic events (mainly resulting from poverty and political violence/instability) as well as significant PTSD symptoms (at least 11) and anxiety complaints (at least 5). The treatment group received 15 sessions over 5 weeks that consisted of trauma-processing activities, cooperative play, and creative expressive elements delivered in groups at school. The comparison group consisted of wait-list controls who received the intervention after the study concluded. Assessments compared across subgroups were made at 6 months postintervention and included child-reported PTSD symptoms (Post-Traumatic Stress Scale) and functional impairment (contextually constructed 10-item checklist). Subgroup comparisons included age, exposure to violence, and sex.

Table 59. Cognitive behavioral therapy/creative expressive school-based group intervention versus wait-list control: study characteristics

Author, Year	Inclusion Criteria (Sex and Age Group)	Type of Trauma/ Subgroup	Study Design and Duration	Comparison Groups	Baseline Number	Risk of Bias
Tol, et al., 2010[71]	Male and female school children in Poso, Indonesia (mean age 10.08 and 9.78 for treatment and wait-list groups, respectively) who were exposed to ≥1 events, or had significant (≥11) PTSD symptoms and anxiety complaints (≥5)	Poverty and political violence/ instability Age, exposure to violence, sex	Cluster-RCT with wait-list control 15 sessions over 5 weeks	G1: School-based group intervention including CBT techniques, trauma-processing activities, cooperative play, and creative expressive elements G2: Wait-list control	Randomized: 403 G1: 182 G2: 221 1-week followup G1: 182 G2: 211 6-month followup G1: 177 G2: 191 Analyzed: G1: 182 G2: 221	Medium

CBT = cognitive behavioral therapy; G = group; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial

The applicability of these interventions is limited to the specific populations recruited for each study. Thus, the TF-CBT study findings[51] are applicable to children in resource-poor settings suffering from severe natural disasters who may not have significant post-traumatic stress symptoms but are at high risk for developing these symptoms. The findings of the school-based intervention[66] apply to younger school-age students exposed to poverty and political violence/instability with significant PTSD and anxiety symptoms.

Key Points

To address KQ 3, we found two studies that examined subgroup differences in the effectiveness or efficacy of interventions targeting exposure to trauma (n=1) and exposed to trauma and already experiencing symptoms (n=1).

Trauma-Focused Cognitive Behavioral Therapy Versus No Treatment

We identified one prospective cohort study comparing the effectiveness of a TF-CBT school-based intervention versus no treatment.[51] This study targeted children in the sixth and seventh grades (mean age=13.2 years) 1.5 years after exposure to an earthquake resulting in serious direct threats to life, including witnessing mutilating injuries, agonizing screams of distress, and cries for help. Two schools closest to the study staff's clinics were chosen for treatment and two other schools served as the control condition. The effectiveness of the intervention on outcomes was compared for girls versus boys.

- PTSD symptoms:
  - *Sex:* There were not significant differences in the effectiveness of the intervention on PTSD symptoms by sex (insufficient SOE).
- Depression symptoms:
  - *Sex:* There were not significant differences in the effectiveness of the intervention on PTSD symptoms by sex (insufficient SOE).

Cognitive Behavioral Therapy /Creative Expressive School-Based Group Intervention Versus Wait-List Control

We identified one RCT comparing the efficacy of a CBT/creative expressive school-based group intervention with that of a wait-list control.[71] This study targeted children exposed to poverty or political violence/instability war who had significant PTSD and anxiety symptoms. Subgroup differences examined included age, exposure to violence, and sex.

- PTSD symptoms:
  - *Age:* There were no significant differences in efficacy of the intervention on PTSD symptoms by age (insufficient SOE).
  - *Exposure to violence:* There were no significant differences in efficacy of the intervention on PTSD symptoms by exposure to violence (insufficient SOE).
  - *Sex:* Intervention effect on reducing PTSD symptoms was significantly greater for female than male students (low SOE).
- Functional impairment:
  - *Age:* There were no significant differences in efficacy of the intervention on functional impairment by age (insufficient SOE).
  - *Exposure to violence:* There were no significant differences in efficacy of the intervention on functional impairment by exposure to violence (insufficient SOE).

- *Sex:* Intervention effect on reducing functional impairment was significantly greater for female than male students (low SOE).

Detailed Synthesis

Trauma-Focused Cognitive Behavioral Therapy Versus No Treatment

One prospective cohort study[51] recruited children from four schools in an area hit by an earthquake to receive TF-CBT or no treatment and compared intervention effects on PTSD and depression symptoms by sex. This trial found that no significant differences in the effectiveness of the intervention on PTSD or depression symptoms by sex (Table 60). We graded the SOE as insufficient for outcomes with nonsignificant findings in effectiveness of the intervention by subgroup (sex), given that only one study met inclusion criteria for this intervention (Table 61).

- PTSD symptoms:
  - *Sex:* There were not significant differences in the effectiveness of the intervention on PTSD symptoms by sex (insufficient SOE).
- Depression symptoms:
  - *Sex:* There were not significant differences in the effectiveness of the intervention on PTSD symptoms by sex (insufficient SOE).

Table 60. Trauma-focused cognitive behavioral therapy versus no treatment: results

Author, Year	Comparison Groups	Subgroups Examined	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Goenjian, et al., 1997[51]	G1: TF-CBT G2: comparison schools (no treatment)	Sex	No significant differences in effectiveness of intervention on PTSD symptoms by sex. (CPTSD-RI, range=0-68) 1.5 years postintervention Sex (mean change) G1 male: -11.2 G1 female:-14.0 G2 male: 2.4 G2 female: 8.4 Interaction term sex* treatment not significant	No significant differences in effectiveness of intervention on depression symptoms by sex. (DSRS, range=0-72) 1.5 years postintervention Sex (mean change) G1 male: -2.5 G1 female: 0 G2 male: 5.0 G2 female: 4.9 Interaction term Sex by treatment not significant	NR	NR

CPTSD-RI = Child Post-Traumatic Stress Scale-Reaction Index; DSRS = Depression Self-Rating Scale; G = group; NR = not reported; PTSD = post-traumatic stress disorder; TF-CBT = trauma-focused cognitive behavioral therapy

Table 61. Cognitive behavioral therapy/creative expressive school-based group intervention versus wait-list control: results

Author, Year	Comparison Groups	Subgroups Examined	Trauma Symptom Outcomes	Mental Health Outcomes	Physical Health Outcomes	Other Outcomes
Tol, et al., 2010[71]	G1: School-based group intervention including CBT techniques, trauma-processing activities, cooperative play, and creative expressive elements G2: Wait-list control	Age, exposure to violence, sex	No significant differences in efficacy of intervention on PTSD symptoms by age or level of exposure to violence Intervention effect on reducing PTSD symptoms significantly greater for female than male students (Child Post-Traumatic Stress Scale, range= 0-68) 6 months postintervention Age β (95% CI) G1: 0.018 (-0.017 to 0.053) G2: -0.012 (-0.047 to 0.023) p=0.19 Exposure β (95% CI) G1: -0.018 (-0.042 to 0.006) G2: -0.024 (-0.048 to 0.000) p=0.54 Sex (female) β (95% CI) G1: -0.090 (-0.161 to -0.019) G2: 0.060 (-0.011 to 0.131) p=0.004	NR	NR	No significant differences in efficacy of intervention on functional impairment by age or level of exposure to violence Intervention effect on reducing functional impairment significantly greater for female than male student (Child-reported through contextually constructed 10-item checklist, range=10-40) 6 months postintervention Age β (95% CI) G1: 0.018 (-0.006 to 0.042) G2: 0.000 (-0.024 to 0.024) p=0.346 Exposure β (95% CI) G1: -0.012 (-0.036 to 0.012) G2: -0.006 (-0.018 to 0.006) p=0.698 Gender (female) β (95% CI) G1: -0.120 (-0.179 to -0.061) G2: 0.012 (-0.047 to 0.071) p=0.004

CBT = cognitive behavior therapy; CI = confidence interval; G = group; NR = not reported; PTSD = post-traumatic stress disorder

Cognitive Behavioral Therapy/Creative Expressive School-Based Group Intervention Versus Wait-List Control

One RCT[71] recruited children with a mean age of 10 years to receive a school-based group intervention based on CBT and creative expressive principles and compared the intervention effects by age, exposure to violence, and sex. This trial found no significant differences in the efficacy of the intervention on PTSD symptoms or functional impairment by age or exposure to violence. Females, however, had a significantly better response to treatment than males in terms of reducing PTSD symptoms and reducing functional impairment (Table 62). We graded the SOE as low for outcomes with significant differences in efficacy of the intervention by subgroups (sex for PTSD symptoms and functional impairment) and insufficient for outcomes with nonsignificant findings in efficacy of the intervention by subgroup (age and exposure to

violence for PTSD symptoms and functional impairment), given that only one study met inclusion criteria for this intervention (Table 62).

Table 62. Strength of evidence for Key Question 3: subgroup comparisons

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Subgroup	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
TF-CBT vs. no treatment	1; 64 (53)	PTSD symptoms	Sex	Medium	Unknown	Direct	Imprecise	No significant differences in effectiveness of intervention on PTSD symptoms by sex (p=NS) Insufficient
	1; 64 (53)	Depression symptoms	Sex	Medium	Unknown	Direct	Imprecise	No significant differences in effectiveness of intervention on depression symptoms by sex (p=NS) Insufficient
CBT/creative expressive school-based group intervention vs. wait-list control	1; 403 (403)	PTSD symptoms	Age	Medium	Unknown	Direct	Imprecise	No significant differences in efficacy of intervention on PTSD symptoms by age or level of exposure to violence (G1: 0.018 [-0.017 to 0.053], G2: -0.012 [-0.047 to 0.023]) Insufficient
			Exposure to violence				Imprecise	No significant differences in efficacy of intervention on PTSD symptoms by age or level of exposure to violence (G1: -0.018 [-0.042 to 0.006], G2: -0.024 [-0.048 to 0.000]) Insufficient
			Sex				Precise	Intervention effect on reducing PTSD symptoms significantly greater for female than male students (G1: -0.090 [-0.161 to -0.019], G2: 0.060 [-0.011 to 0.131]) Low

Table 62. Strength of evidence for Key Question 3: subgroup comparisons (continued)

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Subgroup	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
CBT/creative expressive school-based group intervention vs. wait-list control	1; 403 (403)	Functional Impairment (child-reported)	Age	Medium	Unknown	Direct	Imprecise	No significant differences in efficacy of intervention on functional impairment by age or level of exposure to violence (G1: 0.018 [-0.006 to 0.042], G2: 0.000 [-0.024 to 0.024]) Insufficient
			Exposure to violence				Imprecise	No significant differences in efficacy of intervention on functional impairment by age or level of exposure to violence (G1: -0.012 [-0.036 to 0.012], G2: -0.006 [-0.018 to 0.006]) Insufficient
			Sex				Precise	Intervention effect on reducing functional impairment significantly greater for female than male students (G1: -0.120 [-0.179 to -0.061], G2: 0.012 [-0.047 to 0.071]) Low

CBT = cognitive behavioral therapy; G = group; NS = not significant; PTSD = post-traumatic stress disorder; RCT = randomized controlled trial; TF-CBT = trauma-focused cognitive behavioral therapy

Key Question 4: Harms in Interventions Targeting Children Exposed to Trauma: Psychotherapy Interventions

Description of Included Studies

We identified nine studies focusing on psychotherapy targeting children exposed to trauma and/or experiencing traumatic stress symptoms. We present retention rates for all nine psychotherapy studies in Table 63: low rates of retention could be a proxy measure for unidentified adverse events or harms.

Table 63. Psychotherapy interventions: study characteristics

Author, Year	Intervention Type	Study Addressed Harms? (Yes/No)	Number Randomized Number Analyzed	Retention %
Berkowitz, et al., 2011[53]	CFTSI G1: CFTSI G2: Wait-list control	No	Randomized total: 112 Analyzed total: 106 (6 excluded after randomization) G1: 53 G2: 53 3-month followup: 83 G1: NR G2: NR	Total: 78.3% G1: NR G2: NR Study reported no difference in retention between G1 and G2
Smith, et al., 2007[58]	TF-CBT G1: TF-CBT G2: Wait-list control	Yes No adverse events reported	Randomized total: 38 Analyzed: 24 (9 excluded after randomization) G1: 12 G2: 12 All dropouts occurred prior to initiation of intervention	Total: 82.8% G1: NR G2: NR No dropouts in either group after initiation of intervention
Zehnder, 2010[50]	Early psychological intervention G1: Early psychological intervention G2: Usual care	No	Randomized total: 101 G1: 51 G2: 50 Analyzed at 2 months: 100 G1: 50 G2: 50 Analyzed at 6 months: 99 G1: 49 G2: 50	2-month total: G1: 98.0% G2: 100% 6-month total: G1: 96.1% G2: 100%
Ahrens, et al., 2002[59]	CPT G1: CPT G2: Wait-list control	No	Randomized total: 38 G1: 19 G2: 19 Analyzed total: 38 G1: 19 G2: 19	Total: 100% G1: 100% G2: 100%
Kemp, et al., 2010[63]	EMDR G1: EMDR G2: Wait-list control	No	Randomized total: 27 G1: 13 G2: 14 Analyzed total: 24 G1: 12 G2: 12	Overall: 88.9% G1: 92.3% G2: 85.7%

Table 63. Psychotherapy interventions: study characteristics (continued)

Author, Year	Intervention Type	Study Addressed Harms? (Yes/No)	Number Randomized Number Analyzed	Retention %
Catini, et al., 2009[60]	G1: Narrative exposure therapy (KIDNET) G2: Meditation-relaxation therapy	No	Randomized total: 31 G1: 16 G2: 15 Analyzed at 1 month: 31 G1: 16 G2: 15 Analyzed at 6 months: 30 G1: 16 G2: 14	1 month overall: 100% G1: 100% G2: 100% 6 months overall: 96.8% G1: 100% G2: 93.3%
Salloum, et al., 2008[61]	G1: Group grief- and trauma-focused intervention G2: Individual grief- and trauma-focused intervention	No	Randomized total: 56 G1: 28 G2: 28 Analyzed total: 45 G1: 23 G2: 22	Overall: 80.4% G1: 82.1 G2: 78.6 Completers did not differ significantly from noncompleters in reported post-traumatic stress (p=0.787) or depression (p=0.286)
Salloum, 2012[62]	G1: Group grief- and trauma-focused intervention with coping skills and trauma narrative processing G2: Individual grief- and trauma-focused intervention with coping skills only	No	Randomized total: 72 G1: 39 G2: 33 Analyzed at post-treatment: 66 G1: 34 G2: 32 Analyzed at 3 months: 64 G1: 34 G2: 30 Analyzed at 6 months post-treatment: 64 G1: 34 G2: 30	Overall: 80.4% G1: 82.1 G2: 78.6 Completers did not differ significantly from noncompleters in reported post-traumatic stress (p = 0.787) or depression (p = 0.286)
Ford, 2012 [49]	Emotion regulation therapy G1: TARGET (emotion regulation therapy) G2: ETAU (relational supportive therapy)	No	Randomized total: 59 G1: 33 G2: 26 Analyzed total: 46 G1: 26 G2: 20	Overall: 78.0% G1: 78.8% G2: 76.9%

CBITS = Cognitive Behavioral Intervention for Trauma in Schools; CFTSI = Child and Family Traumatic Stress Intervention; CPT = cognitive processing therapy; EMDR = eye movement desensitization and reprocessing; ETAU = enhanced treatment as usual; G = group; KIDNET = Narrative Exposure Therapy for children; NR = not reported; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TF-CBT = trauma-focused cognitive behavioral therapy

Of the nine studies, only one study mentioned possible harms or adverse effects for KQ 4.[58] This study examined TF-CBT versus a wait-list control group (described in detail previously).

Key Points

- *Attrition for psychotherapy interventions*: Because attrition may be an indicator of undetected harms, we evaluated the retention rates in intervention and control groups for nine psychotherapy interventions. The studies reported small or nonsignificant differences in retention between intervention and control groups. The small sample sizes and absence of information on reasons for attrition in many included studies makes it challenging to interpret this evidence as suggesting equivalence: we therefore grade the evidence as insufficient because the studies do not all always attribute reasons for discontinuation.
- *Overall adverse events for TF-CBT:* Participants in the TF-CBT in both intervention and control groups did not exhibit any adverse events. We rated the evidence as insufficient because the small sample size was not likely to be powered adequately to test for equivalence in adverse events.

Detailed Synthesis

Harms in Trauma-Focused Cognitive Behavioral Therapy Versus Wait-List Control

One RCT found no mental health harms, physical harms, or other adverse events in either intervention or control study arm (Table 64); we graded the evidence as insufficient (Table 65).

Table 64. Psychotherapy interventions: results

Author, Year	Intervention Type	Mental Health Harms	Physical Harms	Other Effects
Smith, et al., 2007[58]	TF-CBT	No adverse effects reported	No adverse effects reported	No adverse effects reported

TF-CBT = trauma-focused cognitive behavioral therapy

Table 65. Strength of evidence for Key Question 4: psychotherapy interventions

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
TF-CBT vs. wait-list control	1; 38 (24)	Overall adverse events/harms	RCT Low	Unknown	Direct	Imprecise	No adverse events found with TF-CBT or wait-list control; significance was not reported Insufficient

KQ = Key Question; RCT = randomized controlled trial; TF-CBT = trauma-focused cognitive behavioral therapy

Key Question 4: Harms in Interventions Targeting Children Exposed to Trauma: School-Based Interventions

Harms in School-Based Interventions

We found nine studies examining KQ 1 and KQ 2 with school-based interventions. Table 66 summarizes these interventions and includes information on attrition: high attrition could be a proxy measure for unidentified adverse events or harms such as retraumatization.

Of the nine school-based interventions, only one study mentioned possible harms or adverse effects for KQ 4.[65] This trial evaluated an intervention of TGCT with classroom-based psychoeducation and skills training versus the classroom-based psychoeducation and skills training alone and addressed KQ 4.

Table 66. School-based interventions: study characteristics

Author, Year	Intervention Type	Study Addressed Harms? (Yes/No)	Number Randomized Number Analyzed	Retention %
Berger, et al., 2009[54]	ERASE Stress G1: ERASE Stress G2: Wait-list control	No	Randomized total: 166 G1: 84 G2: 82 Analyzed total: 166 G1: 84 G2: 82	Total: 100% G1: 100% G2: 100%
Gelkopf, et al., 2009[55]	ERASE Stress G1: ERASE Stress G2: Wait-list control	No	Randomized total: 107 G1: 58 G2: 49 Analyzed: 107 G1: 58 G2: 49	Total: 100% G1: 100% G2: 100%
Stein, et al., 2003[64]	CBITS G1: CBITS G2: Wait-list control	No	Randomized total: 126 G1: 61 G2: 65 Analyzed, 3-month, total: 117 G1: 54 G2: 63 6-month followup: 113 G1: NR G2: NR	3-month total: 92.9% G1: 88.5% G2: 96.9% 6-month total: 89.6% G1: NR G2: NR
Jaycox, 2009[47]	CBITS G1: SSET (CBITS) G2: Wait-list control	No	Randomized total: G1: 39 G2: 39 Analyzed total: G1: 39 G2: 37	Total: G1: 100% G2: 94.9%
Layne, et al., 2008[65]	TGCT G1: TGCT + classroom-based psychoeducation and skills training G2: Classroom-based psychoeducation and skills training	Yes	Randomized total: 159 G1: 77 G2: 82 Completed post-treatment assessment total: 127 G1: 66 G2: 61 4-month followup: 67 G1: 36 G2: 31	Post-treatment assessment: 79.4% G1: 85.7% G2: 74.4% 4-month followup: 41.9% G1: 46.8% G2: 37.8%
Berger, et al., 2007[56]	OTT G1: OTT G2: Wait-list control	No	Randomized total: 142 G1: 70 G2: 72 Analyzed total: 142 G1: 70 G2: 72	Total: 100% G1: 100% G2: 100%

Table 66. School-based interventions: study characteristics (continued)

Author, Year	Intervention Type	Study Addressed Harms? (Yes/No)	Number Randomized Number Analyzed	Retention %
Tol, et al., 2008;[66] Tol, et al., 2010[71]	CBT/creative expressive school-based group Intervention G1: Intervention G2: Wait-list control	No	Randomized total: 403 G1: 182 G2: 221 Analyzed at 1-week total: 393 G1: 182 G2: 211 6-month followup: 368 G1: 177 G2: 191	1-week total: 97.5% G1: 100% G2: 95.5% 6-month total: 91.3% G1: 97.3% G2: 86.4%
Tol et al., 2012[67]	CBT/creative expressive school-based group intervention G1: School-based group intervention including CBT and creative expressive elements G2: Wait-list control	No	Randomized total: 399 G1: 199 G2: 200 Only two participants were not African American at randomization, so these two participants were not analyzed at baseline or in any of the followup Analyzed at 1-week and 3-month followup: 397 G1: 198 G2: 199	Total: 100% G1: 100% G2: 100%
Goenjian et al., 1997,[51] Goenjian et al., 2005[52]	TF-CBT G1: School-based TF-CBT G2: Comparison schools	No	Randomized total: 64 G1: 35 G2: 29 Analyzed at 18 months: 64 G1: 35 G2: 29 Analyzed at 3 years: 62 G1: 35 G2: 27	18-month total: 100% G1: 100% G2: 100% 3-year total: 96.9% G1: 100% G2: 93.1%

CBT = cognitive behavioral therapy; CBITS = Cognitive Behavioral Intervention for Trauma in Schools; ERASE Stress = Enhancing Resilience among Students Experiencing Stress; G = group; NR = not reported; OTT = Overshadowing the Threat of Terrorism; SSET = Support for Students Exposed to Trauma; TF-CBT = trauma-focused cognitive behavioral therapy; TGCT = trauma and grief component therapy for adolescents

The authors calculated the Reliable Change Index (RCI) for post-traumatic stress, depression, traumatic grief, and existential grief in order to quantify the number of reliably deteriorated cases. The RCI is based on the standard error (SE) of the difference between two test scores and denotes whether differences in test scores (with chance of error typically calculated at $p<.05$) reflect statistically reliable (i.e., significant) change instead of random fluctuation. RCI values consist of a difference score (e.g., pretreatment minus post-treatment, pretreatment minus followup) divided by the SE of the difference set at $p<.05$ and can be used to classify study participants according to treatment response on a given outcome variable. Those whose difference scores are positive and exceed the SE are reliably improved cases, those whose difference scores are negative and exceed the SE are reliably deteriorated cases, and those whose difference scores do not exceed the SE are treatment nonresponders. An RCI score was

calculated for each participating student on each measured outcome variable. Those who reliably deteriorated were included under harms of the study intervention compared with the comparator.

Key Points

- *Adherence for school-based interventions*: Because adherence may be an indicator of undetected harms, we evaluated the adherence rates in intervention and control groups for six school-based interventions. The studies reported small differences in adherence between intervention and control groups. The small sample sizes and absence of information on reasons for low adherence in many included studies makes it challenging to interpret this evidence as suggesting equivalence: we therefore grade the evidence as insufficient because the studies do not all always attribute reasons for discontinuation or low adherence.
- *Posttraumatic stress for TGCT:* Participants in the TGCT intervention group did not exhibit any significant increase in reliable deterioration in post-traumatic stress. Because of the small sample size with wide confidence intervals, we graded the strength of evidence (SOE) as insufficient for the results of one study with imprecise estimates.
- *Depression for TGCT:* Participants in the TGCT intervention group did not exhibit any significant increase in reliable deterioration in depression. Because of the small sample size with wide confidence intervals, we graded the SOE as insufficient for the results of one study with imprecise estimates.
- *Traumatic grief for TGCT:* Participants in the TGCT intervention group did not exhibit any significant increase in reliable deterioration in traumatic grief. Odds ratios and confidence intervals were unable to be calculated owing to lack of participants with reliable deterioration. We graded the SOE as insufficient for the results of one study with imprecise estimates.
- *Existential grief for TGCT:* Participants in the TGCT intervention group did not exhibit any significant increase in reliable deterioration in existential grief. Odds ratios and confidence intervals were unable to be calculated owing to lack of participants with reliable deterioration. We graded the SOE as insufficient for the results of one study with imprecise estimates.

Detailed Synthesis

Harms in Trauma and Grief Component Therapy for Adolescents with Classroom-Based Psychoeducation and Skills Training Versus Classroom-Based Psychoeducation and Skills Training Control

One RCT[65] found no significant differences in reliable deterioration for post-traumatic stress, depression, traumatic grief, and existential grief by study arm at post-treatment or at 4-month followup (Table 67). Because the evidence on post-traumatic stress, depression, traumatic grief, and existential grief comes from a single study with imprecise estimates, we graded the SOE as insufficient (Table 68).

Table 67. School-based interventions: results

Author, Year	Intervention Type	Mental Health Harms	Physical Harms	Other Effects
Layne, et al., 2008[65]	TGCT	No significant differences in "reliable deterioration" (RCI) for post-traumatic stress (UCLA Reaction Index-Revised Total Scale Score) G1: 3/66 significantly deteriorated G2: 6/61 significantly deteriorated Odds ratio for reliable deterioration at post-treatment = 0.46 (95% CI, 0.12 to 1.77) Odds ratio not calculable at 4-month followup because no reliably deteriorated cases No significant differences in reliable deterioration for depression (Depression Self-Rating Scale) G1: 6/65 significantly deteriorated G2; 10/60 significantly deteriorated Odds ratio for reliable deterioration at post-treatment = 0.55 (95% CI, 0.21 to 1.43) Odds ratio not calculable at 4-month followup because no reliably deteriorated cases No significant differences in reliable deterioration for traumatic grief (UCLA Grief Index, Traumatic Grief Subscale) G1: 0/40 significantly deteriorated G2: 2/24 significantly deteriorated Odds ratio not calculable because no reliably deteriorated cases at post-treatment No significant differences in reliable deterioration for existential grief (UCLA Grief Index, Existential Grief Subscale) G1: 0/40 significantly deteriorated G2: 4/26 significantly deteriorated Odds ratio not calculable because no reliably deteriorated cases at post-treatment	NR	NR

CI = confidence interval; G = group; NR = not reported; RCI = Reliable Change Index; TGCT = trauma and grief component therapy for adolescents; UCLA = University of California, Los Angeles

Table 68. Strength of evidence for Key Question 4: trauma and grief component therapy for adolescents

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
TGCT with classroom-based psychoeducation and skills training vs. classroom-based psychoeducation and skills	1; 160 (127)	Deterioration in post-traumatic stress	RCT Medium	Unknown	Direct	Imprecise	No greater deterioration in post-traumatic stress; results were not found to be significant Insufficient
	1; 160 (127)	Deterioration in depression	RCT Medium	Unknown	Direct	Imprecise	No greater deterioration in depression; results were not found to be significant Insufficient
	1; 160 (127)	Deterioration in traumatic grief	RCT Medium	Unknown	Direct	Imprecise	No greater deterioration in traumatic grief; results were not found to be significant Insufficient
	1; 160 (127)	Deterioration in existential grief	RCT Medium	Unknown	Direct	Imprecise	No greater deterioration in existential grief; results were not found to be significant Insufficient

RCT = randomized controlled trial; TGCT = trauma and grief component therapy for adolescents

Key Question 4: Harms in Interventions Targeting Children Exposed to Trauma: Medication Interventions

Description of Included Studies

Four studies evaluated medication interventions. Table 69 describes retention rates for all medication interventions.

Three of four medication studies mentioned possible harms or adverse effects for KQ 4.[68-70] One study evaluated harms for sertraline versus placebo, including overall adverse events, dropouts because of adverse events, any severe adverse events, any serious adverse events, increase in suicidality ratings, active suicidality, disturbed sleep, agitation, headache, abdominal pain, nausea, pharyngitis, vomiting, accidental injury, respiratory tract infections, diarrhea, dizziness, hyperkinesis, rhinitis, dry mouth, and dysmenorrhea.[70] One study[68] recorded any adverse events for imipramine versus usual care in the form of chloral hydrate medication for sleep. Another study[69] evaluated adverse events in a trial comparing outcomes for children treated with imipramine, fluoxetine, or a placebo.

Table 69. Medication management harms: study characteristics

Author, Year	Intervention Type	Study Addressed Harms? (Yes/No)	Number Randomized Number Analyzed	Retention %
Robb, et al., 2010[70]	Sertraline G1: Sertraline G2: Placebo	Yes	Randomized total: 131 G1: 67 G2: 62 Analyzed total: 128 G1: 67 G2: 61 Completed study: 98 G1: 47 G2: 51	Total: 76.0% G1: 70.1% G2: 82.3% Study looked at dropouts due to medication adverse events
Nugent, et al., 2010[57]	Propranolol G1: Propranolol G2: Placebo	No	Randomized total: 29 G1: 14 G2: 15 Analyzed: 26 G1: 12 G2: 14 6 patients were nonadherent	Total: 68.9% G1: 64.3% G2: 73.3%
Robert, et al., 2008[69]	G1: Imipramine G2: Fluoxetine G3: Placebo	Yes	Randomized total: 62 G1: 21 G2: 19 G3: 22 Analyzed total: 60 G1: 20 G2: 18 G3: 22	Total: 96.8% G1: 95.2% G2: 94.7% G3: 100% Dropouts were due to consent and staffing issues, not to adverse effects of medications
Robert, et al., 1999[68]	G1: Imipramine G2: Placebo	Yes	Randomized total: 25 G1: 12 G2: 13 Analyzed total: 25 G1: 12 G2: 13	Total: 100% G1: 100% G2: 100%

G = group

Key Points: Imipramine Versus Chloral Hydrate or Placebo

- *Retention:* The studies did not report differential dropout rates; we graded the evidence as insufficient.
- *Overall adverse events or harms:* Participants in the imipramine intervention group did not exhibit any adverse events or harms in two studies.[68,69] Because of the small sample sizes of each study, short duration of treatment, no significance given, and imprecise estimates, we graded the SOE as insufficient for the results.

Key Points: Fluoxetine Versus Placebo

- *Retention:* The study reported a 5.3 percent difference in dropouts; we graded the evidence, based on a single small study, as insufficient.
- *Overall adverse events or harms:* Participants in the fluoxetine intervention group did not exhibit any adverse events or harms in the study[69];we graded the evidence, based on a single small study, as insufficient.

Key Points: Sertraline Versus Placebo

A single study comparing sertraline to placebo reported numerous adverse events but no significant differences between study arms. As a result, we graded the following outcomes as insufficient for:

- Any adverse events
- Disturbed sleep
- Agitation
- Headache/abdominal pain
- Nausea
- Pharyngitis
- Vomiting
- Accidental injury
- Respiratory tract infections
- Diarrhea
- Dizziness
- Hyperkinesis
- Rhinitis

The study also reported some incidents of severe adverse events (undefined), serious adverse events (undefined), dry mouth, and dysmenorrhea among patients taking sertraline compared with none for patients in the placebo arm. The authors did not run statistical tests that adjusted for zero-cell counts in the placebo arm. The study reported higher incidents of dropouts due to adverse events, increased suicidality ratings, and active suicidality in the sertraline arm compared with the placebo arm but did not report the results of statistical significance tests. We rated these outcomes also as insufficient.

Detailed Synthesis: Imipramine

Harms in Imipramine Versus Chloral Hydrate or Placebo

Two RCTs[68,69] found no mental health, physical, or other adverse events or harms in either study arm (Table 70). We graded the SOE as low for harms. Two studies met inclusion criteria; however, they were small, of short duration, without significance, and lacking precision in the estimates of effect (Table 71).

Detailed Synthesis: Fluoxetine

Harms in Fluoxetine Versus Placebo Control

One single small RCT[69] found no mental health, physical, or other adverse events or harms in either study arm (Table 70); we graded the SOE as insufficient (Table 71).

