Draft Systematic Review

Number xx

Psychosocial and Pharmacologic Interventions for Disruptive Behavior in Children and Adolescents: A Systematic Review

Prepared for:
Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
5600 Fishers Lane
Rockville, MD 20857
www.ahrq.gov

Contract No. [To be included in the final version.]

Prepared by:
[To be included in the final version.]

Investigators:
[To be included in the final version.]

AHRQ Publication No. xx-EHCxxx
<Month Year>

This report is based on research conducted by the XXXX Evidence-based Practice Center (EPC) under contract to the Agency for Healthcare Research and Quality (AHRQ), Rockville, MD (Contract No. XXX-20XX-XXXXX). The findings and conclusions in this document are those of the authors, who are responsible for its contents; the findings and conclusions do not necessarily represent the views of AHRQ. Therefore, no statement in this report should be construed as an official position of AHRQ or of the U.S. Department of Health and Human Services.

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

The information in this report is intended to help healthcare decision makers—patients and clinicians, health system leaders, and policymakers, among others—make well-informed decisions and thereby improve the quality of healthcare 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.

Suggested citation: [To be included in the final version.]

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 healthcare in the United States. These reviews provide comprehensive, science-based information on common, costly medical conditions, and new healthcare 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 https://effectivehealthcare.ahrq.gov/about/epc/evidence-synthesis

AHRQ expects that these systematic reviews will be helpful to health plans, providers, purchasers, government programs, and the healthcare system as a whole. Transparency and stakeholder input are essential to the Effective Health Care Program. Please visit the website (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.

If you have 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, 5600 Fishers Lane, Rockville, MD 20857, or by email to epc@ahrq.hhs.gov.

Robert Otto Valdez, Ph.D., M.H.S.A
Director
Agency for Healthcare Research and Quality

Therese Miller Ph.D.
Director
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

Christine Chang, M.D., M.P.H.
Director
Evidence-based Practice Center Program
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

Meghan Wagner, Pharm.D., M.B.A.
Task Order Officer
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

Anjali Jain, M.D.
Task Order Officer
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

Acknowledgments

[To be included in the final version.]

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 $5,000 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.

The list of Key Informants who provided input to the report will be included in the final version.

Technical Expert Panel

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 healthy 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 $5,000 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.

The list of Technical Experts who provided input to the report will be included in the final version.

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 do not necessarily represent the views of individual reviewers. AHRQ may also seek comments from other Federal agencies when appropriate.

Peer Reviewers must disclose any financial conflicts of interest greater than $5,000 and any other relevant business or professional conflicts of interest. Because of their unique clinical or content expertise, individuals with potential non-financial conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any potential non-financial conflicts of interest identified.

The list of Peer Reviewers who reviewed the report will be included in the final version.

Psychosocial and Pharmacologic Interventions for Disruptive Behavior in Children and Adolescents

Abstract

Objectives. To determine the most effective treatments for disruptive behavior disorders in children and adolescents.

Data sources. Ovid® MEDLINE®, the Cochrane Library, PsycINFO®, and Embase® databases were searched from 2014 to March 7, 2023. Additionally, we reviewed all studies included in the prior 2015 Agency for Healthcare Research and Quality review.

Review methods. We dual reviewed abstracts and full-text articles; data extraction was checked by a second reviewer; risk of bias and strength of evidence were assessed by two reviewers; and disagreements were resolved by consensus.

Results. For this review, 152 studies in 179 publications (145 randomized controlled trials [RCTs] and 7 nonrandomized studies) met inclusion criteria.

Psychosocial interventions: Multicomponent interventions (parent or teacher plus child) substantially reduced parent-reported disruptive behavior more than usual care or waitlist in preschool children (10 RCTs, N=784, standard mean difference [SMD] -0.96, 95% confidence interval [CI] -1.39 to -0.60) and moderately reduced disruptive behavior in school-age children (9 RCTs, N=524, SMD -0.61, 95% CI -1.05 to -0.10). Similarly, interventions that involved the parent only and not the child also moderately reduced parent-reported disruptive behavior in preschool children (13 RCTs, N=1,222, SMD -0.61, 95% CI -0.99 to -0.31) and slightly reduced disruptive behavior in school-age children (6 RCTs, N=842, SMD -0.39, 95% CI -0.63 to -0.19). Comparisons between psychosocial interventions generally showed only minor differences in disruptive behaviors in preschool and school-age children. Findings in adolescents for multicomponent and child-only interventions versus usual care and waitlist and versus another intervention were mixed. Through pairwise, indirect, and network meta-analyses, we were not able to determine whether multicomponent, parent-only, or child-only interventions are superior overall, though there was less evidence in child-only interventions and interventions in adolescents.

Pharmacologic interventions: There was limited evidence to support the use of stimulants and/or antipsychotics for disruptive behavior disorders in selected children. Treatment response was more likely with stimulant treatment alone (2 RCTs) or with add-on risperidone (2 RCTs) compared to placebo. Study withdrawal due to adverse events was higher with any pharmacotherapy relative to placebo (6 RCTs, N=911, RR 3.44, 95% CI 1.35 to 8.75)

Evidence was insufficient to determine whether psychosocial, pharmacological, or a combination of psychological and pharmacological interventions are more effective in reducing disruptive behaviors in children and adolescents. Evidence was also inconsistent or insufficient to determine if benefits and harms of treatment interventions varied based on patient, clinical, or treatment characteristics, or treatment history.

