Comparative Effectiveness Review
Number 89

Effective Health Care Program

Child Exposure to Trauma: Comparative Effectiveness of Interventions Addressing Maltreatment

Executive Summary

Background

Condition and Therapeutic Strategies

Child maltreatment is a global public health problem.[1, 2] In the United States alone, approximately 6.2 million children were involved in 3.4 million referrals to Child Protective Services (CPS) in FY 2011.[3] The prevalence of child maltreatment translates into a significant economic burden to society, cutting across many different service sectors including child welfare, health and mental care, special education, and criminal justice. A recent U.S. study estimates that the aggregate lifetime costs of nonfatal and fatal child maltreatment (in 2010 dollars) are $124 billion.[4] Exposure to abuse and/or neglect in childhood has serious adverse consequences across the life span, including increased risk of emotional and behavioral disturbances, delinquency and violent crime, and chronic disease.[1, 2, 5-12]

This comparative effectiveness review (CER)[13] focuses on parenting interventions, trauma-focused treatments, and enhanced foster care approaches that address child exposure to maltreatment. It is the first in a two-part series focusing on clinical (psychosocial and/or pharmacological) interventions for children exposed to traumatic experiences. The second review in the series focuses on clinical interventions with children exposed to traumatic events other than maltreatment. Both reviews were carried

Effective Health Care Program

The Effective Health Care Program was initiated in 2005 to provide valid evidence about the comparative effectiveness of different medical interventions. The object is to help consumers, health care providers, and others in making informed choices among treatment alternatives. Through its Comparative Effectiveness Reviews, the program supports systematic appraisals of existing scientific evidence regarding treatments for high-priority health conditions. It also promotes and generates new scientific evidence by identifying gaps in existing scientific evidence and supporting new research. The program puts special emphasis on translating findings into a variety of useful formats for different stakeholders, including consumers.

The full report and this summary are available at **www.effectivehealthcare.ahrq.gov/reports/final.cfm**.

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out under the auspices of the Agency for Healthcare Research and Quality's (AHRQ) Effective Health Care Program, the goal of which is to improve the quality, effectiveness, and efficiency of health care delivery[14] with highly rigorous and transparent systematic reviews. The goal of this review is twofold: to provide stakeholders with a synthesis of the best evidence in the field of child maltreatment and to identify critical areas to address in future intervention research.

Scope and Key Questions

This review provides a critical analysis and synthesis of the comparative efficacy and effectiveness of interventions (psychosocial and pharmacological) that address child well-being and/or promote positive child welfare outcomes (safety, placement stability, and permanency) for maltreated children ages birth to 14 years. The review also examines (1) how interventions with different characteristics (modality, theoretical orientation, setting) compare in improving child outcomes, (2) how interventions compare in terms of treatment engagement and retention, and (3) adverse events associated with the interventions or comparators reviewed. The review highlights gaps in the current scientific literature and important areas for future research to build the evidence base for interventions with maltreated children. Although pharmacotherapy was included in our definition of interventions for this review, we did not identify any eligible studies for inclusion.

The inclusion and exclusion criteria for studies reviewed in this CER were defined using the PICOTS (populations, interventions, comparators, outcomes, timing, settings) framework. We call attention to several difficult exclusion decisions that were made to enhance the generalizability of the review in light of extensive clinical heterogeneity in the literature. First, we excluded studies with families broadly identified as "at risk": due to sociodemographic or other risk factors for maltreatment. The intent of this exclusion criterion was to focus the review on children with a known maltreatment history or involvement with child protective services (CPS). Although children at risk and children with known maltreatment exposure can present similar risk and clinical profiles,[15-17] intervention with parents involved with CPS presents markedly different therapeutic and operational challenges compared with preventive intervention with children at risk. Second, we excluded older adolescents (> 15 years) in recognition of the major shift in developmental needs and capacities during middle and late adolescence (e.g., autonomy, physical maturity, emphasis on peer relationships).[18] In both exclusion cases, if a trial included children from the included group and the excluded group, the study was included in the review if data from the two groups could be disaggregated in data abstraction. Third, systems- or service-delivery level approaches were excluded so as to focus on "clinical-level" interventions at the child, parent, and family levels. We recognize that systems approaches, such as differential response and solution-focused casework, are well-accepted and widely used within child welfare and affect the work of related care systems. At the same time, these approaches and their evaluations were so diverse that they warranted a separate review.

We acknowledge that these exclusion decisions may have resulted in the exclusion of trials that, arguably, might bolster evidence for included interventions or support inclusion of other interventions. We also recognize these exclusions, particularly related to excluding "mixed" populations combining children at risk with children with known maltreatment or CPS involvement, may be considered a rarified approach by some. Our intent was threefold: (1) to reduce the noise of clinical heterogeneity that currently undermines the extant evidence base, (2) to maintain the rigorous approach for study inclusion that has been employed across AHRQ CERs, and (3) to avert yet more heterogeneity due to inconsistent, vague, or absent definitions of samples of children defined as at risk or an admixture of at risk and maltreated. As we attempted to follow these principles, we have striven for the utmost clarity in delineating our decisions for the reader. With these perspectives in mind, we believe that this review makes a groundbreaking contribution to the field by challenging researchers, clinicians, and policymakers to stringently assess the strength of the available evidence so as to chart clear direction for future of research.

Key Questions

This review sought to address the following key questions (KQs):

KQ 1: What is the comparative effectiveness of interventions with children exposed to maltreatment for promoting child well-being outcomes? Specifically:

a. Mental and behavioral health (e.g., severity or number of traumatic stress symptoms or syndromes; post-traumatic stress disorder (PTSD); attachment disorders; depressive symptoms; anxiety symptoms; disruptive, aggressive, and delinquent behavior)

b. Healthy caregiver-child relationship (e.g., secure attachment; caregiver responsivity and sensitivity; positive parental attitudes toward childrearing; parental perceptions of the child and casual attributions about the child's behavior; caregiver-child interactions; and family functioning)

c. Healthy development (e.g., cognitive, language, physical maturation)

d. School-based functioning (e.g., grade retention, disciplinary referrals, attendance)

KQ 2: What is the comparative effectiveness of interventions with children exposed to maltreatment for promoting child welfare outcomes? Specifically:

a. Safety (i.e., prevention of maltreatment recurrence)

b. Placement stability for children in out-of-home care

c. Positive permanency outcomes for children in out-of-home care

KQ 3: Among the interventions under review, how do interventions with particular characteristics compare in improving child outcomes? Specifically:

a. Modality (i.e., individual, dyadic, group, family-based format)

b. Theoretical orientation (e.g., cognitive behavioral, psychodynamic)

c. Type of setting (i.e., specialty or nonspecialty service-delivery settings)