Table 70. Medication management: results

Author, Year	Intervention Type	Mental Health Harms	Physical Harms	Other Effects
Robb, et al., 2010[70]	G1: Sertraline G2: Placebo	Increased suicidality G1: 6 (9.0%) G2: 4 (6.5%) Risk ratio, NR Active suicidality G1: 1 G2: 0 Risk ratio, NR No significant increased risk of disturbed sleep G1: 7 (10.4%) G2: 8 (12.9%) Risk ratio, 0.81; 95% CI, 0.31 to 2.10 No significant increased risk of agitation G1: 4 G2: 2 Risk ratio=1.85, 95% CI, 0.35 to 9.75	No significant increased risk of headache G1: 17 (25.4%) G2: 12 (19.4%) Risk ratio, 1.31; 95% CI, 0.68 to 2.52 No significant increased risk of abdominal pain G1: 10 (14.9%) G2: 13 (21.0%) Risk ratio, 0.71; 95% CI, 0.34 to 1.50 No significant increased risk of nausea G1: 9 (13.4%) G2: 6 (9.7%) Risk ratio, 1.39; 95% CI, 0.52 to 3.67 No significant increased risk of pharyngitis G1: 7 (10.4%) G2: 6 (9.7%) Risk ratio, 1.08; 95% CI, 0.38 to 3.04 No significant increased risk of vomiting G1: 9 (13.4%) G2: 3 (4.8%) Risk ratio, 2.78; 95% CI, 0.79 to 9.79 No significant increased risk of accidental injury G1: 6 (9.0%) G2: 6 (9.7%) Risk ratio, 0.93; 95% CI, 0.32 to 2.72 No significant increased risk of respiratory tract infection G1: 6 (9.0%) G2: 4 (6.5%) Risk ratio, 1.39; 95% CI, 0.41 to 4.69	No significant increased risk of any adverse events G1: 51 (76.1%) G2: 47 (75.8%) Risk ratio, 1.00; 95% CI, 0.83 to 1.22 Any severe adverse event G1: 5 (7.5%) G2: 0 (0%) Risk ratio, NC Any serious adverse event (hospitalization for agitation and hyperactivity; 12-year-old with herpes zoster with hysterical reaction and suicidal ideation) G1: 2 (3.0%) G2: 0 (0%) Risk ratio, NC Dropouts due to adverse events from study medication G1: 5 (7.5%) G2: 2 (3.2%) Risk ratio, NR

Table 70. Medication management: results (continued)

Author, Year	Intervention Type	Mental Health Harms	Physical Harms	Other Effects
Robb, et al., 2010[70] (continued)			No significant increased risk of diarrhea G1: 6 (9.0%) G2: 3 (4.8%) Risk ratio, 1.85, 95% CI, 0.48 to 7.08 No significant increased risk of dizziness G1: 3 (4.5%) G2: 5 (8.1%) Risk ratio, 0.56, 95% CI, 0.14 to 2.23 No significant increased risk of hyperkinesis G1: 7 (10.4%) G2: 1 (1.6%) Risk ratio, 6.48, 95% CI, 0.82 to 51.16 No significant increased risk of rhinitis G1: 5 (7.5%) G2: 1 (1.6%) Risk ratio, 4.63, 95% CI, 0.56 to 38.51 Dry mouth G1: 5 (7.5%) G2: 0 (0%) Risk ratio, NC Dysmenorrhea G1: 0 (0%) G2: 2 (5.3%) Risk ratio, NC	
Robert, et al., 2008[69]	G1: Imipramine G2: Fluoxetine G3: Placebo	Authors reported no adverse events	Authors reported no adverse events	Authors reported no adverse events
Robert, et al., 1999[68]	G1: Imipramine G2: Placebo	Authors reported no adverse events	Authors reported no adverse events	Authors reported no adverse events

CI = confidence interval; G = group; NC = not calculable, NR = not reported

Table 71. Strength of evidence for Key Question 4: medication interventions

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Imipramine medication vs. chloral hydrate or placebo	2; 87 (85)	Overall adverse events/harms	RCT Medium	Consistent	Direct	Imprecise	No harms were found in either study for imipramine vs. chloral hydrate or vs. placebo. Significance was not reported for either study nor was manner of assessment. Low
Fluoxetine medication vs. placebo	1; 62 (60)	Overall adverse events/harms	RCT Low	Unknown	Direct	Imprecise	No harms or adverse events were found in one study for fluoxetine vs. placebo. Significance was not reported nor was manner of assessment. Insufficient
Sertraline medication vs. placebo	1; 129 (128)	Overall adverse events/harms	RCT Low	Unknown	Direct	Imprecise	Risk ratio for overall adverse events with sertraline was 1.00 compared with placebo. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Dropouts due to adverse events	RCT Low	Unknown	Indirect	Imprecise	Sertraline with a greater than double increase in dropouts compared with placebo due to adverse events from study medication. Significance was not provided. Insufficient
	1; 129 (128)	Disturbed sleep	RCT Low	Unknown	Direct	Imprecise	Sertraline with a risk ratio of 0.81 of disturbing sleep compared with placebo. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Headache	RCT Low	Unknown	Direct	Imprecise	Sertraline with a risk ratio of 1.31 of increasing headache compared with placebo. 95% CI was wide and result not found to be significant. Insufficient

Table 71. Strength of evidence for Key Question 4: medication interventions (continued)

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Sertraline medication vs. placebo (continued)	1; 129 (128)	Dysmenorrhea	RCT Low	Unknown	Direct	Imprecise	Sertraline had fewer episodes of dysmenorrhea compared with placebo (0 to 2). Significance was not reported. Insufficient
	1; 129 (128)	Dry mouth	RCT Low	Unknown	Direct	Imprecise	Sertraline had 5 episodes of dry mouth compared with 0 from the placebo group. Significance was not reported. Insufficient
	1; 129 (128)	Rhinitis	RCT Low	Unknown	Indirect	Imprecise	Sertraline had a risk ratio of 4.63 of patients having rhinitis compared with placebo. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Hyperkinesis	RCT Low	Unknown	Direct	Imprecise	Sertraline had a risk ratio of 6.48 of increasing hyperkinesis compared with placebo. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Dizziness	RCT Low	Unknown	Direct	Imprecise	Sertraline had a risk ratio of 0.56 of patients having dizziness compared with placebo. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Diarrhea	RCT Low	Unknown	Direct	Imprecise	Sertraline had a risk ratio of 1.85 of patients having diarrhea compared with placebo. 95% CI was wide and result not found to be significant. Insufficient

Table 71. Strength of evidence for Key Question 4: medication interventions (continued)

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Sertraline medication vs. placebo (continued)	1; 129 (128)	Respiratory tract infection	RCT Low	Unknown	Indirect	Imprecise	Sertraline had a risk ratio of 1.39 in increasing respiratory tract infections compared with placebo. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Abdominal pain	RCT Low	Unknown	Direct	Imprecise	Sertraline had a risk ratio of 0.71 compared with placebo of increasing abdominal pain. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Nausea	RCT Low	Unknown	Direct	Imprecise	Sertraline had a risk ratio of 1.39 compared with placebo of increasing nausea symptoms. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Pharyngitis	RCT Low	Unknown	Indirect	Imprecise	Sertraline had a 1.08 risk ratio compared with placebo of increasing pharyngitis. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Vomiting	RCT Low	Unknown	Direct	Imprecise	Sertraline had a 2.78 risk ratio compared with placebo of increasing vomiting. 95% CI was wide and result not found to be significant. Insufficient
	1; 129 (128)	Accidental injury	RCT Low	Unknown	Direct	Imprecise	Sertraline had a risk ratio of 0.93 compared with place of increasing accidental injuries. 95% CI was wide and result not found to be significant. Insufficient

Table 71. Strength of evidence for Key Question 4: medication interventions (continued)

Intervention	Number of Studies; Subjects (Analyzed)	Outcome	Risk of Bias	Consistency	Directness	Precision	Magnitude of Effect and Strength of Evidence
Sertraline medication vs. placebo (continued)	1; 129 (128)	Increased suicidality	RCT Low	Unknown	Direct	Imprecise	Sertraline had more cases of increases in suicide ratings than placebo (6 to 4). Significance was not provided. Insufficient
	1; 129 (128)	Active suicidality	RCT Low	Unknown	Direct	Imprecise	Sertraline had 1 case of active suicidality vs. 0 cases for placebo. Significance was not provided. Insufficient
	1; 129 (128)	Any serious adverse event	RCT Low	Unknown	Direct	Imprecise	Sertraline had 2 serious adverse events compared with 0 in the placebo group. Significance was not reported. Insufficient
	1; 129 (128)	Any severe adverse event	RCT Low	Unknown	Direct	Imprecise	Sertraline had 5 severe adverse events compared with 0 in the placebo group. Significance was not provided. Insufficient
	1; 129 (128)	Agitation	RCT Low	Unknown	Direct	Imprecise	Sertraline was shown to have a risk ratio of 1.85 to increase agitation. 95% CI was wide and result not found to be significant. Insufficient

CI = confidence interval; RCT = randomized controlled trial

Harms in Sertraline Intervention Versus Placebo Control

One RCT[70] found no significant increase in overall adverse events, disturbed sleep, agitation, headache, abdominal pain, nausea, pharyngitis, vomiting, accidental injury, respiratory tract infections, diarrhea, dizziness, hyperkinesis, or rhinitis, by study arm. The study did not report tests of statistical significance for differences in study arms (favoring placebo) for dropouts due to adverse events, increase in suicidality ratings, or active suicidality. The authors reported incidents of any serious adverse events, any severe adverse events, dry mouth, and dysmenorrhea in the sertraline arm but none in the placebo arm (Table 70). We graded the SOE as insufficient for all reported harms (Table 71).

Discussion

This section begins with a summary of key findings and strength of evidence (SOE) for each Key Question (KQ), followed by sections on the applicability of the findings, the limitations of the comparative review process, the limitations of the evidence base, and gaps in the evidence that may benefit from future research.

Key Findings and Strength of Evidence

Overview

Overall, the evidence from 21 trials and 1 observational study (20 articles) evaluated 6 types of interventions targeting children exposed to trauma (7 studies, 8 articles)[51-57] and 13 types of interventions targeting children already experiencing traumatic stress symptoms (15 studies, 16 articles).[58-61,63-66,68-71] These interventions were marked by substantial heterogeneity in components, dose, frequency, involvement of family members, and mode and method of delivery. The wide variety of approaches presented challenges to attempts to combine or categorize interventions as we had anticipated.

Although we identified numerous potential interventions in our protocol, very few studies examining these interventions met our inclusion criteria, likely because the interventions have not been implemented among children with trauma from sources other than maltreatment or sexual abuse. For example, we did not find any evidence on child-parent psychotherapy, an intervention primarily used for maltreated children.

We also dropped 35 studies for high risk of bias. We most commonly eliminated studies with high risk of bias because of selection bias (n=30), including poor randomization and lack of allocation concealment for trials and failure to control for confounding factors for observational studies (see Appendix E for further details). Other common reasons for the removal of studies with high risk of bias included attrition bias or differential attrition bias (n=12; e.g., loss to followup of ≥20% or differential loss to followup of ≥15% without appropriate handling of missing data), detection bias (n=11; e.g., bias in outcome assessment), and performance bias (n=9; e.g., not controlling for concurrently occurring or unintended interventions) Of these, we dropped 34 of 35 for multiple reasons; we dropped only 1 study with a single reason for the high risk of bias rating that invalidated all findings: a 77% drop-out rate (see Appendix E for more details). Having a study design less rigorous than a controlled trial did not drive our decision to drop the study for high risk of bias; we excluded only 4 of these 35 studies that had observational (prospective cohort) study designs. Most of these studies dropped for high risk of bias tested interventions similar to those included in our review (e.g., psychotherapeutic interventions such as cognitive behavioral therapy (CBT), eye movement desensitization and reprocessing (EMDR), exposure therapies, school-based interventions including Cognitive Behavioral Intervention for Trauma in Schools (CBITS) and pharmacotherapeutic interventions such as sertraline and other selective serotonin reuptake inhibitors [SSRIs]). Although high risk of bias studies may have added to some of the sparse evidence in this literature, their inclusion would not have materially altered strength of evidence because they would not have increased our confidence in the estimate of effect.

Key Question 1: Treatment Based on Trauma Exposure

We sought evidence on the effectiveness of interventions targeting children exposed to trauma on a range of traumatic stress, mental health, physical health, and other outcomes. These included the following:

- Prevention of and reduction in traumatic stress symptoms or syndromes (e.g., post-traumatic stress disorder [PTSD], acute stress disorder [ASD], developmental trauma disorder [DTD])
- Prevention of or reduction in mental health conditions or symptoms (e.g., depression, anxiety)
- Prevention of or reduction in physical health conditions or symptoms (e.g., sleep disorders, eating disorders, pain, overweight or obesity, asthma, cardiovascular problems, gastrointestinal problems, headaches)
- Reduction in risk-taking behaviors (including substance use), behavioral problems (including conduct disorder and attention deficit hyperactivity disorder [ADHD]), or criminal activities
- Healthy development, including improvements in interpersonal/social functioning or reductions in signs of developmental regression
- School-based functioning
- Improvements in quality of life
- Decreased suicidality

At least one outcome from each included study had to relate to the assessment of trauma symptoms or syndromes. We also included findings that showed non-beneficial outcomes associated with the intervention (e.g., no significant changes in outcomes between groups or significantly worse outcomes in the intervention group).

Summary of Findings by Intervention

Seven studies (in eight articles) on six different interventions provided information on a subset of these outcomes.[51-57] Five interventions evaluated a variety of psychotherapeutic approaches compared with wait-list controls,[54-56] no treatment,[51,52] usual care,[50] and supportive therapy[53]; the sixth intervention evaluated the efficacy of propranolol compared with placebo.[57] The propranolol study[57] and the early psychological intervention study[50] found no improvement in any outcomes. All other interventions reported some improvement in one or more outcomes.[51-56] Notably, three of the four interventions showing evidence of benefit (trauma-focused cognitive behavioral therapy [TF-CBT] and both mixed school groups interventions, ERASE Stress and Overshadowing the Threat of Terrorism) compared outcomes from interventions with outcomes from wait-list controls or no intervention.[51,52,54-56] The Child and Family Traumatic Stress Intervention (CFTSI) trial was the only study showing evidence of benefit with an active group comparator.[53]

Summary of Findings Across Interventions

Table 72 presents a summary of the SOE across all evaluated outcomes for interventions targeting children exposed to trauma. All studies evaluated traumatic stress symptoms, although the specific measure varied by study. Five studies (four treatment types) evaluated PTSD diagnosis[53-57]; of these, three studies (two treatment types, CFTSI and mixed school group ERASE Stress) found evidence of improvement favoring intervention arms.[53-55] Four studies (three treatment types) evaluated severity of PTSD symptoms[54-57]; three studies representing two treatments found evidence of improvement favoring intervention arms (both school-based interventions).[54-56] Three studies (one study presented in two publications) evaluating PTSD symptoms found evidence of improvement[51-53,56]; the early intervention study found no benefit (early psychological intervention).[50]

Six studies evaluated mental health outcomes, specifically anxiety, depression, and dissociative symptoms.[50-55,56] Both studies evaluating anxiety[53,56] reported improvement in anxiety; three studies evaluating depression[51,52,54,55] reported improvement in depression and the early psychological intervention found no improvement in depressives symptoms[50]; and one study found no improvement in dissociative symptoms.[53]

Four studies evaluated physical health outcomes.[54-57] All three that evaluated somatic complaints found evidence of benefit favoring the intervention arm.[54-56] A single study evaluating physiological reactivity found no evidence of benefit.[57]

Regarding other outcomes, all three studies that evaluated functional impairment found evidence of benefit.[54-56] The single study that evaluated behavior problems found no evidence of benefit.[50]

Summary of Findings by Outcome

Appendix F presents detailed findings by outcome for interventions with some evidence of benefit. We rated the evidence as low for all these outcomes, based on the limited number of studies (generally no more than one study per intervention) and small sample sizes.

Table 72. Summary of strength of evidence grades for interventions to prevent traumatic stress symptoms (Key Question 1)

Intervention	Comparator	Number of Studies	PTSD Diagnosis	PTSD Severity	PTSD Symptoms	Anxiety	Depression	Dissociative Symptoms	Somatic Complaints	Physiological Reactivity	Functional Impairment	Behavioral Problems
Trauma-focused cognitive behavioral therapy (school group and individual)	No treatment	1[51,52]	NE	NE	L (+)	NE	L (+)	NE	NE	NE	NE	NE
Child and Family Traumatic Stress Intervention	Supportive therapy	1[53]	L (+)	NE	L (+)	L (+)	NE	I	NE	NE	NE	NE
Mixed (psychoeducational material, cognitive behavioral skills, meditative practices, bio-energetic exercises, art therapy, narrative techniques, and home assignments) ERASE Stress (school groups)	Wait-list control that received religious classes	2[54,55]	L (+)	L (+)	NE	NE	L (+)	NE	L (+)	NE	L (+)	NE
Mixed (psychoeducational material and skills training with meditative practices, bio-energy exercises, art therapy, and narrative techniques for reprocessing traumatic experiences) Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1[56]	I	L (+)	L (+)	L (+)	NE	NE	L (+)	NE	L (+)	NE
Early psychological intervention	Usual care	1[50]	NE	NE	I	NE	I	NE	NE	NE	NE	I
Propranolol	Placebo	1[57]	I	NE	I	NE	NE	NE	NE	I	NE	NE

I = insufficient strength of evidence due to lack of evidence of effect; L (+) = low strength of evidence of benefit; NE = not evaluated by study authors; PTSD = post-traumatic stress disorder

Key Question 2: Treatment Based on Trauma Exposure and Already Having Symptoms

As in KQ 1, we sought evidence of the effectiveness of interventions designed to treat children exposed to trauma who were already experiencing symptoms on a variety of traumatic stress, mental health, physical health, and other outcomes. These included the following:

- Remission of PTSD
- Reduction in severity or number of traumatic stress syndromes or symptoms
- Prevention of or reduction in co-occurring mental health conditions or symptoms (e.g., depression, anxiety)
- Prevention of or reduction in co-occurring physical health conditions or symptoms (e.g., sleep disorders, eating disorders, pain, overweight or obesity, asthma, cardiovascular problems, gastrointestinal problems, headaches)
- Reduction in risk-taking behaviors (including substance use), behavioral problems (including conduct disorder and ADHD), or criminal activities;
- Healthy development including improvements in interpersonal/social functioning or reductions in signs of developmental regression
- School-based functioning
- Improvements in quality of life
- Decreased suicidality

As with KQ 1, at least one outcome from each included study had to relate to the assessment of trauma symptoms or syndromes. We also included findings that showed non-beneficial outcomes associated with the intervention (e.g., no significant changes in outcomes between groups or significantly worse outcomes in the intervention group).

Summary of Findings by Intervention

Fifteen studies reported on a subset of outcomes for 13 different interventions.[47,49,58-70] Ten of 13 interventions (presented in 12 studies[47,49,58-67]) evaluated a variety of psychotherapeutic approaches; of these interventions, 5 interventions reported in 7 studies compared outcomes with wait-list controls[47,58,59,63,64,66,67] and 2 with usual care.[49,65]

Three interventions used active comparators: one compared outcomes for narrative exposure therapy with meditation-relaxation therapy outcomes,[60] one grief- and trauma-focused intervention (GTFI) compared group therapy with individual therapy,[61] and a third compared outcomes for GTFI with coping skills and narrative processing with GTFI with coping skills only.[62] Three of 13 interventions focused on medications: one compared imipramine to chloral hydrate,[68] a second compared imipramine to fluoxetine and placebo;[69] and a third compared sertraline to placebo.[70]

As in the cluster of studies reporting on interventions targeting children exposed to trauma, no pharmacological interventions found evidence of benefit for any outcome, and the sertraline study suggested that the intervention arm fared worse than the control arm.[70] Three studies with active arms (Narrative Exposure Therapy, and both GFTI treatments) did not report evidence of benefit for any outcome.[60,61] All other interventions that compared outcomes to wait-list controls found some evidence of benefit for one or more outcomes.[58,59,63,64,66]

Summary of Findings Across Interventions

Table 73 presents a summary of the SOE across all evaluated outcomes for interventions targeting children exposed to trauma who already had symptoms. All studies evaluated traumatic stress symptoms, although the specific measure varied by study.[47,49,58-70] Four studies evaluated PTSD diagnosis[58,60,62,63]; of these, two found evidence of improvement favoring intervention arms (TF-CBT, EMDR).[58,63] Fifteen studies evaluated PTSD symptoms, but only four interventions were graded as having low SOE of improvement.[58,59,63,65] One study suggested evidence of worse outcomes for the intervention arm, sertraline, compared with the placebo arm for parent-rated PTSD symptoms and clinician-rated PTSD severity.[70]

Twelve studies representing 10 interventions evaluated mental health outcomes, specifically anxiety, depression, and internalizing symptoms.[47,49,58,59,61-67,70] Six studies reported no improvement in one or all outcomes evaluated.[49,61-63,66,70] One[58] of 5 interventions reported in 6 studies[49,58,62,63,66,67] evaluating anxiety symptoms reported improvements; 4 interventions reported in 5 studies[47,58,59,64,65] out of 10 interventions reported in 12 studies[47,49,58,59,61-67,70] were graded as having low SOE for improvement in depression; and 2 studies found no improvement in internalizing behaviors.[62,63]

Two studies evaluated physical symptoms or general health outcomes; neither found evidence of benefit.[60, 63]

Seven studies[60,62-64,66,67,70] evaluated a range of other outcomes, including functional symptoms, psychosocial dysfunction, acting out or aggression, shyness/anxiety, learning problems, quality of life, externalizing/conduct problem behaviors, global distress, anger, and supernatural complaints. One study suggested evidence of worse quality of life outcomes for the intervention arm, sertraline, compared with the placebo arm.[70] Two[60,63] of three studies evaluating general functioning did not find evidence of benefit. A third study found mixed results.[66] One study found evidence of benefit for the intervention arm on psychosocial dysfunction.[64] One[67] of three studies[62,66,67] found evidence of benefit for the intervention arm on externalizing/conduct problem behavior. No studies found any evidence of benefit for acting out or aggression, shyness, learning problems, quality of life, externalizing/conduct problem behaviors, global distress, anger, or supernatural complaints.

Summary of Findings by Outcome

Appendix F presents detailed findings by outcome for interventions with some evidence of benefit. We rated the evidence as low for all of these outcomes, based on the limited number of studies (generally no more than one study per intervention and no intervention having more than two studies combined) and small sample sizes.

Table 73. Summary of strength of evidence grades for interventions to treat traumatic stress symptoms (Key Question 2)

Intervention	Comparator	Number of Studies	PTSD Diagnosis/criteria	PTSD Severity	PTSD Symptoms	Anxiety	Depression	Internalizing Behavior	Physical Symptoms	General Functioning	Psychosocial Dysfunction	Acting Out/aggression	Shyness/anxiety	Learning	Quality of Life	Externalizing /Conduct Problem Behavior	Global Distress	Anger	Supernatural Complaints
Trauma-focused cognitive behavioral therapy	Wait-list control	1[58]	L (+)	NE	L (+)	L (+)	L (+)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Cognitive processing therapy	Wait-list control	1[59]	NE	NE	L (+)	NE	L (+)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Narrative Exposure Therapy	Meditation-relaxation therapy	1[60]	I	NE	I	NE	NE	NE	I	I	NE	NE	NE	NE	NE	NE	NE	NE	NE
Grief- and Trauma-Focused Intervention-Group	Grief- and trauma-focused intervention-individual	1[61]	NE	NE	I	NE	I	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Grief-and Trauma-Focused Intervention with Coping Skills and Narrative Processing	Grief-and trauma-focused intervention with coping skills only	1[62]	I	NE	I	I	I	I	NE	NE	NE	NE	NE	NE	NE	I	I	NE	NE
Emotion Regulation Therapy	Relational supportive therapy	1[49]	NE	NE	I	I	I	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	I	NE
Eye movement desensitization and reprocessing	Wait-list control	1[63]	L (+)	NE	L (+)	I	I	I	I	I	NE	NE	NE	NE	NE	I	NE	NE	NE

Table 73. Summary of strength of evidence grades for interventions to treat traumatic stress symptoms (Key Question 2)

Intervention	Comparator	Number of Studies	PTSD Diagnosis/criteria	PTSD Severity	PTSD Symptoms	Anxiety	Depression	Internalizing Behavior	Physical Symptoms	General Functioning	Psychosocial Dysfunction	Acting Out/aggression	Shyness/anxiety	Learning	Quality of Life	Externalizing /Conduct Problem Behavior	Global Distress	Anger	Supernatural Complaints
Cognitive Behavioral Intervention for Trauma in Schools	Wait-list control	2[47,64]	NE	NE	I	NE	L (+)	NE	NE	NE	L (+)	I	I	I	I	NE	NE	NE	NE
Trauma and grief component therapy (school groups)	Usual care	1[65]	NE	NE	L (+)	NE	L (+)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Mixed (CBT techniques and creative expressive elements) (school groups)	Wait-list control	2[66,67]	NE	NE	I	I	I	NE	NE	I	I	I	NE	NE	NE	L (+)	NE	NE	I
Imipramine	Chloral hydrate or placebo	2[68,69]	NE	NE	I	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Fluoxetine	Placebo	1[69]	NE	NE	I	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Sertraline	Placebo	1[70]	NE	L (-)	L (-)	NE	I	NE	NE	NE	NE	NE	NE	NE	L (-)	NE	NE	NE	NE

CBT = cognitive behavioral therapy; I = insufficient strength of evidence due to lack of evidence of effect; L (+) = low strength of evidence of benefit; L (-) = low strength of evidence of no benefit; NE = not evaluated by study authors; PTSD = post-traumatic stress disorder

Key Question 3: Treatment Subgroup Comparisons for Interventions Targeting Children Exposed to Trauma, Some of Whom Already Have Symptoms

Our review found only two studies that examined subgroup characteristics that moderated the effect of the interventions tested by an interaction term. We elected not to summarize findings that merely presented results stratified by subgroups because of the risk of overinterpreting results from underpowered subsamples. Both studies that examined subgroup characteristics that moderated the effect of an intervention on an outcome were school-based interventions: one intervention examined the effect of TF-CBT targeting children exposed to trauma[51] and a second examined the effect of CBT on treatment of trauma-exposed children who already had symptoms at baseline.[71] Both examined sex subgroups; in addition, one study evaluated age group and exposure to violence.[71] The TF-CBT study did not find any differences in relationship between intervention and PTSD symptoms or depression.[51] The CBT study found no significant differences by age group or exposure to violence with respect to PTSD symptoms or functional impairment. The study did, however, find significant differences by sex suggesting that the intervention effect on PTSD symptoms and functional impairment were greater for girls than boys.[71] Table 74 presents the findings of the single trial with evidence of subgroup differences with respect to intervention efficacy.

Key Question 4: Harms Associated With Interventions Targeting Children Exposed to Trauma, Some of Whom Already Have Symptoms

Five studies reported harms associated with interventions.[58,65,68-70] One study examined harms of TF-CBT versus wait-list control and found no adverse events in study group or control.[58] No mention was made of how harms were assessed or evaluated.

A second study examined the harms of trauma and grief component therapy (TGCT) for adolescents with classroom-based psychoeducation and skills training versus the classroom-based psychoeducation and skills training alone.[65] The study used a Reliable Change Index (RCI) for post-traumatic stress, depression, traumatic grief, and existential grief in order to quantify the number of reliably deteriorated cases. The authors found no significant differences in reliable deterioration for post-traumatic stress, depression, traumatic grief, and existential grief by study arm at post-treatment or at 4-month followup.

Three studies evaluated the harms of medications.[68-70] Two studies found no adverse events for imipramine compared with chloral hydrate[68] or placebo,[69] or for imipramine compared with fluoxetine.[69] These studies did not, however, report how adverse events or harms were assessed. One study found no significantly increased adverse events with sertraline in any adverse events, disturbed sleep, agitation, headache, abdominal pain, nausea, pharyngitis, vomiting, accidental injury, respiratory tract infections, diarrhea, dizziness, hyperkinesis, rhinitis, or by study arm. The study also reported some incidents of severe adverse events (undefined), serious adverse events (undefined), dry mouth, and dysmenorrhea among patients taking sertraline compared with none for patients in the placebo arm. The study reported higher incidents of dropouts due to adverse events, increased suicidality ratings, and active suicidality in the sertraline arm compared with the placebo arm but did not report the results of statistical significance tests.[70]

Table 74. Summary of results for child post-traumatic stress disorder treatment subgroup comparisons (Key Question 3)

Subgroup	Intervention	Comparator	Number of Trials, Number of Participants	Outcome	Strength of Evidence and Magnitude of Effect	Type of Exposure
Sex	Mixed school group	Wait-list control	1,[66] 403	PTSD symptoms	Low; intervention effect on reducing PTSD symptoms significantly greater for female than male students (G1: -0.090 [-0.161 to -0.019] vs. G2: 0.060 [-0.011 to 0.131])	Poverty and political violence/ instability
				Functional impairment	Low; intervention effect on reducing functional impairment significantly greater for female than male students (G1: -0.120 [-0.179 to -0.061] vs. G2: 0.012 [-0.047 to 0.071])	Poverty and political violence/ instability

G = group; KQ = Key Question; PTSD = post-traumatic stress disorder

Findings in Relation to What Is Already Known

Few systematic reviews have evaluated the treatment of traumatic stress in children; those that have done so have generally combined maltreatment as a form of trauma with single-episode exposure to trauma and trauma other than maltreatment. Because of the complicated relationship dynamics between a child and an abusive or neglectful parent, interventions might impact these groups differently. Generalizing the results of treatments found to be effective with a maltreated population to children with other types of trauma may mislead clinicians and policymakers. In addition, the focus or essential components of treatments targeting maltreated children with traumatic stress may differ significantly. This review attempts to decrease the heterogeneity of the population, thereby increasing the specificity of results, by examining interventions targeting children exposed to potentially traumatic events other than child maltreatment.

Our view of the heterogeneity of this population reflects ongoing debates about diagnostic classification. Van der Kolk notes that a child who experiences trauma as a single isolated exposure may be more likely to present with a discrete conditioned or behavioral response[73]; this difference has led experts in the field to propose a new diagnostic classification for the "Diagnostic and Statistical Manual of Mental Disorders, 5th Edition" (DSM-V), the Complex Developmental Trauma Disorder, to capture the impact of trauma in children who may experience ongoing traumatic stress from a young age. This proposed classification is intended to capture the experience of multiple or chronic and prolonged developmentally adverse traumatic events, most often of an interpersonal nature.

Despite the heterogeneity of these populations, some interventions investigated in children with a history of maltreatment or neglect may also hold promise in treating children with traumatic stress that is not related to maltreatment. Examples include child-parent psychotherapy (CPP), an empirically validated treatment for children under the age of 6 years that has been found to be effective with children with a history of exposure to intimate partner violence,[28] and parent-child interaction therapy (PCIT), an effective treatment for children with behavior problems and for children with a history of abuse.[74] Both CPP and PCIT include treatment components that may offer assistance to families with a child with traumatic stress other than maltreatment, particularly because they involve close collaboration with the caregiver. We found no evidence of these interventions that met our study criteria. In addition, the companion review that evaluated treatment of maltreated children found a few studies that tested interventions such as CPP or PCIT on outcomes such as recidivism and healthy caregiver-child relationships. The companion review found similar limitations as our review in volume and type of evidence: it found sparse evidence on interventions targeting maltreated children, with most trials being single studies that could not be combined, with low sample sizes and few head-to-head comparisons. Both reviews conclude that strong recommendations cannot be made based on the findings. Differences in interventions, outcomes, and patient characteristics across the two reviews precluded additional synthesis of the findings.

Symptoms of depression and anxiety are common among children with PTSD. Pharmacological interventions such as SSRIs and psychotherapy such as CBT that are effective in the treatment of depression and anxiety in children may also be found to be effective with children exposed to traumatic stress. TF-CBT is one such treatment that has been modified for use with children with traumatic stress. We found two studies demonstrating the effectiveness of TF-CBT when compared with wait-list control groups,[51,52,58] but no head-to-head trials. We found two studies on SSRIs, specifically on fluoxetine and sertraline, comparing outcomes with children in a placebo arm. Neither found evidence of effectiveness.[69,70]

Implications for Clinical and Policy Decisionmaking

The lack of definitive evidence on interventions targeting children exposed to trauma, some of whom already have symptoms, makes it challenging to identify clear recommendations for clinical and policy decisionmaking. The most compelling implications of our results relate to future research. Our results clearly indicate the need for more research for all types of interventions using randomized controlled trials (RCTs) with head-to-head comparisons of interventions with active comparators, for possibly relevant interventions such as CPP and PCIT, for studies on pharmacological interventions, and for assessment of interventions more efficacious in particular subgroups. Additional research using valid and reliable measures such as clinical interviews to assess symptoms of traumatic stress and different traumatic stress syndromes such as developmental trauma disorder (DTD) is also needed. Because these trials are time-consuming and typically expensive, investigators may wish to consider alternative approaches to gathering evidence such as system monitoring and reporting on the uses of interventions in different practice settings to determine the effectiveness of interventions for children exposed to specific types of trauma.