Conclusions. Multicomponent psychosocial interventions (parent or teacher plus child) and parent-only psychosocial interventions were better than treatment as usual or waitlist at reducing parent report of child disruptive behaviors for preschool and school-age children immediately post-treatment. In these children, direct and indirect comparisons of multicomponent, parent-only, and child-only interventions generally found no or only minor differences in reducing disruptive behaviors, although effectiveness differed by specific psychosocial intervention. Results of multicomponent interventions and child-only interventions were mixed in adolescents and studies in adolescents were few. Pharmacotherapy may be helpful in reducing disruptive behaviors in some children who have inadequate response to psychosocial interventions, but use was also associated with an increased risk of experiencing any adverse event. For all age groups, evidence for some psychosocial interventions and all pharmacological interventions was limited, as was reporting of long-term outcomes. Additional research is needed to aid the clinician in selecting the intervention most likely to be effective in reducing disruptive behaviors well beyond treatment completion.

Contents

Tables

Figures

Appendixes

Executive Summary

Main Points

- When pooled, multicomponent (parent or teacher plus child) psychosocial interventions were better than usual care or waitlist in reducing parent-reported disruptive behavior measures in preschool and school-age children when assessed immediately post-treatment (strength of evidence [SOE]: Moderate).
- Parent-only psychosocial interventions were better than usual care or waitlist in reducing disruptive behavior in preschool (SOE: Moderate) and school-age children (SOE: Low) when assessed immediately post-treatment.
- Evidence for multicomponent interventions and child-only psychosocial interventions versus usual care or waitlist was mixed in adolescents; likewise, comparisons of psychosocial interventions also yielded mixed results in adolescents. (SOE: Low to Insufficient)
- We were unable to determine whether multicomponent, parent-only, or child-only interventions are most effective in reducing disruptive behaviors (SOE: Insufficient).
- Evidence for some psychosocial interventions and for longer-term treatment effects was limited (SOE: Low to Insufficient).
- We were unable to determine whether psychosocial, pharmacological, or a combination of psychological and pharmacological interventions are more effective in reducing disruptive behaviors in children and adolescents (SOE: Insufficient).
- Stimulant plus add-on risperidone therapy and nonstimulant therapy was associated with reduced disruptive behaviors in some children compared with placebo, but pharmacotherapy was associated with a small increase in the risk of experiencing any adverse event (SOE: Low).
- Evidence for differential benefit and harms of interventions based on patient, clinical, and treatment characteristics and treatment history was inconsistent or insufficient.

Background and Purpose

In childhood and adolescence, disruptive behaviors are a common reason for childhood referral to mental health services.[1] Using the 2016 National Survey of Children's Health (N=43,283 children aged 3-17), the prevalence of current disruptive behaviors/conduct problems was 7.4 percent (compared with 7.1% for anxiety and 3.2% for depression).[2] Included in this review are studies in children and adolescents formally diagnosed with a disruptive behavior disorder (DBD), such as oppositional defiant disorder (ODD), conduct disorder (CD), and intermittent explosive disorder (IED) and studies in children and adolescents with clinically significant disruptive behavior who may not be formally diagnosed with a DBD. Key decisional dilemmas for this review include determining the most effective treatments (while weighing benefits and harms) for DBDs and disruptive behaviors and determining if any child/adolescent, clinical, or treatment characteristic or treatment history impacts the benefits and harms of treatment.

In 2015, Agency for Healthcare Research and Quality (AHRQ) published a comparative effectiveness review on psychosocial and pharmacologic interventions for disruptive behavior disorders in children and adolescents.[3] The present review builds on AHRQ's 2015 review, and

includes reanalysis of studies included in that review and more recently published evidence for psychosocial and pharmacological treatments for DBDs in order to guide clinical practice and provide the evidence base for guideline development.

Methods

The methods for this systematic review followed AHRQ Methods Guide for Effectiveness and Comparative Effectiveness Reviews (https://effectivehealthcare.ahrq.gov/products/cer-methods-guide/overview).[4] The study Key Questions and an abridged table of inclusion and exclusion criteria are below. The full version of both is available in the appendixes. Three contextual questions on disparities in diagnosis, treatment, and outcomes of treatment are also included in the full report.

Key Question 1. In children under 18 years of age with disruptive behaviors, which **psychosocial** interventions are effective for improving psychosocial outcomes compared to no treatment or other psychosocial interventions?

Key Question 2. In children under 18 years of age with disruptive behaviors, which **pharmacologic** interventions are effective for improving psychosocial outcomes compared to placebo or other pharmacologic interventions?

Key Question 3. In children under 18 years of age with disruptive behaviors, what is the relative effectiveness of **psychosocial** interventions alone compared with **pharmacologic** interventions alone for improving psychosocial outcomes?

Key Question 4. In children under 18 years of age with disruptive behaviors, are **combined psychosocial and pharmacologic** interventions more effective for improving psychosocial outcomes compared to either psychosocial or pharmacologic interventions alone?

Key Question 5. What are the **harms** associated with treating children under 18 years of age for disruptive behaviors with either psychosocial, pharmacologic or combined interventions?

Key Question 6 (edited for length). Do interventions for disruptive behaviors differ in effectiveness and harms based on **patient characteristics, clinical characteristics, treatment characteristics, and treatment history**?

Contextual Question 1**.** What are the disparities in the diagnosis of disruptive behavior disorders (based on characteristics such as gender, race/ethnicity, socioeconomic status, other social determinants of health, or other factors) in children and adolescents?