KQ 4: How do interventions compare for improving child outcomes within population subgroups? Specifically:

a. Child subgroups

i. Age and other sociodemographic subgroups (e.g., race, ethnicity, sex)

ii. Type of maltreatment exposure (e.g., neglect, physical abuse, sexual abuse)

iii. Severity of maltreatment exposure

iv. Presence of mental or behavioral health problems (e.g., complex traumatic stress disorders, serious emotional disturbance) or other special needs (e.g., failure to thrive, prenatal substance exposure)

b. Caregiver subgroups

i. Primary caregiving context (e.g., biological parent; foster, kin [relative], or adoptive caregivers; residential program or group home)

ii. Presence of mental health problems, substance abuse, or domestic violence

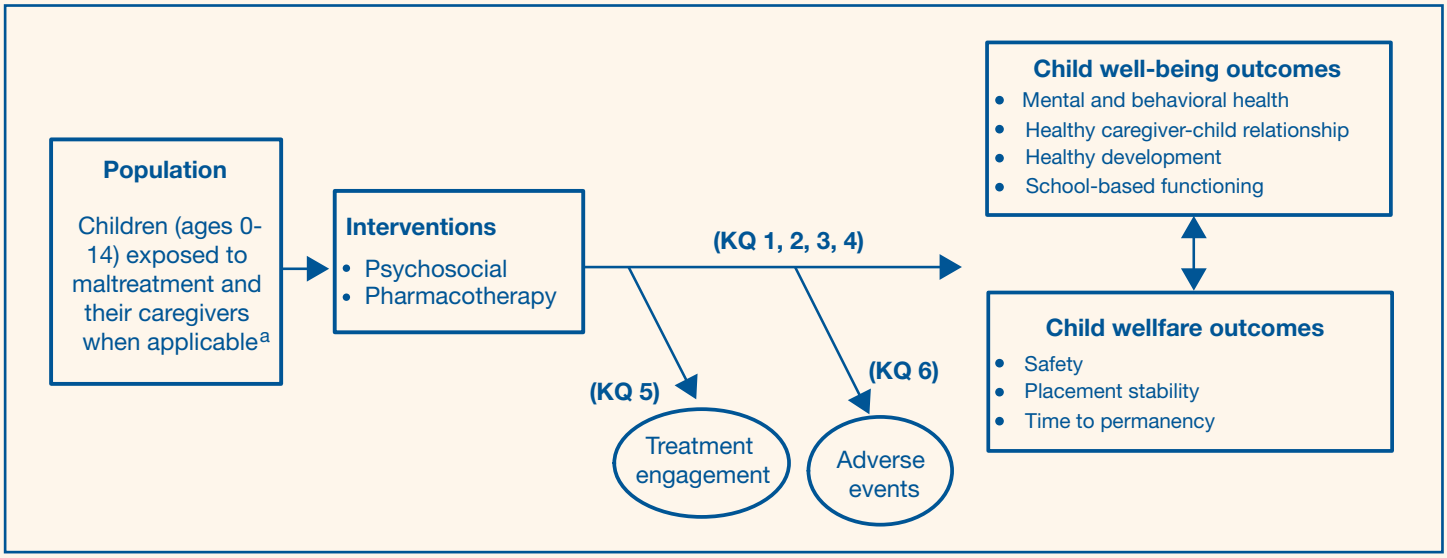
iii. Sociodemographic groups (e.g., age, race, ethnicity, sex)

KQ 5: What is the comparative effectiveness of interventions with children exposed to maltreatment for engaging children and/or caregivers in treatment (e.g., treatment adherence, treatment withdrawal)?

KQ 6: What adverse events are associated with interventions for children exposed to maltreatment (e.g., retraumatization, caregiver distress)?

The analytic framework we developed to guide the systematic review process is shown in Figure A.

Figure A. Analytic framework



[a] Population may include the child's primary caregiver(s) when the intervention targets the caregiving context.

Methods

A team of researchers conducted this review using the methods described in AHRQ's Methods Guide for Effectiveness and Comparative Effectiveness Reviews.[19] The team included three clinical psychologists, a family medicine physician, and a developmental psychologist all specializing in child maltreatment, as well as several researchers with expertise in AHRQ CER methodology.

Topic Refinement

The topic was nominated in a public process. With key informant input, the RTI-UNC Evidence-based Practice Center (EPC) clarified the scope of the project. After we generated an analytic framework, preliminary KQs, and preliminary inclusion/exclusion criteria in the form of PICOTS, our KQs were posted for public comment on AHRQ's Effective Health Care Web site from March 18, 2011, to April 15, 2011. We revised the KQs as needed based on review of the comments and discussion with a seven-member Technical Expert Panel (TEP), primarily for ensuring that the PICOTS aligned with the needs and understanding of the topic by stakeholders in the field. The RTI-UNC EPC incorporated public comments and guidance from the TEP into a final research protocol, which was posted on the AHRQ Web site on November 15, 2011.

Literature Search and Review Strategy

We systematically searched, reviewed, and analyzed the scientific evidence for each KQ. We conducted focused searches of MEDLINE® (via PubMed), Social Sciences Citation Index®, PsycINFO®, and the Cochrane Library. An experienced research librarian used a predefined list of search terms and medical subject headings. To ensure clinical relevancy, we limited searches to publications from 1990 and later. We also limited the search to studies published in English. We searched existing evidence-based registries and databases on interventions for children and maltreated children to identify relevant peer-reviewed articles that the systematic literature search may have missed. We also searched unpublished and grey literature relevant to the review. Methods for identifying grey literature included a review of trial registries, specifically ClinicalTrials.gov, Health Services Research Projects in Progress (www.nlm.nih.gov/hsrproj/), and the European Union Clinical Trials Register (www.clinicaltrialsregister.eu/). Further, AHRQ requested Scientific Information Packets from the developers and distributors of the interventions identified in the literature review. Scientific Information Packets allow an opportunity for the intervention developers and distributors to provide the EPC with both published and unpublished data that they believe should be considered for the review. We included unpublished studies that met all inclusion criteria and contained enough information on the research methods used for the risk of bias assessment. Last, we searched the reference lists of review articles pertinent to the review but that did not meet the criteria for inclusion.

Trained reviewer pairs independently evaluated each of the titles and abstracts. For each article that either or both reviewers chose to include from the abstract review, two reviewers reviewed their full texts for eligibility against our PICOTS (Table A) and study design eligibility criteria (i.e., systematic reviews, randomized controlled trials, nonrandomized controlled trials, cohort studies, and case-control studies; $N > 10$). During full-text review, if both reviewers agreed that a study did not meet the eligibility criteria, the study was excluded. Reviewers resolved conflicts by discussion and consensus or by consulting a third member of the review team.

Table A. Population, Intervention, Comparator, Timing, Setting (PICOTS)	
Domain	**Description**
Population	• Children aged 0 to 14 years exposed to child maltreatment. For this review, we used the definition of maltreatment provided by the Centers for Disease Control and Prevention:[20] ◆ Child abuse: words or overt actions that cause harm, potential harm, or threat of harm to a child ◆ Child neglect: failure to provide for a child's basic physical, emotional, or educational needs or to protect a child from harm or potential harm; privation (conditions of severe social deprivation). • Children aged 0 to 14 whose families were involved with child protective services, including children who remained in the care of their biological parent and those placed in out-of-home care (e.g., foster care, kinship care, group home care). We excluded studies that targeted children known to have been placed in out-of-home care because the child's behavior or condition posed a threat to their community or was beyond the control of his or her family (e.g., youth referred or mandated by the juvenile justice system to out-of-home placement because of multiple criminal offenses; children placed in out-of-home care due to serious emotional disturbance and no involvement with the child protective services). • The population included the child's primary caregiver(s) when the intervention targeted the caregiving context. The primary caregiver was defined as the biological parent; foster, kinship (relative), or adoptive caregiver; or caregivers in a residential program or group home. • Child subgroups were defined by age, type of maltreatment exposure, severity of maltreatment exposure, presence of child behavioral and mental health problems, and sociodemographic groups (race, ethnicity, and sex). • Caregiver subgroups were defined as caregiving context (i.e., primary caregiver/environment), presence of caregiver substance abuse or other mental health disorder, caregiver sociodemographic characteristics (age, race, ethnicity, and sex).
Interventions	Clinical interventions designed to prevent, ameliorate, or improve mental health symptoms, behavior problems, or psychopathology; optimize child development and functioning; and/or improve child welfare outcomes, including the following: • Psychotherapy/psychosocial interventions delivered at the individual, caregiver, and/or family level (including Trauma-Focused Cognitive Behavioral Therapy, Parent-Child Interaction Therapy, Attachment and Biobehavioral Catch-up, the Incredible Years) • General and specific types of pharmacotherapy (e.g., selective serotonin reuptake inhibitors [SSRIs]). Strategies or approaches designed to improve the system of care for maltreated children and caregivers at the service-delivery or organizational level were excluded. Examples include intensive family preservation or reunification service models, solution-focused/based casework, differential response, and routine preservice foster parent training programs.