We note the difficulty of conducting large-scale trials and maintaining retention among children with traumatic stress symptoms. The potential for commercial sponsorship of studies in this population is also unclear. One potential pathway for funders of research is the use of practice-based research. The Centers for Medicare and Medicaid Services (CMS) offers a policy of coverage with evidence development to allow reimbursement for novel or unproven interventions while simultaneously generating evidence for evaluation. This type of approach may serve as a model for public and private payers for generating new evidence on a relatively small and difficult-to-reach population that often receives off-label interventions.

Research is sparse on interventions targeting children who have been exposed to traumas other than maltreatment and family violence but who are not necessarily already exhibiting clinical syndromes (e.g., PTSD). However, some psychotherapy interventions targeting children exposed to trauma appear promising based on study design rigor and magnitude and precision of effects found, with no associated harms reported. These interventions include ERASE Stress (a mixed school-based group intervention) and CFTSI. There was less compelling evidence regarding potentially promising interventions targeting children with trauma exposure with already existing symptoms or syndromes. Although some individual psychotherapy studies found significant decreases in traumatic stress symptoms or syndromes and related psychopathology (e.g., depression, anxiety) and dysfunction, the low sample sizes, small magnitudes of effect, and low generalizability found in many of these studies preclude definitive recommendation. Based on the preliminary evidence in this systematic review, clinicians and policymakers facing a choice of options may elect to focus on therapies with some evidence of effectiveness. Because clinical care rarely comprises exact manualized interventions, clinicians might also seek to create patient-centered treatments composed of specific components of several interventions that have particular theoretical, evidence-based, or anecdotal benefits. Additional research focused on testing these specific components rather than a particular standardized intervention may further promote the creation of efficacious, individualized, treatments.

Applicability

As noted, during the review process we systematically abstracted key factors that may affect the applicability of the evidence base. We identified these key factors a priori, using as our

guidepost the definition of applicability provided by the Agency for Healthcare Research and Quality (AHRQ) Effective Health Care (EHC) Program that defines applicability as "the extent to which the effects observed in published studies are likely to reflect the expected results when a specific intervention is applied to the population of interest under real-world conditions."[75]Additionally, we explicitly sought to identify factors that related to each element of the population, intervention, comparators, outcomes, timing, and setting (PICOTS) framework that was used to guide the review. In the following sections, we present the major issues that emerged from our analysis of factors affecting the applicability of the evidence base.

Population

The evidence base of interventions for children exposed to traumas other than sexual trauma and family violence is limited. Although age groups represented by individual studies range from 7 to 17 years of age and in some cases older (up to 19 years of age), only 2 studies included children younger than 7 years of age.[68,69] No studies that addressed KQ 1 that recruited children exposed to a traumatic event (but did not assess for already occurring symptoms) included children younger than 7 years of age. In addition, the type of exposure varied widely across studies. The studies that addressed KQ 1 included two studies of children exposed to a natural disaster, two studies of children exposed to war/terrorism, three studies of children exposed to accidents, and one study with mixed trauma types. The treatment studies that addressed KQ 2 included children who had trauma exposure and were already experiencing symptoms, but trauma type also differed across studies. Three of the four pharmacotherapy studies[57,68,69] included children treated in an emergency room who had experienced accidents (motor vehicle, thermal injuries, or mixed) and were experiencing acute stress symptoms.[68,69] The applicability of these findings is unknown in children exposed to mixed traumas, natural disasters, war or political violence, or other types of traumas. Thus, the applicability of the evidence is somewhat limited to characteristics of children included in each specific study.

Intervention

The evidence base reflects the diverse range of intervention approaches in the field. Several interventions noted in the evidence base were not found in this review. Only 4 interventions (2 ERASE Stress school-based mixed intervention trials and 2 CBITS trials) addressing KQ 2 were able to be combined in the evidence table. Most interventions varied in intensity as well, with delivery ranging from 4 to 20 sessions for the psychotherapies and from 1 to 10 weeks for medication administration in the pharmacotherapeutic interventions. Most were lower intensity (up to 12 weekly sessions or approximately 3 months in duration) and only 1 intervention[65] was of medium intensity (13 to 24 weekly sessions or approximately 6 months in duration). The majority of studies delivered the intervention under more ideal than real-world conditions, such as by staff with specialized training and/or under close supervision of a highly specialized clinician (often the intervention developer). As noted, the interventions analyzed in the results all indicated the use of a manual. However, the interventions appear to vary considerably in the degree to which they are ready for dissemination, and studies offer minimal discussion of fidelity in the literature we reviewed. Thus, studies do not provide clarity on whether children received interventions as manualized or adapted interventions fit to the target population. Therefore, the potential for translation of these interventions into real-world settings is unclear.

Comparators

The evidence was primarily composed of studies that used inactive controls, usual care, or wait-list[76-78] controls. For treatment studies addressing KQ 2, only two trials were head-to-head comparisons,[61,62] and only one pharmacotherapy was a head-to-head comparison of two different types of antidepressants[69] versus a third (control) group. The other interventions addressing KQ 1 consisted of two inactive control comparisons,[51,52] two usual care comparators,[50,53] and three wait-list controls,[54-56] and, for the single pharmacotherapy trial, one placebo comparator. Most of the remaining KQ 2 psychotherapy trials[47,58-60,63,64,66,67] utilized wait-list control comparators; two trials had usual care comparators.[49,65] The KQ 2 pharmacotherapy trials used more rigorous sets of comparators, including a usual care comparator (chloral hydrate)[68] and a placebo comparator.[70]

Outcomes

Of the many outcomes searched for in the literature, relatively few were found in the studies included in this review. For example, no studies examined decreased suicidality as a study outcome; risk-taking behaviors such as substance use; conduct disorders; criminal activities; or individual physical health conditions such as obesity, cardiovascular disease, or sleep problems. Thus, the applicability of these types of outcomes that concern clinicians is unknown. In addition, no studies relied on clinician diagnosis of PTSD either during the baseline period or during followup. Studies that did examine PTSD diagnosis as an outcome[53-58,60,63] used a self-reported diagnostic instrument such as the UCLA PTSD Index and Child PTSD Symptom Scale (CPSS). None of the mental health outcomes examined were assessed via clinician diagnosis. The evidence base for the efficacy or effectiveness of trauma interventions in improving trauma symptoms or syndromes, mental health outcomes, physical health outcomes, and other outcomes such as functional impairment and quality of life was mostly based on child self-report, with few relying on parent reports[47,62-64,66] or teacher reports[47,64] of impairment or behaviors. Most of the outcomes were measured at baseline and followup at the end of the intervention. Few followups were completed at multiple end points, and the long-term effects of the interventions are largely unknown. These limitations on outcome measures reduce the applicability for clinicians needing to choose a treatment based on these findings.

Setting

Nearly half of the studies were conducted outside the United States, including Armenia,[51,52] Sri Lanka,[54,60,67] Israel,[55,56] London,[58] Bosnia,[65] Switzerland[50] and Indonesia.[66] Several studies conducted in the Middle East and Asia that were delivered in school settings[54-56,67] may not be applicable to school settings in the United States. A majority of the pharmacotherapies recruited subjects via the emergency room,[57,68,69] with followup either in the hospital during an inpatient stay or in an outpatient setting.

Limitations of the Review Process

As discussed in the previous section, the applicability of our systematic review is limited given the population, outcomes, and setting limits we placed on our included studies. Our exclusions, described in the methods, served to focus the review (particularly in relation to its companion on interventions to address child maltreatment) and to control for sources of

heterogeneity. Nonetheless, these exclusions necessarily limited the scope of this review. We describe important limitations below.

First, several of our population criteria limited the review. We focused our review exclusively on children 17 years of age or younger because of the differences in intervention types, outcomes of interest, and developmental aspects of how adults and children process traumatic events. Effectiveness of adult treatments for trauma exposures are covered in a separate AHRQ review.[79] We also excluded studies that examined children exposed to maltreatment or family violence, also described in a separate AHRQ review,[36] because of the critical differences in these types of trauma exposures and the associated impact on type and delivery of the intervention.

Our outcome criteria also limited our review. We required studies report change in traumatic stress symptoms or syndromes as an outcome to align with our primary objective of examining intervention effectiveness on these outcomes. The criterion requiring traumatic stress symptoms or syndromes as at least 1 study outcome resulted in the exclusion of 16 articles that were identified through our search strings, but did not report on traumatic stress symptom outcomes. The nature of trauma interventions targeting other mental health conditions and functioning such as suicide or conduct problems may differ in objectives, design, and delivery from trauma interventions targeting traumatic stress symptoms or syndromes. We included these other types of outcomes as secondary outcomes of interest for studies that examined traumatic stress symptoms or syndromes as an outcome because of the importance of identifying other potential benefits that results from a single intervention.

Additional criteria served to further focus our review. We required a publication date of 1990 or later to focus on supportive evidence from currently relevant treatments because of the evolving nature of the field. We also required a sample size of 10 or more to ensure that we focused on hypothesis-testing studies rather than descriptive accounts from case series or case reports. We excluded these study designs as well as cross-sectional, nonsystematic reviews, retrospective cohort studies, and non-nested case control studies, because these types of study designs make isolating the effect of an intervention difficult to validly assess. Finally, we excluded studies that were not written in English, thus decreasing the applicability to countries where researchers publish in other languages.

Finally, as noted previously, we limited the synthesis to trials and observational studies with low and medium risk of bias. Given the limitations of the included studies and their applicability to other contexts, however, including high risk-of-bias studies would likely have increased the pool of evidence without resulting in more actionable evidence.

Limitations of the Evidence

This Comparative Effectiveness Review finds that the field of interventions targeting children exposed to trauma other than maltreatment or family violence is still in its infancy. Although we found no evidence of publication bias from our review of scientific information packets and grey literature, we found very few trials that addressed each of the KQs of intervention efficacy, especially whether efficacy differed by subgroups or whether the interventions were associated with harms. Most were unique interventions; thus, combining the findings across studies or replicating significant findings was not permitted from the evidence base. Furthermore, several of the known types of interventions used to treat child traumatic stress (noted in the introduction section) were not found in any study included in this review. Thus, the efficacy of these types of interventions (e.g., CPP, Skills Training in Affective and Interpersonal

Regulation/Narrative Story-Telling [STAIR/NST], dialectical behavior therapy [DBT], structured psychotherapy for adolescents responding to chronic stress [SPARCS], PCIT, trauma systems therapy [TST], particular antidepressants, stimulants, antipsychotics, benzodiazepines, equine-assisted psychotherapy) to treat children exposed to trauma other than maltreatment or family violence was not evaluated in this review.

Data on pharmacological interventions are sparse and marked by methodological limitations. Only one trial targeted children exposed to trauma, and three trials focused on treatment trials for children already experiencing symptoms. These pharmacologic interventions were small trials and none had findings of benefit. Two trials administered medications for only 7 days; this duration is inadequate because antidepressants typically take 1-4 weeks to become effective.[80] Reaching steady-state for serum concentrations for a medication such as fluoxetine typically takes longer than 7 days.[81] None of the included studies determined the actual efficacy of fluoxetine administered for longer durations in concordance with usual practices. Finally, many other types of medications routinely used to treat traumatic stress in adults and children exposed to maltreatment and family violence have not been adequately tested in this population. In addition, the heterogeneity in samples, particularly with respect to child characteristics and type of trauma, makes synthesis of the findings difficult. Furthermore, most studies did not note or study the important clinical distinctions of whether each child had experienced a single trauma or multiple traumas, or whether each child had comorbid mental health conditions that can affect the efficacy of interventions on outcomes. Very few studies included young children (ages 5 or younger), and only one[71] compared efficacy of an intervention across child age. These child characteristics, which are important to clinical decisions, have not been accounted for in the evidence base of interventions targeting children exposed to trauma other than maltreatment or family violence, some of whom already have symptoms.

Another limitation of the evidence base results from outcome assessment methods. The outcomes studied were mostly based on child self-reports. Few studies used a clinical interview to assess PTSD diagnosis or other mental health outcomes. Although controversy exists regarding whether PTSD is an appropriate diagnosis for children, determining whether an intervention can affect clinically meaningful syndromes of traumatic stress symptoms requires future research. As noted earlier, few included studies assessed longer-term outcomes.

Finally, the applicability of the findings is limited by setting and type of trauma exposure. Nearly half of the included studies (11 of 23) were conducted outside the United States. In addition, the findings of individual studies are applicable only to children with similar characteristics and exposure to the same types of trauma. The types of trauma experienced by children in the included studies varied widely. For example, of the seven PTSD studies targeting exposure to trauma that addressed KQ 1, two studies included children exposed to a natural disaster, two studies included children exposed to war/terrorism, two studies included children exposed to accidents, and 1 study included children with mixed trauma types. The treatment studies that addressed KQ 2 included children with similar heterogeneity. Findings may not translate across setting, culture, economic conditions, and trauma type.

Research Gaps

Future studies on interventions targeting children exposed to trauma other than maltreatment and family violence, some of whom already have symptoms, are warranted for several reasons. First, the evidence base for well-designed interventions that lack sufficient bias addressing child trauma other than maltreatment and family violence is small. The heterogeneity in types of

interventions prevented combining the results of more than two studies per intervention, thus precluding examination of the consistency of associations. No evidence was found for several interventions commonly used to treat children with trauma exposures. A published systematic review of sports and games interventions did not find any well-designed interventions that met their inclusion criteria, thus indicating a need for additional, well-designed studies in this field.[45] Although most psychotherapy interventions were manualized for delivery, several did not assess treatment fidelity. In addition, only four pharmacotherapy trials were included in this review, and those trials did not study many types of commonly prescribed medications for children exposed to trauma.

Second, the sample sizes of the studies included in this review were small to medium. Identifying children with trauma exposure and obtaining informed consent limits the feasibility of recruiting large sample sizes for randomized controlled trials. Insufficient funding also may contribute to small sample sizes.

The small sample sizes created several problems with the reliability of the analyses and rendered subgroup analysis all but impossible. Thus, several analyses were likely underpowered to detect significant associations. The lack of power becomes even more problematic when attempting to adjust analyses for important covariates that may confound the relationship between the intervention and outcomes. Loss of subjects to followup makes the issues related to sample size even more pronounced. Subgroup analyses also become difficult with small sample sizes, evidenced by the review finding only two studies that examined the intervention-outcome link across varying subgroup characteristics. This is especially problematic given that the efficacy of particular interventions is thought anecdotally to differ across factors such as developmental age of the child and/or type, severity, or experience of single versus multiple traumas. Whether this hypothesis holds true in research trials remains unknown. The difficulty of conducting studies in this population suggests that future research may require focus on observational studies, including heightened attention to research involving registry data.

Third, the outcomes reported were largely based on self-report symptomatology instead of clinical interview diagnosis. Although there is controversy surrounding the appropriateness of the PTSD diagnosis in children, the use of a standardized interview to qualify clinical syndromes rather than changes in symptoms is needed. Demonstrating that a statistically significant change in symptoms is clinically relevant is difficult. The current shift to a more inclusive diagnostic system in DSM-V focused on DTD might inform future research efforts that target and treat children based on already occurring DTD and targeting prevention of DTD among exposed children. Only one study[65] used the Reliable Change Index (RCI) to quantify whether symptom changes over time were differentially significant, although RCI was used to study harms (i.e., deterioration in symptoms over time) rather than improvements in outcomes. Few studies reported actual effect sizes. In addition, several important outcomes, such as suicidality, were not not tested in any trial included in this review.

Finally, few studies assessed harms associated with participating in a particular intervention. Although study dropouts could be quantified based on reported numbers of participants at baseline and each follow-up assessment, adherence to the protocol was not assessed in any study. Future studies of child trauma interventions require formal testing for harms, especially for risk of retraumatization.

Conclusions

Our review uncovered a modest and heterogeneous body of evidence, marked by numerous interventions with a single study. We did not find studies that attempted to replicate findings of effective interventions; rather, studies tested unique interventions. No pharmacotherapy intervention demonstrated effectiveness; in one study of sertraline, children in the intervention arm tended to fare worse than those in the placebo arm.[70] Studies demonstrating improvement in outcomes generally compared results of interventions with wait-list controls. With a single exception,[53] studies comparing interventions with active controls did not show benefit. Some psychotherapy interventions targeting children exposed to trauma appear promising based on the magnitude and precision of effects found. These interventions were school-based treatments with elements of CBT. There was less compelling evidence regarding potentially promising interventions targeting children exposed to traumatic events already experiencing symptoms; each such intervention also had elements of CBT.

Authors typically evaluated short-term outcomes. The body of evidence provides no insight on how interventions targeting children exposed to trauma or already experiencing traumatic stress symptoms might influence healthy long-term development. We found very little evidence on how effectiveness might vary by child characteristics and no evidence on how effectiveness might vary by treatment characteristics or setting. We also found almost no evidence on harms associated with psychological treatments. Only pharmacological interventions attempted to assess harms in this vulnerable population.

Our findings may be interpreted as a call to action: psychotherapeutic intervention may be beneficial relative to no treatment, but far more research is required to produce definitive guidance on the comparative effectiveness of psychotherapeutic or pharmacological interventions targeting children exposed to trauma, some of whom already have symptoms.

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80. Eli Lilly. Prozac. Drug insert from Eli Lilly. Section 12.3.

81. Eli Lilly. Prozac. Drug insert from Eli Lilly. Section 5.12.

Appendix A. Search Strategy

Initial Search

We performed the initial searches on October 7, 2011.

PubMed

Search	Queries	Result
#1	Search "Stress Disorders, Traumatic"[Mesh] OR "PTSD"[tiab] OR "post-traumatic stress disorders"[tiab] OR "post-traumatic stress disorder"[tiab] OR "posttraumatic stress disorders"[tiab] OR "posttraumatic stress disorder"[tiab]	21143
#2	Search “Traumatizing”[tiab] OR “Traumatising”[tiab] OR “Trauma”[tiab] OR “Traumatic”[tiab] OR “Traumas”[tiab] OR “Traumatization”[tiab] OR “Traumatisation”[tiab] OR “Traumatized”[tiab] OR “Traumatised”[tiab] OR "peritraumatic"[tiab]	204776
#3	Search "Social Problems/psychology"[Mesh]	38563
#4	Search "Life Change Events"[Mesh]	16956
#5	Search "Stress, Psychological"[Mesh]	76655
#6	Search "Wounds and Injuries/psychology"[Mesh]	12642
#7	Search "Disasters"[Mesh]	53414
#8	Search "Child Abuse"[Mesh:NoExp]	15267
#9	Search "survival/psychology"[Mesh]	365
#10	Search #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9	394477
#11	Search "Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh]	2556949
#12	Search #10 AND #11	114458
#13	Search #12 Limits: Humans, English, Publication Date from 1990/01/01 to 2011/10/01	73765
#14	Search "Psychotherapy"[Mesh]	134281
#15	Search "Complementary Therapies"[Mesh]	151648
#16	Search "Mental Health Services"[Mesh]	65842
#17	Search "Therapeutics/psychology"[Mesh]	40809
#18	Search (therapy[tiab] OR therapies[tiab]) AND ("school"[tiab] OR "classroom"[tiab])	4818
#19	Search "Adaptation, Psychological"[Mesh]	88217
#20	Search #13 AND (#14 OR #15 OR #16 OR #17 OR #18 OR #19)	10452
#21	Search "Psychotropic Drugs"[Mesh]	115148
#22	Search "Antidepressive Agents"[Pharmacological Action]	109847
#23	Search "Monoamine Oxidase Inhibitors"[Pharmacological Action]	18997
#24	Search "Anticonvulsants"[Pharmacological Action]	120327
#25	Search "Adrenergic Agents"[Pharmacological Action]	301992
#26	Search "Antipsychotic Agents"[Pharmacological Action]	114700
#27	Search "Tranquilizing Agents"[Pharmacological Action]	168833
#28	Search "Benzodiazepines"[MeSH]	54555
#29	Search "Opiate Alkaloids"[Mesh]	69666
#30	Search "Anesthetics, Dissociative"[Pharmacological Action]	8346
#31	Search #13 AND (#21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30)	1526
#32	Search #20 OR #31	11742
#33	Search "Randomized Controlled Trial"[Publication Type] OR "Randomized Controlled Trials as Topic"[Mesh] OR "Single-Blind Method"[Mesh] OR "Double-Blind Method"[Mesh] OR "Random Allocation"[Mesh]	457269
#34	Search "meta-analysis"[Publication Type] OR "meta-analysis as topic"[MeSH Terms] OR "meta-analysis"[All Fields]	50439
#35	Search "Comparative Study"[Publication Type] OR "comparative study"	1550017
#36	Search ("review"[Publication Type] AND "systematic"[tiab]) OR "systematic review"[All Fields] OR ("review literature as topic"[MeSH AND "systematic"[tiab])	43153
#37	Search "Cohort Studies"[Mesh] OR “cohort effect”[MeSH Term] OR cohort*[tiab] OR "Case-Control Studies"[Mesh]	1292585
#38	Search #32 AND (#33 OR #34 OR #35 OR #36 OR #37)	3835

Cochrane Database

ID	Search	Hits
#1	"Stress Disorders, Traumatic"[Mesh] OR "PTSD"[tiab] OR "post-traumatic stress disorders"[tiab] OR "post-traumatic stress disorder"[tiab] OR "posttraumatic stress disorders"[tiab] OR "posttraumatic stress disorder"[tiab]	1215
#2	"Traumatizing"[tiab] OR "Traumatising"[tiab] OR "Trauma"[tiab] OR "Traumatic"[tiab] OR "Traumas"[tiab] OR "Traumatization"[tiab] OR "Traumatisation"[tiab] OR "Traumatized"[tiab] OR "Traumatised"[tiab] OR "peritraumatic"[tiab]	9379
#3	"Social Problems/psychology"[Mesh]	2
#4	"Life Change Events"[Mesh]	381
#5	"Stress, Psychological"[Mesh]	2932
#6	"Wounds and Injuries/psychology"[Mesh]	33
#7	"Disasters"[Mesh]	103
#8	"Child Abuse"[Mesh:NoExp]	512
#9	"survival/psychology"[Mesh]	4
#10	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9)	13130
#11	"Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh]	119851
#12	(#10 AND #11)	3662
#13	(#12), from 1990 to 2011	3312
#14	"Psychotherapy"[Mesh]	6422
#15	"Complementary Therapies"[Mesh]	791
#16	"Mental Health Services"[Mesh]	1380
#17	"Therapeutics/psychology"[Mesh]	1
#18	(therapy[tiab] OR therapies[tiab]) AND ("school"[tiab] OR "classroom"[tiab])	28136
#19	"Adaptation, Psychological"[Mesh]	2611
#20	(#13 AND (#14 OR #15 OR #16 OR #17 OR #18 OR #19))	806
#21	"Psychotropic Drugs"[Mesh]	658
#22	"Antidepressive Agents"[Pharmacological Action]	4456
#23	"Monoamine Oxidase Inhibitors"[Pharmacological Action]	546
#24	"Anticonvulsants"[Pharmacological Action]	2077
#25	"Adrenergic Agents"[Pharmacological Action]	142
#26	"Antipsychotic Agents"[Pharmacological Action]	3311
#27	"Tranquilizing Agents"[Pharmacological Action]	530
#28	"Benzodiazepines"[MeSH]	2858
#29	"Opiate Alkaloids"[Mesh]	3
#30	"Anesthetics, Dissociative"[Pharmacological Action]	255
#31	(#13 AND (#21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30))	96
#32	(#20 OR #31)	859
#33	"Randomized Controlled Trial"[Publication Type] OR "Randomized Controlled Trials as Topic"[Mesh] OR "Single-Blind Method"[Mesh] OR "Double-Blind Method"[Mesh] OR "Random Allocation"[Mesh]	350440
#34	"meta-analysis"[Publication Type] OR "meta-analysis as topic"[MeSH Terms] OR "meta-analysis"[All Fields]	18058
#35	"Comparative Study"[Publication Type] OR "comparative study"	138001
#36	("review"[Publication Type] AND "systematic"[tiab]) OR "systematic review"[All Fields] OR ("review literature as topic"[MeSH AND "systematic"[tiab])	28267
#37	"Cohort Studies"[Mesh] OR "cohort effect"[MeSH Term] OR cohort*[tiab] OR "Case-Control Studies"[Mesh]	20840
#38	(#32 AND (#33 OR #34 OR #35 OR #36 OR #37))	763
#39	"Humans"[Mesh] in Cochrane Reviews, Other Reviews, Clinical Trials, Methods Studies, Technology Assessments and Economic Evaluations	419685
#40	(#38 AND #39)	703

EMBASE

No.	Query	Results
#1	'posttraumatic stress disorder'/exp OR 'acute stress disorder'/exp	26,326
#2	'psychiatric treatment'/exp	251,511
#3	#1 AND #2	5,519
#4	#3 AND 'human'/de AND (1990:py OR 1991:py OR 1992:py OR 1993:py OR 1994:py OR 1995:py OR 1996:py OR 1997:py OR 1998:py OR 1999:py OR 2000:py OR 2001:py OR 2002:py OR 2003:py OR 2004:py OR 2005:py OR 2006:py OR 2007:py OR 2008:py OR 2009:py OR 2010:py OR 2011:py) AND ('article'/it OR 'review'/it)	4,154
#5	'adolescent'/exp OR 'child'/exp OR 'newborn'/exp	2,555,988
#6	#4 AND #5	673

PsycINFO, CINAHL, IPA

#	Query	Results
S9	S8 Limiters - Published Date from: 19900101-20111031; Publication Year from: 1990-2011; English; Language: English; Age Groups: Childhood (birth-12 yrs), Neonatal (birth-1 mo), Infancy (2-23 mo), Preschool Age (2-5 yrs), School Age (6-12 yrs), Adolescence (13-17 yrs); Population Group: Human; Exclude Dissertations; English Language; Exclude MEDLINE records; Language: English; Age Groups: Infant, Newborn: birth-1 month, Infant: 1-23 months, Child, Preschool: 2-5 years, Child: 6-12 years, Adolescent: 13-18 years, All Infant, All Child; Language: English; Articles about Human Studies Search modes - Boolean/Phrase	259
S8	S5 or S7	2523
S7	S4 and S6	1646
S6	DE "Drug Therapy"	94763
S5	S1 and S4	889
S4	S2 or S3	160444
S3	"Posttraumatic Stress Disorder" OR DE "Reactive Psychosis" OR DE "Stress Reactions" OR DE "Psychological Stress" OR DE "Acute Stress Disorder" OR DE "Emotional Trauma"	44624
S2	"Injuries" OR DE "Burns" OR DE "Electrical Injuries" OR DE "Head Injuries" OR DE "Spinal Cord Injuries" OR DE "Wounds"	117260
S1	DE "Psychotherapeutic Techniques" OR DE "Animal Assisted Therapy" OR DE "Autogenic Training" OR DE "Cotherapy" OR DE "Dream Analysis" OR DE "Ericksonian Psychotherapy" OR DE "Guided Imagery" OR DE "Mirroring" OR DE "Morita Therapy" OR DE "Motivational Interviewing" OR DE "Mutual Storytelling Technique" OR DE "Paradoxical Techniques" OR DE "Psychodrama"	25614

Web of Science (ISI)

Set	Results	Query
# 12	384	#11 AND #7 AND #6 Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 11	214,119	#10 OR #9 OR #8 Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 10	5,864	Topic=(Psychotherapeutic) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 9	40,901	Topic=(Psychotherapy) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 8	170,421	Topic=(drug therapy) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 7	849,415	Topic=(child) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 6	40,897	#5 OR #4 OR #3 OR #2 OR #1 Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 5	32,295	TS=(PTSD) OR TS=(posttraumatic) OR TS=("stress disorder") Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 4	2,633	Topic=(Emotional Trauma) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 3	7,579	Topic=(traumatic event) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 2	5,407	Topic=(childhood trauma) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 1	403	TS=("acute stress disorder") Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On

Number of records after duplicates removed: 5,990

Update Search

We performed update searches from July 31 – August 1, 2012.