Contextual Question 2. What are the disparities in the treatment of disruptive behaviors or disruptive behavior disorders (based on characteristics such as gender, race/ethnicity, socioeconomic status, other social determinants of health, or other factors) in children and adolescents?

Contextual Question 3. How do disparities in the diagnosis and treatment of disruptive behaviors or disruptive behavior disorders affect behavioral and functional outcomes (e.g., compliance with teachers, contact with the juvenile justice system, substance abuse)?

Table ES-1. PICOTS: Inclusion and exclusion criteria (edited for length)

PICOTS	Inclusion	Exclusion
Population	**KQs 1-6.** Children under 18 years of age with disruptive behavior such as aggression, defiance, and violence or diagnosed with a disruptive behavior disorder	Asymptomatic children
Interventions	**KQs 1, 3-6.** Psychosocial interventions for child, parents/family, or both **KQs 2-6.** Pharmacologic interventions **KQs 4-6.** Combined psychosocial and pharmacologic interventions	Specialized diet or dietary supplements Speech, occupational, physical therapy, other interventions
Comparators	Other included psychosocial or pharmacologic intervention; inactive treatment including waitlist control, no treatment, usual care, and placebo	No comparison group, excluded interventions
Outcomes	**KQs 1-4, 6.** Behavioral outcomes including aggressive behavior and violent behavior **KQs 1-4, 6.** Functional outcomes such as interactions with the juvenile justice system and out of home placement **KQ 5, 6.** Adverse effects/harms	
Timing	**KQs 1-6.** Any length of followup	
Setting	**KQs 1-6.** Clinical settings	Exclude school wide or system wide settings
Study Design	RCTs, comparative nonrandomized trials that adjust for confounding variables (N≥100)	Published before 1994

Abbreviations: KQ = Key Question; PICOTS = populations, interventions, comparators, outcomes, timing, setting, and study design; RCT = randomized controlled trial

Literature searches. Ovid® MEDLINE®, the Cochrane Library, PsycINFO®, and Embase® were searched from 2014 (end of search for prior review) to March 7, 2023.

Data analysis and synthesis. Pooled analyses were conducted using a random effects model based on the profile likelihood method[5] to obtain pooled standard mean difference and mean difference.[6] A network meta-analysis was also conducted for psychosocial interventions but was limited due to inconsistency between direct and indirect findings.

Results

A total of 152 studies (in 179 publications) were included in this review. From 44 studies in preschool children and 71 studies in school-age children, multicomponent interventions (parent or teacher plus child) and parent-only interventions resulted in greater improvement on parent-reported disruptive behaviors scales than treatment as usual or waitlist. However, it was not clear whether multicomponent interventions, parent-only, or child-only interventions lead to greater reductions in disruptive behaviors.

There were 17 studies conducted in adolescents and results were mixed for multicomponent interventions and child-only interventions versus treatment as usual or waitlist, making it difficult to conclude that any one intervention or intervention type is preferred for reducing disruptive behaviors. Due to the heterogeneity of the interventions and outcomes reported, it

remains unclear whether multicomponent interventions or child-only interventions result in greater reduction in disruptive behaviors in this age group. Across age groups, most trials that compared active psychosocial interventions found no differences between interventions.

Table ES-2. Summary of findings table for ECBI and CBCL scores in studies of psychosocial interventions versus TAU/waitlist

Age Category	Intervention-Type vs. TAU/Waitlist Timeframe[a]	ECBI Intensity Scores/ CBCL Externalizing Scores	ECBI Problem Scores
Preschool	Parent-only Posttreatment	Moderate effect ++	Moderate effect ++
	Parent-only Short term	Moderate effect +	Large effect +
	Parent-only Intermediate term	Small effect +	Small effect +
	Multicomponent Posttreatment	Large effect ++	Large effect +
	Multicomponent Long term	No effect +	Insufficient evidence
School-age	Parent-only Posttreatment	Small effect +	Moderate effect +
	Parent-only Short term	Moderate effect +	Small effect +
	Parent-only Intermediate term	Small effect +	Insufficient evidence
	Parent-only Long term	Small effect +	Small effect +
	Multicomponent Posttreatment	Moderate effect ++	Moderate effect +
	Multicomponent Short term	Moderate effect +	No evidence
	Multicomponent Intermediate term	Small effect +	No evidence
	Multicomponent Long term	Small effect +	No evidence
School-age (continued)	Child-only Posttreatment	Large effect +	No evidence
Adolescent	Multicomponent Multisystemic Therapy Posttreatment	No effect +	No evidence
	Multicomponent Multisystemic Therapy Short term	No effect +	No evidence
	Multicomponent Family Therapy Short term	Large effect +	No evidence
	Child-only	No evidence	No evidence

Abbreviations: CBCL = Child Behavior Checklist; CI = confidence interval; ECBI = Eyberg Child Behavior Inventory; MD = mean difference; RCT = randomized controlled trial; SMD = standardized mean difference; SOE = strength of evidence; TAU = treatment as usual

+ = low strength of evidence; ++ = moderate strength of evidence

[a] Short term: ≤24 weeks; intermediate term: 25-47 weeks; long term: ≥48 weeks

In trials of pharmacotherapy, stimulants and/or antipsychotics performed moderately better than placebo in reducing aggression in the short term, based on treatment response. Evidence for other pharmacologic interventions was too sparse to draw conclusions.