Table A. Population, Intervention, Comparator, Timing, Setting (PICOTS) (continued)	
Domain	**Description**
Comparator	• The comparison condition as defined in the respective studies. Active controls were comparison groups that received another structured intervention. Inactive controls were comparison groups that did not receive another structured intervention.
Outcomes	**Child well-being outcomes** • Child mental and behavioral health (e.g., prevention of or reduction in severity or number of traumatic stress symptoms or syndromes; post-traumatic stress disorder (PTSD); attachment disorders; depressive symptoms; anxiety symptoms; disruptive, aggressive, and delinquent behavior) • Healthy caregiver-child relationship (e.g., secure attachment; increased caregiver responsiveness and sensitivity to the child; positive caregiver-child interaction; increased positive attitudes toward childrearing, perceptions of the child and causal attributions about the child's behavior, family functioning) • Healthy development (e.g., cognitive, language, physical) • School-based functioning (e.g., grade retention, disciplinary referrals, attendance) **Child welfare outcomes** • Safety (e.g., prevention of maltreatment recurrence or reduced number of subsequent involvements with child protective services) • Placement stability for children in out-of-home care • Positive permanency outcomes for children in out-of-home care **Treatment engagement and adherence** • Readiness or motivation to engage in an intervention • Treatment completion **Adverse events** • Retraumatization • Caregiver distress
Timing	• Short-term duration: postintervention (i.e., at treatment completion) to <6 months • Long-term duration: ≥6 months after treatment completion
Setting	• Studies conducted in the United States or internationally • Interventions provided in both specialty service delivery settings (e.g., outpatient and inpatient mental health care settings) and nonspecialty service delivery settings (e.g., schools, community-based providers, shelters, prison or diversion programs) • Home-based and out-of-home care (e.g., foster or kin care, residential treatment, group settings)

Risk of Bias Assessment of Individual Studies

For each included study, we assessed the potential for selection bias, performance bias, attrition bias, detection bias, confounding, and reporting bias (see Table A). Teams of two independent reviewers rated the risk of bias for each study. Disagreements between the two reviewers were resolved by discussion and consensus or by consulting a third member of the team.

Results of this assessment are encapsulated in a rating of low, medium, or high risk of bias. In general, a study with a low risk of bias has a strong design, measures outcomes appropriately, uses appropriate statistical and analytical methods, reports low attrition, and describes methods and outcomes clearly and precisely. Studies with a medium risk of bias are those that do not meet all criteria required for low risk of bias but do not have flaws that are likely to cause major bias. Studies with a high risk of bias include those with at least one major weakness that has the potential to cause significant bias and undermine confidence in the validity of results. Examples of flaws leading to a high risk of bias rating include differences in groups at baseline, high overall attrition, or substantial differential attrition across study conditions. A high risk of bias rating was not assigned to a study merely because critical information was not reported or unclear.[21] However, "unclear" methodology was taken into consideration in grading the strength of evidence based on the study (described below). To maintain a focus on the best available evidence, studies with a high risk of bias are not included in the results.

Data Synthesis

We report results from direct comparisons of different interventions in the form of a qualitative synthesis. We did not conduct a quantitative meta-analysis because of issues related to heterogeneity, insufficient numbers of similar studies, and insufficiency or variation in outcome reporting. We report magnitude of effect data as 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.[22]

Strength of Evidence Grading

We graded the strength of evidence for child well-being outcomes (KQ 1), child welfare outcomes (KQ 2), interventions with different characteristics (KQ 3), subpopulations (KQ 4), and adverse events (KQ 5) on the basis of guidance established for the EPC program.[23] This approach incorporates four key domains: risk of bias (including study design and aggregate quality), consistency, directness, and precision of the evidence.

Two reviewers assessed each domain independently and also assigned an overall grade for each key outcome listed in the framework; they resolved any conflicts through consensus discussion. If a consensus was not met, the team brought in a third reviewer to settle the conflict. We used the strength of evidence grades defined by Owens and colleagues:[23]

- **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**.

Applicability

We assessed the applicability of the evidence following guidance from Atkins and colleagues.[24] We used the PICOTS framework to explore factors that affect or limit applicability.