PubMed: 31 July – 1 August 2012

Search	Queries	Result
#1	Search "Stress Disorders, Traumatic"[Mesh] OR "PTSD"[tiab] OR "post-traumatic stress disorders"[tiab] OR "post-traumatic stress disorder"[tiab] OR "posttraumatic stress disorders"[tiab] OR "posttraumatic stress disorder"[tiab]	22765
#2	Search “Traumatizing”[tiab] OR “Traumatising”[tiab] OR “Trauma”[tiab] OR “Traumatic”[tiab] OR “Traumas”[tiab] OR “Traumatization”[tiab] OR “Traumatisation”[tiab] OR “Traumatized”[tiab] OR “Traumatised”[tiab] OR "peritraumatic"[tiab]	215530
#3	Search "Social Problems/psychology"[Mesh]	40603
#4	Search "Life Change Events"[Mesh]	17615
#5	Search "Stress, Psychological"[Mesh]	80968
#6	Search "Wounds and Injuries/psychology"[Mesh]	13381
#7	Search "Disasters"[Mesh]	55082
#8	Search "Child Abuse"[Mesh:NoExp]	15808
#9	Search "Survival/psychology"[Mesh]	379
#10	Search #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9	413713
#11	Search "Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh]	2638499
#12	Search #10 AND #11	119610
#13	Search #10 AND #11 Filters: Humans	119059
#14	Search #10 AND #11 Filters: Humans; English	99843
#15	Search #10 AND #11 Filters: Publication date from 1990/01/01 to 2012/12/31; Humans; English	78503
#16	Search "Psychotherapy"[Mesh]	138671
#17	Search "Complementary Therapies"[Mesh]	159377
#18	Search "Mental Health Services"[Mesh]	68208
#19	Search "Therapeutics/psychology"[Mesh]	43216
#20	Search (therapy[tiab] OR therapies[tiab]) AND ("school"[tiab] OR "classroom"[tiab])	5073
#21	Search "Adaptation, Psychological"[Mesh]	92153
#22	Search #15 AND (#16 or #17 or #18 or #19 or #20 or #21)	11096
#23	Search "Psychotropic Drugs"[Mesh]	119162
#24	Search "Antidepressive Agents"[Pharmacological Action]	112776
#25	Search "Monoamine Oxidase Inhibitors"[Pharmacological Action]	19226
#26	Search "Anticonvulsants"[Pharmacological Action]	123086
#27	Search "Adrenergic Agents"[Pharmacological Action]	306352
#28	Search "Antipsychotic Agents"[Pharmacological Action]	116968
#29	Search "Tranquilizing Agents"[Pharmacological Action]	171777
#30	Search "Benzodiazepines"[MeSH]	55585
#31	Search "Opiate Alkaloids"[Mesh]	71025
#32	Search "Anesthetics, Dissociative"[Pharmacological Action]	8666
#33	Search #15 AND (#23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32)	1590
#34	Search #22 or #33	12433
#35	Search "Randomized Controlled Trial"[Publication Type] OR "Randomized Controlled Trials as Topic"[Mesh] OR "Single-Blind Method"[Mesh] OR "Double-Blind Method"[Mesh] OR "Random Allocation"[Mesh]	482202
#36	Search "meta-analysis"[Publication Type] OR "meta-analysis as topic"[MeSH Terms] OR "meta-analysis"[All Fields]	57226
#37	Search "Comparative Study"[Publication Type] OR "comparative study"	1594025
#38	Search ("review"[Publication Type] AND "systematic"[tiab]) OR "systematic review"[All Fields] OR ("review literature as topic"[MeSH AND "systematic"[tiab])	49862
#39	Search "Cohort Studies"[Mesh] OR “cohort effect”[MeSH Term] OR cohort*[tiab] OR "Case-Control Studies"[Mesh]	1377387
#40	Search #34 AND (#35 or #36 or #37 or #38 or #39)	4074
#41	Search #40 AND (2011/09:2012/07[edat])	108

Cochrane database: 31 July 2012

ID	Search	Hits
#1	"Stress Disorders, Traumatic"[Mesh] OR "PTSD"[tiab] OR "post-traumatic stress disorders"[tiab] OR "post-traumatic stress disorder"[tiab] OR "posttraumatic stress disorders"[tiab] OR "posttraumatic stress disorder"[tiab]	1304
#2	"Traumatizing"[tiab] OR "Traumatising"[tiab] OR "Trauma"[tiab] OR "Traumatic"[tiab] OR "Traumas"[tiab] OR "Traumatization"[tiab] OR "Traumatisation"[tiab] OR "Traumatized"[tiab] OR "Traumatised"[tiab] OR "peritraumatic"[tiab]	10124
#3	"Social Problems/psychology"[Mesh]	2
#4	"Life Change Events"[Mesh]	392
#5	"Stress, Psychological"[Mesh]	3096
#6	"Wounds and Injuries/psychology"[Mesh]	34
#7	"Disasters"[Mesh]	113
#8	"Child Abuse"[Mesh:NoExp]	540
#9	"Survival/psychology"[Mesh]	4
#10	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9)	14061
#11	"Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh]	124150
#12	(#10 AND #11)	4017
#13	(#12), from 1990 to 2012	3667
#14	"Psychotherapy"[Mesh]	6822
#15	"Complementary Therapies"[Mesh]	933
#16	"Mental Health Services"[Mesh]	1500
#17	"Therapeutics/psychology"[Mesh]	1
#18	(therapy[tiab] OR therapies[tiab]) AND ("school"[tiab] OR "classroom"[tiab])	27752
#19	"Adaptation, Psychological"[Mesh]	2724
#20	(#13 AND (#14 OR #15 OR #16 OR #17 OR #18 OR #19))	943
#21	"Psychotropic Drugs"[Mesh]	765
#22	"Antidepressive Agents"[Pharmacological Action]	4622
#23	"Monoamine Oxidase Inhibitors"[Pharmacological Action]	571
#24	"Anticonvulsants"[Pharmacological Action]	2213
#25	"Adrenergic Agents"[Pharmacological Action]	150
#26	"Antipsychotic Agents"[Pharmacological Action]	3464
#27	"Tranquilizing Agents"[Pharmacological Action]	532
#28	"Benzodiazepines"[MeSH]	3035
#29	"Opiate Alkaloids"[Mesh]	3
#30	"Anesthetics, Dissociative"[Pharmacological Action]	265
#31	(#13 AND (#21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30))	145
#32	(#20 OR #31)	1015
#33	"Randomized Controlled Trial"[Publication Type] OR "Randomized Controlled Trials as Topic"[Mesh] OR "Single-Blind Method"[Mesh] OR "Double-Blind Method"[Mesh] OR "Random Allocation"[Mesh]	364044
#34	"meta-analysis"[Publication Type] OR "meta-analysis as topic"[MeSH Terms] OR "meta-analysis"[All Fields]	20632
#35	"Comparative Study"[Publication Type] OR "comparative study"	142717
#36	("review"[Publication Type] AND "systematic"[tiab]) OR "systematic review"[All Fields] OR ("review literature as topic"[MeSH AND "systematic"[tiab])	34190
#37	"Cohort Studies"[Mesh] OR "cohort effect"[MeSH Term] OR cohort*[tiab] OR "Case-Control Studies"[Mesh]	22819
#38	(#32 AND (#33 OR #34 OR #35 OR #36 OR #37))	922
#39	"Humans"[Mesh] in Cochrane Reviews, Other Reviews, Trials, Methods Studies, Technology Assessments and Economic Evaluations	435462
#40	(#38 AND #39)	853
#41	(#40), from 2011 to 2012	165

EMBASE: 1 August 2012

No.	Query	Results
#7	#6 AND [1-9-2011]/sd NOT [1-8-2012]/sd	39
#6	#4 AND #5	709
#5	'adolescent'/exp OR 'child'/exp OR 'newborn'/exp	2,698,263
#4	#3 AND 'human'/exp AND (1990:py OR 1991:py OR 1992:py OR 1993:py OR 1994:py OR 1995:py OR 1996:py OR 1997:py OR 1998:py OR 1999:py OR 2000:py OR 2001:py OR 2002:py OR 2003:py OR 2004:py OR 2005:py OR 2006:py OR 2007:py OR 2008:py OR 2009:py OR 2010:py OR 2011:py) AND ('article'/it OR 'review'/it)	4,337
#3	#1 AND #2	5,998
#2	'psychiatric treatment'/exp	262,802
#1	'posttraumatic stress disorder'/exp OR 'acute stress disorder'/exp	29,172

PsycINFO, CINAHL, IPA: 1 August 2012

No.	Query	Results
S10	S9	6
S9	S8	262
S8	S5 or S7	2653
S7	S4 and S6	1748
S6	DE "Drug Therapy"	100284
S5	S1 and S4	918
S4	S2 or S3	171392
S3	"Posttraumatic Stress Disorder" OR DE "Reactive Psychosis" OR DE "Stress Reactions" OR DE "Psychological Stress" OR DE "Acute Stress Disorder" OR DE "Emotional Trauma"	47150
S2	"Injuries" OR DE "Burns" OR DE "Electrical Injuries" OR DE "Head Injuries" OR DE "Spinal Cord Injuries" OR DE "Wounds"	125794
S1	DE "Psychotherapeutic Techniques" OR DE "Animal Assisted Therapy" OR DE "Autogenic Training" OR DE "Cotherapy" OR DE "Dream Analysis" OR DE "Ericksonian Psychotherapy" OR DE "Guided Imagery" OR DE "Mirroring" OR DE "Morita Therapy" OR DE "Motivational Interviewing" OR DE "Mutual Storytelling Technique" OR DE "Paradoxical Techniques" OR DE "Psychodrama"	26508

Web of Science (ISI): 1 August 2012

Set	Results	Query
# 1	430	TS=("acute stress disorder") Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 2	5,969	TS=(childhood trauma) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 3	8,303	TS=(traumatic event) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 4	2,908	TS=(emotional trauma) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 5	35,170	TS=(PTSD) OR TS=(posttraumatic) OR TS=("stress disorder") Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 6	44,540	#5 OR #4 OR #3 OR #2 OR #1 Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 7	900,200	TS=(child) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 8	184,616	TS=(drug therapy) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 9	42,555	TS=(psychotherapy) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 10	6,136	TS=(psychotherapeutic) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 11	230,032	#10 OR #9 OR #8 Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 12	425	#11 AND #7 AND #6 Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 13	368	(#12) AND Language=(English) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=All Years Lemmatization=On
# 14	56	(#13) AND Language=(English) Databases=SCI-EXPANDED, SSCI, A&HCI Timespan=2011-2012 Lemmatization=On

PILOTS database: **31 July 2012**

No.	Queries
#2	Search Query #2 DE=("adolescents" or "children") 7322 Published Works results found in PILOTS Database Date Range: Earliest to Current
#3	Search Query #3 DE="ptsd" 26897 Published Works results found in PILOTS Database Date Range: Earliest to Current
#4	Search Query #4 DE="prevention" 1482 Published Works results found in PILOTS Database Date Range: Earliest to 2012
#5	Search Query #5 (DE=("adolescents" or "children")) and(DE="ptsd") and(DE="prevention") 117 Published Works results found in PILOTS Database Date Range: Earliest to Current Limited to:
#6	Search Query #6 42225 Published Works results found in PILOTS Database Date Range: 1990 to 2012 Limited to:
#7	Search Query #7 (DE=("adolescents" or "children")) and(DE="ptsd") and(DE="prevention") 117 Published Works results found in PILOTS Database Date Range: Earliest to Current Limited to:
#9	Search Query #9 (DE=("adolescents" or "children")) and(DE="ptsd") and(DE="prevention") 117 Published Works results found in PILOTS Database Date Range: Earliest to Current Limited to:

Number of records after duplicates removed: 483

Revised Search

We performed revised searches from July 31 – 3, 2012.

PubMed: 2 August 2012

Search	Queries	Result
#1	Search "Stress Disorders, Traumatic"[Mesh] OR "PTSD"[tiab] OR "post-traumatic stress disorders"[tiab] OR "post-traumatic stress disorder"[tiab] OR "posttraumatic stress disorders"[tiab] OR "posttraumatic stress disorder"[tiab]	22782
#2	Search “Traumatizing”[tiab] OR “Traumatising”[tiab] OR “Trauma”[tiab] OR “Traumatic”[tiab] OR “Traumas”[tiab] OR “Traumatization”[tiab] OR “Traumatisation”[tiab] OR “Traumatized”[tiab] OR “Traumatised”[tiab] OR "peritraumatic"[tiab]	215654
#3	Search "Social Problems/psychology"[Mesh]	40620
#4	Search "Life Change Events"[Mesh]	17621
#5	Search "Stress, Psychological"[Mesh]	81015
#6	Search "Wounds and Injuries/psychology"[Mesh]	13385
#7	Search "Disasters"[Mesh]	55094
#8	Search "Child Abuse"[Mesh:NoExp]	15817
#9	Search "Survival/psychology"[Mesh]	379
#10	Search "acute stress disorder"[All Fields] OR "acute stress disorders"[All Fields]	366
#11	Search #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10	413928
#12	Search "Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh]	2639285
#13	Search #11 and #12	119654
#14	Search #11 and #12 Filters: Humans	119103
#15	Search #11 and #12 Filters: Humans; English	99884
#16	Search #11 and #12 Filters: Publication date from 1990/01/01 to 2012/12/31; Humans; English	78544
#17	Search "Psychotherapy"[Mesh]	138716
#18	Search "Complementary Therapies"[Mesh]	159479
#19	Search "Mental Health Services"[Mesh]	68238
#20	Search "Therapeutics/psychology"[Mesh]	43256
#21	Search (therapy[tiab] OR therapies[tiab]) AND ("school"[tiab] OR "classroom"[tiab])	5074
#22	Search "Adaptation, Psychological"[Mesh]	92204
#23	Search #17 OR #18 OR #19 OR #20 OR #21 OR #22	443282
#24	Search ("trauma-focused" OR "trauma focused" OR "child-parent" OR "child parent" OR Narration[Mesh]) AND (therapy OR therapies OR therapeutic*)	2046
#25	Search "Cognitive Behavioral Intervention for Trauma in Schools"	14
#26	Search CBITS	4
#27	Search "Skills Training in Affective and Interpersonal Regulation"	8
#28	Search "Dialectical Behavior Therapy"	191
#29	Search SPARCS	42
#30	Search "Parent-Child Interaction Therapy"	59
#31	Search "Eye Movement Desensitization Reprocessing"[Mesh] OR "Eye Movement Desensitization Reprocessing"	54
#32	Search "Equine-Assisted Therapy"	34
#33	Search "Critical Incident Stress Debriefing"	80
#34	Search "Crisis Intervention"[Mesh]	4977
#35	Search "Child-Development Community Policing"	5
#36	Search #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35	7435
#37	Search #36 NOT #23	1135
#38	Search #16 AND #37	61
#39	Search "Randomized Controlled Trial"[Publication Type] OR "Randomized Controlled Trials as Topic"[Mesh] OR "Single-Blind Method"[Mesh] OR "Double-Blind Method"[Mesh] OR "Random Allocation"[Mesh]	482524
#40	Search "meta-analysis"[Publication Type] OR "meta-analysis as topic"[MeSH Terms] OR "meta-analysis"[All Fields]	57327
#41	Search "Comparative Study"[Publication Type] OR "comparative study"	1594606
#42	Search ("review"[Publication Type] AND "systematic"[tiab]) OR "systematic review"[All Fields] OR ("review literature as topic"[MeSH AND "systematic"[tiab])	49942
#43	Search "Cohort Studies"[Mesh] OR “cohort effect”[MeSH Term] OR cohort*[tiab] OR "Case-	1378353

Search	Queries	Result
	Control Studies"[Mesh]	
#44	Search #38 AND (#39 or #40 or #41 or #42)	8

EMBASE: 3 August 2012

Search	Queries	Result
#1	'posttraumatic stress disorder'/exp OR 'acute stress disorder'/exp	29,186
#2	'psychiatric treatment'/exp	262,882
#3	#1 AND #2	6,005
#4	#3 AND 'human'/exp AND (1990:py OR 1991:py OR 1992:py OR 1993:py OR 1994:py OR 1995:py OR 1996:py OR 1997:py OR 1998:py OR 1999:py OR 2000:py OR 2001:py OR 2002:py OR 2003:py OR 2004:py OR 2005:py OR 2006:py OR 2007:py OR 2008:py OR 2009:py OR 2010:py OR 2011:py) AND ('article'/it OR 'review'/it)	4,337
#5	'adolescent'/exp OR 'child'/exp OR 'newborn'/exp	2,699,004
#6	#4 AND #5	709
#7	'post-traumatic stress disorders' OR 'post-traumatic stress disorder'/exp OR 'posttraumatic stress disorders' OR 'posttraumatic stress disorder'/exp	28,847
#8	'social problem'/exp/mj	371,779
#9	'life event'/exp/mj	6,794
#10	'mental stress'/exp/mj	25,211
#11	'injury'/exp/mj	825,967
#12	'disaster'/exp/mj	12,102
#13	'child abuse'/mj	14,597
#14	'survival'/mj	18,629
#15	#7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14	1,267,521
#16	#2 AND #15	30,962
#17	'mental health service'/exp/mj	24,106
#18	'therapy'/exp OR therapy OR therapies AND ('school'/exp OR school OR classroom)	1,087,826
#19	'adaptive behavior'/exp/mj	17,979
#20	#16 AND 'human'/exp AND (1990:py OR 1991:py OR 1992:py OR 1993:py OR 1994:py OR 1995:py OR 1996:py OR 1997:py OR 1998:py OR 1999:py OR 2000:py OR 2001:py OR 2002:py OR 2003:py OR 2004:py OR 2005:py OR 2006:py OR 2007:py OR 2008:py OR 2009:py OR 2010:py OR 2011:py) AND ('article'/it OR 'review'/it)	17,634
#21	'psychotropic agent'/exp/mj	399,776
#22	'antidepressant agent'/exp/mj	153,461
#23	'monoamine oxidase inhibitor'/exp/mj	21,644
#24	'anticonvulsive agent'/exp/mj	132,516
#25	'adrenergic agents'/exp OR 'adrenergic agents'	471,979
#26	'neuroleptic agent'/exp/mj	124,623
#27	'tranquilizer'/exp/mj	187,605
#28	'benzodiazepine derivative'/exp/mj	64,069
#29	'opiate'/exp/mj	17,328
#30	#21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29	921,633
#31	#1 OR #15	1,267,897
#32	#30 AND #31	61,188
#33	#32 AND ('human'/exp OR 'human') AND (1990:py OR 1991:py OR 1992:py OR 1993:py OR 1994:py OR 1995:py OR 1996:py OR 1997:py OR 1998:py OR 1999:py OR 2000:py OR 2001:py OR 2002:py OR 2003:py OR 2004:py OR 2005:py OR 2006:py OR 2007:py OR 2008:py OR 2009:py OR 2010:py OR 2011:py) AND ('article'/it OR 'review'/it)	28,002
#34	#5 AND #33	3,755
#35	#5 AND #20	3,534
#36	#34 NOT #35	3,576
#37	#1 AND #5 AND #30 AND 'human'/exp AND (1990:py OR 1991:py OR 1992:py OR 1993:py OR 1994:py OR 1995:py OR 1996:py OR 1997:py OR 1998:py OR 1999:py OR 2000:py OR 2001:py OR 2002:py OR 2003:py OR 2004:py OR 2005:py OR 2006:py OR 2007:py OR 2008:py OR 2009:py OR 2010:py OR 2011:py) AND ('article'/it OR 'review'/it) AND ([embase]/lim OR [embase classic]/lim)	126
#38	#37 NOT #35	78

Child PTSD Psycinfo, CINAHL, IPA: 3 August 2012

#	Query	Results
S33	S32	11
S32	S31 NOT (S16 OR S19)	106
S31	S1 and S30	154
S30	S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29	2648
S29	("trauma-focused" OR "trauma focused" OR "child-parent" OR "child parent" OR Narration) AND (therapy OR therapies OR therapeutic*)	875
S28	"Critical Incident Stress Debriefing"	220
S27	"Equine-Assisted Therapy"	23
S26	"Eye Movement Desensitization Reprocessing"	339
S25	"Parent-Child Interaction Therapy"	227
S24	SPARCS	75
S23	"Dialectical Behavior Therapy"	857
S22	"Skills Training in Affective and Interpersonal Regulation"	5
S21	CBITS	16
S20	"Cognitive Behavioral Intervention for Trauma in Schools"	15
S19	S17 or S18	9893
S18	((((((DE "Drugs") OR (DE "Monoamine Oxidase Inhibitors")) AND (DE "Anticonvulsive Drugs" OR DE "Antidepressant Drugs")) OR (DE "Adrenergic Drugs")) OR (DE "Tranquilizing Drugs")) OR (DE "Benzodiazepines")) OR "opiate alkaloid" OR "opiate alkaloids" OR "dissociative anesthetics" OR "dissociative anesthetics" AND (S2 OR S3)	8225
S17	DE "Drug Therapy" AND (S2 OR S3)	1748
S16	S1 and S15	1770
S15	S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14	261469
S14	DE "Survivors"	10288
S13	DE "Child Abuse"	27903
S12	DE "Disasters"	6021
S11	DE "Wounds" OR DE "Injuries"	8210
S10	DE "Psychological Stress"	6948
S9	DE "Life Changes"	1949
S8	TI "social problems" OR AB "social problems"	5679
S7	TI ("Traumatizing" OR "Traumatising" OR "Trauma" OR "Traumatic" OR "Traumas" OR "Traumatization" OR "Traumatisation" OR "Traumatized" OR "Traumatised" OR "peritraumatic") OR AB ("Traumatizing" OR "Traumatising" OR "Trauma" OR "Traumatic" OR "Traumas" OR "Traumatization" OR "Traumatisation" OR "Traumatized" OR "Traumatised" OR "peritraumatic")	94990
S6	TI "posttraumatic stress disorder" OR AB "posttraumatic stress disorders"	5700
S5	TI "post-traumatic stress disorder" OR AB "post-traumatic stress disorders"	2759
S4	TI ptsd OR AB ptsd	19144
S3	"Posttraumatic Stress Disorder" OR DE "Reactive Psychosis" OR DE "Stress Reactions" OR DE "Psychological Stress" OR DE "Acute Stress Disorder" OR DE "Emotional Trauma"	47150
S2	"Injuries" OR DE "Burns" OR DE "Electrical Injuries" OR DE "Head Injuries" OR DE "Spinal Cord Injuries" OR DE "Wounds"	125794
S1	DE "Psychotherapeutic Techniques" OR DE "Animal Assisted Therapy" OR DE "Autogenic Training" OR DE "Cotherapy" OR DE "Dream Analysis" OR DE "Ericksonian Psychotherapy" OR DE "Guided Imagery" OR DE "Mirroring" OR DE "Morita Therapy" OR DE "Motivational Interviewing" OR DE "Mutual Storytelling Technique" OR DE "Paradoxical Techniques" OR DE "Psychodrama"	26508

Number of records after duplicates removed: 97

Handsearches

Handsearches yielded 230 additional records.

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Appendix B. Abstract and Full-Text Forms

The following are lists of fields used in the abstract and full text review forms. Please see the Evidence Tables (Appendix D) for fields used in the data abstraction forms.

Reviewers were asked to complete the following fields for screening abstracts for inclusion:

Ref ID	
Year	
Title	
Journal	
Abstract	
Exclusion Code (list of options is provided below):	1-Wrong publication type
	2-Wrong study design
	3-Wrong population
	4-Wrong or no intervention
	5-Wrong or no comparator
	6-Wrong or no outcome
Inclusion	
If include, enter sample size.	
Bkg	
Reviewer 1 (Initials)	
Reviewer 2 (Initials)	
Comments	

Reviewers were asked to consider and complete the following fields when reviewing full texts for inclusion:

Reviewer Initials		
Ref ID		
Author		
Year		
Article Title		
Study/Trial Name (if applicable)		
Include/Exclude Codes	INCLUDE	
	Exc1: Publication type	
	Exc2: Study design	
	Exc3: Population	
	Exc4: Wrong or no intervention	
	Exc5: Wrong or no comparator	
	Exc6: Wrong or no outcome	
	Exc7: Sample size N<10	
Study Design	RCT	
	NRCT	
	SysRev / M-A	
	Prosp cohort	
	Nested case-control	
Interventions: Symptom Prevention:	Psychological	CBT
		TF-CBT
		CPP
		STAIR/NST
		TGCT
		CBITS
	Pharmacological	Morphine
		Clonidine
		Other (specify in comments)
	CAM	Equine-assisted psychotherapy
		Other (specify in comments)

	Other (e.g., Web; systems level)	
Interventions: Symptom Treatment	Psychological	DBT
		SPARCS
		PCIT
		EMDR
	Pharmacological	SSRIs
		Bupropion
		Venlafaxine
		Mirtazapine
		Imipramine
		MAOIS
		Stimulants (specify in comments)
		Antipsychotics (specify in comments)
		Benzodiazepines (specify in comments)
		Other (specify in comments)
	CAM	Equine-assisted psychotherapy
		Other (specify in comments)
	Other (e.g., Web; systems level)	
KQs: Mark X in cell(s)	1	
	2	
	3a	
	3b	
	3c	
	4	
Comments		
Companion or Parent Study Articles		
BKG ('X'): Use only if article is excluded		

Appendix C. Excluded Studies

Excluded for Wrong Publication Type

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Excluded for Wrong or No Outcome

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Appendix D. Evidence Tables

Evidence Table 1. Study characteristics

Author, Year, Trial Name	Goal of Intervention	Study Design	Overall Sample Size	Group Sample Sizes	Baseline Age Range (Mean)	Country	Setting	Funding Source
Ahrens, 2002[1] NA	Evaluate efficacy of cognitive processing therapy on self-reported symptoms of trauma	RCT	38	Randomized: 38 G1: 19 G2: 19 Analyzed: G1: NR G2: NR	Overall: 15-18 years (16.4 years)	US	Youth facility for adolescent offenders	NR
Berger, 2007[2] OTT	Evaluate effectiveness of OTT in reducing posttraumatic stress symptoms in elementary-school students with various levels of terrorism-related distress	Cluster RCT	142	Randomized: G1: 70 G2: 72 Analyzed: G1: 70 G2: 72	Overall: Grades 2-6 (NR)	Israel	School	NR
Berger, 2009[3] ES-SL	Evaluate the efficacy of a school-based intervention in reducing stress-related symptomatology among children exposed to a tsunami	Cluster RCT	166	Randomized: G1: 84 G2: 82 Analyzed: G1: 84 G2: 82	Overall: 9-15 years (NR)	Sri Lanka	School	NR
Berkowitz, 2011[4] NA	Prevent development of chronic PTSD when provided within 30 days of exposure to potentially traumatic event	RCT	106	Randomized:112 G1: 53 G2: 53 Analyzed: G1:53 G2:53 3 Mos. followup: 83 G1: NR G2: NR	Overall: 7-17 years (12 years)	US	Outpatient MH	Government

Evidence Table 1. Study characteristics (continued)

Author, Year, Trial Name	Goal of Intervention	Study Design	Overall Sample Size	Group Sample Sizes	Baseline Age Range (Mean)	Country	Setting	Funding Source
Catani, 2009[5] NA	Effectiveness of KIDNET vs. a meditation-relaxation protocol for highly affected children	RCT	31	Randomized: 31 G1: 16 G2: 15 Analyzed 1 Mos.: 31 G1: 16 G2: 15 6 Mos.: 30 G1: 16 G2: 14	Overall: 8-14 years (NR) G1: 11.6 years G2: 12.3 years	Sri Lanka	Relief camp	Multiple
Ford, 2012[6] TARGET	Examine the effectiveness of TARGET vs. ETAU to reduce PTSD severity, enhance emotion regulation skills, reduce associated symptoms and cognitions, and increase optimism and self-efficacy	RCT	59	Randomized: G1: 33 G2: 26 Analyzed: G1: 26 G2: 20	Overall: 13-17 years (NR) (14.7 years)	US	Residential facility	Government
Gelkopf, 2009[7] ERASE-Stress	Examine the effectiveness of the ERASE-Stress program to reduce and prevent posttraumatic reactions in secondary students	Cluster RCT	114	Randomized: G1: 58 G2: 49 Analyzed: G1: 58 G2: 49	Overall: NR (13.05 years)	Israel	School	NR
Goenjian, 1997; 2005[8, 9] NA; NA	Reduce PTSD and depression among students who experienced an earthquake	Prospective Cohort	64	Randomized[a]: G1: 35 G2: 29 Analyzed: 18 Mos./3 years: G1: 35 G2: 29 5 years: G1: 36 G2: 27	Overall: NR (13.2 years) G1: 13.2 years G2: 13.3 years	Armenia	School	NR

Evidence Table 1. Study characteristics (continued)

Author, Year, Trial Name	Goal of Intervention	Study Design	Overall Sample Size	Group Sample Sizes	Baseline Age Range (Mean)	Country	Setting	Funding Source
Jaycox, 2009[10] SSET	Establish program feasibility, conduct a small pilot study to observe change as a function of participation, and evaluate participant and parent satisfaction with the program	RCT	78	Randomized: G1: 39 G2: 39 Analyzed: G1: 39 G2: 37	Overall: NR (11.5 years) G1: 11.4 years G2: 11.5 years	US	School	Government
Kemp, 2010[11] NA	Reduce PTSD symptoms and non-trauma symptoms in children who suffered injury from motor vehicle accidents	RCT	27	Randomized: G1: 13 G2: 14 Analyzed: G1: 12 G2: 12	Overall: NR (8.93 years) G1: NR G2: NR	Australia	Outpatient MH	NR
Layne, 2008[12] TGCT	Evaluate the effectiveness of school- and community-based intervention program for adolescents exposed to severe trauma, traumatic bereavement, and adversity	RCT	159	Randomized: G1: 77 G2: 82 Analyzed: G1: 66 G2: 61	Overall: 13-19 years (NR)	Bosnia	School	Foundation/ non-profit
Nugent, 2010[13] NA	Prevent PTSD in children at risk for PTSD at an ER	RCT	29	Randomized: 29 G1: 14 G2: 15 Analyzed: 26 G1: 12 G2: 14	Overall: 10-18 years (NR) G1: 15 years G2: 14 years	US	Inpatient ER	Multiple
Robb, 2010[14] NA	Evaluate the safety and efficacy of sertraline in children and adolescents with PTSD	RCT	131	Randomized: 131 G1: 67 G2: 62 Analyzed: 128 G1: 67 G2: 61	Overall: 6-17 years (NR) Children: G1: 8.4 years G2: 8.5 years Adolescents: G1: 14.1 years G2: 14.7 years	US	Outpatient MH	Multiple

Evidence Table 1. Study characteristics (continued)

Author, Year, Trial Name	Goal of Intervention	Study Design	Overall Sample Size	Group Sample Sizes	Baseline Age Range (Mean)	Country	Setting	Funding Source
Robert, 1999[15] NA	Evaluate the effectiveness of imipramine vs. chloral hydrate in thermally-injured children with symptoms of acute stress disorder	RCT	25	Randomized: 25 G1: 12 G2: 13 Analyzed: 25 G1: 12 G2: 13	Overall: 2-19 years (NR) G1: 10 years G2: 6 years	US	Inpatient	Multiple
Robert, 2008[16] NA	Test the efficacy of imipramine vs. fluoxetine in pediatric burn patients with the symptoms of acute stress disorder	RCT	62	Randomized: 62 G1: 21 G2: 19 G3: 22 Analyzed: 60 G1: 20 G2: 18 G3: 22	Overall: 4-18 years (10.8 years)	US	Inpatient	Foundation/ non-profit
Salloum, 2008[17] NA	Decrease symptoms of PTSD, depression, traumatic grief symptoms, and global distress in child survivors of a hurricane	RCT	56	Randomized: 45 G1: 23 G2: 22 Analyzed: 34 G1: 18 G2: 16	NR	US	School	Government
Salloum, 2012[18] NA	Build coping skills using GTI with CN, examine differential effect of only C versus CN on distress, behavior, social support and treatment satisfaction, and determine if effects were maintained at 3 and 12 Mos. post-intervention	RCT	72	Randomized: 72 G1: 39[b.] G2: 33 Analyzed Post-treatment: 68 G1: 34 G2: 32 3 Mos. followup: 64 G1: 34 G2: 30 12 Mos.: 64 G1: 34 G2: 30	6-12 years (9.6 years)	US	School	Multiple

Evidence Table 1. Study characteristics (continued)

Author, Year, Trial Name	Goal of Intervention	Study Design	Overall Sample Size	Group Sample Sizes	Baseline Age Range (Mean)	Country	Setting	Funding Source
Smith, 2007[19] NA	Evaluate efficacy of TF-CBT for treatment PTSD in children	RCT	38	Randomized: G1: 12 G2: 12 Analyzed: G1: 12 G2: 12	Overall: 8-18 years (13.69 years)	United Kingdom	Outpatient MH	Foundation/ non-profit
Stein, 2003[20] NA	Reduce symptoms of PTSD & depression	RCT	126	Randomized: G1: 61 G2: 65 Analyzed: G1: 54 G2: 63	Overall: NR (11 years)	US	School	Multiple
Tol, 2008; 2010[21, 22] NA; NA	Examine moderators and mediators of a school-based psychosocial intervention for children affected by political violence	Cluster RCT	403	Randomized: 403 G1: 182 G2: 221 1 week followup: G1: 182 G2: 211 6 Mos: G1: 177 G2: 191 Analyzed: G1: 182 G2: 221	Overall: 7-15 years (9.9 years)	Indonesia	School	Foundation/ non-profit
Tol, 2012[23] NA	Decrease PTSD, depressive and anxiety symptoms via manualized CBT intervention with creative expression to increase coping skills in children.	Cluster RCT	399	Randomized: 399 G1: 199 G2: 200 1 week followup: 399 G1: 199 G2: 200 3 Mos. followup: 397 G1: 198 G2: 199 Analyzed: G1: 198 G2: 199	9-12 years (11.03 years)	Sri Lanka	School	Foundation/ non-profit

Evidence Table 1. Study characteristics (continued)

Author, Year, Trial Name	Goal of Intervention	Study Design	Overall Sample Size	Group Sample Sizes	Baseline Age Range (Mean)	Country	Setting	Funding Source
Zehnder, 2010[24] NA	Decrease ASD and prevent PTSD, depressive symptoms, and behavior problems	RCT	101	Randomized: G1: 51 G2: 50 Analyzed 2 Mos: G1: 50 G2: 50 6 Mos: G1: 49 G2: 50	Overall: 7-16 years (NR)	Switzerland	Multiple	Foundation/ non-profit

[a.] The sample sizes from the two studies do not match up exactly. The 2005 publication (#840) explains that 2 subjects from G1 were lost to follow-up at 5 years yet somehow the N grows by 1 person. 2 subjects were also lost from the control (sample reduced from 29 to 27).

[b.] Two Hispanics were excluded from the study due to rest of the sample being African American.

Abbreviations: ASD = Acute Stress Disorder; C = coping skills; CBT = Cognitive Behavioral Therapy; CN = coping skills and trauma loss narrative; ER = emergency room; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; ETAU = Enhanced Treatment as Usual; G = group; GTI = Grief and Trauma Intervention; KIDNET = Narrative Exposure Therapy for children; MH = mental health; Mos. = months; NA = not applicable; NR = not reported; OTT = Overshadowing the Threat of Terrorism; PTSD = Posttraumatic Stress Disorder; RCT = randomized controlled trial; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; TGCT = Trauma and Grief Component Therapy; US = United States; vs. = versus.