One study each provided insufficient evidence on whether treatment with psychosocial or pharmacologic intervention resulted in greater reduction in disruptive behaviors or whether combined treatment with psychosocial plus pharmacologic interventions is superior to either treatment alone. There was also insufficient evidence to evaluate the extent to which patient or family characteristics, clinical characteristics, treatment characteristics, or patient history may modify treatment response based on author reports.

While very few studies of psychosocial interventions mentioned adverse events during or after treatment, 17 trials of pharmacotherapy reported harms. Pharmacologic interventions were associated with a large increase in the likelihood of withdrawal from the study due to adverse events compared with placebo and a small increase in the risk of experiencing any adverse event versus placebo. Serious adverse events were infrequently reported with no clear difference between any pharmacotherapy and placebo.

Evidence was inconsistent or insufficient to determine differential treatment benefits and harms based on patient, clinical, or treatment characteristics, or treatment history.

The contextual questions on disparities, while not examined systematically, found numerous studies of DBD diagnostic disparities based on patient characteristics, including gender, race, and socioeconomic status (SES).[7-13] In general, studies found that boys are more likely than girls, Black and Hispanic children are more likely than White children, and children with low SES are more likely that those with higher SES to receive a DBD diagnosis. Evidence on treatment disparities was more limited but suggests Black or Hispanic children and children with low SES are less likely to receive DBD treatment relative to White children and children with higher SES.[14] We did not identify any studies directly addressing how these DBD diagnostic and treatment disparities affect behavioral or functional outcomes.

Limitations of the Evidence Base

While there was moderate-strength evidence that, when pooled, multicomponent and parent-only psychosocial interventions in preschool children and multicomponent interventions in school-aged children are better than usual care or waitlist at reducing disruptive behaviors when assessed immediately post-treatment, not all interventions demonstrated benefit and benefit was often not sustained or not reported long term. There was substantial heterogeneity across age groups regarding criteria and methods of population enrollment (e.g., primary diagnosis, concomitant diagnoses), as well as substantial heterogeneity in psychosocial treatments (and how they were delivered) and outcome measures reported, which made it challenging to draw definitive conclusions. Studies also did not report how representative the enrolled sample population was to the population of children and adolescents with disruptive behaviors.

Implications for Clinical and Policy Decisions

Findings from this review indicate that psychosocial interventions provide greater reductions in parent-reported disruptive behavior than no treatment or usual care in preschool and school-aged children immediately post treatment. Because long-term evidence was often lacking or sparse, treatment should include routine followup to ensure sustainability of benefits.

Interventions were generally more successful in preschool and school-age children compared with adolescents, which supports early treatment. Additionally, results did not differ based on the presence or absence of a formal disruptive behavior diagnosis, indicating that treatment may be helpful in children who score above the clinical threshold on behavioral instruments without a DBD diagnosis.

Additional efforts are be needed to ensure Black and non-Hispanic White children are appropriately diagnosed and treated for DBDs, which includes addressing barriers such as lack of parent education about the condition and access to culturally-competent care.

Select children may also benefit from pharmacotherapy when psychosocial interventions alone are inadequate.

Conclusions

Multicomponent (parent or teacher plus child) psychosocial interventions and parent-only psychosocial interventions were better than treatment as usual or waitlist at reducing parent report of child disruptive behaviors for preschool and school-age children immediately post-treatment. In these children, direct and indirect comparisons of multicomponent, parent-only, and child-only interventions generally found no or only minor differences in reducing disruptive behaviors, although effectiveness differed by specific psychosocial intervention. Results of multicomponent interventions and child-only interventions were mixed in adolescents and studies in adolescents were few. Pharmacotherapy may be helpful in reducing disruptive behaviors in some children who have inadequate response to psychosocial interventions alone, but pharmacotherapy was associated with an increased risk of experiencing any adverse event. For all age groups, evidence for some psychosocial interventions and all pharmacological interventions was limited as was reporting of long-term outcomes. Additional research is needed to aid the clinician in selecting the intervention most likely to reduce disruptive behaviors well beyond treatment completion.

1. Introduction

1.1 Background

In childhood and adolescence, disruptive behaviors are a common reason for childhood referral to mental health services.[1] Using the 2016 National Survey of Children's Health (N=43,283 for children aged 3-17), the prevalence of current disruptive behaviors/conduct problems was 7.4 percent (compared with 7.1% for anxiety and 3.2% for depression).[2] Included in this review are studies in children and adolescents formally diagnosed with a disruptive behavior disorder (DBD), such as oppositional defiant disorder (ODD), conduct disorder (CD), and intermittent explosive disorder (IED) and studies in children and adolescents with clinically significant disruptive behavior who may not be formally diagnosed with a DBD.

The core features of DBDs are problems in self-control of emotions and behaviors. For example, the prominent feature of ODD is a persistent pattern (at least 6 months) of angry or irritable mood, argumentative or defiant behavior, or vindictiveness which is exhibited during an interaction with nonsiblings.[15] Individuals with IED frequently fail to control their aggressive impulses and react with physical or verbal aggression grossly out of proportion to the provocation and the outbursts are not premeditated. Conduct disorder is associated with the violation of others' rights or major societal norms and can include physical aggression, property destruction, theft, and/or serious violation of rules. The behaviors characteristic of DBD often lead to difficulties in multiple domains of functioning including social, academic, and occupational. To meet diagnostic criteria, these behaviors must cause impairments in the child's or adolescent's functioning at home, at school, or with peers. Disobedient and negative behavior can be normative at certain stages of development or in special circumstances, and isolated incidents of antisocial or criminal acts are not sufficient to support a diagnosis of ODD or CD. In contrast, DBDs are characterized by behaviors that are more severe and frequent than normally expected and result in significant functional impairment. The cause(s) of DBDs in children and adolescents are not fully understood but are likely often multi-factorial, with risk factors including genetic, environmental, and experiential factors such as parental psychopathology and/or substance use, parenting style, low socioeconomic status (SES), and exposure to violence and adverse childhood experiences (ACEs).[16-20] Having multiple risk factors is associated with increased likelihood of DBDs.[18,19,21] Co-occurrence of other mental health/neurodevelopmental disorders is common in DBDs. For example, individuals with a lifetime diagnosis of ODD have a nearly 70 percent rate of comorbidity with other behavioral disorders such as attention-deficit/hyperactivity disorder (ADHD), CD, and IED and have high rates of substance use, depressive, and anxiety disorders.[22] Sixteen to twenty percent of people with CD also have comorbid ADHD and 45 to 70 percent of adolescents with CD go on to develop antisocial personality disorder.[22,23]