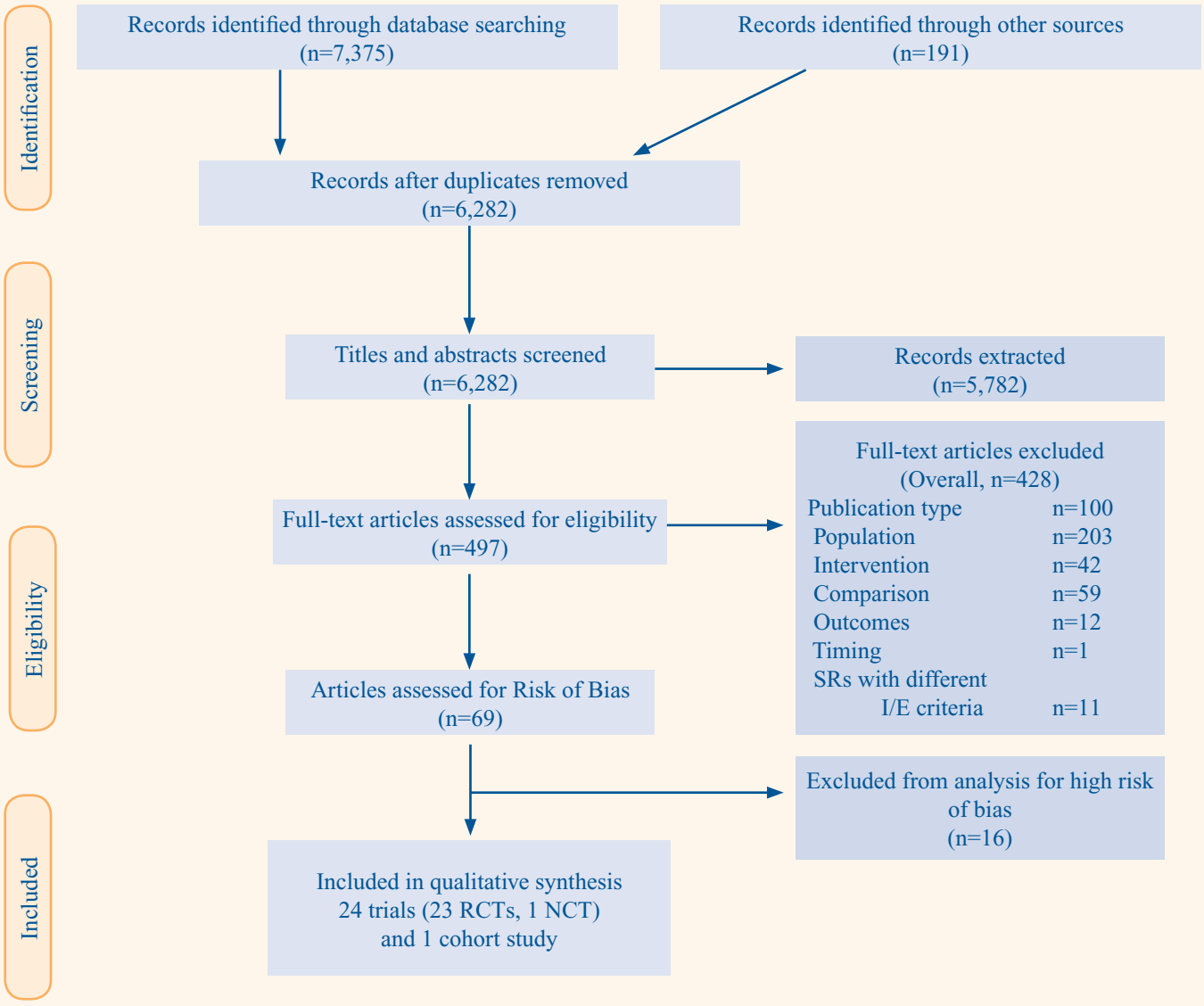
Results

We provide a summary of results by key question. KQs 1 and 2 synthesize the evidence by type of intervention. KQ 3 synthesizes the evidence by intervention characteristics, and KQ 4 synthesizes the evidence for child and caregiver population subgroups. KQ 5 summarizes the evidence for the one trial that was identified addressing treatment engagement and retention. KQ 6 summarizes the evidence for the one trial that was identified that addressed adverse events. Detailed descriptions of included studies, key points, detailed synthesis, summary tables, and expanded strength of evidence tables that include the magnitude of effect can be found in the full report. Our summary of results tables below present the strength of evidence grades for each KQ.

Results of Literature Searches

Figure B presents our literature search results. Literature searches through May 4, 2012, for the current report identified 6,282 unduplicated citations. We excluded 5,782 records at the title and abstract review stage. For the 497 articles reviewed at the full-text stage, we eliminated 428. A table of all excluded studies, organized by reason for exclusion, is provided in Appendix C. The most common reasons for exclusion at the full text level were (1) the study included children outside of the target age range (0 to 14) without stratification by age or the study's focus was on children at risk for abuse or neglect without known CPS involvement; (2) systems-level approaches (wrong intervention); or (3) lack of a comparison group (wrong comparison). After assessing risk of bias for all included studies (before data abstraction), we eliminated studies that we rated high risk of bias. This process left a total of 25 studies, reported in 53 articles with outcomes assessed as either medium or low risk of bias.

Figure B. Disposition of articles (PRISMA figure)



*we were unable to access the FT of three articles
Abbreviations: I/E = inclusion/exclusion; NCT = nonrandomized controlled trial; RCT = randomized controlled trial
From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. DOI:10.1371/journal.pmed 1000097.
For more information, visit www.prisma-statement.org.

Key Question 1. Comparative Effectiveness of Interventions for Improving Child Well-Being Outcomes

The summary of results for KQ 1 is presented in Table B (see below). We included a total of 21 trials, (19 efficacy trials and 2 effectiveness trials,[25, 26)] that included nonrandomized controlled trial.[27] With the exception of 1 intervention, the body of evidence for interventions that addressed child well-being in maltreated children was predominantly low strength of evidence or was insufficient to draw conclusions. Low strength of evidence was largely attributable to most bodies of evidence consisting of only one trial, many with small sample sizes. We applied a moderate strength of evidence grade for mental and behavioral health and caregiver-child relationship outcomes for only one intervention, evaluated in an effectiveness trial: a brief foster parent training program called Keeping Foster Parents Trained and Supported (KEEP).[25] We found no eligible studies that assessed school-based functioning, an anomaly given the pervasive emphasis on school readiness and performance in the U.S. educational system.

Key Question 2. Comparative Effectiveness of Interventions for Improving Child Welfare Outcomes

The summary of results for KQ 2 is presented in Table B. We included a total of 9 trials in KQ 2, 4 effectiveness trials[26, 28-30] (including 2 large effectiveness trials)[29,30] and 1 noncurrent cohort study.[22] With the exception of two interventions,[29, 30] the body of evidence for interventions that addressed child welfare outcomes was predominantly low strength of evidence or was insufficient to draw conclusions. We found moderate strength of evidence for two interventions: a home-visiting approach with maltreating parents (SafeCare)[29] and the foster parent training program, KEEP.[30] Only one intervention (Parent-Child Interaction Therapy combined with a motivational intervention) was assessed in more than one trial.[28, 31]

Table B. Summary strength of evidence Key Questions 1 and 2

Type	Intervention (G1)	Intervention (G2)	Outcomes	N Trials, Participate	Strength of Evidence; Magnitide of Effect
Parenting Interventions	Attachment and Biobehavioral Catch-up	Active control[a]	Mental and behavioral health	2,[32-35] 213	Low, G1>G2; NR
			Healthy caregiver-child relationship	2,[36-37] 166	Low, G1>G2; NR
			Healthy development	1, [38] 37	Low, G1>G2; NR
		Wait list	Mental and behavioral health	1,[39] 58	Low, G1>G2; medium (partial eta squared=0.436 or 0.511)
			Healthy caregiver-child relationship	1,[39] 58	Low, G1>G2; medium or large (partial eta squared=0.59 or 0.791)
	Attachment-Based Intervention	Usual care	Mental and behavioral health	1,[40] 79	Insufficient
			Healthy caregiver-child relationship	1,[40] 79	Low, G1>G2; small to medium (d=0.47, r=0.36 or 0.37)
	Child-Parent Psychotherapy[b]	Active control[a] Usual care	Healthy caregiver-child relationship	2,[41-42] 159	Insufficient
			Healthy caregiver-child relationship	2,[41-42] 141	Low, G1>G2; medium to large (h=0.64 to 1.34)
	Incredible Years Adaptation	Usual care	Mental and behavioral health	1,[43] 64	Insufficient
			Healthy caregiver-child relationship	1,[43] 64	Low, G1>G2; small to medium (d=0.40 or 0.59)
	Keeping Foster and Kinship Parents Trained and Supported	Usual care	Mental and behavioral health	1,[25] 700	Moderate, G1>G2; small (d=0.26)
			Healthy caregiver-child relationship	1,[25] 700	Moderate, G1>G2; small (d=0.29)
			Placement stability	1,[30] 700	Insufficient
			Permanency	1,[30] 700	Moderate, G1>G2; NR
	Nurse-Home Visitation Intervention	Usual care	Mental and behavioral health	1,[26] 163	Insufficient
			Healthy caregiver-child relationship	1,[26] 163	Insufficient
			Safety	1,[26] 163	Insufficient
	PCIT Adaptation Package	PCIT Adaptation Package Enhancedc	Safety	1,[31] 75	Insufficient
		Usual care	Safety	2,[28, 31] 153	Low, G1>G2; NR[d]
	PCIT Adaptation Package Enhancedc	Usual care	Safety	1,[31] 88	Insufficient
	SafeCare	Usual care	Safety	1,[29] 2175	Moderate, G1>G2; HR=0.74 to 0.83
	Videotape Intervention	Control videotape	Mental and behavioral health	1,[44] 30	Insufficient

Table B. Summary strength of evidence Key Questions 1 and 2 (continued)

Type	Intervention (G1)	Intervention (G2)	Outcomes	N Trials, Participate	Strength of Evidence; Magnitide of Effect
Trauma-Focused Treatments	Combined Parent-Child Cognitive Behavioral Therapy	Active control[a]	Mental and behavioral health	1,[45] 75	Low, G1>G2; medium (d=0.61)
			Healthy caregiver-child relationship	1,[45] 75	Insufficient
	Eye Movement Desensitization and Reprocessing	Active control[a]	Mental and behavioral health	1,[46] 14	Insufficient
	Group Psychotherapy for Sexually Abused Girls	Active control[e]	Mental and behavioral health	1,[47] 71	Low, G1<G2; small to medium (d=0.36 to 0.79)
	Group Treatment Program for Sexual Abuse	Inactive control	Mental and behavioral health	1,[27] 30	Low, G1>G2; NR
	Trauma-Focused Cognitive Behavioral Therapy	Active control[f]	Mental and behavioral health	2,[48-49] 315	Low, G1>G2; small to medium (d=0.30 to 0.70)
			Healthy caregiver-child relationship	1,[48] 229	Low, G1>G2; small to medium (d=0.38 or 0.57)
	Trauma-Focused Cognitive Behavioral Therapy Group Adaptation	Active control[e]	Mental and behavioral health	1,[50] 44	Insufficient
			Healthy caregiver-child relationship	1,[50] 44	Insufficient