Evidence Table 2. Population characteristics

Author, Year, Trial Name	Sex	Type of Trauma	Inclusion and Exclusion Criteria
Ahrens, 2002[1] NA	Male	Mixed	Inclusion: incarcerated and met criteria for PTSD using DSM-IV criteria Exclusion: none specified
Berger, 2007[2] OTT	Male & Female	War	Inclusion: students in an area with high levels of terrorism-related trauma exposure Exclusion: parent did not sign informed consent
Berger, 2009[3] ES-SL	Male & Female	Natural disasters	Inclusion: students at selected school in Sri Lanka Exclusion: parent/caregiver did not sign informed consent
Berkowitz, 2011[4] NA	Male & Female	Mixed	Inclusion: exposure to a PTE; endorsed at least one new and distressing symptoms of PTSD within 30 days of the PTE Exclusion: receiving counseling or mental health treatment, had developmental delay, diagnosed with psychotic or bipolar disorder, non-English speaking refused participation
Catani, 2009[5] NA	Male & Female	Natural disasters	Inclusion: 8-14 years, living in newly erected refugee camps located in a village that had been destroyed by a tsunami 3 weeks earlier Exclusion: mental retardation, psychosis, or any neurological disorder
Ford, 2012[6] TARGET	Female	Multiple	Inclusion: self-reported delinquency determined by NDS; full or partial PTSD determined by CAPS-CA structured diagnostic interview Exclusion: substantial cognitive impairment determined by scores <16 on Orientation, Attention, and Recall sections of MMSE; on 1-to-1 suicide watch; age <13 or age >18
Gelkopf, 2009[7] ERASE-Stress	Male	War	Inclusion: 7th and 8th grade students in conflicted region of Israel Exclusion: parent did not sign informed consent
Goenjian, 1997; 2005[8, 9] NA; NA	Male & Female	Natural disasters	Inclusion: NR Exclusion: NR
Jaycox, 2009[10] SSET	Male & Female	Other	Inclusion: LES >3; CPSS ≥11; clinical interview to validate the screener; parental consent Exclusion: NA
Kemp, 2010[11] NA	Male & Female	Injury	Inclusion: ages 6-12, score of at least 12 on UCLA PTSD-RI or met at least 2 DSM-IV criteria for PTSD Exclusion: psychotropic meds, concurrent psychological conditions; past history of sexual and physical abuse or neglect; had suffered a serious head injury with persistent associated neurological dysfunction; scores in Accident and Emergency <12 on the GCS

Evidence Table 2. Population characteristics (continued)

Author, Year, Trial Name	Sex	Type of Trauma	Inclusion and Exclusion Criteria
Layne, 2008[12] TGCT	Male & Female	War	Inclusion: trauma exposure before, during, and/or after war; current distress; functional impairment Exclusion: psychosis; threat to self or others; unable to attend group meetings, judged not appropriate for group-based intervention; highly disruptive behavioral; substance abuse; reluctance to participate in group setting
Nugent, 2010[13] NA	Male & Female	Injury	Inclusion: 4 or more positive responses on STEPP; GCS ≥ to 14; recent injury Exclusion: hyper-sensitivity to beta-blockers; bradycardia; cardiogenic or hypovolemic shock; diabetes; preexisting heart condition; treatment for asthma, no parental consent; injuries or medical treatment procedures contraindicated propranolol
Robb, 2010[14] NA	Male & Female	Multiple	Inclusion: 6-17 years, PTSD diagnosis on K-SADS-PL; UPID≥30; CGI-S≥4; able to cooperate with study procedures; nonpregnant; nonlactating; if of childbearing age on contraception; parental consent Exclusion: trauma ongoing, history of bipolar, schizophrenia/psychosis, bulimia, anorexia, autism, suicide; current suicide risk; substance abuse or dependence 6 months prior, receiving therapy for PTSD, history of seizure d/o or cognitive or neuro-deficits, clinically significant abnormalities on physical exam, medical history, EKG or laboratory tests, use of psychotropics other than Benadryl, chloral hydrate, stimulants; history of failure to respond or adverse reaction to SSRIs
Robert, 1999[15] NA	Male & Female	Injury	Inclusion: 2-19 years; hospitalized with acute burns who exhibited ASD symptoms for ≥2 days and nights without a marked decrease in symptoms on the second night; ability to participate in the study; free of medical conditions; proximal to hospital; parental consent Exclusion: ASD symptoms for <2 days and nights; no ASD symptoms; ventilated; children <2 years or >19
Robert, 2008[16] NA	Male & Female	Injury	Inclusion: ≥4 years; presenting with ASD symptoms for >2 days, ≤30 days post-burn; no medical contraindications Exclusion: <4 years; >30 days post-burn; medical contraindications
Salloum, 2008[17] NA	Male & Female	Natural disasters	Inclusion: parental consent; enrolled in 2nd-6th grade; not actively suicidal; grieving or experiencing at least moderate level of PTSD symptoms due to death or any hurricane-related stressor; clinically appropriate for group participation Exclusion: NR
Salloum, 2012[18] NA	Male & Female	Multiple	Inclusion: parental consent and child assent; enrolled in 2nd-6th grade; exposure to violence, hurricane-related exposure, and death; moderate level of PTSD symptoms (25≤UCLA-PTSD-I) Exclusion: suicidal ideation determined by MFQ-C; deemed clinically inappropriate for group participation by evaluator
Smith, 2007[19] NA	Male & Female	Mixed	Inclusion: 8-18 years; PTSD relating to a single traumatic event; English speaking Exclusion: presence of organic brain damage; unconscious >15 minutes during the trauma; significant learning difficulty; ongoing trauma related threat in environment; recently initiated treatment with psychotropic med or other psychological treatment

Evidence Table 2. Population characteristics (continued)

Author, Year, Trial Name	Sex	Type of Trauma	Inclusion and Exclusion Criteria
Stein, 2003[20] NA	Male & Female	Community violence	Inclusion: substantial exposure to violence, PTSD symptoms in clinical range, willing to participate in group Exclusion: appearance of being too disruptive to participate in a group; not English speaking
Tol, 2008; 2010[21, 22] NA; NA	Male & Female	Other	Inclusion: school children exposed to >1events, or who were positive for PTSD symptoms and anxiety symptoms Exclusion: inability to function in a group setting; severe psychiatric problems
Tol, 2012[23] NA	Male & Female	War	Inclusion: screened positive on CPDS for existence of risk factors and absence of protective factors Exclusion: not in grades 4-7
Zehnder, 2010[24] NA	Male & Female	Injury	Inclusion: Medical treatment after RTA; 7-16 years Exclusion: not fluent in German; severe head injury (GCS>11); previous intellectual impairment

[a.] Unable to diagnose PTSD given that it was 12 hours after admission and close to time of injury.

Abbreviations: ASD = Acute Stress Disorder; CAPS-CA = Clinician-Administered Post-Traumatic Stress Disorder Scale for Children and Adolescents; CGI-S = Clinical Global Impressions – Severity Scale; CPDS = Child Psychosocial Distress Screener; CPSS = Child PTSD Symptom Scale; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; EKG = electrocardiogram; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; GCS = Glasgow Coma Scale; K-SADS-PL = Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version; LES = Life Experiences Survey; MFQ-C = Mood and Feelings Questionnaire – Child Version; MMSE = Mini Mental State Exam; NA = not applicable; NDS = National Delinquency Study; NR = not reported; OTT = Overshadowing the Threat of Terrorism; PTE =potentially traumatic event; PTSD = Posttraumatic Stress Disorder; RTA = road traffic accident; SSET = Support for Students Exposed to Trauma; SSRI = Selective serotonin re-uptake inhibitors; STEPP = Screening Tool for Early PTSD; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TGCT = Trauma and Grief Component Therapy; UCLA-PTSD-I = University of California, Los Angeles Post-Traumatic Stress Disorder Index; UCLA PTSD-RI = University of California, Los Angeles Reaction Index; UPID = University of California, Los Angeles Index for DSM-IV for children

Evidence Table 3. Population baseline characteristics

Author, Year, Trial Name	Baseline PTSD Measure	% With PTSD Diagnosis	Baseline Age Mean (Range)	Baseline % Female	Baseline % Nonwhite	Study Population Broadly Applicable?
Ahrens, 2002[1] NA	PSS-SR, Mean Overall: NR G1: 16.89 G2: 19.36	Overall: 100% G1: 100% G2: 100%	Overall: 15-18 years (16.4 years) G1: NR G2: NR	Overall: 0% G1: 0% G2: 0%	Overall: 39% G1: NR G2: NR	No
Berger, 2007[2] OTT	UPID, Mean Overall: NR G1: 25.6 G2: 23.5	Overall: 15.5% G1: 8.6% G2: 6.9%	2nd-3rd Grade: G1: n=35 (50%) G2: n=34 (47.2%) 4th-6th Grade: G1: n=35 (50%) G2: n=38 (52.8%)	Overall: 45.8% G1: 44.3% G2: 47.2%	NR	Yes
Berger, 2009[3] ES-SL	UPID, Mean Overall: NR G1: 44.94 G2: 47.23	NR	Overall: 9-14 years (NR)	Overall: G1: 41.7% G2: 56.3%	NR	Yes
Berkowitz, 2011[4] NA	UCLA PTSD-I, Mean Overall: NR G1: 53.3 G2: 51.74	NR	Overall: 7-17 years (12 years) G1: NR G2: NR	Overall: 52% G1: NR G2: NR	Overall: 68% G1: NR G2: NR	Yes
Catani, 2009[5] NA	UPID, Mean Overall: NR G1: 37.9 G2: 36.7	Overall: 100% G1: 100% G2: 100%	Overall: NR (NR) G1: 11.6 years G2: 12.3 years	Overall: 45.2% G1: 37.5% G2: 53.3%	NR	No
Ford, 2012[6] TARGET	CAPS-CA, Mean Overall: NR G1: 58.9 G2: 47.5	Full PTSD, Overall: n=37 G1: 64% G2: 61% Partial PTSD, Overall: n=22 G1: 36% G2: 39%	Overall: 13-17 years (14.7 years) G1: NR G2: NR	Overall: 100% G1: 100% G2: 100%	Overall: 75% G1: NR G2: NR	No
Gelkopf, 2009[7] ERASE-Stress	UPID, Mean Overall: NR G1: 23.6 G2: 20.4	NA	Overall: 12-14.5 years (13.05 years) G1: NR G2: NR	Overall: 0% G1: 0% G2: 0%	NR	No
Goenjian, 1997; 2005[8, 9] NA; NA	CPTSD-RI, Mean Overall: NR G1: 45.3 G2: 41.1	Overall: NR G1: 60% G2: 52%	Overall: NR (13.2 years) G1: 13.2 years G2: 13.3 years	Overall: NR G1: 69% G2: 67%	NR	Yes

Evidence Table 3. Population baseline characteristics (continued)

Author, Year, Trial Name	Baseline PTSD Measure	% With PTSD Diagnosis	Baseline Age Mean (Range)	Baseline % Female	Baseline % Nonwhite	Study Population Broadly Applicable?
Jaycox, 2009[10] SSET	CPSS, Mean Overall: NR G1: 17.46 G2: 19.4	NA	Overall: NR G1: 11.4 years G2: 11.5 years	Overall: 51.32% G1: 53.85% G2: 48.65%	Overall: 96.05% G1: 94.87% G2: 97.30%	No
Kemp, 2010[11] NA	UCLA PTSD-RI, Mean Overall: 27.09 G1: 25.92 G2: 27.29	NR	Overall: NR (8.93 years) G1: NR G2: NR	Overall: 44.4% G1: 23.0% G2: 64.3%	NR	Yes
Layne, 2008[12] TGCT	UPID, Mean Overall: NR G1: 36.37 G2: 33.02	NR	Overall: NR G1: 13-18 years G2: 14-19 years	Overall: NR G1: 63% G2: 66%	NR	Yes
Nugent, 2010[13] NA	NR	Overall: NA[a.] G1: NA G2: NA	Overall: 10-18 years (15 years) G1: 15 years G2: 14 years	Overall: 48.3% G1: 42.9% G2: 53.3%	Overall: 6.9% G1: 0% G2: 13.3%	No
Robb, 2010[14] NA	UPID, Mean Overall: NR G1: 43.8 G2: 42.1	Overall: 100% G1: 100% G2: 100%	Overall: NR Children (6-11) G1: 8.4 G2: 8.5 Adolescents (12-17) G1: 14.1 G2: 14.7	Overall: 60.5% Children G1: 48.7% G2: 48.6% Adolescents: G1: 75% G2: 77.8%	Overall: 41.9% Children G1: 40% G2: 37.1% Adolescents G1: 42.9% G2: 48.1%	Yes
Robert, 1999[15] NA	Mean no. of symptoms Overall: 6.1 G1: 6.4 G2: 5.8	NA	Overall: 2-19 years (8 years) G1: 10 years G2: 6 years	Overall: 44% G1: 41.6% G2: 46.2%	Overall: NR G1: NR G2: NR	No
Robert, 2008[16] NA	ASC-Kids, Mean Overall: NR G1: 42.6 G2: 47.6 G3: 44.6	NR	Overall: 4-18 years (10.8 years) G1: 10.6 years G2: 10.3 years G3: 11.5 years	Overall: 26.7% G1: 10% G2: 27.8% G3: 40.9%	Overall: 93.3% G1: 90% G2: 100% G3: 90.9%	No
Salloum, 2008[17] NA	UPID, Mean Overall: 43.23 G1: 44.03 G2: 42.32	Overall: 53% G1: NR G2: NR	NR	Overall: NR G1: 32% G2: 42.8%	Overall: 95% G1: 96.4% G2: 96.4%	Yes

Evidence Table 3. Population baseline characteristics (continued)

Author, Year, Trial Name	Baseline PTSD Measure	% With PTSD Diagnosis	Baseline Age Mean (Range)	Baseline % Female	Baseline % Nonwhite	Study Population Broadly Applicable?
Salloum, 2012[18] NA	UCLA-PTSD-I, Mean Overall: NR G1: 46.82 G2: 42.80	Overall: NR G1: 48.6%, n=18 G2: 39.4%, n=13	Overall: 9.6 years (6-12 years) G1: NR G2: NR	Overall: 44.3 % G1: 51.4% G2: 36.4%	Overall: 100% G1: 100% G2: 100%	No
Smith, 2007[19] NA	CPSS, Mean Overall: NR G1: 28.1 G2 28.3	Overall: 100% G1: 100% G2: 100%	Overall: NR (13.89 years) G1: 14.45 years G2: 13.33 years	Overall: 50% G1: 50% G2: 50%	Overall: 55% G1: 50% G2: 58%	Yes
Stein, 2003[20] NA	CPSS, Mean Overall: 24 G1: 24.5 G2: 23.5 CDI, Mean Overall: NR G1: 17.6 G2: 16.7	Overall: 100% G1: 100% G2: 100%	Overall: NR G1: 11 years G2: 10.9 years	Overall: NR G1: 33% G2: 38%	Overall: NR G1: NR G2: NR	Yes
Tol, 2008; 2010[21, 22] NA; NA	CPSS, Mean Overall: 21.7 G1: 20.92 G2: 22.35	NA	Overall: 7-15 years (9.9 years) G1: 10.08 years G2: 9.78 years	Overall: 48.6% G1: 54.4% G2: 43.0%	NR	Yes
Tol, 2012[23] NA	CPSS, Mean Overall: NR G1: 15.03 G2: 15.70	Overall: NR G1: NR G2: NR	Overall: 11.03 years (9-12 years) G1: NR G2: NR	Overall: 38.6% G1: NR G2: NR	Overall: NR G1: NR G2: NR	No
Zehnder, 2010[24] NA	NR	Total ASD Overall: 22.2% G1: n=11 G2: n=9 Initial ASD: 4.0% Initial Subsyndromal ASD: 16.2%	Overall: G1:11.8 G2:11.3	Overall: NR G1: 40.8% G2: 42.0%	Overall: NR G1: NR G2: NR	No

[a.] Unable to diagnose PTSD given that it was 12 hours after admission and close to time of injury.

Abbreviations: ASC-Kids = Acute Stress Disorder Checklist; ASD = Acute Stress Disorder; CAPS-CA = Clinician-Administered Post-Traumatic Stress Disorder Scale for Children and Adolescents; CPSS = Child PTSD Symptom Scale; CPTSD-RI = Child Post-Traumatic Stress Reaction Index; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; G = group; NA = not applicable; NR = not reported; OTT = Overshadowing the Threat of Terrorism; PSS-SR = Post-Traumatic Stress Disorder Symptom Scale Self Report; PTSD = Post-Traumatic Stress Disorder; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TGCT = Trauma and Grief Component Therapy; UCLA PTSD-I = University of California, Los Angeles Post-Traumatic Stress Disorder Index; UPID = University of California, Los Angeles Index for DSM-IV for children.

Evidence Table 4. Intervention descriptions

Author, Year, Trial Name	Intervention Group 1 Description Recipient	Intervention Group 2 Description Recipient	Intervention Group 3 Description Recipient	Was Intervention Manualized?	Co-interventions	Is the Intervention Broadly Applicable?
Ahrens, 2002[1] NA	Other psychotherapy Eight, 60 minute, sessions of CPT; duration NR Child	Inactive control Waitlist Child	NA	Yes	Yes; Both groups are incarcerated Overall: 100% G1: 100% G2: 100%	No; Only applicable to incarcerated adolescent males
Berger, 2007[2] OTT	Other psychotherapy Eight, 90 minute, sessions Child	Other psychotherapy Waitlist Child	NA	Yes	No	Yes
Berger, 2009[3] ES-SL	Other psychotherapy Twelve, 90 minute, weekly sessions Child & Caregiver	Inactive control Waitlist Child	NA	Yes	Yes; Intervention targeted primarily to children but involved some homework to be completed with caregiver	Yes
Berkowitz, 2011[4] NA	Other psychotherapy Four, 60-90 minute, weekly sessions of CFTSI Child & Caregiver	Other psychotherapy Four sessions supportive intervention Child & Caregiver	NA	Unclear or NR	No	Yes
Catani, 2009[5] NA	Other psychotherapy Six, 60-90 minute, 2-week NET sessions Child	CAM therapy Meditation-relaxation protocol Child	NA	Yes	No	No; The study was conducted too quickly and over too short a time period
Ford, 2012[6] TARGET	Other psychotherapy Twelve, 50-minute, weekly TARGET sessions Child	Other psychotherapy Twelve, 50-minute, weekly ETAU sessions Child	NA	Yes	No	Yes

Evidence Table 4. Intervention descriptions (continued)

Author, Year, Trial Name	Intervention Group 1 Description Recipient	Intervention Group 2 Description Recipient	Intervention Group 3 Description Recipient	Was Intervention Manualized?	Co-interventions	Is the Intervention Broadly Applicable?
Gelkopf, 2009[7] ERASE-Stress	Other psychotherapy Twelve, 90 minute, weekly sessions of psycho-educational material and skill training plus meditative practices and narrative techniques Child	Inactive control Waitlist Child	NA	Yes	No	Yes
Goenjian, 1997; 2005[8, 9] NA; NA	TF-CBT Four, 30 minute, 3-week group sessions and an average of 2, 1 hour, 3 week individual sessions Child	Inactive control None Child	NA	Unclear or NR	No	Yes
Jaycox, 2009[10] SSET	Other psychotherapy Ten, 45 minute, weekly sessions Child	Other psychotherapy Waitlist Child		Yes	No	Yes
Kemp, 2010[11] NA	EMDR Four, 60 minute, sessions, every 7-10 days over a six-week period Child	Inactive control Waitlist Child	NA	Unclear or NR	No	Yes
Layne, 2008[12] TGCT	TGCT Seventeen-20, 60-90 minute, weekly group sessions throughout the school year Child	Other psychotherapy Classroom-based psycho-education and skills training Child	NA	Yes	Yes; Both groups received classroom skills-based psycho-education and skills training	Yes

Evidence Table 4. Intervention descriptions (continued)

Author, Year, Trial Name	Intervention Group 1 Description Recipient	Intervention Group 2 Description Recipient	Intervention Group 3 Description Recipient	Was Intervention Manualized?	Co-interventions	Is the Intervention Broadly Applicable?
Nugent, 2010[13] NA	Other meds Ten days of 2.5 mg/kg Propranolol twice daily with a max dose of 40 mg twice daily with a 5-day taper Child	Other meds Double-Blinded Placebo group Child	NA	Yes	No	Yes
Robb, 2010[14] NA	SSRIs Ten weeks Sertraline at 25mg for week 1 then increased to 50mg for 2 weeks; Increase every 2 weeks as clinically indicated up to a maximum of 200 mg by week 7 Child	Other meds Double-Blinded Placebo group Child	NA	No	Yes; 2 week screening period prior to initiation of drug study included 3 psycho-educational/CBT sessions for all participants	Yes
Robert, 1999[15] NA	Other meds One week of Imipramine dosed at 1mg/kg with a maximum dose of 100 mg Child	Other meds One week of Chloral Hydrate at 25 mg/kg with a max dose of 500 mg Child	NA	Yes	Yes; All received pain, itching, and anxiety management along with physical rehabilitation	Yes

Evidence Table 4. Intervention descriptions (continued)

Author, Year, Trial Name	Intervention Group 1 Description Recipient	Intervention Group 2 Description Recipient	Intervention Group 3 Description Recipient	Was Intervention Manualized?	Co-interventions	Is the Intervention Broadly Applicable?
Robert, 2008[16] NA	Other meds One week of Imipramine at 1mg/kg with a maximum dose of 100 mg Child	SSRIs Seven days of Fluoxetine at 5 mg for weight<40kg, b/w 40-60kg was 10 mg, weight>60kg was 20 mg Child	Other meds Double-Blinded Placebo Child	Yes	Yes; Psychotherapy concomitantly, Mean units G1: 15.2 G2: 12.6 G3: 12.6 Music therapy concomitantly, Mean units G1: 8.0 G2: 2.9 G3: 5.3 Child life services/ interventions, Mean units G1: 2.1 G2: 1.1 G3: 1.3	Yes
Salloum, 2008[17] NA	Other psychotherapy Ten weeks of 60 minute sessions of Project LAST[a.]; duration NR Child	Other psychotherapy Ten weeks of 60 minute sessions of Project LAST[a.]; duration NR Child	NA	Yes	Yes; Anger management counseling Overall: 1 (2.4%) G1: NR G2: NR Prior mental health treatment Overall: 7 (17.1%) G1: NR G2: NR	No; Level of providers' training more specialized than what is typically available
Salloum, 2012[18] NA	Other psychotherapy Twelve, 50-60 minute, 10-week sessions of GTI-CN[b.] Child & Caregiver	Other psychotherapy Twelve, 50-60 minute, 10-week sessions of GTI-C[b.] Child & Caregiver	NA	Yes	No	Yes

Evidence Table 4. Intervention descriptions (continued)

Author, Year, Trial Name	Intervention Group 1 Description Recipient	Intervention Group 2 Description Recipient	Intervention Group 3 Description Recipient	Was Intervention Manualized?	Co-interventions	Is the Intervention Broadly Applicable?
Smith, 2007[19] NA	CBT Ten, 10 week, sessions Child & Caregiver	Inactive control Child & Caregiver	NA	Yes	No	Yes
Stein, 2003[20] NA	CBITS Ten weekly group sessions over a 3 Mos. period Child	CBITS Waitlist Child	NA	Yes	No	Yes
Tol, 2008; 2010[21, 22] NA; NA	Other psychotherapy Fifteen sessions over 5 weeks of a manualized classroom-based intervention combining CBT and creative-expression techniques in a structured format Child	Inactive control Waitlist Child	NA	Yes	No	Yes
Tol, 2012[23] NA	CBT Fifteen, 5-week sessions of a manualized group school-based intervention combining CBT and creative expression elements Child	Inactive control Waitlist Child	NA	Yes	Yes, Overall: 19 students with severe symptoms in both study arms received individual supportive counseling. G1: NR G2: NR	No; Intensive group therapies are not typical or easy 3 times a week; likely not culturally appropriate in some contexts (e.g. songs, artistic expression)
Zehnder, 2010[24] NA	Other psychotherapy One, 30 minute, session Child & Caregiver	Inactive control None Child		No	No	Yes

[a.] A home-based intervention that combines techniques from CBT and narrative therapy.

[b.] Ten group sessions, 1 individual session, and 1 parent session.

Abbreviations: b/w = between; CAM = Complementary and Alternative Medicine; CBITS = Cognitive-Behavioral Intervention for Trauma in Schools; CBT = Cognitive Behavioral Therapy; CFTSI = Child and Family Traumatic Stress Intervention; CPT = Cognitive Processing Therapy; EMDR = Eye Movement and Desensitization Reprocessing; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; ETAU = Enhanced Treatment as Usual; G = group; GTI-C Grief and Trauma intervention with coping skills; GTI-CN = Grief and Trauma Intervention with coping skills and trauma narrative processing; kg = kilogram; LAST = Loss and Survival Team; mg = milligram; Mos. = months; NA = not applicable; NET = Narrative Exposure Therapy; NR = not reported; OTT = Overshadowing the Threat of Terrorism; SSET = Support for Students Exposed to Trauma; SSRI = Selective serotonin re-uptake inhibitors; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; TGCT = Trauma and Grief Component Therapy.

Evidence Table 5. Benefits (KQ 1 & 2)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Ahrens, 2002[1] NA	NA	NR	PSS-SR (range: NR), Mean Difference Pretreatment G1: 16.89 (SD=10.49) G2: 19.36 (SD=10.12) Within group change: G1: -9.07 (calculated) G2: 1.02 (calculated) Between group change: -10.09 (calculated) ANOVA (1, 36)=19.44, p=0.0001 IES (range: NR), Mean Difference Pretreatment G1: 35.52 (SD=11.80) G2: 33.42 (SD=8.70) Within group change: G1: -12.11 (calculated) G2: 2.08 (calculated) Between group change: -14.19 (calculated) ANOVA (1, 36)=20.49, p=0.0001	BDI (range: NR), Mean difference Pretreatment G1: 15.26 (SD=12.10) G2: 18.52 (SD=9.97) Within group change: G1: -8.38 (calculated) G2: -0.58 (calculated) Between group change (95% CI): -7.80 (calculated) ANOVA (1, 36)=17.95, p=0.02

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Berger, 2007[2] NA	UPID-Severity (range: 0-68): Pretreatment G1: 25.6 (SD=12.3) G2: 23.5 (SD=11.2) Within group change at post-treatment: G1: -11.7 (calculated) G2: 0.4 (calculated) Between group change at post-treatment: -12.1 (calculated) Between group ANOVA: F=129.33, df=1,140, p<0.001 Symptoms (range: 0-17): Pretreatment G1: 7.6 (SD=3.9) G2: 6.7 (SD=3.8) Within group change at post-treatment: G1: -3.7 (calculated) G2: 0.9 (calculated) Between group change at post-treatment: -4.6 (calculated) Between group ANOVA: F=132.62, df=1,140, p<0.001	UPID-Diagnosis Pretreatment G1: 8.6% (calculated) G2: 6.9% (calculated) Within group change in proportion with PTSD at post-treatment G1: -8.6% (calculated) G2: 0% Between group change in PTSD diagnosis proportion at post-treatment: -8.6% Significance not reported	NA	SCARED, Generalized Anxiety, Mean Generalized anxiety (range: 8-24): Pretreatment G1: 12.5 (SD=2.9) G2: 12.4 (SD=3.1) Within group change at post-treatment: G1: -2.3 (calculated) G2: 0.5 (calculated) Between group change at post-treatment: -2.8 (calculated) Between group ANOVA: F=59.25, df=1,140, p<0.001 Separation anxiety (range: 7-21): Pretreatment G1: 14.8 (SD=4.3) G2: 14.3 (SD=3.7) Within group change at post-treatment: G1: -2.6 (calculated) G2: -0.2 (calculated) Between group change at post-treatment: -2.4 (calculated) Between group ANOVA: F=29.24, df=1,140, p<0.001

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Berger, 2009[3] ES-SL	UPID (range: 0-68), Mean Pretreatment G1: 44.94 (SD=8.7) G2: 47.23 (SD=7.2) Within group change at post-treatment: G1: -8.73 (calculated) G2: -1.52 (calculated) Between group change at post-treatment: -7.21 (calculated) Between group ANOVA: F=53.52, df=1,164, p<0.001	Categorical measure of probable PTSD was constructed by assessing whether reported symptoms met criteria for DSM-IV PTSD Dx, Mean Probably PTSD Pretreatment G1: 28% (SD=33.3%) G2: 26% (31.7%) Within group change at post-treatment: G1: -27.3% (calculated) G2: -2.6% (calculated) Between group change at post-treatment: -24.7% (calculated) Between group chi-square: X^2=14.02, df=2, p=0.001	NA	Brief BDI (range: 0-21), Mean Pretreatment G1: 4.44 (SD=3.2) G2: 4.04 (SD=3.3) Within group change at post-treatment: G1: -1.89 (calculated) G2: -0.34 (calculated) Between group change at post-treatment: -1.55 (calculated) Between group ANOVA: F=22.55, df=1,164, p<0.001

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Berkowitz, 2011[4] NA	UPID (range: NR) full or partial diagnosis 3 Mos. followup Treatment variable OR (95% CI)): 0.268 (0.10, 0.71), p<0.01 TSCC Post Traumatic Stress Index Scale (range: NR): Pretreatment G1: 53.30 (SD=1.34) G2: 51.74 (SD=1.29) Within group change at post-treatment assessment: G1: -10.33 (calculated) G2: -5.62 (calculated) Within group change at 3 Mos.: G1: -13.56 (calculated) G2: -9.52 (calculated) Between group change at post-treatment assessment: -4.71 (calculated) Between group change at 3 Mos. assessment: -4.04 (calculated) Repeated measures with mixed effect models: F=3.25, df=163, p=0.04	NR	NA	TSCC-Dissociation Index (range: NR) Pretreatment G1: 47.64 (SD=1.12) G2: 48.23 (SD=1.07) Within group change at post-treatment assessment: G1: -5.38 (calculated) G2: -3.11 (calculated) Within group change at 3 Mos.: G1: -6.62 (calculated) G2: -4.69 (calculated) Between group change at post-treatment assessment: -2.27(calculated) Between group change at 3 Mos. assessment: -1.95 (calculated) Repeated measures with mixed effect models: F=1.28, df=163, p=0.28 TSCC Anxiety Index (range: NR): Pretreatment G1: 51.34 (SD=1.33) G2: 50.45 (SD=1.29) Within group change at post-treatment assessment: G1: -10.48 (calculated) G2: -4.96 (calculated) Within group change at 3 Mos: G1: -11.70 (calculated) G2: -8.63 (calculated) Between group change at post-treatment assessment: -5.52 (calculated) Between group change at 3 Mos. assessment: -3.07 (calculated) Repeated measures with mixed effect models: F=4.89, df=163, p=0.009

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Catani, 2009[5] NA	NA	UCLA PTSD Diagnosis Pretreatment G1: 100% G2: 100% Within group change in proportion at post-treatment assessment: G1: -75% G2: -66.6% Within group change in proportion at 6 Mos.: G1: -81.3% G2: -71.4% Between group change at post-treatment assessment: 8.4% (calculated) X^2 difference p=NS Between group change at 6 Mos. assessment: -9.9% X^2 difference p=NS	UCLA PTSD Symptoms (range: 0-80), Pretreatment G1: 37.94 (SD=14.8) G2: 36.58 (SD=14.9) Within group change at post-treatment assessment: G1: -25.53 (calculated) G2: -23.99 (calculated) Within group change at 6 Mos.: G1: -26.63 (calculated) G2: -26.83 (calculated) Between group change at post-treatment assessment: -1.54 (calculated) Between group change at 6 Mos. assessment: 0.20 (calculated) Repeated measures ANOVA for time*treatment interaction p=0.9	NR
Ford, 2012[6] TARGET	NA	CAPS-CA (range: NR), B Symptoms, Mean Pretreatment: G1: 19.4 (SD=9.2) G2: 13.3 (SD=3.8) Within group change at post-treatment assessment: G1: -8.7 (SD=8.6) d=1.01 G2: -4.6 (SD=4.8) d=0.95 Between group change at post-treatment assessment: -4.1 (SD=6.4); 95% CI (calculated) -0.22, 8.42; d=0.64 CAPS-CA, C Symptoms, Mean Pretreatment: G1: 22.5 (SD=8.0) G2: 18.8 (SD=5.9) Within group change at post-treatment assessment: G1: -8.5 (SD=8.2) d=1.04 G2: -4.9 (SD=6.6) d=0.75	NA	TSCC (range: NR), Anxiety. Mean Pretreatment: G1: 7.2 (SD=3.6) G2: 6.8 (SD=4.5) Within group change at post-treatment assessment: G1: -2.4 (SD=3.9) d=0.61 G2: -1.3 (SD=4.7) d=0.27 Between group change at post-treatment assessment: -1.2 (SD=3.6); 95% CI (calculated) -1.46, 3.66; d=0.32 TSCC, Depression, Mean Pretreatment: G1: 7.4 (SD=3.7) G2: 6.9 (SD=4.1) Within group change at post-treatment assessment: G1:-2.3 (SD=3.6) d=0.65 G2: -2.6 (SD=4.0) d=0.65 Between group change at post-treatment assessment: 0.3 (SD=3.6); 95% CI

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Ford, 2012[6] TARGET (continued)		Between group change at post-treatment assessment: -3.5 (SD=8.4), 95% CI (calculated) -0.93, 8.13; d=0.42 CAPS-CA, D Symptoms, Mean Pretreatment: G1: 17.4 (SD=8.2) G2: 15.4 (SD=6.3) Within group change at post-treatment assessment: G1: -7.4 (SD=7.4) d=0.99 G2: -7.4 (SD=6.1) d=1.23 Between group change at post-treatment assessment: 0.02 (SD=7.5); 95% CI (calculated) -4.12, 4.12; d=0.00 CAPS-CA, Total Score: Mean Pretreatment: G1: 58.9 (SD=20.7) G2: 47.5 (SD=10.6) Within group change at post-treatment assessment: G1: -24.4 (SD=19.5) d=1.26 G2: -17.0 (SD=12.6) d=1.35 Between group change at post-treatment assessment: -7.4 (SD=14.1); 95% CI (calculated) -16.96, 2.16; d=0.53 PTCI, Mean Pretreatment: G1: 108.2 (SD=32) G2: 104.6 (SD=33) Within group change at post-treatment assessment: G1: -17.9 (SD=33.6) d=0.53 G2: -10.6 (SD=33.4) d=0.32 Between group change at post-treatment assessment: 7.2 (SD=34.3); 95% CI (calculated) -12.79, 27.39; d=0.21		(calculated) -2.56, 1.96; d=-0.10 TSCC, Anger, Mean Pretreatment: G1: 8.8 (SD=7.1) G2: 8.3 (SD=6.0) Within group change at post-treatment assessment: G1: -1.0 (SD=7.4) d=0.13 G2: -2.5 (SD=5.4) d=0.46 Between group change at post-treatment assessment: 1.5 (SD=4.9); 95% CI (calculated) -5.46, 2.46; d=-0.30