Some studies report disparities in the diagnosis and treatment of DBDs due to such factors as gender, race/ethnicity, and SES, suggesting that diagnosis (and subsequent treatment) may be subject to observer bias. For example, several studies have found that Black children who exhibit disruptive behaviors are more likely to be diagnosed with ODD than White children who engage in similar behaviors, while White children are more likely to be diagnosed with ADHD than Black children.[10,12,24] These differences in identifying children with a DBD or disruptive behaviors, which are observer and context dependent, disproportionately affect minority children; the diagnosis impacts the child's treatment options and the child may also experience

long-term consequences related to the negative associations with being diagnosed with a DBD as opposed to a less-stigmatized diagnosis (e.g., adjustment disorder, autism, ADHD).[7]

Treatment of DBDs include psychosocial interventions such as parent training, individual and family psychotherapy, psychosocial education, pharmacotherapy for the child, or a combination of psychosocial and pharmacological interventions.[25,26] Psychosocial interventions may focus on guiding the parent in their perceptions of themselves, the child, and best way to interact with the child, especially in managing problem behaviors. Examples of parent-only psychosocial interventions include Incredible Years, Positive Parenting Program (Triple P), Helping the Noncompliant Child, and Tuning into Kids, among others. For this review, the term "multicomponent" refers to the parent or teacher plus the child as the focus of the intervention. Other psychosocial interventions include both the parent (or teacher) and the child in the intervention and include Parent-Child Interaction Therapy (PCIT), family therapy, and Multisystemic Therapy. The child alone is the focus of other psychosocial interventions, used most often in older children, such as play therapy, Specific Skills Training, and cognitive behavioral therapy (CBT). Pharmacotherapy primarily involves the use of stimulants and antipsychotics, although mood stabilizers, antiseizure medications, and selective norepinephrine reuptake inhibitors (atomoxetine) are also used.

Key decisional dilemmas for this review include determining the most effective treatments (while weighing benefits and harms) for DBDs and disruptive behaviors; determining if any child/adolescent characteristic, clinical characteristic, treatment characteristics, or treatment history impacts the benefits and harms of treatment; and assessing the presence and extent of disparities in the diagnosis and treatment of DBDs and their effect on psychosocial outcomes.

1.2 Purpose and Scope of the Systematic Review

In 2015, Agency for Healthcare Research and Quality (AHRQ) published a comparative effectiveness review on psychosocial and pharmacologic interventions for disruptive behavior disorders in children and adolescents.[3] The present review builds on AHRQ's 2015 review, and includes reanalysis of studies included in that review and more recently published evidence for psychosocial and pharmacological treatments for DBDs in order to guide clinical practice and provide the evidence base for guideline development. The Patient-Centered Outcomes Research Institute (PCORI) partnered with the American Academy of Pediatrics (AAP) and contracted with AHRQ to conduct the review. The purpose for this review is to inform an update to the AAP's policy statement on Addressing Early Childhood Emotional and Behavioral Problems.

2. Methods

2.1 Review Approach

The methods for this systematic review followed Agency for Healthcare Research and Quality (AHRQ) *Methods Guide for Effectiveness and Comparative Effectiveness Reviews* (https://effectivehealthcare.ahrq.gov/products/cer-methods-guide/overview).[4] This systematic review is in accordance with the Preferred Items for Reporting in Systematic Reviews and Meta-Analyses (PRISMA).[27] A detailed description of the methods can be found in **Appendix A**; the literature search strategies can be found in **Appendix B**; the literature flow diagram can be found in **Appendix C**; the evidence tables can be found in **Appendix D**; the risk of bias tables can be found in **Appendix E**; the detailed results for preschool children can be found in **Appendix F**; descriptions of common psychosocial interventions can be found in **Appendix G**; the detailed results for school age children can be found in **Appendix H**; the detailed results for adolescents can be found in **Appendix I**; details on the network meta-analysis can be found in **Appendix J**; detailed results on Key Question 2 can be found in **Appendix K**; detailed results on Key Question 5 can be found in **Appendix L**; detailed results on Key Question 6 can be found in **Appendix M**; detailed results on the Contextual Questions can be found in **Appendix N**; strength of evidence tables can be found in **Appendix O**; a list of the included studies can be found in **Appendix P**; and a list of the excluded studies can be found in **Appendix Q**. This report adhered to the PCORI Methodology Standards Checklist, which can be found in **Appendix R.**

2.1.1 Key Questions

AHRQ posted the Key Questions on the AHRQ Effective Health Care Website for public comment from January 10, 2023, to January 31, 2023. We received 50 public comments from 11 individuals and organizations. Organizations commenting included the National Institute of Mental Health, the American Academy of Child and Adolescent Psychiatry and the National Association of State Directors of Developmental Disabilities Services. In general, commenters expressed that the proposed Key Questions are important ones and were pleased at efforts to assess treatment effects by patient demographics and clinical characteristics, as well as by treatment characteristics and treatment history. Most comments involved requests to look at additional factors that may affect treatment success or to add additional outcomes. Based on public comments we clarified that intermittent explosive disorder (IED) is an included diagnosis in the populations, interventions, comparators, outcomes, timing, setting, study design (PICOTS) table (under population). We also reworded Key Questions 1-4 for clarity.