Table B. Summary strength of evidence Key Questions 1 and 2 (continued)

Type	Intervention (G1)	Intervention (G2)	Outcomes	N Trials, Participate	Strength of Evidence; Magnitide of Effect
Enhanced Foster Care Interventions	Bucharest Early Intervention Project	Usual care (institutional care in Romania)	Mental health and behavior	1,[51-55] 136	Low, G1>G2; OR 2.8 [95% CI, 1.2 to 6.4]
			Healthy caregiver-child relationship	1,[54, 56-57] 136	Low, G1>G2; NR
			Healthy development	1,[57-63] 136	Low, G1>G2; effect size[h]=0.47 or 0.62
	Fostering Healthy Futures	Inactive control	Mental and behavioral health	1,[64] 156	Low, G1>G2; small to medium (d=0.30 to 0.51)
			Placement stability	1,[65]110	Low, G1>G2; OR=0.18 to 0.56
			Permanency	1,[65]110	Low, G1>G2; OR=5.14
	Middle School Success	Usual care	Mental health and behavior	1,[66-67] 100	Low, G1>G2; small to medium (d=0.35 to 0.57)
			Placement stability	1,[66] 100	Low, G1>G2; medium (d=0.50)
	Multi-dimensional Treatment Foster Care for Preschoolers	Usual care	Mental health and behavior	1,[68-69] 117	Low, G1>G2; medium (d=0.64 to 0.68)
			Healthy caregiver-child relationship	1,[70-71] 117	Low, G1>G2; NR
			Healthy development	1,[72] 23	Low, G1>G2; NR
			Placement stability	1,[73] 117	Insufficient
			Permanency	1,[74-75] 90	Low, G1>G2; NR
	New Orleans Intervention	Usual care	Safety	1,[22] 255	Low, G1>G2; RRR=0.67 to 0.75
			Permanency	1,[22] 240	Low, G1<G2; NR

[a] Active comparator is an approach derived from an intervention wherein the degree to which core components of the original model are implemented is unclear and/or core components are omitted or substantively modified.
b Intervention is a variant of relationship-based dyadic psychotherapy as developed and manualized by Cicchetti and colleagues.[41,42]
[c] "Enhanced" refers to the provision of individualized services, such as adult mental health treatment and marital counseling, to the parents.
[d] Chaffin et al., 2011,[28] reports a hazard ratio but it is not statistically significant (i.e., reported as a trend).
[e] Active comparator is an approach representative of a conventional practice in the field.
[f] One comparator is a conventional approach; the other is a derived approach.
[g] Effect size measure is not specified; therefore, we did not classify the magnitude of effect as small, medium, or large.
Note: Table is organized alphabetically by intervention name. For estimation of the magnitude of effect, we include only the statistically significant ($p<0.05$) effect sizes provided by study authors and do not calculate effect sizes as part of our analysis. Interpretation of the effect size as small, medium, or large is defined as Cohen's d = 0.20, 0.50, and 0.80; Cohen's h = 0.20, 0.50, and 0.80; and correlation coefficient r = 0.10, 0.30, and 0.50, respectively.[76] When authors use eta or partial eta squared effect sizes, we use the interpretation that the authors provide.[39, 77] We include an effect size range when more than two effect sizes are reported.
Abbreviations: CI = confidence interval; G = group; NR = not reported; OR = odds ratio; PCIT = Parent-Child Interaction Therapy; RRR = relative risk reduction.

Key Question 3. Comparative Effectiveness of Interventions With Different Characteristics

We found no studies that compared the efficacy or effectiveness of interventions delivered in different settings. We also found no studies in which the design or methods clearly indicated that modality (i.e., service delivery format) was a comparison of interest. Our team carefully avoided excessive interpretation to make a study "fit" with this KQ.

Regarding theoretical orientation, meaningful contrasts were elusive. Our a priori focus on theoretical orientation was intended to identify studies with interventions that clearly ascribed to a particular orientation and not to elevate treatments with a unifying theory over multiply determined approaches. It was difficult to infer a particular orientation and interpret results comparing eclectic approaches. Even when a treatment ascribed to a primary theory, rarely did an intervention adhere exclusively to that theory or related intervention strategies. Some "borrowed" facets of various orientations; others balanced one or more perspectives. Additionally, many studies did not fully describe the key components of their interventions, making it difficult to know what actually occurred within treatment sessions and whether the therapist's actions corresponded to the purported theory.

Thus, we were able to identify three trials reported for which the driving theoretical orientation(s) were clearly differentiated or explained across the experimental and control conditions: Attachment and Biobehavioral Catch-up was compared with a didactic, nonrelationship-based approach,[32-38] and Trauma-Focused Cognitive Behavioral Therapy[48] was compared with psychodynamic child-centered treatment. Each trial showed benefit in favor of the experimental intervention.

Key Question 4. Comparison of Intervention Effectiveness for Improving Child Well-Being or Child Welfare Outcomes in Population Subgroups

Table C presents the summary of results for KQ 4. The results are a listing of interventions that showed low or moderate strength of evidence for KQ 1 or KQ 2 outcomes by subgroups.

As noted earlier, our Key Questions specified other salient child and caregiver characteristics as subgroups to examine in KQ 4; however, we identified no eligible studies for these additional areas. A number of studies excluded parents with active substance abuse or mental illness and children with documented developmental disabilities. It was particularly notable that we could not identify studies for inclusion in this KQ that attended to race or ethnicity, given the attention to racial and ethnic disparities in the child welfare arena.

Table C. Key Question 4 Summary

Subgroup/Intervention (G1)	Comparison (G2)	Mental and Behavioral Health	Caregiver-Child Relationship	Development	Safety	Placement Stability	Permanency
Age: Early Childhood	-	-	-	-	-	-	-
Attachment and Biobehavioral Catch-up	Active control	L G1>G2	L G1>G2	L G1>G2	-	-	-
Attachment and Biobehavioral Catch-up	Inactive control	L G1>G2	L G1>G2	-	-	-	-
Attachment-Based Intervention	Usual care	-	L G1>G2	-	-	-	-
Bucharest Early Intervention Project	Usual care[a]	L G1>G2	L G1>G2	L G1>G2	-	-	-

Table C. Key Question 4 Summary (continued)