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Gelkopf, 2009[7] ERASE-Stress	UPID, PTSD Severity, Mean Pretreatment G1: 23.6 (SD=9.3) G2: 20.4 (SD=10.3) Within group change at post-treatment: G1: -10.9 (calculated) G2: -1.9 (calculated) Between group change at post-treatment: -9.0 (calculated) Between group ANOVA: F=49.42, df=1,106, p<0.001	UPID (range: 0-68), PTSD Diagnosis Pretreatment G1: 5.2% (calculated) G2: 0% (calculated) Within group change at post-treatment: G1: -5.2% (calculated) G2: 6.1% (calculated) Between group change at post-treatment: -11.3% (calculated) p=NR	NA	Depression Brief BDI (range: 0-21), Mean Pretreatment G1: 3.1 (SD=2.9) G2: 2.3 (SD=2.9) Within group change at post-treatment: G1: -1.6 (calculated) G2: 0.2 (calculated) Between group change at post-treatment: -1.8 (calculated) Between group ANOVA: F=18.66, df=1,106, p<0.001
Goenjian, 1997; 2005[8, 9] NA; NA	CPTSD-RI (range: 0-80), Mean[8a.] Pretreatment G1: 45.3 (SD=11.0) G2: 41.1 (SD=9.0) Within group change at 1.5 years: G1: -13.1 (calculated) G2: 6.1 (calculated) Between group change at 1.5 years: -19.2 (calculated) Adjusted between group MANOVA treatment*time: F=31.16, df=1,56, p<0.05 Within group change at 3.5 years: G1: -16.3 (SD=13.0) G2: -5.4 (SD=11.0) Between group change at 3.5 years: -10.9 (calculated) Reported t-test between group difference: t=3.5, df=61, p<0.001	NR	NA	DSRS (range: 0-63), Depression Pretreatment G1: 16.8 (SD=5.9) G2: 15.3 (SD=5.5) Within group change at 1.5 years: G1: -0.8 (calculated) G2: 4.9 (calculated) Between group change at 1.5 years G1 vs. G2: -5.7 (calculated) Between group difference p value not reported Within group change at 3.5 years: G1: -1.7 (SD=5.4) G2: 2.7 (SD=6.7) Between group change at 3.5 years: -4.4 (calculated) Reported t-test between group difference: t=2.9, df=61, p<0.01

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Jaycox, 2009[10] SSET	NA	NA	CPSS (range: NR), Mean Pretreatment: G1: 17.46 (SD=10.37) G2: 19.41 (SD=10.00) Within group change at post-treatment assessment: G1: -3.74 (calculated), d=-0.39 G2: -1.09 (calculated), d=-0.16 Between group change at post-treatment assessment: -2.65 (calculated); d=-0.23; regression estimate for followup controlling for baseline=0.58, t=-1.89, p=0.058; fixed effects model adjusted for school and group leader found that estimates "remained stable"	CDI (range: NR), Mean Pretreatment: G1: 13.87 (SD=8.52) G2: 14.32 (SD=9.20) Within group change at post-treatment assessment: G1: -2.10 (calculated); d=-0.25 G2: 0.60 (calculated) d=0.07 Between group change at post-treatment assessment:-2.70 (calculated); d= -0.32; regression estimate of followup controlling for baseline=0.65, t=-1.99, p=0.046; fixed effects model adjusted for school and group leader found that estimates “remained stable”

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Kemp, 2010[11] NA	NA	Meeting two or more PTSD (DSM-IV) diagnostic criteria based on systematic clinical assessment Pretreatment G1: 100% G2: 100% Within group change in proportion at post-treatment: G1: -75% G2: 0% Between group change at post-treatment: -75% (calculated) X2 (1, n=24)=14.40, p<0.001)	PTSD-RI symptoms Pretreatment G1: 25.92 (SD=12.18) G2: 27.29 (SD=12.58) Magnitude of effect not specified by intervention type. MANCOVA controlling for group differences at pretreatment for number of DSM-IV PTSD criteria and Child PTS-RI scores F(2, 17)=9.32, p<0.01 A priori contrasts identified a significant pre to post reduction in the number of DSM-IV PTSD criteria [t(11)=4.17, p<0.01] and Child PTS-RI scores [t(11)=4.26, p=0.001] for G1 but not for G2	STAIC – State Anxiety (range: 20-60), Mean Pretreatment G1: 28.50 (SD=4.68) G2: 32.33 (SD=8.37) Within group change: G1: 0.33 (calculated) G2: -0.66 (calculated) Between group change (95% CI): 0.99 (calculated) p=NS STAIC-Trait Anxiety (range: 20-60) Pretreatment G1: 35.42 (SD=7.51) G2: 39.58 (SD=7.23) Within group change: G1: -1.92 (calculated) G2: -3.41(calculated) Between group change (95% CI): 1.49 (calculated) p=NS CDS-Depression (range: 66-330) Pretreatment G1: 138.42 (SD=24.72) G2: 137.50 (SD=27.87) Within group change: G1: -2.67 (calculated) G2: -6.25 (calculated) Between group change (95% CI): 3.58 (calculated) p=NS

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Layne, 2008[12] TGCT	NA	NR	UCLA-PTSD-RI-R (range: 0-68) Pretreatment G1: 36.37 (SD=14.27) G2: 33.02 (SD=10.27) Within group change: G1 (95% CI): -11.85 (-15.28, -8.42) G2 (95% CI): -5.67 (-8.93, -2.42) Between group difference: -6.18 (calculated) MANOVA between group time*treatment group interaction F=6.77, df=1,125, p=0.01	DSRS (range: 0-72)[c.], Pretreatment G1: 32.61 (SD=11.39) G2: 28.61 (SD=9.86) Within group change: G1 (95% CI): -2.69 (-5.33, -0.06) G2 (95% CI): 1.91 (-0.68, 4.51) Between group difference: -2.78 (calculated) MANOVA between group time*treatment group interaction F=6.16, df=1,125, p<0.05
Nugent, 2010[13] NA	CAPS-CA (range: NR)[d.] No means reported. Between group differences at followup not reported. Intent-to-treat linear regression predicting PTSD symptoms at post-treatment, adjusted for sex, age, and prior trauma PTSD severity, showed treatment group OR (95% CI)=1.32 (0.84, 2.08) (calculated)	CAPS-CA[d.] Diagnosis No data reported for PTSD diagnosis other than X^2<1; p=NS for G1 vs. G2 at post-treatment	NA	NR

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Robb[e], 2010[14] NA	NA	NR	UCLA PTSD-RI-R (range: 0-68) Pretreatment G1: 43.8 (SD=8.5) G2: 42.1 (SD=8.8) Within group LS mean change LOCF: G1: -20.4 (SD=2.1) G2: -22.8 (SD=2.1) Between group LS mean change score difference LOCF 95% CI: -7.6, 2.9, p=0.373 CSDC, parent-rated (range: 0-30) Pretreatment G1: 33.5 (SD=10.5) G2: 34.1 (SD=10.4) Within group LS mean change LOCF: G1: -12.4 (SD=1.7) G2: -17.3 (SD=1.9) Between group LS mean change score difference LOCF 95% CI: -9.1, -0.6, p=0.025 CGI-S, clinician-rated (range: 0-7) Pretreatment G1: 4.5 (SD=0.6) G2: 4.4 (SD=0.6) Within group LS mean change LOCF: G1: -1.4 (SD=0.2) G2: -1.8 (SD=0.2) Between group LS mean change score difference LOCF 95% CI: -0.8, 0.0, p=0.031 CGI-I, clinician-rated symptom improvement (range: 0-7) Pretreatment G1: NA G2: NA Within group LS mean change LOCF: G1: 2.4 (SD=0.2) G2: 2.2 (SD=0.2) Between group LS mean change score difference LOCF 95% CI: -0.6, 0.3, p=0.415	CDRS-R (range: 0-17), Mean Pretreatment G1: 40.3 (SD=14.4) G2: 41.2 (SD=14.2) Within group LS mean change LOCF: G1: -10.0 (SD=1.5) G2: -12.3 (SD=1.6) Between group LS mean change score difference LOCF 95% CI: -6.0,1.3, p=0.210

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Robert[f], 1999[15] NA	NA	ASD symptom responders G1: 83% G2: 38% Between-group difference in relieving ASD symptoms, X^2=5.24, df=1, p=0.04	NR	NR
Robert[9], 2008[16] NA	NA	ASD Checklist % responders at post-treatment: G1: 60.0% G2: 72.2% G3: 54.5% Between group difference in % responders at post-treatment p=NS	ASD Checklist, Mean Pretreatment G1: 42.6 (SD=12.4) G2: 47.6 (SD=15.0) G3: 44.6 (SD=14.0) Within group % change in mean score post-treatment G1: -62.6% (SD 39.5) G2: -73.6% (SD 40.4) G3: -65.1% (SD 41.5) Between group difference in % change in mean score post-treatment: p=NS	NR

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Salloum[h.], 2008[17] NA	NA	NR	UPID-PTSD Symptoms (range: 0-80) Pretreatment G1: 28.28 (SD=13.61) G2: 31.32 (SD=12.43) Post-treatment G1: 44.03 (SD=13.03) G2: 42.32 (SD=9.58) Within group change at post-treatment assessment: G1: -15.75 (calculated) G2: -11.00 (calculated) Within group change in proportion at 20 day followup: G1: -21.60 (calculated) G2: -20.47 (calculated) Between group change at post-treatment assessment: -4.75 (calculated) Intent-to-treat analyses effect size: 0.95 Between group change at 6 Mos. assessment: -1.13 (calculated) Intent-to-treat analyses effect size: 1.34 General linear modeling repeated measure procedure time*treatment interaction p=NS	MFQ-C, Mean Pretreatment G1: 25.48 (SD=9.17) G2: 23.41 (SD=9.58) Within group change at post-treatment assessment: G1: -8.57 (calculated) G2: -2.95 (calculated) Within group change in proportion at 20 day followup: G1: -12.48 (calculated) G2: -9.18 (calculated) Between group change at post-treatment assessment: -5.62 (calculated) Intent-to-treat analyses effect size: 0.47 Between group change at 6 Mos. assessment: -3.30 (calculated) Intent-to-treat analyses effect size: 0.92 General linear modeling repeated measure procedure time*treatment interaction p=NS

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Salloum, 2012[18] NA	NA	UCLA PTSD-I of 38+ (clinically significant PTSD) Pretreatment: G1: 46.2% G2: 39.4% Within group change at 12 Mos. assessment: G1: -40.3% G2: -29.4% Between group change at 12 Mos. assessment: -10.9%, p=NR	UCLA-PTSD-I (range: NR) Pretreatment: G1: 46.82 (SD=13.00) G2: 42.80 (SD=10.77) Within group change at post-treatment assessment: G1: -15.64, d=0.92, p=NR G2: -15.23, d=0.78, p=NR Between group change at post-treatment assessment: -0.41, p=NR Within group change at 3 Mos. assessment: G1: -16.94, d=1.06, p=NR G2: -16.5, d=0.78, p=NR Between group change at 3 Mos. assessment: -0.44, p=NR Within group change at 12 Mos. assessment: G1: -22.08, d=1.83, p=NR; (RCI: 70.59% improved, 2.94% deteriorated) G2: -17.27, d=1.50, p=NR (RCI: 60% improved, 3.33% deteriorated) Between group change at 12 Mos. assessment: -4.81, ANOVA time*treatment interaction p=NS; RCI difference p=NS	MFQ-C of 29+ (clinically significant depression) Pretreatment: G1: 43.6% G2: 27.3% Within group change at 12 Mos. assessment: G1: -43.6% G2: -20.8% Between group change at 12 Mos. assessment: -22.8%, p=NR MFQ-C (range: NR) Pretreatment: G1: 27.62 (SD=10.18) G2: 22.83 (SD=8.65) Within group change at post-treatment assessment: G1: -9.12, d=0.91, p=NR G2: -9.00, d=0.99, p=NR Between group change at post-treatment assessment: -0.12, p=NR Within group change at 3 Mos. assessment: G1: -9.18, d=0.87, p=NR G2: -8.00, d=0.85, p=NR Between group change at 3 Mos. assessment: -1.18, p=NR Within group change at 12 Mos. assessment: G1: -13.94, d=1.43, p=NR (RCI: 52.9% improved, 0% deteriorated) G2: -9.00, d=0.97, p=NR (RCI: 43.33% improved, 3.33% deteriorated) Between group change at 12 Mos. assessment: -4.94, ANOVA time*treatment interaction p=NR; RCI difference p=NS EGI (range: NR) Pretreatment: G1: 53.03 (SD=17.75) G2: 46.00 (SD=21.83)

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Salloum, 2012[18] NA				Within group change at post-treatment assessment: G1: -16.90, d=0.92, p=NR G2: -16.69, d=0.78, p=NR Between group change at post-treatment assessment: -0.39, p=NR Within group change at 3 Mos. assessment: G1: -19.62, d=0.96, p=NR G2: -16.62, d=1.18, p=NR Between group change at 3 Mos. assessment: -3.00, p=NR Within group change at 12 Mos. assessment: G1: -26.72, d=1.61, p=NR (RCI: 68.75% improved, 0% deteriorated) G2: -19.00, d=0.91, p=NR (RCI: 55.17% improved, 3.45% deteriorated) Between group change at 12 Mos. assessment: -7.72, ANOVA time*treatment interaction p=NR; RCI difference p=NS GD (range: NR) Pretreatment: G1: 2.71 (SD=1.32) G2: 2.72 (SD=1.13) Within group change at post-treatment assessment: G1: -0.80, d=0.60, p=NR G2: -1.03, d=0.86, p=NR Between group change at post-treatment assessment: 0.23, p=NR Within group change at 3 Mos. assessment: G1: -1.36, d=1.06, p=NR G2: -1.34, d=0.78, p=NR Between group change at 3 Mos. assessment: -0.02, p=NR Within group change at 12 Mos. assessment: G1: -1.53, d=1.19, p=NR G2: -1.24, d=1.06, p=NR Between group change at 12 Mos. assessment: -0.29, ANOVA time*treatment interaction p=NR

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Smith, 2007[19] NA	NA	ADIS-C/P PTSD Diagnosis (range: NR) Pretreatment G1: 100% G2: 100% Within group change in proportions at post-treatment: G1: -92% G2: -42% Between group change in proportions at post-treatment: -50% (calculated) X^2=6.8, df=1, 24, p<0.01	CPSS Symptoms (range: NR) Pretreatment G1: 28.1 (SD=8.8) G2: 28.3 (SD=10.5) Within group change at post-treatment: G1: -25.1 (calculated) G2: -3.05 (calculated) Between group change at post-treatment: -22.05 (calculated) MANCOVA F=48.3, df=1,18, p<0.001 C-RIES Symptoms (range: NR) Pretreatment G1: 47.5 (SD=11.5) G2: 41.6 (SD=11.7) Within group change at post-treatment: G1: -39.0 (calculated) G2: -6.3 (calculated) Between group change at post-treatment: -32.7 (calculated) MANCOVA F=36.8, df=1,18, p<0.001 CAPS symptoms (range: NR) Pretreatment G1: 60.9 (SD=9.6) G2: 54.7 (SD=14.6) Within group change at post-treatment: G1: -48.9 (calculated) G2: -14.4 (calculated) Between group change at post-treatment: -34.5 (calculated) MANCOVA F=20.2, df=1,18, p<0.005	DSRS Depression (range: NR) Pretreatment G1: 18.3 (SD=5.2) G2: 13.9 (SD=5.6) Within group change at post-treatment: G1: -10.3 (calculated) G2: -0.6 (calculated) Between group change at post-treatment: -9.7 (calculated) MANCOVA F=19.1, df=1,18, p<0.001 RCMAS Anxiety (range: NR) Pretreatment G1: 19.8 (SD=5.6) G2: 16.3 (SD=5.7) Within group change at post-treatment: G1: -12.4 (calculated) G2: 0.2 (calculated) Between group change at post-treatment: -12.6 (calculated) MANCOVA F=14.3, df=1,18, p<0.005

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Stein, 2003[20] NA	NA	NA	CPSS symptoms (range: 0-51) Pretreatment G1: 24.5 (6.8) G2: 23.5 (7.2) Within group change: G1: -15.6 (calculated) G2: -8.0 (calculated) Adjusted between group change (95% CI): -7.0 (-10.8, -3.2)	CDI Depression (range: 0-52) Difference Pretreatment G1: 17.6 (10.8) G2: 16.7 (7.3) Within group change: G1: -8.2 (calculated) G2: -4.0 (calculated) Adjusted between group change (95% CI): -3.4 (-6.5, -0.4)

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Tol, 2008; 2010[21, 22] NA; NA	NA	NR	CPSS (range: 0-68) Pretreatment G1: 20.92 (SD=8.75) G2: 22.35 (SD=8.39) Within group change at 1 week: G1: -9.10 (SD=9.20) G2: -4.85 (SD=9.49) Within group change at 6 Mos.: G1: -10.35 (SD=8.89) G2: -6.15 (SD=10.04) Between group difference at 1 week (95% CI): d=0.55 (0.35, 0.75) Between group difference at 6 Mos.: Mixed method regression analysis mean change difference adjusted for school mean (95% CI): 2.78 (1.02, 4.53), d=0.44 (0.24, 0.64)	DSRS depression (range: 0-36) Pretreatment G1: 12.29 (SD=3.33) G2: 12.55 (SD=3.47) Within group change at 1 week: G1: -0.80 (SD=3.88) G2: 0.50 (SD=4.33) Within group change at 6 Mos.: G1: -0.82 (SD=3.82) G2: 0.16 (SD=4.73) Between group difference at 1 week (95% CI): d=0.31 (0.12, 0.51) Between group difference at 6 Mos.: Mixed method regression analysis mean change difference adjusted for school mean (95% CI): -0.70 (-0.08, 1.49), d= 0.24 (0.04, 0.43) SCARED-5 anxiety (range: 0-10) Pretreatment G1: 4.38 (SD=1.76) G2: 4.46 (SD=1.87) Within group change at 1 week: G1: -0.97 (SD=2.16) G2: -0.65 (SD=2.32) Within group change at 6 Mos.: G1: -1.06 (SD=2.45) G2: -0.96 (SD=2.49) Between group difference at 1 week (95% CI): d=0.14 (-0.05, 0.34) Between group difference at 6 Mos.: Mixed method regression analysis mean change difference adjusted for school mean (95% CI): -0.12 (-0.31, 0.56), d=0.04 (-0.16, 0.24)

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Tol, 2012[23] NA	NA	NA	CPSS (range: 0-51), PTSD symptoms: Pretreatment G1: 15.03 (SD=8.89) G2: 15.70 (SD=9.12) Within group change at post-treatment assessment: G1: NR G2: NR Between group change at post-treatment assessment: NR LGCM estimate (SE): 0.281 (0.332); p=NS	DSRS (range: 0-36), Depressive symptoms: Pretreatment G1: 8.39 (SD=4.54) G2: 8.56 (SD=4.37) Within group change at post-treatment assessment: G1: NR G2: NR Between group change at post-treatment assessment: NR LGCM estimate (SE): 0.115 (0.112); p=NS SCARED-5 (range 0-10), Anxiety symptoms: Pretreatment G1: 3.29 (SD=2.13) G2: 3.17 (SD=2.16) Within group change at post-treatment assessment: G1: NR G2: NR Between group change at post-treatment assessment: NR LGCM estimate (SE): -0.037 (0.065); p=NS SDQ (range: 0-40), Psychological difficulties: Pretreatment G1: 10.74 (SD=5.57) G2: 10.29 (SD=5.44) Within group change at post-treatment assessment: G1: NR G2: NR Between group change at post-treatment assessment: NR LGCM estimate (SE): -0.198 (0.280); p=NS

Evidence Table 5. Benefits (KQ 1 & 2) (continued)

Author, Year, Trial Name	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention of Reduction in Mental Health Conditions or Symptoms
Tol, 2012[23] NA				Supernatural complaints (range: 0-18): Pretreatment G1: 2.21 (SD=2.59) G2: 1.97 (SD=1.92) Within group change at post-treatment assessment: G1: NR G2: NR Between group change at post-treatment assessment: NR LGCM estimate (SE): -0.121 (0.064); p<0.06
Zehnder, 2010[24] NA	IBS-K (range: NR), Mean Pretreatment: G1: 29.3 (SD=23.7) G2: 26.3 (SD=23.0) Within group change at Time 1 assessment: G1: -7.7 (calculated) G2: -7.8 (calculated) Between group change at Time 1 assessment: 0.1 (calculated) Within group change at Time 2 assessment: G1: -5.7 (calculated) G2: -4.4; (calculated) Between group change at Time 2 assessment: -1.3 (calculated) Repeated measures ANOVA treatment*time interaction: F=0.10, p=NS	NA	NA	DIKJ (range: NR), Mean Pretreatment: G1: 10.1 (SD=6.0) G2: 9.6 (SD=6.5) Within group change at Time 1 assessment: G1: -1.9 (calculated) G2: -1.0 (calculated) Between group change at Time 1 assessment: -0.9 (calculated) Within group change at Time 2 assessment: G1: -1.0 (calculated) G2: -0.9 (calculated) Between group change at Time 2 assessment -0.1 (calculated) Repeated measures ANOVA treatment*time interaction: F=0.01, p=NS

[a.] 18 month data reported in #840 differs slightly from that reported in #1589.

[b.] Post-Tx results and mean change only reported in figure.

[c.] Also conducted 4 month follow-up on PTSD, Depression, and Grief Reactions. These analyses were only done on those who had pre, post, and 4-month follow-up data (not ITT analysis).

[d.] Girls receiving propranolol reported more PTSD symptoms relative to girls receiving placebo. Boys receiving propranolol showed a nonsignificant trend toward fewer PTSD symptoms than boys receiving placebo.

[e.] Sertraline did not demonstrate efficacy compared with placebo.

[f.] No standardized scales used.

[g.] Placebo was statistically as effective as either Imipramine or Fluoxetine in treating symptoms of ASD.

[h.] Treatment satisfaction 1: "I learned more about grief and trauma reactions" (1-10, with 10 being highest); mean score at follow-up: 9.20. Treatment satisfaction 2: "I expressed my thoughts and feelings about what happened"; mean score at follow-up: 9.18. Treatment satisfaction 3: "On a scale from 1 to 10, how helpful was counseling for you?"; mean score at follow-up: 9.31.

[i.] Debriefing was no more effective than placebo group intervention, although both groups made significant improvements in PTSD symptoms.

Abbreviations: ADIS-C/P = Anxiety Disorders Interview Schedule; ASD = Acute Stress Disorder; BDI = Beck Depression Inventory; CAPS-CA = Clinician-Administered Post-Traumatic Stress Disorder Scale For Children And Adolescents; CDI = Child Depression Inventory; CDRS-R = Children's Depression Rating Scale-Revised; CDS = Children's Depression Scale; CGI-I = Clinical Global Impressions-Improvement Scale; CGI-S = Clinical Global Impressions – Severity Scale; CI = confidence interval; CPSS = Child PTSD Symptom Scale; CPTSD-RI = Child Post-Traumatic Stress Reaction Index; C-RIES = Children's Revised Impact of Event Scale; CSDC = Child Stress Disorder Checklist; d = effect size; df = degrees of freedom; DIKJ = German Version of CDI; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; DSRS = Depression Self-Rating Scale; Dx = diagnosis; EGI = Extended Grief Inventory; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; G = group; GD = Global Distress; IBS-K = German Version of CAPS-CA; IES = Impact of Events Scale; LGCM = latent growth curve modeling; LOCF = last observation carried forward; LS = least-squares; MFQ-C = Mood and Feeling Questionnaire – Child Version; Mos. = months; N = number; NA = not applicable; NR = not reported; NS = not significant; OR = odds ratio; PSS-SR = Post-Traumatic Stress Disorder Symptom Scale Self Report; PTCI = Post-Traumatic Cognitions Inventory; PTSD = Posttraumatic Stress Disorder; RCI = Reliable Change Index; RCMAS = Revised Children's Manifest Anxiety Scale; SCARED = Screen for Child Anxiety Related Emotional Disorders; SCARED-5 = Self-Report for Anxiety-Related Disorders; SD = standard deviation; SDQ = Strengths and Difficulties Questionnaire; SE = standard error; SSET = Support for Students Exposed to Trauma; STAIC – State Trait Anxiety Inventory for Children; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TGCT = Trauma and Grief Component Therapy; TSCC = Trauma Symptom Checklist for Children; UCLA PTSD-I = University of California, Los Angeles Post-Traumatic Stress Disorder Index; UCLA-PTSD-RI-R = University of California, Los Angeles Post-Traumatic Stress Disorder Reaction Index, Revised; UCLA PTSD-Symptom Severity = University of California, Los Angeles Post-Traumatic Stress Disorder – Symptom Severity; UPID = University of California, Los Angeles Index for DSM-IV for children.

Evidence Table 6. Benefits (KQ1 & 2)

Author, Year, Trial Name	Prevention or Reduction in Physical Health Conditions or Symptoms	Reduction in Risk-Taking Behaviors, Behavioral Problems, or Criminal Activities
Ahrens, 2002[1] NA	NR	NR
Berger, 2007[2] OTT	DPS (range: 0-6), Mean G1: 2.1 (SD=1.7) G2: 1.9 (SD=1.6) Within group change at post-treatment: G1: -1.0 (calculated) G2: 0.1 (calculated) Between group change at post-treatment: -1.1 (calculated) Between group ANOVA: F=40.44, df=1,140, p<0.001	NR
Berger, 2009[3] ES-SL	DPS (range: 0-5), Mean Pretreatment G1: 1.46 (SD=1.0) G2: 1.26 (SD=1.0) Within group change at post-treatment: G1: -0.82 (calculated) G2: 0.19 (calculated) Between group change at post-treatment: -1.01 (calculated) Between group ANOVA: F=44.80, df=1,164, p<0.001	NR
Berkowitz, 2011[4] NA	NR	NR
Catani, 2009[5] NA	# of physical symptoms Pretreatment G1: 1.75 (SD=1.34) G2: 1.80 (SD=1.26) Within group change at post-treatment assessment: G1: -0.25 (calculated) G2: -1.13 (calculated) Within group change at 6 Mos.: G1: -0.25 (calculated) G2: -0.51 (calculated) Between group change at post-treatment assessment: 0.88 (calculated) Repeated measures ANOVA for time*treatment interaction p=NS Between group change at 6 Mos. assessment: 0.26 (calculated) Repeated measures ANOVA for time*treatment interaction p=NS	NR

Evidence Table 6. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Prevention or Reduction in Physical Health Conditions or Symptoms	Reduction in Risk-Taking Behaviors, Behavioral Problems, or Criminal Activities
Ford, 2012[6] TARGET	NR	NR
Gelkopf, 2009[7] ERASE-Stress	DPS (range 0-5), Mean Pretreatment G1: 2.1 (SD=1.3) G2: 1.9 (SD=1.2) Within group change at post-treatment: G1: -1.0 (calculated) G2: unknown based on data reporting error Between group change at post-treatment: unknown based on data reporting error Between group ANOVA: F=24.07, df=1,106, p<0.001	NR
Goenjian, 1997; 2005[8, 9] NA; NA	NR	NR
Jaycox, 2009[10] SSET	NR	NR
Kemp, 2010[11] NA	GHQ-12-General Health (range: 0-12) Pretreatment G1: 1.09 (SD=1.92) G2: 4.25 (SD=4.11) Within group change: G1: 0.82 (calculated) G2: -0.42 (calculated) Between group change: 1.24 (calculated) p=NS	CBCL, Parent rating (range: 30-100), Pretreatment G1: 36.73 (SD=22.49) G2: 30.10 (SD=34.16) Within group change: G1: -8.28 (calculated) G2: 13.07 (calculated) Between group change (95% CI): -21.35 (calculated) p=NS
Layne, 2008[12] TGCT	NR	NR
Nugent, 2010[13] NA	No between group difference in heart rate during or after trauma narrative p=NS No other data given	NR
Robb[d], 2010[14] NA	NR	NR
Robert[e], 1999[15] NA	NR	NR
Robert[f], 2008[16] NA	NR	NR

Evidence Table 6. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Prevention or Reduction in Physical Health Conditions or Symptoms	Reduction in Risk-Taking Behaviors, Behavioral Problems, or Criminal Activities
Salloum[9], 2008[17] NA	NR	NR
Salloum, 2012[18] NA	NA	CBCL (range: NR), t-score of 63+ (clinically significant parent-reported internalizing problem behavior) Pretreatment: G1: 20.5% G2: 12.1% Within group change at 12 Mos. assessment: G1: -14.6% G2: 1.2% Between group change at 12 Mos. assessment: 15.8%, p=NR CBCL, Parent-reported Internalizing symptoms Pretreatment: G1: 9.50 (SD=7.33) G2: 8.76 (SD=5.69) Within group change at post-treatment assessment: G1: NR G2: NR Between group change at post-treatment assessment: NR Within group change at 3 Mos. assessment: G1: -2.00, d=0.29, p=NR G2: -1.33, d=0.21, p=NR Between group change at 3 Mos. assessment: -0.67, p=NR Within group change at 12 Mos. assessment: G1: -3.61, d=0.58, p=NR (RCI: 17.86% improved, 0% deteriorated) G2: -1.52, d=0.26, p=NR (RCI: 14.29% improved, 4.76% deteriorated) Between group change at 12 Mos. assessment: -2.09, ANOVA time*treatment interaction p=NR; RCI difference p=NR Internalizing symptoms changed over time, F(2,94)=4.46, p=0.015 for both treatment conditions. CBCL, Parent-reported Externalizing symptoms Pretreatment: G1: 12.39 (SD=7.49) G2: 10.05 (SD=8.73) Within group change at post-treatment assessment: G1: NR G2: NR

Evidence Table 6. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Prevention or Reduction in Physical Health Conditions or Symptoms	Reduction in Risk-Taking Behaviors, Behavioral Problems, or Criminal Activities
Salloum, 2012[18]		Between group change at post-treatment assessment: NR Within group change at 3 Mos. assessment: G1: 0.97, d=0.12, p=NR G2: 0.05, d=0.006, p=NR Between group change at 3 Mos. assessment: 0.92, p=NR Within group change at 12 Mos. assessment: G1: -2.78, d=0.35, p=NR G2: 0.57, d=0.06, p=NR Between group change at 12 Mos. assessment: -2.21, ANOVA time*treatment interaction using ITT analysis: F(2,108)=3.81, p=0.026
Smith, 2007[19] NA	NR	NR
Stein, 2003[20] NA	NR	NR
Tol, 2008; 2010 [21, 22] NA	NR	Parent-rated Children's Aggression Scale for Parents (range: 33-132) Pretreatment G1: 42.18 (SD=9.09) G2: 44.63 (SD=12.08) Within group change at 1 week: G1: -1.44 (SD=4.72) G2: -1.16 (SD=4.23) Within group change at 6 Mos.: G1: -2.03 (SD=4.71) G2: -1.48 (SD=4.69) Between group difference at 1 week (95% CI): d=0.06 (-0.13, 0.25) Between group difference at 6 Mos. (95% CI): d=0.12 (-0.07, 0.31)
Tol, 2012[23] NA	NA	Conduct problems: Pretreatment: G1: 2.00 (SD=2.84) G2: 1.99 (SD=2.23) Within group change at post-treatment: G1: NR G2: NR Between group change at post-treatment: NR LGCM estimate (SE): -0.132 (0.045); p<0.01

Evidence Table 6. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Prevention or Reduction in Physical Health Conditions or Symptoms	Reduction in Risk-Taking Behaviors, Behavioral Problems, or Criminal Activities
Zehnder, 2010[24] NA	NR	CBCL-German version (range: NR), Mean Pretreatment: G1: 53.4 (SD=9.3) G2: 50.6 (SD=9.1) Within group change at Time 1 assessment: G1: -3.4 (calculated) G2: -0.6 (calculated) Between group change at Time 1 assessment: -2.8 (calculated) Within group change at Time 2 assessment: G1: -2.6 (calculated) G2: -1.8 (calculated) Between group change at Time 2 assessment: -0.8 (calculated) Repeated measures ANOVA treatment*time interaction: F=0.01, p=NS

Note: No eligible study reported on decreased suicidality in the context of KQ1 or KQ2.