A Technical Expert Panel (TEP) also reviewed the Key Questions, PICOTS inclusion and exclusion criteria, and the intended approach. The Key Questions and inclusion/exclusion criteria were further modified based on input with 10 TEP members (that included two Federal partners).

Overall, public and TEP comments did not lead to a need for substantial changes to the intended approach. The final protocol was posted on the Effective Health Care website on March 23, 2023 (https://effectivehealthcare.ahrq.gov/products/disruptive-behavior/protocol) and registered on PROSPERO (CRD42023412751).

Key Question 1. In children under 18 years of age with disruptive behaviors, which psychosocial interventions are effective for improving short-term and long-term psychosocial outcomes compared to no treatment or other psychosocial interventions?

Key Question 2. In children under 18 years of age with disruptive behaviors, which pharmacologic interventions are effective for improving short-term and long-term psychosocial outcomes compared to placebo or other pharmacologic interventions?

Key Question 3. In children under 18 years of age with disruptive behaviors, what is the relative effectiveness of psychosocial interventions alone compared with pharmacologic interventions alone for improving short-term and long-term psychosocial outcomes?

Key Question 4. In children under 18 years of age with disruptive behaviors, are combined psychosocial and pharmacologic interventions more effective for improving short-term and long-term psychosocial outcomes compared to either psychosocial or pharmacologic interventions alone?

Key Question 5. What are the harms associated with treating children under 18 years of age for disruptive behaviors with either psychosocial, pharmacologic or combined interventions?

Key Question 6.

Key Question 6a. Do interventions for disruptive behaviors vary in effectiveness and harms based on patient characteristics, including gender, age (including pubertal changes and use of oral contraceptives), racial/ethnic minority, LGBTQ+ status, English proficiency, health literacy, socioeconomic status, insurance status, rural versus urban, developmental status or delays, family history of disruptive behavior disorders or other mental health disorders, prenatal use of alcohol and drugs (specifically methamphetamine), history of trauma or Adverse Childhood Experiences (ACEs), parental ACEs, access to social supports (neighborhood assets, family social support, worship community, etc.), personal and family beliefs about mental health (e.g. stigma around mental health), or other social determinants of health?

Key Question 6b. Do interventions for disruptive behaviors vary in effectiveness and harms based on clinical characteristics or manifestations of the disorder, including specific disruptive behavior (e.g., stealing, fighting) or specific disruptive behavior disorder (e.g., oppositional defiant disorder, conduct disorder), co-occurring

behavioral disorders (e.g., attention deficit hyperactivity disorder, autism spectrum disorder, internalizing disorders), related personality traits and symptom clusters, presence of non-behavioral comorbidities, age of onset, and duration?

Key Question 6c. Do interventions for disruptive behaviors vary in effectiveness and harms based on treatment history of the patient?

Key Question 6d. Do interventions for disruptive behaviors vary in effectiveness and harms based on characteristics of treatment, including setting (e.g., group homes, residential treatment, family setting), duration, delivery, timing, and dose?

2.1.2 Contextual Questions

Following the methods of the U.S. Preventive Services Task Force (USPSTF),[28] Contextual Questions represent issues in a review for which a valid, but not necessarily systematic, summary of current research is needed in order to provide context on the issue.

Contextual Question 1. What are the disparities in the diagnosis of disruptive behavior disorders (based on characteristics such as gender, race/ethnicity, socioeconomic status, other social determinants of health, or other factors) in children and adolescents?

Contextual Question 2. What are the disparities in the treatment of disruptive behaviors or disruptive behavior disorders (based on characteristics such as gender, race/ethnicity, socioeconomic status, other social determinants of health, or other factors) in children and adolescents?

Contextual Question 3. How do disparities in the diagnosis and treatment of disruptive behaviors or disruptive behavior disorders affect behavioral and functional outcomes (e.g., compliance with teachers, contact with the juvenile justice system, substance abuse)?

2.1.3 PICOTS

Table 1 describes the PICOTS criteria that was used to screen studies. See **Appendix Table A-1** for the full PICOTS table.