Subgroup/Intervention (G1)	Comparison (G2)	Mental and Behavioral Health	Caregiver-Child Relationship	Development	Safety	Placement Stability	Permanency
Child-Parent Psychotherapy	Usual care	-	L G1>G2	-	-	-	-
Multidimensional Treatment Foster Care for Preschoolers	Usual care	L G1>G2	L G1>G2	L G1>G2	-	L G1>G2	-
New Orleans Intervention	Usual care	-	-	-	L G1>G2	-	L G1<G2
SafeCare	Usual care	-	-	-	M G1>G2	-	-
Age: Middle Childhood	-	-	-	-	-	-	-
Fostering Healthy Futures	Inactive control	L G1>G2	-	-	-	L G1>G2	L G1>G2
Age: Early Adolescence	-	-	-	-	-	-	-
Middle School Success	Usual care	L G1>G2	-	-	-	L G1>G2	-
Sex: Females							
Group Psychotherapy for Sexually Abused Girls	Active control	L G1>G2	-	-	-	-	-
Group Treatment Program for Sexual Abuse	Inactive control	L G1>G2	-	-	-	-	-
Type of Maltreatment: Neglect	-	-	-	-	-	-	-
Bucharest Early Intervention Project	Usual care[a]	L G1>G2	L G1>G2	L G1>G2	-	-	-
SafeCare	Usual care	-	-	-	M G1>G2	-	-
Type of Maltreatment: Physical Abuse	-	-	-	-	-	-	-
Combined Parent-Child Cognitive Behavioral Therapy	Active control	L G1>G2	-	-	-	-	-
Parent-Child Interaction Therapy Adaptation Package	Usual care	-	-	-	L G1>G2	-	-
Type of Maltreatment: Sexual Abuse	-	-	-	-	-	-	-
Group Psychotherapy for Sexually Abused Girls	Active control	L G1>G2	-	-	-	-	-
Group Treatment Program for Sexual Abuse	Inactive control	L G1>G2	-	-	-	-	-
Trauma-Focused Cognitive Behavioral Therapy	Active control	L G1>G2	L G1>G2	-	-	-	-
Presence of Mental or Behavioral Problems	-	-	-	-	-	-	-

Table C. Key Question 4 Summary (continued)

Subgroup/Intervention (G1)	Comparison (G2)	Mental and Behavioral Health	Caregiver-Child Relationship	Development	Safety	Placement Stability	Permanency
Combined Parent-Child Cognitive Behavioral Therapy	Active control	L G1>G2	-	-	-	-	-
Group Psychotherapy for Sexually Abused Girls	Active control	L G1<G2	-	-	-	-	-
Group Treatment Program for Sexual Abuse	Inactive control	L G1>G2	-	-	-	-	-
Trauma-Focused Cognitive Behavioral Therapy	Active control	L G1>G2	L G1>G2	-	-	-	-
Caregiving Context: Maltreating Parent	-	-	-	-	-	-	-
Attachment and Biobehavioral Catch-up	Active control	L G1>G2	L G1>G2	-	-	-	-
Attachment-Based Intervention	Usual care	-	L G1>G2	-	-	-	-
Child-Parent Psychotherapy	Usual care	-	L G1>G2	-	-	-	-
Combined Parent-Child Cognitive Behavioral Therapy	Active control	L G1>G2	-	-	-	-	-
New Orleans Intervention	Usual care	-	-	-	L G1>G2	-	L,G1<G2
Parent-Child Interaction Therapy Adaptation Package	Usual care	-	-	-	L G1>G2	-	-
SafeCare	Usual care	-	-	-	M G1>G2		-
Caregiving Context: Foster Parent	-	-	-	-	-	-	-
Attachment and Biobehavioral Catch-up	Active control	L G1>G2	L G1>G2	L G1>G2	-	-	-
Attachment and Biobehavioral Catch-up	Inactive control	L G1>G2	L G1>G2		-	-	-
Bucharest Early Intervention Project	Usual carea	L G1>G2	L G1>G2	L G1>G2	-	-	-
Keeping Foster and Kinship Parents Trained and Supported	Usual care	M G1>G2	M2 G1>G	-	-	-	M G1>G2
Middle School Success	Usual care	L G1>G2	-	-	-	L G1>G2	-
Multidimensional Treatment Foster Care for Preschoolers	Usual care	L G1>G2	L G1>G2	L G1>G2		L G1>G2	-

Abbreviations: G = group; L = low; M = moderate.

Key Question 5. Comparative Effectiveness of Interventions With Children Exposed to Maltreatment for Engaging Children and/or Caregivers in Treatment

We identified one trial in the literature relevant to KQ 5 that assessed the comparative effectiveness of a motivational intervention designed to increase maltreating parents' engagement and retention in a dyadic parenting intervention (Parent-Child Interaction Therapy, PCIT). PCIT combined with the motivational intervention yielded increased intervention engagement and retention relative to those assigned to receive PCIT with the standard CPS orientation. This finding pertaining to the impact of the motivational intervention on treatment engagement and retention was graded as having a moderate strength of evidence due to the size of the study and because it was an effectiveness trial. The PCIT-motivational intervention trial is notable both because of its strength of evidence and in light of the paucity of comparative research on treatment engagement and retention.

Key Question 6. Adverse Events Associated With Interventions for Children Exposed to Maltreatment

We included a KQ examining adverse events because there is the potential for harms, even temporary, associated with treatment of children exposed to maltreatment. Such harms may take the form of retraumatization associated with gradual exposure or caregiver distress resulting from an increased awareness of harm to a child exposed to abuse and neglect experiences. Only two trials reported an incident that the authors classified as an adverse event. Of those trials, only one reported active surveillance of adverse events, which was the inclusion criterion for KQ 6. This trial assessed the comparative efficacy of Trauma Focused-Cognitive Behavioral Therapy (TF-CBT) and nondirective supportive therapy (active control) for sexually-abused preschoolers. Fewer children in TF-CBT experienced the adverse event of removal from treatment because of persistent sexually inappropriate behavior involving another child or adult (low SOE).

Discussion

Key Findings and Strength of Evidence

Overall, the evidence from 24 trials (23 randomized and 1 nonrandomized controlled trial) and one cohort study (reported in 53 articles) included in this CER provides preliminary support for a number of promising approaches for addressing child exposure to maltreatment. Approaches varied in treatment target, intensity, modality, and theoretical conceptualizations of therapeutic change. With the exception of two interventions, KEEP and SafeCare, the body of evidence for interventions that addressed child well-being or child welfare outcomes in maltreated children was predominantly low strength of evidence or was insufficient to draw firm conclusions.

Our review illuminates major substantive and methodological gaps in the evidence and highlights critical areas for future research. To be fair, these gaps reflect the relatively new field of evidence-based mental health treatment provided in the context of the myriad and complex challenges of caring for maltreated children, engaging and retaining maltreating parents in treatment, and working within the parameters of the child welfare arena. Head-to-head studies are scarce, as are multiple or independent (i.e., tested by researchers unaffiliated with intervention developers) trials. Sample sizes are commonly very small. A major gap in the literature with implications for widespread implementation is the issue of "dose" or how much of an intervention is needed to affect change. None of the included studies addressed this issue. With the exception of studies involving younger children, few interventions were designed for or studied efficacy or effectiveness within specific age or developmental ranges. Similarly, studies rarely took into consideration or elucidated findings as they related to maltreatment type, severity, chronicity, timing, and exposure to other traumatic experiences. Also underrepresented in the literature were studies about interventions that explicitly evaluated efficacy or effectiveness with the most vulnerable and challenging-to-serve families; that is, maltreated children whose parents were struggling with issues such as substance abuse, domestic violence, and mental illness. For feasibility issues, such families were commonly excluded from a study sample.

Implications for Clinical Practice

For clinicians, the stringent criteria of this CER may raise questions about its applicability for typical practice settings such as community mental health agencies, health centers, schools, and private practices. Although there has been a groundswell of support for using evidence-based treatments, they are relatively new models that often are unfamiliar to a community practitioner. Clinicians may have relatively few intervention options meeting the criteria for greater strength of evidence described in this report. Even so, the findings presented here may encourage clinicians to consider the relative evidence for

one or another approach in a given clinical context and in their treatment decisions. The interventions highlighted as benefiting mental and behavioral health, caregiver child relationships, child development, and child welfare status represent treatment selection priorities. Studies that were included yet found to have lesser scientific support may be second-line options or represent best available options for given predisposing maltreatment events or certain clinical presentations.