Abbreviations: CBCL = Child Behavior Checklist; CI = confidence interval; d = effect size; df = degrees of freedom; DPS = DISC Predictive Scales; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; G = group; GHQ-12; General Health Questionnaire; ITT = Intent-to-treat; LGCM = latent growth curve modeling; Mos. = months; NA = not applicable; NR = not reported; NS = not significant; OTT = Overshadowing the Threat of Terrorism; RCI – Reliable Change Index; SD = standard deviation;; SE = standard error; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TGCT = Trauma and Grief Component Therapy.

Evidence Table 7. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Healthy Development[a.]	School-Based Functioning	Quality of Life	Comparator Broadly Applicable	Outcomes Broadly Applicable
Ahrens, 2002[1] NA	NR	NR	NR	Yes	No
Berger, 2007[2] OTT	CDIS (range: 0-16), Mean Pretreatment G1: 8.5 (SD=2.3) G2: 8.2 (SD=2.2) Within group change at post-treatment: G1: -1.7 (calculated) G2: 0.1 (calculated) Between group change at post-treatment: -1.8 (calculated) Between group ANOVA: F=132.62, df=1,140, p<0.001	NR	NR	Yes	Yes
Berger, 2009[3] ES-SL	CDIS (range: 7-35), Mean Pretreatment G1: 11.29 (SD=3.9) G2: 12.05 (SD=4.7) Within group change at post-treatment: G1: -2.71 (calculated) G2: -0.26 (calculated) Between group change at post-treatment: -2.45 (calculated) Between group ANOVA: F=40.73, df=1,164, p<0.001	NR	NR	Yes	Unsure
Berkowitz, 2011[4] NA	NR	NR	NR	Yes	Yes

Evidence Table 7. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Healthy Development[a.]	School-Based Functioning	Quality of Life	Comparator Broadly Applicable	Outcomes Broadly Applicable
Catani, 2009[5] NA	Pretreatment G1: 2.06 (SD=1.34) G2: 2.14 (SD=1.17) Within group change at post-treatment assessment: G1: -1.56 (calculated) G2: -1.34 (calculated) Within group change at 6 Mos.: G1: -1.62 (calculated) G2: -1.43 (calculated) Between group change at post-treatment assessment: -0.22 (calculated) Repeated measures ANOVA for time*treatment interaction p=NS Between group change at 6 Mos. assessment: -0.19 (calculated) Repeated measures ANOVA for time*treatment interaction p=NS	NR	NR	No	Yes
Ford, 2012[6] TARGET	NR	NR	NR	Yes	Yes
Gelkopf, 2009[7] ERASE-Stress	DPS (range: 7-35), Mean Pretreatment G1: 12.6 (SD=3.7) G2: 12.7 (SD=4.2) Within group change at post-treatment: G1: -2.3 (calculated) G2: -0.3 (calculated) Between group change at post-treatment: -2.0 (calculated) Between group ANOVA: F=15.50, df=1,106, p<0.001	NR	NR	Yes	Yes
Goenjian, 1997;2005[8, 9] NA; NA	NR	NR	NR	Yes	Yes

Evidence Table 7. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Healthy Development[a.]	School-Based Functioning	Quality of Life	Comparator Broadly Applicable	Outcomes Broadly Applicable
Jaycox, 2009[10] SSET	SDQ (range: NR), Mean Parent Rated, Pretreatment: G1: 11.64 (SD=5.80) G2: 12.46 (SD=5.90) Within group change at post-treatment assessment: G1: -1.92 (calculated); d=-0.39 G2: -1.16 (calculated); d=-0.28 Between group difference at post-treatment assessment: -0.76 (calculated); d=-0.10; regression estimate for followup controlling for baseline=NR, t=-0.19, p=NS Teacher Rated: Pretreatment: G1: 11.33 (SD=7.87) G2: 8.59 (SD=7.37) Within group change at post-treatment assessment: G1: -1.05 (calculated); d=0.006 G2: 0.71 (calculated); d=0.28 Between group difference at postttreatment assessment: -0.34 (calculated); d=-0.28; regression estimate for followup controlling for baseline=NR, t=-1.22, p=NS	NR	NR	Yes	Yes
Kemp, 2010[11] NA	General Functioning Scale Pretreatment G1: 21.00 (SD=4.38) G2: 19.21 (SD=4.55) Within group change: G1: -1.27 (calculated) G2: -0.13 (calculated) Between group change (95% CI): -1.14 (calculated) p=NS	NR	NR	Yes	No
Layne, 2008[12] TGCT	NR	NR	NR	Yes	Yes

Evidence Table 7. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Healthy Development[a.]	School-Based Functioning	Quality of Life	Comparator Broadly Applicable	Outcomes Broadly Applicable
Nugent, 2010[13] NA	NR	NR	NR	Yes	Yes
Robb[b], 2010[14] NA	NR	NR	PQ-LES-Q (range: 0-17) Pretreatment G1: 49.6 (SD=9.5) G2: 49.5 (SD=10.4) Within group LS mean change LOCF: G1: 7.2 (SD=1.3) G2: 10.7 (SD=1.5) Between group LS mean change score difference LOCF 95% CI: 0.2, 6.8 p=0.037	Yes	Yes
Robert[d], 2008[16] NA	NR	NR	NR	Yes	Yes
Salloum[e], 2008[17] NA	NR	NR	NR	Yes	Yes
Salloum, 2012 [18] NA	MSPSS Pretreatment: G1: 48.03 (SD=8.49) G2: 45.53 (SD=6.88) Effect size at post-treatment assessment: G1: d=0.04 G2: d=0.36 Effect size at 3 Mos. assessment: G1: d=0.38 G2: d=0.39 Effect size at 12 Mos. assessment: G1: d=0.17 G2: d=0.51 Significant effect of time on perceived social support F(3,186)=3.28, p=0.022, but no significant effect found by time*treatment	NA	NA	Yes	Yes

Evidence Table 7. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Healthy Development[a.]	School-Based Functioning	Quality of Life	Comparator Broadly Applicable	Outcomes Broadly Applicable
Smith, 2007[19] NA	NR	NR	NR	Yes	Yes
Stallard[f], 2006[25] NA	NR	NR	NR	Yes	Yes
Stein, 2003[20] NA	PSC (range: 0-70): parent-rated psychosocial dysfunction Pretreatment G1: 19.1 (9.4) G2: 16.2 (8.1) Within group change: G1: -6.6 (calculated) G2: 0.3 (calculated) Adjusted between group change (95% CI): -6.4 (-10.4, -2.3)	TCRS, teacher-rated learning problems (range: 6-30) Pretreatment G1: 13.8 (7.3) G2: 12.7 (7.0) Within group change: G1: -1.1 (calculated) G2: 0.6 (calculated) Adjusted between group change (95% CI): -1.1 (-2.9, 0.8) TCRS teacher-rated shyness/anxiousness (range: 6-30) Pretreatment G1: 10.2 (4.1) G2: 11.0 (5.1) Within group change: G1: -0.4 (calculated) G2: -0.4 (calculated) Adjusted between group change (95% CI): 0.1 (-1.5, 1.7) TCRS teacher-rated acting out problems (range: 6-30) Pretreatment G1: 11.3 (7.0) G2: 10.6 (5.5) Within group change: G1: -1.9 (calculated) G2: -0.4 (calculated) Adjusted between group change (95% CI): -1.0 (-2.5, 0.5) 6 Mos. Assessment Between-group difference change from baseline (95% CI): -0.9 (-2.6, 0.8) G1: -2.1 G2: 0.1	NR	Yes	Yes

Evidence Table 7. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Healthy Development[a.]	School-Based Functioning	Quality of Life	Comparator Broadly Applicable	Outcomes Broadly Applicable
Tol, 2008; 2010[21, 22] NA; NA	Child-reported functional Impairment (range: 10-40),[g.] Pretreatment G1: 18.03 (SD=5.61) G2: 17.90 (SD=5.39) Within group change at 1 week: G1: -3.30 (SD=5.52) G2: -1.11 (SD=4.98) Within group change at 6 Mos.: G1: -3.48 (SD=5.70) G2: -2.06 (SD=5.07) Between group difference at 1 week (95% CI): d=0.42 (0.22, 0.61) Between group difference at 6 Mos.: Mixed method regression analysis mean change difference adjusted for school mean (95% CI): -0.52 (-0.43, 1.46); d=0.26 (0.07, 0.46) Parent-reported functional impairment (range: 10-40) Pretreatment G1: 14.04 (SD=4.24) G2: 14.20 (SD=4.43) Within group change at 1 week: G1: -1.44 (SD=4.72) G2: -1.16 (SD=4.23) Within group change at 6 Mos.: G1: -2.03 (SD=4.71) G2: -1.48 (SD=4.69) Between group difference at 1 week(95% CI): d=0.10 (-0.09, 0.29) Between group difference at 6 Mos.: d=0.07 (-0.12, 0.26)	NR	NR	Yes	Yes

Evidence Table 7. Benefits (KQ1 & 2) (continued)

Author, Year, Trial Name	Healthy Development[a.]	School-Based Functioning	Quality of Life	Comparator Broadly Applicable	Outcomes Broadly Applicable
Tol, 2012[23] NA	SDQ, Pro-social behavior: Pretreatment G1: 8.21 (SD=1.82) G2: 8.34 (SD=1.72) Within group change at post-treatment: G1: NR G2: NR Between group change at post-treatment: NR LGCM estimate (SE): 0.016 (0.052); p=NS Functional impairment: Pretreatment: G1: 3.64 (SD=4.47) G2: 3.23 (SD=4.37) Within group change at post-treatment: G1: NR G2: NR Between group change at post-treatment: NR LGCM estimate (SE): -0.036 (0.143); p=NS	NA	NA	Yes	Yes
Zehnder, 2010[24] NA	NR	NR	NR	Yes	Yes

Note: No eligible study reported on decreased suicidality in the context of KQ1 or KQ2.

[a.] Healthy development as an outcome included improvements in interpersonal/social functioning or signs of developmental regression.

[b.] Sertraline did not demonstrate efficacy compared with placebo.

[c.] No standardized scales used.

[d.] Placebo was statistically as effective as either Imipramine or Fluoxetine in treating symptoms of ASD.

[e.] Treatment satisfaction 1: "I learned more about grief and trauma reactions" (1-10, with 10 being highest); mean score at follow-up: 9.20. Treatment satisfaction 2: "I expressed my thoughts and feelings about what happened"; mean score at follow-up: 9.18. Treatment satisfaction 3: "On a scale from 1 to 10, how helpful was counseling for you?"; mean score at follow-up: 9.31.

[f.] Debriefing was no more effective than placebo group intervention, although both groups made significant improvements in PTSD symptoms.

[g.] Child's Report: contextually constructed 10-item checklist.

Abbreviations: CDIS = Child Diagnostic Interview Schedule; CI = confidence interval; d = effect size; df = degrees of freedom; DPS = DISC Predictive Scales; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; G = group; LGCM = latent growth curve modeling; LOCF = last observation carried forward; LS = least-squares; Mos. = months; MSPSS = Multidimensional Scale of Perceived Social Support; NA = not applicable; NR = not reported; NS = not significant; OTT = Overshadowing the Threat of Terrorism; PSC = Pediatric Symptom Checklist; PQ-LES-Q = Pediatric Quality of Life Enjoyment and Satisfaction Questionnaire; SD = standard deviation; SDQ = Strengths and Difficulties Questionnaire; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TCRS = Teacher Child Rating Scale; TGCT = Trauma and Grief Component Therapy.

Evidence Table 8. Subgroup analyses

Author, Year, Trial Name	Sub-Group Analyzed	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention or Reduction in Mental Health Conditions or Symptoms
Ahrens, 2002[1] NA	NA	NA	NA	NA	NA
Berger, 2007[2] OTT	NA	NA	NA	NA	NA
Berger, 2009[3] ES-SL	NA	NA	NA	NA	NA
Berkowitz, 2011[4] NA	NA	NA	NA	NA	NA
Catani, 2009[5] NA	NA	NA	NA	NA	NA
Ford, 2012[6] TARGET	NA	NA	NA	NA	NA
Gelkopf, 2009[7] ERASE-Stress	NA	NA	NA	NA	NA
Goenjian, 1997; 2005[8, 9] NA; NA	Sex	CPTSD-RI, Mean[8] Pre-Tx (1.5 years post-earthquake) Male G1: 41.6 G2: 38.5 Female G1: 47.1 G2: 42.7 18 Mos. (3 years post-earthquake) Male G1: 30.4 G2: 40.9 Female G1: 33.1 G2: 51.1 Change from Baseline Male G1: -11.2 G2: 2.4 Female G1: -14.0 G2: 8.4 Interactions with Tx or time: NS	NR	NR	DSRS, Mean[8] Pre-Tx (1.5 years post-earthquake) Male G1: 15.5 G2: 12.7 Female G1: 17.4 G2: 16.4 18 Mos. (3 years post-earthquake) Male G1: 13.0 G2: 17.7 Female G1: 17.4 G2: 21.3 Change from Baseline Male G1: -2.5 G2: 5.0 Female G1: 0 G2: 4.9

Evidence Table 8. Subgroup analyses (continued)

Author, Year, Trial Name	Sub-Group Analyzed	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention or Reduction in Mental Health Conditions or Symptoms
Jaycox, 2009[10] SSET	NA	NA	NA	NA	NA
Kemp, 2010[11] NA	NA	NA	NA	NA	NA
Layne, 2008[12] TGCT	NA	NA	NA	NA	NA
Nugent, 2010[13] NA	Sex	CAPS-CA Decreased PTSD symptoms reported by boys in G1 vs. G2, R^2=0.32, p=0.09 Girls in G1 reported more PTSD symptoms than girls in G2, R^2=0.44, p=0.05	NA	NA	NA
Robb, 2010[14] NA	Age & Sex	NA	NA	NA	CDRS-R Older age associated with greater endpoint improvement in CDRS-R total score (r=-0.20; p<0.05) Nonwhite patients were more likely to achieve greater endpoint improvement in CDRS-R total score (r=0.36; p<0.0001)
Robert, 1999[15] NA	NA	NA	NA	NA	NA
Robert, 2008[16] NA	NA	N/A	N/A	N/A	N/A
Salloum, 2008[17] NA	Age & Sex	NA	NA	UPID Four 2 (gender) by 2 (age) ANCOVAs, controlling for pretreatment distress Interaction effect p=0.054 partial n^2=0.082 Mean Improvement Younger Girls: 36.7 Boys: 30.1 Older Girls: 23.3 Boys: 29.7	NA

Evidence Table 8. Subgroup analyses (continued)

Author, Year, Trial Name	Sub-Group Analyzed	Prevention of Traumatic Stress Symptoms or Syndromes	Remission of PTSD	Reduction in Severity or Number of Traumatic Stress Syndromes or Symptoms	Prevention or Reduction in Mental Health Conditions or Symptoms
Salloum, 2012[18] NA	Age[a.]	NA	NA	NA	NA
Smith, 2007[19] NA	NA	NA	NA	NA	NA
Stallard, 2006[25] NA	NA	NA	NA	NA	NA
Stein, 2003[20] NA	NA	NA	NA	NA	NA
Tol, 2008; 2010[21, 22] NA; NA	Age & Sex	NA	NA	CPSS[b.], β (95% CI) Age β (95% CI) G1: 0.018 (-0.017, 0.053) G2: -0.012 (-0.047, 0.023) p=0.19 Sex (female) β (95% CI) G1: -0.090 (-0.161, -0.019) G2: 0.060 (-0.011, 0.131) p=0.004	NA
Tol, 2012[23] NA	Age, Sex, Past exposure to violence, Current stressors[c.]	NA	NA	NA	NA
Zehnder, 2010[24] NA	Age & Sex[d.]	NA	NA	NA	NA

[a.] No differences in age found.

[b.] CPSS coefficients represent the change in PTSD symptom standard deviations and for function impairment over 6 months for a one-unit increase in the predictor. Function impairment considered self-reported hygiene, sleep, eating, praying, household chores, social interaction with peer and family members, play, studying, and school chores.

[c.] Sub-group analyses conducted but not planned a priori and not adequately powered.

[d.] Statistical issues prevent use of these sub-group analyses.

Abbreviations: ANCOVA = analysis of covariance; CAPS-CA = Clinician-Administered Post-Traumatic Stress Disorder Scale For Children and Adolescents; CDRS-R = Children's Depression Rating Scale-Revised; CI = confidence interval; CPSS = Child PTSD Symptom Scale; CPTSD-RI = Child Post-Traumatic Stress Reaction Index; DSRS = Depression Self-Rating Scale; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; G = group; Mos. = months; NA = not applicable; NS = not significant; OTT = Overshadowing the Threat of Terrorism; PTSD = Posttraumatic Stress Disorder; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TGCT = Trauma and Grief Component Therapy; Tx = treatment; UPID = University of California, Los Angeles Index for DSM-IV for children.

Evidence Table 9. Subgroup analyses

Author, Year, Trial Name	Prevention or Reduction in Physical Health Conditions or Symptoms	Reduction in Risk-Taking Behaviors, Behavioral Problems, or Criminal Activities	Healthy Development[a.]	School-Based Functioning	Quality of Life	Decreased Suicidality
Ahrens, 2002[1] NA	NA	NA	NA	NA	NA	NA
Berger, 2007[2] OTT	NA	NA	NA	NA	NA	NA
Berger, 2009[3] ES-SL	NA	NA	NA	NA	NA	NA
Berkowitz, 2011[4] NA	NA	NA	NA	NA	NA	NA
Catani, 2009[5] NA	NA	NA	NA	NA	NA	NA
Ford, 2012[6] TARGET	NA	NA	NA	NA	NA	NA
Gelkopf, 2009[7] ERASE-Stress	NA	NA	NA	NA	NA	NA
Goenjian, 1997; 2005[8, 9] NA; NA	NR	NR	NR	NR	NR	NR
Jaycox, 2009[10] SSET	NA	NA	NA	NA	NA	NA
Kemp, 2010[11] NA	NA	NA	NA	NA	NA	NA
Layne, 2008[12] TGCT	NA	NA	NA	NA	NA	NA
Nugent, 2010[13] NA	NA	NA	NA	NA	NA	NA
Robb, 2010[14] NA	NA	NA	NA	NA	NA	CDRS-R G1: 4/5 with reported suicidality at baseline showed reduction p=NR G2: 5/6 with reported suicidality at baseline showed reduction p=NR
Robert, 1999[15] NA	NA	NA	NA	NA	NA	NA
Robert, 2008[16] NA	N/A	N/A	N/A	N/A	N/A	N/A

Evidence Table 9. Subgroup analyses (continued)

Author, Year, Trial Name	Prevention or Reduction in Physical Health Conditions or Symptoms	Reduction in Risk-Taking Behaviors, Behavioral Problems, or Criminal Activities	Healthy Development[a.]	School-Based Functioning	Quality of Life	Decreased Suicidality
Salloum, 2008[17] NA	NA	NA	NA	NA	NA	NA
Salloum, 2008[18] NA	NA	NA	NA	NA	NA	NA
Smith, 2007[19] NA	NA	NA	NA	NA	NA	NA
Stallard, 2006[25] NA	NA	NA	NA	NA	NA	NA
Stein, 2003[20] NA	NA	NA	NA	NA	NA	NA
Tol, 2008; 2010[21, 22] NA; NA	NA	NA	Functional Impairment[b.] Age β (95% CI) G1: 0.018 (-0.006, 0.042) G2: 0.000 (-0.024, 0.024) p=0.346 Sex (female) β (95% CI) G1: -0.120 (-0.179, -0.061) G2: 0.012 (-0.047, 0.071) p=0.004	NA	NA	NA
Tol, 2012[23] NA	NA	NA	NA	NA	NA	NA
Zehnder, 2010[24] NA	NA	NA	NA	NA	NA	NA

[a.] Healthy development as an outcome included improvements in interpersonal/ social functioning or signs of developmental regression.

[b.] Child's Report: contextually constructed 10-item checklist.

Abbreviations: CDRS-R = Children's Depression Rating Scale-Revised; CI = confidence interval; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; G = group; NA = not applicable; NR = not reported; OTT = Overshadowing the Threat of Terrorism; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TGCT = Trauma and Grief Component Therapy.

Evidence Table 10. Harms

Author, Year, Trial Name	Overall Adverse Events	Withdrawals Due to Adverse Events	Low Adherence Due to Adverse Events	Mortality	Suicidality
Ahrens, 2002[1] NA	NR	NR	NR	NR	NR
Berger, 2007[2] OTT	NR	NR	NR	NR	NR
Berger, 2009[3] ES-SL	NR	NR	NR	NR	NR
Berkowitz,[a.] 2011[4] NA	NR	NR	NR	NR	NR
Catani, 2009[5] NA	NR	NR	NR	NR	NR
Ford, 2012[6] TARGET	NR	NR	NR	NR	NR
Gelkopf, 2009[7] ERASE-Stress	NR	NR	NR	NR	NR
Goenjian, 1997; 2005[8, 9] NA; NA	NR	NR	NR	NR	NR
Jaycox, 2009[10] SSET	NR	NR	NR	NR	NR
Kemp, 2010[11] NA	NR	NR	NR	NR	NR
Layne,[b.] 2008[12] TGCT	NR	NR	NR	NR	NR
Nugent, 2010[13] NA	NR[c.]	NR	G1: 5 G2: 4	NA	NR
Robb,[d.] 2010[14] NA	G1: 51, RR 1.00 G2: 47	G1: 5 G2: 2	NR	G1: 0 G2: 0	G1: 6 reported increased ratings, 1 reported active suicidality G2: 4 reported increased ratings, 0 reported active suicidality
Robert, 1999[15] NA	NR	NR	NR	NR	NR
Robert,[e.] 2008[16] NA	NR	NR	NR	NR	NR
Salloum,[f.] 2008[17] NA	NR	NR	NR	NR	NR

Evidence Table 10. Harms (continued)

Author, Year, Trial Name	Overall Adverse Events	Withdrawals Due to Adverse Events	Low Adherence Due to Adverse Events	Mortality	Suicidality
Salloum, 2012[18] NA	NR	NR	NR	NR	NR
Smith, 2007[19] NA	NR	NR	NR	NR	NR
Stallard,[g.] 2006[25] NA	NR	NR	NR	NR	NR
Stein,[h.] 2003[20] NA	NR	NR	NR	NR	NR
Tol, 2008; 2010[21, 22] NA; NA	NR	NR	NR	NR	NR
Tol, 2012[23] NA	NR	NR	NR	NR	NR
Zehnder, 2010[24] NA	NR	NR	NR	NR	NR

[a.] The study did not discuss harms but avoidance is stated as a potential reason for dropout; 15 participants did not return after the baseline session, 5 did not attend the final session, and 3 did not participate in the follow-up.

[b.] This intervention calculated the Reliable Change Index (RCI) for four measures (posttraumatic stress, depression, traumatic grief, and existential grief). No significant differences in proportion with deterioration in intervention versus comparison group.

[c.] Harms were not actually reported specifically, higher symptoms in Girls may be harm with Propranolol, 2 in G1 were lost at 6-week follow-up and 1 in G2 were lost at 6-week follow-up.

[d.] Only 70.1% (n=47) of patients completed treatment for all causes with Sertraline vs. 82.3% (n=51) with Placebo completed treatment. Discontinuation was higher in children (35.9% sertraline vs. 20.0% placebo) than adolescents (21.4% sertraline vs. 14.8% placebo). Most frequent reason for discontinuation among patients with sertraline was miscellaneous - not related to study drug (lost to follow-up, withdrew consent, etc.). However, it might be too much of a leap to say that it was not due to study drug.

[e.] Authors reported no adverse events during the study. 2 dropped out - 1 due to change of guardians, 1 due to change of psych rater.

[f.] Withdrawals per group: G1: 5, G2: 6. Completers did not differ significantly from non-completers in reported posttraumatic stress (p=0.787) or depression (p=0.286).

[g.] Authors reported no adverse events during the study. However, participation rate was low at 42% of patients screened.

[h.] No adverse events noted other than withdrawals. G1: 5 withdrew & did not receive intervention and in G2: 0 withdrew.

Abbreviations: ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; G = group; NR = not reported; OTT = Overshadowing the Threat of Terrorism; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy.

Evidence Table 11. Harms

Author, Year, Trial Name	Re-Traumatization	Disturbed Sleep	Agitation	Sedation	Weight Gain	Other Adverse Effects
Ahrens, 2002[1] NA	NR	NR	NR	NR	NR	NR
Berger, 2007[2] OTT	NR	NR	NR	NR	NR	NR
Berger, 2009[3] ES-SL	NR	NR	NR	NR	NR	NR
Berkowitz, 2011[4] NA	NR	NR	NR	NR	NR	NR
Catani, 2009[5] NA	NR	NR	NR	NR	NR	NR
Ford, 2012[6] TARGET	NR	NR	NR	NR	NR	NR
Gelkopf, 2009[7] ERASE-Stress	NR	NR	NR	NR	NR	NR
Goenjian, 1997; 2005[8, 9] NA; NA	NR	NR	NR	NR	NR	NR
Jaycox, 2009[10] SSET	NR	NR	NR	NR	NR	NR
Kemp, 2010[11] NA	NR	NR	NR	NR	NR	NR
Layne,[a.] 2008[12] TGCT	NR	NR	NR	NR	NR	NR
Nugent, 2010[13] NA	NR	NR	NR	NR	NR	NR

Evidence Table 11. Harms (continued)

Author, Year, Trial Name	Re-Traumatization	Disturbed Sleep	Agitation	Sedation	Weight Gain	Other Adverse Effects
Robb,[b.] 2010[14] NA	NR	G1: 7, RR 0.81 G2: 8	G1: 4, RR 1.85 G2: 2	NR	Median weight did not change on Sertraline but increased 0.53 kg on placebo	Headache G1: 17, RR 1.31 G2: 12 Abdominal Pain G1: 10, RR 0.71 G2: 13 Nausea G1: 9, RR 1.39 G2: 6 Pharyngitis G1: 7, RR 1.08 G2: 6 Vomiting G1: 9, RR 2.78 G2:3 Accidental injury G1: 6, RR 0.93 G2: 6 Respiratory Tract Infection G1: 6, RR 1.39 G2: 4 Diarrhea G1: 6, RR 1.85 G2: 3 Dizziness G1: 3, RR 0.56 G2: 5 Hyperkinesis G1: 7, RR 6.48 G2: 1 Rhinitis G1: 5, RR 4.63 G2: 1 Dry Mouth G1: 5 G2: 0 Dysmenorrhea G1: 0 G2: 2

Evidence Table 11. Harms (continued)

Author, Year, Trial Name	Re-Traumatization	Disturbed Sleep	Agitation	Sedation	Weight Gain	Other Adverse Effects
						Any severe adverse event G1: 5 G2: 0 Any serious adverse event[c.] G1: 2 G2: 0
Robert, 1999[15] NA	NR	NR	NR	NR	NR	NR
Robert,[d.] 2008[16] NA	NR	NR	NR	NR	NR	NR
Salloum,[e.] 2008[17] NA	NR	NR	NR	NR	NR	NR
Salloum, 2012[18] NA	NR	NR	NR	NR	NR	NR
Smith, 2007[19] NA	NR	NR	NR	NR	NR	NR
Stallard,[f.] 2006[25] NA	NR	NR	NR	NR	NR	NR
Stein,[g.] 2003[20] NA	NR	NR	NR	NR	NR	NR
Tol, 2008; 2010[21, 22] NA; NA	NR	NR	NR	NR	NR	NR
Tol, 2012[23] NA	NR	NR	NR	NR	NR	NR
Zehnder, 2010[24] NA	NR	NR	NR	NR	NR	NR

[a.] This intervention calculated the Reliable Change Index (RCI) for four measures (posttraumatic stress, depression, traumatic grief, and existential grief). No significant differences in proportion with deterioration in intervention versus comparison group.

[b.] Only 70.1% (n=47) of patients completed treatment for all causes with Sertraline vs. 82.3% (n=51) with Placebo completed treatment. Discontinuation was higher in children (35.9% sertraline vs. 20.0% placebo) than adolescents (21.4% sertraline vs. 14.8% placebo). Most frequent reason for discontinuation among patients with sertraline was miscellaneous - not related to study drug (lost to follow-up, withdrew consent, etc.). However, it might be too much of a leap to say that it was not due to study drug.

[c.] Hospitalization for agitation and hyperactivity; 12 year old with herpes zoster with hysterical reaction and suicidal ideation.

[d.] Authors reported no adverse events during the study. 2 dropped out - 1 due to change of guardians, 1 due to change of psych rater.

[e.] Withdrawals per group: G1: 5, G2: 6. Completers did not differ significantly from non-completers in reported posttraumatic stress (p=0.787) or depression (p=0.286).

[f.] Authors reported no adverse events during the study. However, participation rate was low at 42% of patients screened.

[g.] No adverse events noted other than withdrawals. G1: 5 withdrew & did not receive intervention and in G2: 0 withdrew.

Abbreviations: ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; G = Group; kg = kilogram; NR = not reported; OTT = Overshadowing the Threat of Terrorism; RR = risk ratio; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TGCT = Trauma and Grief Component Therapy.

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Appendix E. Risk of Bias Assessment

Table E-1. Overall risk of bias assessments

Author, Year, Trial Name	Were Outcome Assessors Masked?	Did Analyses Control for Concurrent Inter-ventions/ Unintended Exposures?	Did the Study Maintain Fidelity to Protocol?	If Overall Attrition ≥ 20% or Differential Attrition ≥ 15% Were Missing Data Appro-priately Handled?	Was Length of Follow-up the Same Be-tween Groups?	Were Inclusion/ Exclusion Criteria Measures Equal, Valid, and Reliable?	Were Health Outcomes Measures Equal, Valid, and Reliable?	Were Harms Assessed Using Equal, Valid, and Reliable Measures?	Are Potential Outcomes Pre-specified and Reported?	Does the Design and/or Analysis Account for Important Con-founding and Modifying Variables?	Risk of Bias
Schauer, 2008[40] KIDNET	Yes	No	Yes	NA	Yes	Yes	Yes	Unclear or NR	Yes	No	High
Scheeringa, 2011[41] NA	Unclear or NR	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Partial	High
Schreier, 2005[42] NA	Unclear or NR	No	Unclear or NR	Unclear or NR	Yes	Yes	Yes	NA	Yes	Cannot determine	High
Shechtman, 2010[43] NA	Unclear or NR	Unclear or NR	Unclear or NR	No	Yes	Yes	NA	NA	Yes	NA	High
Smith, 2007[44] NA	Yes	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes	Yes	Low
Stallard, 2006[45] NA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	High
Stein, 2003[46] NA	No	No	Yes	No	Yes	Yes	Yes	Yes	Unclear or NR	Yes	Medium
Stoddard, 2012[47] NA	Yes	Unclear or NR	Yes	No	Yes	Yes	Yes	Unclear or NR	Yes	No	High
Thabet, 2005[48] NA	Unclear or NR	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	High
Tol et al., 2008;[49] Tol et al., 2010[50] NA; NA	No	Unclear or NR	Yes	NA	Yes	Yes	Yes	NA	Yes	Yes	Medium
Tol, 2012[51] NA	Yes	No	Unclear or NR	NA	Yes	Yes	No	Unclear or NR	Yes	Partial	Medium

Table E-1. Overall risk of bias assessments (continued)

Author, Year, Trial Name	Were Outcome Assessors Masked?	Did Analyses Control for Concurrent Inter-ventions/ Unintended Exposures?	Did the Study Maintain Fidelity to Protocol?	If Overall Attrition ≥ 20% or Differential Attrition ≥ 15% Were Missing Data Appro-priately Handled?	Was Length of Follow-up the Same Be-tween Groups?	Were Inclusion/ Exclusion Criteria Measures Equal, Valid, and Reliable?	Were Health Outcomes Measures Equal, Valid, and Reliable?	Were Harms Assessed Using Equal, Valid, and Reliable Measures?	Are Potential Outcomes Pre-specified and Reported?	Does the Design and/or Analysis Account for Important Con-founding and Modifying Variables?	Risk of Bias
Vijayakumar, 2006[52] NA	No	No	Unclear or NR	No	Yes	No	No	Unclear or NR	Yes	No	High
Wolmer, 2005[53] NA	No	No	Unclear or NR	No	Yes	Unclear or NR	Yes	No	Yes	Partial	High
Wolmer, 2011[54] NA	Unclear or NR	Unclear or NR	Yes	No	Yes	Unclear or NR	Yes	No	Yes	Partial	High
Wolmer, 2011[55] NA	No	No	Yes	NA	Unclear or NR	NA	Yes	Unclear or NR	Yes	Cannot determine	High
Zehnder, 2010[56] NA	Yes	No	Unclear or NR	NA	Yes	Yes	Yes	Yes	Yes	Yes	Medium

Abbreviations: CBI = Classroom-Based Intervention; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-SL = ERASE Stress Sri Lanka; KIDNET = Narrative Exposure Therapy for children; NA = not applicable; NR = not reported; OTT = Overshadowing the Threat of Terrorism; SPC = Stepped Preventive Care; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; TGCT = Trauma and Grief Component Therapy.