Table 1. PICOTS: Inclusion and exclusion criteria (edited for length)

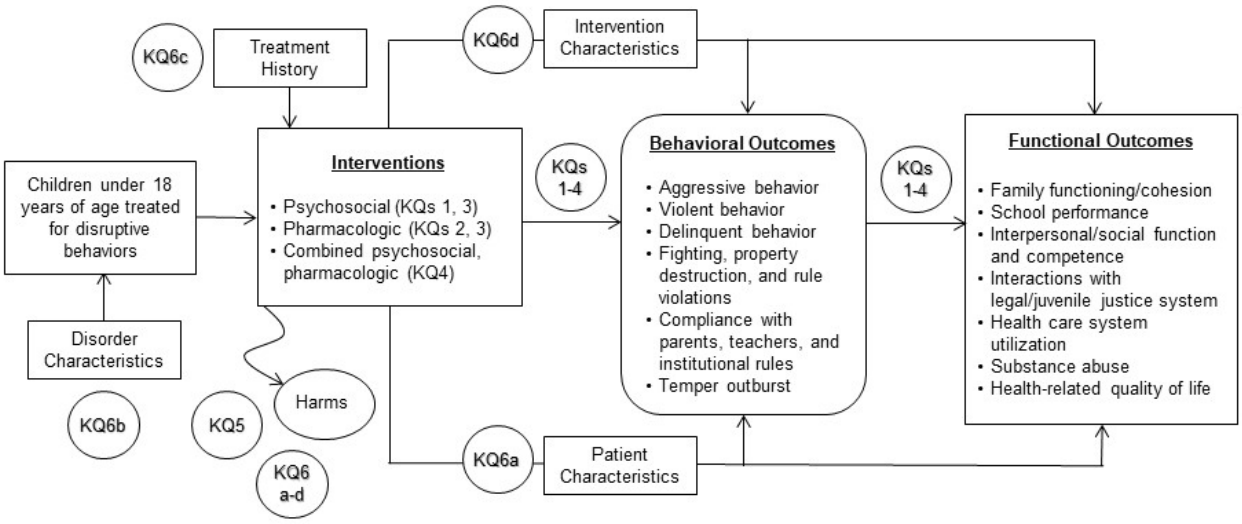
PICOTS	Inclusion	Exclusion
Population	**KQs 1-6.** Children under 18 years of age with disruptive behavior such as aggression, defiance, and violence or diagnosed with a disruptive behavior disorder	Asymptomatic children
Interventions	**KQs 1, 3-6.** Psychosocial interventions for child, parents/family or both **KQs 2-6.** Pharmacologic interventions **KQs 4-6.** Combined psychosocial and pharmacologic interventions	Specialized diet or dietary supplements Speech, occupational, physical therapy and other interventions
Comparators	Other included psychosocial or pharmacologic intervention; inactive treatment including waitlist control, no treatment, usual care, and placebo	No comparison group, excluded interventions
Outcomes	**KQs 1-4, 6.** Behavioral outcomes including aggressive behavior and violent behavior **KQs 1-4, 6.** Functional outcomes such as interactions with the juvenile justice system and out of home placement **KQ 5, 6.** Adverse effects/harms including diabetes, extrapyramidal effects and adverse events	
Timing	**KQs 1-6.** Any length of followup	
Setting	**KQs 1-6.** Clinical settings	Exclude school wide or system wide settings
Study Design	RCTs, comparative nonrandomized trials that adjust for confounding variables (N≥100)	Published before 1994

Abbreviations: KQ = Key Question; PICOTS = populations, interventions, comparators, outcomes, timing, setting, and study design; RCT = randomized controlled trial

2.1.4 Analytic Framework

The analytic framework illustrates how the populations, interventions, and outcomes relate to the Key Questions in the review (**Figure 1**).

Figure 1. Analytic framework



Abbreviations: KQ = Key Question

2.2 Criteria for Inclusion/Exclusion of Studies in the Review

The inclusion/exclusion criteria described in the PICOTS were used to determine if a study qualified for inclusion in the review. We included studies in children diagnosed with a disruptive behavior disorder (DBD) or who are at or above the clinical threshold for DBD based on assessments using validated instruments, such as the Eyberg Child Behavior Inventory (ECBI) or the Child Behavior Checklist (CBCL). To be formally diagnosed with a DBD, the child must meet established criteria, such as that found in the Diagnostic and Statistical Manual of Mental Disorders, Text Revision (DSM-5-TR).[15] To be diagnosed with disruptive behavior for this review (in the absence of a formal diagnosis), the child must meet or exceed a clinical threshold for having disruptive behavior or a conduct problem using a validated clinical instrument (e.g., score $\geq 70^{th}$ percentile on the State-Trait Anger Expression Inventory). We included treatment studies in children with a formal diagnosis of a DBD, as well as studies in children exhibiting disruptive behaviors based on clinical thresholds, which are not secondary to another condition (e.g., autism, attention-deficit/hyperactivity disorder [ADHD]). See **Appendix A** for additional details on study inclusion/exclusion criteria.

2.3 Literature Search Strategy

The evidence base for this review was identified primarily through searches of four databases: Ovid® MEDLINE®, the Cochrane Library, PsycINFO®, and Embase®. The search dates were limited to a publication date of 2014 to March 7, 2023. For the primary search, we concentrated on studies published since the end search dates for the 2015 AHRQ review. **Appendix B** contains the initial Ovid® MEDLINE® search strategy. An updated MEDLINE® search was conducted at the same time the other databases were searched. See **Appendix A** for additional details regarding the search strategy.

2.4 Data Extraction and Data Management

For all studies, a standardized template was used. One reviewer extracted study characteristics and findings and a second reviewer spot checked the data extraction for accuracy. See **Appendix A** for additional data extraction and management details.

2.5 Risk of Bias Assessment

Predefined criteria were used to assess risk of bias of included studies. Randomized controlled trials (RCTs) and nonrandomized studies of interventions (NRSIs) were assessed using a priori established criteria consistent with the approach recommended in the chapter, Assessing the Risk of Bias of Individual Studies, described in the Methods Guide for Effectiveness and Comparative Effectiveness Reviews.[4,29] Studies were rated as having low, moderate, or high risk of bias.[30,31] See **Appendix A** for additional details on risk of bias assessment.