We recognize that providers may turn to other interventions. The selection criteria in this review may still guide that process. Clinicians may consider the extent to which their clientele are reflected in studies of a particular intervention (i.e., sample representativeness), the relevance of study outcomes (i.e., applicability), and the extent to which they are able to adopt a practice with strong attention to fidelity. In light of the limited evidence base for efficacious or effective interventions, this report may also heighten attention in the field to adoption and effective implementation of a new practice; successful implementation depends on clinical training that is supported by adherence to a clear treatment manual, ongoing consultation in model application to clinical practice, and practice that is guided by an expert provider and trainer.[78] Outcome findings in this review may assist clinicians to fine-tune outcomes to be expected from a particular approach, modality, or level of care. On the basis of this refined knowledge, expectations may be communicated to clients to facilitate engagement and positive, realistic expectations for change. These implications are steps toward improving the relevance of research to therapists and other providers, which is critical if standards of care are to improve rather than remain static.

Implications for Policy

This report presents highly specific research that may not correspond readily to practices in real-world community settings. The two approaches for which there was strongest evidence based on effectiveness studies[25, 29, 30] were each tested in only one trial, and the SOE for most interventions included in this review was low. Given the early stage of research in the field, we caution that this report should not be taken as a guide to the selection of specific approaches for wider dissemination. Rather, the central finding of this review for policymakers and payers is the relative scarcity of evidence to guide the field in meeting the needs of this vulnerable population of children.

Two implications for policymakers are immediately evident. First, there is an urgent need for collaborative clinical trials to move the field of child maltreatment intervention research forward. A multisite clinical research network is a powerful platform that could efficiently furnish collaborative studies of sufficient quality and size to build a stronger evidence base for effective practice. The National Child Traumatic Stress Network offers an existing infrastructure that could be expanded to support and provide scientific leadership for collaborative multisite trials. Alternatively, or in addition, an existing clinical research network could be expanded or a new network formed to focus on child maltreatment intervention. Such initiatives will, in many respects, require a paradigm shift in funding to prioritize and adequately support complex research endeavors over single-site, small studies conducted by treatment developers or single research groups. It will also require a recalibration of timeframe expectations for study implementation with vulnerable populations and the creation of flexible funding mechanisms that seamlessly support the trajectory from efficacy to translation for rigorously examined interventions that show consistent, robust effects.

A second area where policymakers can have a major positive impact is in incentivizing higher quality program and administrative data that will both serve research needs and drive data-informed decision-making at the program and clinical levels. Program-record databases typically collect the minimal information pertinent to billing or other administrative needs and not necessarily case-outcome data. Field agencies that must compete for limited dollars to support their programs are rarely able to focus on systematic data or participate readily in rigorous research activities. The collection of implementation and outcome data is rarely incentivized within an agency or practice or in the form of enhanced payment rates from insurers. The end result, in a context of dwindling resources to support the cost of providing quality care, is disincentive for programs to engage in activity beyond what is specifically reimbursed.

Applicability

The evidence base primarily reflects two related contingents of maltreated children: those for whom child welfare involvement or custody represents a proxy for maltreatment, and those for whom maltreatment is concluded through clinical assessment. Each of the two approaches is subject to false negative conclusions, but at a broad level they together reflect the target population of children exposed to maltreatment. Among the studies evaluating parenting interventions with maltreating parents, exclusion criteria may have affected

the applicability of the findings in important ways. These exclusion criteria encompass parents unwilling to participate in the intervention and study, those with active substance use or abuse, those with psychiatric impairment (e.g., severe depression, psychosis), and those affected by a cognitive or neurological disability. Because these population characteristics represent baseline risks that are prevalent in the target population,[79] particularly maternal depression,[80, 81] the applicability of the evidence to the complex presentations encountered in clinical settings is somewhat limited.

The evidence base reflects the diverse range of intervention approaches in the field, which vary considerably in intensity. Those interventions with lower intensity (<12 weekly sessions or approximately 3 months in duration) or moderate intensity (13 to 24 weekly sessions or approximately 6 months in duration) may fit well with the structural needs and expectations encountered in child welfare systems operating under the strict timeline set for permanency planning under the Adoption and Safe Families Act.[82] Most studies delivered the intervention of interest under conditions more favorable than encountered in community settings. The discrepancy appeared most salient in terms of provider qualifications, as those in the experimental conditions tended to receive specialized training and close supervision from a highly specialized clinician, often the intervention developer.

More than half of the comparisons in the evidence base evaluated the efficacy or effectiveness of the intervention against an active control. Of these, 36 percent represented conventional practices in the field, and 64 percent represented derivations of other approaches. The derived approaches made assessment of applicability difficult because it was not clear whether they reflected the best alternative treatments in the field. On the contrary, in several cases the comparator was a modified version of an original model for which evidence of effectiveness exists in the scientific literature or did not appear to maintain core components of the original model with fidelity (the case in five trials).[32-38, 41, 42, 46] The derived approaches also included two that were developed to control for nonspecific aspects of the experimental intervention. As newly developed interventions, the extent to which each represented a "best" alternative treatment could not be determined.

The child welfare outcomes reported in the included studies were based on data drawn primarily from child welfare agency records. This approach may offer important insights into the integration of treatment into child welfare systems but only to the extent that records objectively, accurately, and consistently report the relevant variables within a system and across regions and states. The duration of followup to assess maltreatment recurrence (i.e., safety) was variable across studies, making it somewhat difficult to apply the findings to the already complex recurrence data in the State Child and Family Service Reviews (the data used by the Federal government to monitor State child welfare programs in meeting safety, permanency, and family and child well-being outcomes).

Research Gaps

We identified a number of important gaps in the evidence for the CER. At a broad level, studies rarely distinguished themselves as either efficacy or effectiveness trials. Power analyses were seldom presented; this finding speaks to a serious issue in the field that contributes to variability in definitions of evidence-based practice and understanding of when practices are ready for dissemination.[83] At the level of intervention, studies infrequently undertook head-to-head comparisons with named active treatments; also, studies that used a usual care comparator varied widely in the definition and content of usual care. Overall, the active control treatments varied widely within and across studies and often lacked a clear treatment rationale and specificity about procedures. Such variations, particularly when unlabeled and untested for efficacy, make it difficult to arrive at conclusions regarding comparative effectiveness. Regarding "usual care" or "services as usual" as the control intervention, which was the case for the majority of studies reviewed, no standard exists for this type of control group in the field. Thus, usual care as the control represented a problematic comparator insofar as it is an ill-defined concept.

Also, the definition of maltreatment presented a major challenge. Many of the included studies define maltreatment in terms of a child's involvement with CPS or substantiation of alleged abuse. However, identification of child symptomatology was inconsistent across studies. Typically, an intervention was based on an event (maltreatment or involvement with CPS), rather than symptomatic or functional impairment. Additionally, studies were often vague about their own inclusion criteria, which influenced our decision to restrict the review to children who had a reasonably clear history of maltreatment and to exclude at-risk or mixed populations that posed further definitional challenges. We did not encounter any study that stratified findings by children at risk or with known exposure. Many studies did not provide specific information about the type and number of events, timing, chronicity, context of children's maltreatment, or

any co-occurrence of other potentially traumatic events. We recognize that CPS records and clinical assessment protocols are subject to inaccuracy, misidentification, and omission errors; both are only as accurate as the information that has observed, reported, or inferred.

Many studies exceeded our criteria for risk of attrition bias: total study attrition above 30 percent or differential attrition between the active treatment and control groups greater than 15 percent.[84] We excluded several trials that admirably followed participants over a longer period (e.g., greater than 1 year) because too many of the participants were missing from the analysis of followup data.[85-90]

In some cases, we excluded outcomes or studies that reported only relevant outcomes assessed using measures without well-established reliability and validity. We required that outcome measures offer more than face or construct validity.