Table E-2. Additional risk of bias assessments for all randomized controlled trials (RCTs), case control trials (CCTs), and cohort studies

	RCTs Only		RCTs, CCTs, Cohorts only			Case Control Only	RCTs and CCTs			
Author, Year, Trial Name	**Was allocation concealment adequately generated?**	**Was allocation of treatment adequately concealed?**	**Did the recruitment strategy differ across study groups?**	**Were groups similar at baseline?**	**Did analysis control for baseline group differences?**	**Were cases and controls appro-priately selected?**	**Were providers masked?**	**Were participants masked?**	**Did the study use ITT analyses?**	**Risk of bias**
Adams, 2011[1] SPC	Yes	No	No	Yes	NA	No	No	Yes	Yes	High
Ahrens, 2002[2] NA	Unclear or NR	Unclear or NR	NA	Unclear or NR	No	NA	No	No	Unclear or NR	Medium
Berger, 2007[3] OTT	Unclear or NR	Unclear or NR	No	Yes	NA	Yes	No	No	Yes	Medium
Berger, 2009[4] ES-SL	Unclear or NR	Unclear or NR	No	Yes	NA	Yes	No	No	NA	Medium
Berkowitz, 2011[5] NA	Yes	NA	No	Yes	NA	Unclear or NR	No	No	Yes	Medium
Catani, 2009[6] NA	Yes	No	No	Yes	NA	NA	No	No	Yes	Medium
Chemtob, 2002[7] NA	Unclear or NR	No	NA	Yes	NA	NA	NA	NA	No	High
Chemtob, 2002[8] NA	Yes	Unclear or NR	No	Yes	NA	NA	Unclear or NR	No	No	High
CATS Consortium, 2010[9] NA	NA	NA	Unclear or NR	No	No	NA	No	No	Unclear or NR	High
Ehntholt, 2005[10] NA	No	No	No	No	No	NA	No	No	NA	High
Eksi, 2009[11] NA	NA	NA	Yes	No	No	NA	NA	NA	NA	High
Ford, 2012[12] TARGET	Yes	Yes	No	No	Yes	NA	No	No	Yes	Medium
Gelkopf, 2009[13] ERASE-Stress	Unclear or NR	Unclear or NR	No	Yes	NA	Yes	No	No	Yes	Medium

Table E-2. Additional risk of bias assessments for all randomized controlled trials (RCTs), case control trials (CCTs), and cohort studies (continued)

	RCTs Only		RCTs, CCTs, Cohorts only			Case Control Only	RCTs and CCTs			
Author, Year, Trial Name	Was allocation concealment adequately generated?	Was allocation of treatment adequately concealed?	Did the recruitment strategy differ across study groups?	Were groups similar at baseline?	Did analysis control for baseline group differences?	Were cases and controls appro-priately selected?	Were providers masked?	Were participants masked?	Did the study use ITT analyses?	Risk of bias
Giannopoulou, 2006[14] NA	NA	NA	NA	Unclear or NR	Unclear or NR	NA	NA	No	Yes	High
Gilboa-Schechtman, 2010[57] NA	Yes	Yes	No	No	Yes	NA	No	No	Yes	High
Goenjian, 1997; 2005[58, 59] NA; NA	NA	NA	No	#1589: Yes #840: No	Yes	Unclear or NR	No	No	Yes	Medium
Gordon, 2008[15] NA	Yes	No	No	Unclear or NR	No	NA	No	No	No	High
Jaycox, 2009[16] SSET	Unclear or NR	No	No	No	No	NA	No	No	Yes	Medium
Jaycox, 2010[17] TF-CBT	Unclear or NR	Unclear or NR	Yes	No	Unclear or NR	NA	No	No	Unclear or NR	High
Jordans, 2010[18] CBI	Yes	Yes	No	Yes	NA	Yes	No	No	Yes	High
Karairmak, 2008[19] NA	Unclear or NR	Unclear or NR	Unclear or NR	Unclear or NR	Unclear or NR	Unclear or NR	No	Yes	Yes	High
Karam, 2008[20] NA	NA	NA	NA	NA	NA	Yes	NA	NA	NA	High
Kataoka, 2003[21] NA	Unclear or NR	No	No	No	Yes	NA	No	No	Unclear or NR	High
Kemp, 2010[22] NA	Unclear or NR	No	No	Yes	NA	Yes	No	No	Yes	Medium
Kenardy, 2008[23] NA	No	No	No	No	No	Yes	No	Unclear or NR	Yes	High

Table E-2. Additional risk of bias assessments for all randomized controlled trials (RCTs), case control trials (CCTs), and cohort studies (continued)

	RCTs Only		RCTs, CCTs, Cohorts only			Case Control Only	RCTs and CCTs			
Author, Year, Trial Name	Was allocation concealment adequately generated?	Was allocation of treatment adequately concealed?	Did the recruitment strategy differ across study groups?	Were groups similar at baseline?	Did analysis control for baseline group differences?	Were cases and controls appro-priately selected?	Were providers masked?	Were participants masked?	Did the study use ITT analyses?	Risk of bias
Layne, 2008[24] TGCT	Yes	Yes	No	Yes	Unclear or NR	Yes	No	No	Unclear or NR	Medium
Lesmana, 2009[25] NA	Unclear or NR	No	No	Unclear or NR	Yes	No	No	No	Unclear or NR	High
McClatchey, 2009[26] NA	NA	NA	No	Yes	NA	NA	No	NO	Yes	High
Nixon, 2012[27] NA	Unclear or NR	No	Unclear or NR	No	No	NA	No	No	Yes	High
Nugent, 2010[28] NA	NA	Yes	No	Yes	NA	NA	Yes	Yes	No	Low
Pfeffer, 2002[29] NA	No	No	No	No	Yes	NA	No	No	Yes	High
Qouta, 2012[30] NA	Unclear or NR	Unclear or NR	Unclear or NR	No	Unclear or NR	NA	Unclear or NR	Unclear or NR	No	High
Robb, 2010[31] NA	Yes	Yes	No	Yes	NA	NA	Yes	Yes	Yes	Low
Robert, 1999[32] NA	Yes	Yes	No	No	No	NA	Yes	Yes	Yes	Medium
Robert, 2008[33] NA	Yes	Yes	No	No	No	NA	Yes	Yes	Yes	Low
Ronan, 1999[34] NA	No	No	Unclear or NR	Unclear or NR	Na	No	No	No	Yes	High
Ruf, 2010[35] NA	Yes	No	No	No	No	Yes	No	No	Yes	High
Sadeh, 2008[36] NA	No	No	No	Unclear or NR	No	NA	No	No	Unclear or NR	High
Salloum, 2008[37] NA	Unclear or NR	No	No	Yes	NA	NA	No	No	Yes	Medium

Table E-2. Additional risk of bias assessments for all randomized controlled trials (RCTs), case control trials (CCTs), and cohort studies (continued)

	RCTs Only		RCTs, CCTs, Cohorts only			Case Control Only	RCTs and CCTs			
Author, Year, Trial Name	Was allocation concealment adequately generated?	Was allocation of treatment adequately concealed?	Did the recruitment strategy differ across study groups?	Were groups similar at baseline?	Did analysis control for baseline group differences?	Were cases and controls appro-priately selected?	Were providers masked?	Were participants masked?	Did the study use ITT analyses?	Risk of bias
Salloum, 2012[38] NA	Yes	No	No	Unclear or NR	No	NA	No	No	Yes	Low
Schaal, 2009[39] NA	Yes	No	No	Unclear or NR	No	NA	No	No	No	High
Schauer, 2008[40] KIDNET	No	No	No	Yes	NA	NA	No	No	Unclear or NR	High
Scheeringa, 2011[41] NA	Yes	Unclear or NR	No	Unclear or NR	No	NA	Unclear or NR	No	No	High
Schreier, 2005[42] NA	Unclear or NR	Unclear or NR	No	Unclear or NR	Unclear or NR	NA	Unclear or NR	NA	Unclear or NR	High
Shechtman, 2010[43] NA	Unclear or NR	Unclear or NR	No	No	NA	Yes	No	No	NA	High
Smith, 2007[44] NA	Yes	NA	No	Yes	NA	Yes	Yes	NA	Yes	Low
Stallard, 2006[45] NA	Yes	Yes	No	No	No	NA	No	Yes	Yes	High
Stein, 2003[46] NA	Yes	Yes	No	Yes	NA	NA	No	No	No	Medium
Stoddard, 2012[47] NA	Yes	Yes	No	No	No	NA	Yes	Yes	No	High
Thabet, 2005[48] NA	NA	NA	No	No	No	NA	No	No	Yes	High
Tol et al., 2008;[49] Tol et al., 2010[50] NA; NA	Yes	Unclear or NR	No	Yes	NA	Yes	No	No	Yes	Medium

Table E-2. Additional risk of bias assessments for all randomized controlled trials (RCTs), case control trials (CCTs), and cohort studies (continued)

	RCTs Only		RCTs, CCTs, Cohorts only			Case Control Only	RCTs and CCTs			
Author, Year, Trial Name	Was allocation concealment adequately generated?	Was allocation of treatment adequately concealed?	Did the recruitment strategy differ across study groups?	Were groups similar at baseline?	Did analysis control for baseline group differences?	Were cases and controls appro-priately selected?	Were providers masked?	Were participants masked?	Did the study use ITT analyses?	Risk of bias
Tol, 2012[51] NA	Unclear or NR	Unclear or NR	No	Yes	NA	NA	No	No	No	Medium
Vijayakumar, 2006[52] NA	No	No	Yes	No	No	NA	No	No	No	High
Wolmer, 2005[53] NA	NA	NA	Yes	Yes	NA	NA	No	No	No	High
Wolmer, 2011[54] NA	NA	NA	Unclear or NR	No	NA	NA	No	No	No	High
Wolmer, 2011[55] NA	Unclear or NR	No	No	Unclear or NR	No	NA	No	No	No	High
Zehnder,2010[56] NA	Yes	Yes	No	Yes	NA	NA	No	No	Yes	Medium

Abbreviations: CBI = Classroom-Based Intervention; ERASE-Stress – Enhancing Resilience among Students Experiencing Stress; ES-LS – ERASE Stress Sri Lanka; KIDNET = Narrative Exposure Therapy for children; NA = not applicable; NR = not reported; OTT = Overshadowing the Threat of Terrorism; SPC = Stepped Preventive Care; SSET = Support for Students Exposed to Trauma; TARGET = Trauma Affect Regulation: Guide for Education and Therapy; TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; TGCT = Trauma and Grief Component Therapy.

Table E-3. Quality assessment of systematic reviews

First author, year	Review based on a focused question of interest	Search strategy employed a comprehensive, systematic, literature search	Eligibility criteria for studies clearly described	At least 2 people independently review studies	Authors used a standard method of critical appraisal before including studies	Publication bias assessed	Heterogeneity assessed and addressed	Approach used to synthesize information adequate and appropriate	Risk of Bias
Lawrence, 2010[a.60]	Yes	Yes	Yes	Yes	Yes	NA	NA	NA	Low

[a.] This systematic review did not identify any eligible studies. A quality assessment was performed but no abstraction of data occurred.

Abbreviations: NA = not applicable.

Table E-4. Rationale for high risk of bias rating

Author, Year Trial Name	Primary Reasons for High Risk of Bias Rating
Adams, 2011[1] SPC	High potential for selection bias: • Intervention and control groups differed at baseline. • 406 eligible subjects were "missed, not approached;" no comparison between these children and enroll subjects. High potential for performance bias: • Fidelity of the providers and participants was not assessed. High potential for measurement bias: • Parent characteristics were not collected and entered into models despite the fact that parents delivered the intervention.
Chemtob, 2002[7] NA	High potential for attrition and reporting bias: • No ITT analysis conducted. • No data provided on means comparing G1 to G2 at followup. • Reliability of Children's Reaction Inventory as used to measure treatment effect on PTSD symptoms unknown.
Chemtob, 2002[8] NA	High potential for selection bias: • One group not drawn from the randomized set. • This intervention group came from a less traumatized group. Authors did not control for potential selection bias. • The authors did not provide sufficient data to evaluate differences between the arms. High potential for detection bias: • Authors did not account for multiple comparisons. • Wait-list assessments not performed at the same points in time as the treatment group assessments. • Blinding not clearly reported. High potential for attrition bias: • The clinician evaluation of outcomes comparing treatment to no treatment is based on a very small random sample of the allocated individuals (~17% (37) of the ~75% (214 of 284) that completed the study. • The authors did not use ITT analysis.
CATS Consortium, 2010[9] NA	High potential for selection bias: • Many uncontrolled variables, including nonrandom assignments to groups, non-comparable groups (low level trauma symptoms vs. high trauma). • Did not control for improvement over time without treatment. • No control for extraneous events occurring with treatment.

Table E-4. Rationale for high risk of bias rating (continued)

Author, Year Trial Name	Primary Reasons for High Risk of Bias Rating
Ehntholt, 2005[10] NA	High potential for selection bias: • No control of confounding variables. • Not randomized. • Recruitment subjective to teacher referral. • Groups differed in age. High potential for detection bias: • Follow-up not uniform in groups. High potential for small sample bias: • Small trial.
Eksi, 2009[11] NA	High potential for selection bias: • Did not control for substantial differences between groups at baseline in the analysis. High potential for detection bias • Outcome assessors not blinded. High potential for performance bias: • No fidelity to protocol assessment.
Giannopoulou, 2006[14] NA	High potential for detection bias: • Assessors of outcomes not blinded. High potential for selection bias. • Arms not randomized. • Baseline differences between groups not reported. High potential for reporting bias: • Combined results for the treatment and wait list control groups after reporting similar mean scores between the groups. • Did not report significance level. • Did not report the outcome means separately for the groups.
Gilboa-Schechtman, 2010[57] NA	High potential for selection bias: • The randomization failed and not controlled for in the analysis. • Demographics of participants not reported.
Gordon, 2008[15] NA	High potential for selection bias: • Randomization success not reported. • Did not report between group differences and only controlled for gender in the analysis. High potential for attrition bias: • Did not use ITT analysis.

Table E-4. Rationale for high risk of bias rating (continued)

Author, Year Trial Name	Primary Reasons for High Risk of Bias Rating
Jaycox, 2010[17] TF-CBT	High potential for attrition bias: • Overall attrition rate high at 39% • Differential attrition rate high at 76% in one group and 1% in the other.
Jordans, 2010[18] CBI	High potential for performance bias: • The fidelity to protocol not assessed. High potential for detection bias: • Assessors not blinded to participant assignment.
Karairmak, 2008[19] NA	High potential for selection bias: • Randomization method was not specified. • Baseline characteristics of groups are not reported. High potential for detection bias: • Information about assessors not reported. • Validity of the measure used (Fear Survey Schedule for Children) not clear. High potential for performance bias: • Did not report on the fidelity of the treatment.
Karam, 2008[20] NA	High potential for selection bias: • Confounding by indication. Cases and controls had significant differences on a variety of characteristics. High potential for detection bias: • Assessment tool (War Events Questionnaire) not reliable. • Likely that the outcome assessors not blinded. High potential for attrition bias: • The only followup assessment occurred approximately 46 weeks after the end of the intervention.

Table E-4. Rationale for high risk of bias rating (continued)

Author, Year Trial Name	Primary Reasons for High Risk of Bias Rating
Kataoka, 2003[21] NA	High potential for selection bias: • Quasi experimental design with failed randomization. • Waitlist parents had twice education of Intervention parents (6 vs. 3) but data should have been skewed in the other direction. • Did not account for parental education for PTSD outcome. • High potential for detection bias: • Manual was not validated and used somewhat inconsistently. • Scale had not been validated in immigrant populations. High potential for attrition bias: • Differential attrition. • Did not conduct ITT analysis. High potential for performance bias: • Study was not blinded.
Kenardy, 2008[23] NA	High potential for selection bias: • Participants in intervention group reported greater feelings of horror at baseline. • Participants were randomized by hospital which affected any potential blinding to intervention and added other possible confounding variables which were not discussed or accounted for. • Did not control for selection bias, clustering, or any other interventions.
Lesmana, 2009[25] NA	High potential for selection bias: • Randomization failed. Not controlled for in the analysis. • Demographics of participants not reported.
McClatchey, 2009[26] NA	High potential for selection bias: • Study not randomized. High potential for detection bias: • Baseline measures gathered in-person with group 1 and by phone with group 2. • Outcome assessors not blinded. High potential for performance bias. • Did not assess or control for co-interventions.

Table E-4. Rationale for high risk of bias rating (continued)

Author, Year Trial Name	Primary Reasons for High Risk of Bias Rating
Nixon, 2012[27] NA	High potential for selection bias: • Analyses did not adjust for significant baseline differences in anxiety and prior trauma exposures. High potential for intervention bias: • Small study with high drop-out (36%).
Pfeffer, 2002[29] NA	High potential for selection bias: • Randomization failed. High potential for performance bias: • Participants and providers not blinded to intervention • Participants received care through other interventions (individual and/or family psychotherapy). Not controlled for or mentioned in analysis. High potential for detection bias: • Time between assessments not consistent between patients and varied between 2.5 to 4.5 mos. High potential for attrition bias: • High differential attrition.
Qouta, 2012[30] NA	High potential for selection bias: • Techniques for randomization not reported. • Inclusion and exclusion criteria not specified. • Unclear if study controlled for similar baseline characteristics between groups. High potential for attrition bias: • Analysis not done in ITT fashion. High potential for performance bias: • Techniques for blinding are not reported. High potential for design bias: • Outcomes were not pre-specified.
Ronan, 1999[34] NA	High potential for selection bias: • Randomized by school not individually. Assignment to treatment group was not done by randomization, rather by school attendance, and it was unclear where control group came from; there was little discussion of trying to make up for possible bias, no long-term followup of exposure group. High potential for attrition bias: • High attrition rate (28 out of 69 unavailable for follow up) without assessment to see if subjects who dropped out differed from subjects who remained enrolled.

Table E-4. Rationale for high risk of bias rating (continued)

Author, Year Trial Name	Primary Reasons for High Risk of Bias Rating
Ruf, 2010[35] NA	High potential for selection bias: • Randomization failed and not controlled for in analysis. • Demographics of participants not reported.
Sadeh, 2008[36] NA	High potential for selection bias: • Confounding factors in clusters not controlled for in analysis. • Samples not described. • Success of randomization not reported. • Did not control for all confounding variables. High potential for detection bias: • Instruments used were designed for the study and not validated.
Schaal, 2009[39] NA	High potential for selection bias: • Randomization failed and not controlled for in analysis. • Demographics of participants not reported.
Schauer, 2008[40] KIDNET	High potential for selection bias: • Not truly randomized; 6 schools were chosen based on convenience/safety and all children in a given school received the intervention, while another school served as the control. High potential for sampling bias: • 23% of the sample experienced ongoing domestic violence.
Scheeringa, 2011[41] NA	High potential for selection bias: • Baseline differences not reported. • None of the analyses adjusted for covariates other than race and type of trauma. • Randomization procedure was abandoned midway through study due to Hurricane Katrina hitting; it is impossible to isolate the effect of hurricane Katrina on the outcomes. High potential for attrition bias: • Very high dropout rates (56.4% in treatment group, 52.2% in waitlist group). • ITT analyses not utilized. High potential for sampling bias: • One type of trauma (n=18) was domestic violence; cannot examine relationships in children exposed to other types of trauma.

Table E-4. Rationale for high risk of bias rating (continued)

Author, Year Trial Name	Primary Reasons for High Risk of Bias Rating
Schreier, 2005[42] NA	High potential for selection bias: • Cannot determine if between group differences exist; there is no demographic data reported for the intervention and control groups, only reported overall. • Statistical methods do not explain how potential confounders were accounted for in their analysis. • Allocation concealment and method of randomization not report. High potential for performance bias: • Blinding not reported. • Potential confounding variable; do not report how many participants assessed hospital psychological services.
Shechtman, 2010[43] NA	High potential for selection bias: • Randomization strategy was not reported. High potential for intervention bias: • Adherence to manual was not reported.
Stallard, 2006[45] NA	High potential for measurement bias: • Baseline characteristics differ between groups; analysis did not control for baseline differences or account for confounding variables. • Providers were not blinded to the intervention status of participants.
Stein, 2003[46] NA	High potential for selection bias: • Failure to account for baseline differences between groups. • Success of randomization not reported.
Stoddard, 2012[47] NA	High potential for detection bias: • Assessor blinding not reported. • Improper statistical tests used (i.e. t-tests). High potential for attrition bias: • Small study with no loss to followup information given; calculated loss to followup showed differential rates (with placebo having 30-40% higher drop out). • No ITT analyses conducted.
Thabet, 2005[48] NA	High potential for selection bias: • Not randomized. • Baseline demographics (age, gender, % with PTSD) differ between groups; not controlled for in analysis. • Clustering problem not dealt with in analysis.

Table E-4. Rationale for high risk of bias rating (continued)

Author, Year Trial Name	Primary Reasons for High Risk of Bias Rating
Vijayakumar, 2006[52] NA	High potential for selection bias: • Participants chosen based on ability to read and understand questions; intervention was offered to all participants. • Control group composed of dropouts rather than random assignment. • Self-selected for intervention and control groups, moderate differences between groups, not statistically significant but some large (like PTSD symptoms) and no control for baseline characteristic.
Wolmer, 2005[53] NA	High potential for attrition bias: • Overall loss to follow up from the original study was substantial (77%).
Wolmer, 2011[54] NA	High potential for selection bias: • Baseline difference between groups in exposure to terrorist attacks. • Unclear how wait list control group is derived. High potential for attrition bias: • Substantial differential attrition at Time 3 (23.3% vs. 0%).
Wolmer, 2011[55] NA	High potential for selection bias: • No baseline information (either pre-exposure or pre-intervention) collected, preventing loss to followup calculations, adjustment for any baseline differences, or use of change scores in analyses. High potential for detection bias: • Timing of intervention (9 months prior to trauma exposure) and measurement 3 months after exposure without detailed information about what happened to participants who got exposure but then were in different grades. High potential for performance bias: • Cannot rule out unintentional exposures or unintended interventions affecting results.

Abbreviations: CBI = Classroom-Based Intervention; G = group; ITT = intent-to-treat; KIDNET = Narrative Exposure Therapy for children; PTSD = Post-Traumatic Stress Disorder; SPC = Stepped Preventive Care TF-CBT = Trauma-Focused Cognitive Behavioral Therapy; vs. = versus.

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Appendix F. Summary of Results

Table F-1. Summary of results for interventions targeting children exposed to trauma (KQ 1)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence and Magnitude of Effect	Type of Exposure
PTSD diagnosis	CFTSI	Supportive therapy	1,[1] 106	Low; difference of 4.54 points on the UCLA PTSD-RI Index favoring CFTSI	Mixed (MVA, sexual abuse, witnessing violence, physical assaults, injuries, threats of violence)
	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[2, 3] 273	Low; significantly greater decrease in PTSD diagnosis on the UCLA PTSD-I in one study (24.7% greater decrease in proportion); second study significance not reported (11.3% greater decrease in proportion)	Natural disaster (tsunami); war/terror attacks
PTSD symptoms/severity	TF-CBT	No treatment	1,[4, 5] 65	Low; difference of 19.2 points on child PTSD reaction index at 18 months favoring TF-CBT	Natural disaster (earthquake)
	CFTSI	Supportive therapy	1,[1] 106	Low; difference of 4.71 points on the TSCC PTS Index favoring CFTSI	Mixed (MVA, sexual abuse, witnessing violence, physical assaults, injuries, threats of violence)
	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[2, 3] 273	Low; significantly greater decrease in PTSD symptom severity on the UCLA PTSD-I in both studies (mean differences of 7.21, 9.0)	Natural disaster (tsunami); war/terror attacks
	Mixed Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1,[6] 142	Low; significantly greater decrease in PTSD symptoms on the UCLA PTSD-I (mean difference of 4.6) and significantly greater decrease in PTSD severity (mean difference of 12.1)	War/terror attacks

Table F-1. Summary of results for interventions targeting children exposed to trauma (KQ 1) (continued)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence and Magnitude of Effect	Type of Exposure
Depression symptoms	TF-CBT	No treatment	1,[4, 5] 65	Low; difference of 5.7 points on Depression Rating Scale at 18 months favoring TF-CBT	Natural disaster (earthquake)
	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[2, 3] 273	Low; significantly greater decrease in depression symptoms in both studies on the Brief Beck Depression Inventory (mean differences of 1.55,1.8)	Natural disaster (tsunami); war/terror attacks
Anxiety symptoms	CFTSI	Supportive therapy	1,[1] 106	Low; difference of 5.52 points on the TSCC Anxiety Index favoring CFTSI	Mixed (MVA, sexual abuse, witnessing violence, physical assaults, injuries, threats of violence)
	Mixed Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1,[6] 142	Low; significantly greater decrease in generalized anxiety symptoms (mean difference of 2.8) and significantly greater decrease in separation anxiety symptoms on the SCARED (mean difference of 2.4)	War/terror attacks
Somatic complaints	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[2, 3] 273	Low; significantly greater decrease in somatic complaints in both studies on the DPS (mean differences of 1.01, unknown magnitude in second study)	Natural disaster (tsunami); war/terror attacks
	Mixed Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1,[6] 142	Low; significantly greater decrease in somatic complaints on the DPS (mean difference of 1.1)	War/terror attacks

Table F-1. Summary of results for interventions targeting children exposed to trauma (KQ 1) (continued)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence and Magnitude of Effect	Type of Exposure
Functional impairment	Mixed ERASE Stress (school groups)	Wait-list control that received religious classes	2,[2, 3] 273	Low; significantly greater decrease in functional impairment in both studies on the DPS (mean differences of 2.45, 2.0)	Natural disaster (tsunami); war/terror attacks
	Mixed Overshadowing the Threat of Terrorism (school groups)	Wait-list control	1,[6] 142	Low; significantly greater decrease in functional impairment on 4 items from the *Childhood Diagnostic Interview Schedule* (mean difference of 1.8)	War/terror attacks

Abbreviations: CTSFI = Child and Family Traumatic Stress Intervention; DPS = DISC Predictive Scales; MVA = motor vehicle accident; ERASE-Stress = Enhancing Resiliency among Students Experiencing Stress; PTSD = post-traumatic stress disorder; SCARED = Screen for Child Anxiety Related Emotional Disorders; TF-CBT = trauma-focused cognitive behavioral therapy; TSCC = Trauma Symptom Checklist for Children; UCLA PTSD-I = University of California, Los Angeles Post-Traumatic Stress Disorder – Index for DSM-IV.

Table F-2. Summary of results for child PTSD treatment interventions (KQ 2)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence and Magnitude of Effect	Type of Exposure
PTSD diagnosis	TF-CBT	Wait-list control	1,[7] 24	Low; Cohen effect size 2.20 on the C-RIES scale favoring TF-CBT and Cohen effect size 1.59 on the CAPS-CA scale favoring TF-CBT	Mixed: MVA, assault, witnessed violence
	EMDR	Wait-list control	1,[8] 27	Low; 75% decrease in the EMDR group versus 0% change in the wait-list control group in number of children with 2 or more DSM IV criteria	MVA
PTSD symptoms/severity	TF-CBT	Wait-list control	1,[7] 24	Low; Cohen effect size 2.48 on CPSS scale favoring TF-CBT	Mixed: MVA, assault, witnessed violence
	CBITS	Wait-list control	1,[9] 126	Low; difference of 7 points on CPSS favoring CBITS	Community violence
	CPT	Wait-list control	1,[10] 38	Low; difference of 10.09 points on PSS-SR scale favoring CPT and difference of 14.19 on Impact of Events Scale favoring CPT	Mixed
	EMDR	Wait-list control	1,[8] 27	Low; magnitude of effect not reported by intervention type	MVA
	TGCT (school groups)	Wait-list control	1,[11] 159	Low; reduction in PTSD symptoms of 6.18 favoring TGCT group	War-exposed in Bosnia
	Sertraline	Placebo	1,[12] 129	Low for no benefit; placebo with greater decrease in parent-rated PTSD symptoms over sertraline (LS mean difference 95% CI of -9.1, -0.6 with CSDC); placebo with greater decrease in clinician-rated PTSD severity via CGI-S (LS mean difference 95% CI of -0.8, 0)	Mixed
Depression symptoms	TF-CBT	Wait-list control	1,[7] 24	Low; difference of 12.6 points on the RCMAS favoring TF-CBT	Mixed: MVA, assault, witnessed violence
	CBITS	Wait-list control	1,[9] 126	Low; difference of 3.4 points on CDI favoring CBITS	Community violence
	CPT	Wait-list control	1,[10] 38	Low; difference of 7.8 points on BDI scale favoring CPT	Mixed
	TGCT (school groups)	Wait-list control	1,[11] 159	Low; calculated mean between group difference of 2.78 points favoring TGCT	War-exposed in Bosnia

Table F-2. Summary of results for child PTSD treatment interventions (KQ 2) (continued)

Outcome	Intervention	Comparator	Number of Trials, Number of Participants	Strength of Evidence and Magnitude of Effect	Type of Exposure
Anxiety symptoms	TF-CBT	Wait-list control	1,[7] 24	Low; difference of 9.7 points on the DSRS favoring TF-CBT	Mixed: MVA, assault, witnessed violence
Functional impairment	Mixed school group	Wait-list control	1,[13] 403	Low; significantly greater decrease in functional impairment on a 10 items child-reported checklist in treatment group at 1 week (effect size 0.42) and 6 months (effect size 0.26) postintervention	Poverty and political violence/ instability
Psychosocial dysfunction	CBITS	Wait-list control	1,[9] 126	Low; difference of 6.4 points on PSC favoring CBITS	Community violence
Conduct Problems	Mixed school group	Wait-list control	1,[14] 397	Low; significantly greater reduction in conduct problems in treatment group than wait-list group (LGCM estimate, SE: -0.132, 0.045; p<0.01)	War and political violence/ instability
Quality of Life	Sertraline	Placebo	1,[12] 129	Low for no benefit; placebo with greater improvement in quality of life than sertraline (LS mean difference 95%CI 0.2, 6.8)	Mixed

Abbreviations: BDI = Beck Depression Inventory; CAPS-CA = clinician-administered PTSD scale for children and adolescents; CBITS = Cognitive Behavioral Intervention for Trauma in Schools; CDI = Child Depression Inventory; CPT = cognitive processing therapy; C-RIES = Children's Revised Impact of Event Scale; CSDC = Child Stress Disorder Checklist; LOCF: last observation carried forward; DSRS=Depression Self-Rating Scale; EMDR = eye movement desensitization and reprocessing; MVA = motor vehicle accident; PTSD = post-traumatic stress disorder; PSC = Pediatric Symptom Checklist; RCMAS = Revised Children's Manifest Anxiety Scale; TF-CBT = trauma-focused cognitive behavioral therapy; TGCT = Trauma and Grief Component Therapy

Table F-3. Summary of results for child PTSD treatment subgroup comparisons (KQ 3)

Subgroup	Intervention	Comparator	Number of Trials, Number of Participants	Outcome	Strength of Evidence and Magnitude of Effect	Type of Exposure
Sex	Mixed school group	Wait-list control	1,[13] 403	PTSD symptoms	Low; intervention effect on reducing PTSD symptoms significantly greater for female than male students (G1: -0.090 [-0.161 to -0.019] vs. G2: 0.060 [-0.011 to 0.131])	Poverty and political violence/ instability
				Functional impairment	Low; intervention effect on reducing functional impairment significantly greater for female than male students (G1: -0.120 [-0.179 to -0.061] vs. G2: 0.012 [-0.047 to 0.071])	Poverty and political violence/ instability

Abbreviations: PTSD: post-traumatic stress disorder; vs. = versus

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