Although many studies compared baseline characteristics across study conditions, subgroup analyses to examine differential impact of the intervention were rare (e.g., by exposure type, symptom patterns and levels, severity of maltreatment, and family characteristics). Moreover, the majority of studies we reviewed failed to provide sufficient attention to differences in children's cognitive, social-emotional, and language development. Additionally, small samples precluded subgroup analyses and examination of moderating and mediating effects. As a result, we found limited evidence to assess treatment effectiveness or issues that affected treatment response by age group.

Future Research Needs

The myriad methodological, conceptual, and operational challenges to clinical research with maltreated children cannot be overcome by individual, site-specific, time-limited studies largely conducted by the developers of interventions or single research teams. To move the science forward, there clearly is a need for extensive multisite collaboration. A research network, for example, would provide the platform for efficient and methodologically rigorous collaborative clinical trials. It would allow for large enough samples to examine moderators of treatment response and to investigate subgroups for whom treatments are less, or more, efficacious or effective.[91,92] A clinical research network could be an extension of an existing structure, such as the National Child Traumatic Stress Network. A multisite collaborative would provide a powerful nexus for shared strategies and best practices that result in successful implementation of controlled research studies with vulnerable families. Specific areas for focus in future research are listed below.

Head-to-Head Trials: Additional comparative efficacy and effectiveness trials, comparing interventions with best alternative approaches, are needed to build the evidence for interventions with low strength of evidence. When studies include multiple conditions, reporting of one-to-one (pairwise) comparisons is critical.[93, 94]

Intervention Considerations: Rigorous research is needed to test adaptations of existing interventions, for which there is an established evidence base of efficacy or effectiveness, with new populations and in new settings or contexts. Adaptations may exclude or substantially modify components of an original version resulting in fundamental changes relative to the original intervention. Thus, research on adaptations demands particularly close attention on the part of the researcher to therapist- and participant-level characteristics, as well as other factors (e.g., setting, timing). The paucity of relevant contrasts for KQ 3 suggests a need for a qualitative analysis of the literature to identify treatment characteristics that are relevant to and useful for the field. In the course of our review, we noted the distinction between and unequal attention paid to specific techniques (e.g., intervention-specific strategies and content) in relation to factors that may be common across interventions, at the level of client-therapist interactions (e.g., therapeutic relationship, personal characteristics of therapist and patient, engagement). The latter may be essential to understanding treatment efficacy or effectiveness and merits further attention.[95-97]

Assessment of Clinical Need: The use of common and validated measures for identifying symptomatology to define clinical need is a major omission undermining the strength of the evidence base. Greater coalescence around such measures will help future reviews generalize findings across studies and settings and help achieve consensus in the field around effective and ineffective interventions. Additional research is particularly needed to determine the relative benefits of various interventions across age subgroups.

Outcomes: Future research should pay heightened attention to the consistent use of measures with well-established validity, particularly assessment of improvement in the caregiver-child relationship. Assessment of longer-term outcomes is also scarce in the existing literature; future research should assess the duration of symptom remission or functional improvement, generalization of outcomes from one setting to another, outcome variability according to clinically heterogeneous subgroups, and subsequent retraumatization. Among child welfare outcomes, permanency warrants improved measurement. Currently, outcomes generally reflect study constraints rather than the desired outcome of a constant, stable relationship

with a parent or caregiver who comes to love and accept responsibility for a maltreated child.

Research on Engagement/Retention: We were able to find only one comparative study for inclusion in this review relevant to the issue of engagement and retention. Future research could compare interventions in terms of retention or examine features of interventions associated with engagement and retention.

Study Design and Reporting: Researchers should review and use the Consolidated Standards of Reporting Trials (CONSORT) statement to ensure the greatest clarity in reporting of trials.[98] Future studies need to be adequately powered and statistical power calculations presented. Trials in this field do not typically blind participants or providers, but future studies should make every effort to blind outcome assessors to reduce the risk of detection bias.

Statistical Considerations: Even with concerns about limited sample sizes and attrition, few studies in the literature included an intention to treat (ITT) analysis. ITT analysis may not be useful when differential attrition exists across study conditions, as was often the case for the maltreatment studies we reviewed. However, in cases where there is not high differential attrition, ITT analysis helps to avoid the error of incorrectly attributing effectiveness to an intervention that actually may result from underlying differences in the final study groups. More consistent use and clear reporting of ITT analysis would enhance the interpretability and generalizability of study findings. Other concerns related to statistical analyses and inferences pertain to the need to control for multiple comparisons and limit post-hoc analyses. Future studies should account for multiple comparisons and clearly state planned statistical analyses. In complex multifactorial interventions, planned statistical analyses should include the assessment of mediators and moderators.

Beyond these particular statistical issues, a more fundamental question that merits increased attention in future research is how scientists should approach probabilistic estimates of effects and how to express confidence in their findings. Across the scientific literature we reviewed, researchers used only a classical/frequentist approach to hypothesis testing that views probability as the likelihood of a given result's being true or false; a null hypothesis is rejected or accepted with a certain probability of an accurate conclusion or "true effect." Relying on p-values to assess whether a research finding is true may be subject to inherent error associated with small sample sizes and extensive heterogeneity of design, definitions, and outcomes, among other considerations.[99] Hence, the use of alternate statistical analyses, namely Bayesian methods, may be warranted in future research because of the complexity of the population and heterogeneity of clinical need.

Implementation and Sustainability Research: Rigorous study of implementation and issues related to maintenance of an intervention is needed. Fidelity to the intervention model was infrequently reported and sparse in detail in the current literature. Research on lower intensity interventions and factors that affect accessibility for this vulnerable population is particularly needed, along with increased attention to "dose" or how much of an intervention is needed to effect change. Because most mental health care is based on service reimbursement, future research should take into account the interplay of treatment model and structure, service definitions, utilization management, treatment authorization, and claims submission and authorization.

Conclusions

Maltreatment intervention research, particularly comparative research, remains a relatively nascent field. Much of the research relies on relatively small samples and has limited statistical power, so data cannot be stratified according to subgroups or considered in terms of potential mediators and moderators of effect (e.g., age, type and chronicity of maltreatment). It is important to note that low or insufficient strength of evidence is not equivalent to a judgment of an intervention as ineffective. Rather it reflects the justifiable state of affairs where many promising or widely used approaches have not been the subjects of empirical study with maltreated children. This review draws attention to the herculean efforts involved in conducting high-quality trials of mental health and psychosocial interventions, a challenge that is potentiated with the vulnerable, maltreated population that is the focus of this review.

Although several interventions emerged with evidence to support their comparative efficacy or effectiveness, the strength of the evidence was low for the vast majority of outcomes. Consequently, our main finding was that the literature in this field is strikingly limited due to numerous substantive and methodological gaps. These limitations include (a) the predominance of single trials conducted by the treatment developers testing unique interventions that often employ strategies very similar to those of other approaches, (b) usual care or wait-list controls rather than head-to-head comparisons, (c) short-term outcomes, (d) inadequate reporting of attrition, and (e) wide heterogeneity in type and psychometric soundness of outcome measurement across studies.

Thus, this review serves as an urgent call for improving and building the evidence base for interventions to promote the well-being of maltreated children. A multisite research network is a powerful platform that could facilitate the conduct of large, methodologically rigorous comparative efficacy and effectiveness trials needed to move the field forward. More broadly, a paradigm shift is required on the part of researchers and funders alike to galvanize the commitment and resources necessary for conducting collaborative clinical trials with these particularly vulnerable children and families.

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Full Report

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