2.6 Data Synthesis

Pairwise meta-analyses were conducted to obtain more precise effect estimates for comparative effectiveness of various interventions for disruptive behavior disorder. To determine the appropriateness of meta-analysis, we considered clinical and methodological diversity and assessed statistical heterogeneity. Interventions for disruptive behavior disorder were grouped

into four major categories: parent/caregiver alone, child alone, multicomponent (parent or teacher plus child), and treatment as usual (TAU) or waitlist for psychosocial interventions. (Trials of pharmacotherapy treated the child only and compared treatment to placebo). Separate analyses were conducted based on ages of the enrolled participant populations (preschool, school age, and adolescent), as treatments may differ and/or have different effects based on the age of the child. Analyses were also divided by short-term, intermediate-term, or long-term followup defined as ≤ 24 weeks, 25 to 47 weeks, and ≥ 48 weeks since end of treatment, respectively.

All analyses were conducted using Stata/SE 16.1 (StataCorp, College Station, TX). For pooled analyses, we estimated the magnitude of treatment effects as small, moderate, or large using **Table 2** below as a guide, based on Cohen's effect sizes.[32] We also reported the magnitude of effect for individual studies when not pooled, as data permitted. Additionally, we conducted a network meta-analysis of psychosocial interventions. See **Appendix A** for additional details on data synthesis including methods for network meta-analysis.

Table 2. Definitions of effect sizes

Effect Size	Definition
Small effect	• MD 0.5 to 1.0 points on a 0 to 10-point scale, 5 to 10 points on a 0 to 100-point scale • SMD 0.2 to 0.5 • RR/OR 1.2 to 1.4
Moderate effect	• MD >1 to 2 points on a 0 to 10-point scale, >10 to 20 points on a 0 to 100-point scale • SMD >0.5 to 0.8 • RR/OR 1.5 to 1.9
Large effect	• MD >2 points on a 0 to 10-point scale, >20 points on a 0 to 100-point scale • SMD >0.8 • RR/OR ≥2.0

Abbreviations: MD = mean difference; OR = odds ratio; RR = relative risk; SMD = standardized mean difference

2.7 Grading the Strength of Evidence for Major Comparisons and Outcomes

Outcomes assessed for strength of evidence were prioritized based on input from the TEP and team clinical experts to include the CBCL (externalizing scale), the ECBI (intensity and problem scales), and the Strength and Difficulties Questionnaire. The strength of evidence for comparison-outcome paired within each Key Question focused on these outcomes and was initially assessed by one researcher for each clinical outcome (see PICOTS) by using the approach described in the AHRQ *Methods Guide for Effectiveness and Comparative Effectiveness Review*.[4]

The strength of evidence was assigned an overall grade of high, moderate, low, or insufficient according to a four-level scale (**Table 3**). See **Appendix A** for additional details regarding strength of evidence.

Table 3. Description of the strength of evidence grades

Strength of Evidence	Description
High	We are very confident that the estimate of effect lies close to the true effect for this outcome. The body of evidence has few or no deficiencies. We believe that the findings are stable, i.e., another study would not change the conclusions.
Moderate	We are moderately confident that the estimate of effect lies close to the true effect for this outcome. The body of evidence has some deficiencies. We believe that the findings are likely to be stable, but some doubt remains.
Low	We have limited confidence that the estimate of effect lies close to the true effect for this outcome. The body of evidence has major or numerous deficiencies (or both). We believe that additional evidence is needed before concluding either that the findings are stable or that the estimate of effect is close to the true effect.
Insufficient	We are unable to estimate an effect, or we have no confidence in the estimate of effect for this outcome. The body of evidence has unacceptable deficiencies which precludes reaching a firm conclusion. If no evidence is available, it is noted as “no evidence.”

3. Results

A total of 7,289 abstracts were identified, 7,107 from electronic database searches and an additional 182 from hand searching and bibliography review of included studies and systematic reviews. After dual review of titles and abstracts, 1,160 articles were selected for full-text review, of which 152 studies (in 179 publications) were ultimately included in this review: 145 randomized controlled trials (RCTs) (in 168 publications) and 7 nonrandomized studies of interventions (NSRIs) in 11 publications. See **Appendix C** for the literature flow diagram.

3.1 Key Question 1. Which psychosocial interventions are effective for improving psychosocial outcomes compared to no treatment or other psychosocial interventions?

3.1.1 Overall Key Findings

- Preschool children:
  - When pooled, multicomponent interventions involving the parent or teacher and the child (10 RCTs, N=784) and parent-only interventions (13 RCTs, N=1,222) were better than usual care or waitlist control in reducing parent-reported disruptive behavior measures when assessed immediately post-treatment (strength of evidence [SOE]: Moderate).
  - It is unclear whether multicomponent or parent-only interventions are better at reducing disruptive behaviors in preschool children based on 23 RCTs (N=2,006, SOE: Insufficient).
  - Evidence for some psychosocial interventions and for longer-term treatment effects was limited (SOE: Low to Insufficient).
- School-age children:
  - When pooled, multicomponent interventions involving the parent or teacher and the child (9 RCTs, N=524, SOE: Moderate) and parent-only parent management training interventions (6 RCTs, N=841, SOE: Low) were better than usual care or waitlist control in reducing parent-reported disruptive behavior measures when assessed immediately post-treatment.
  - It is unclear whether multicomponent, parent-only interventions, or child-only interventions are the best at reducing disruptive behaviors in school-age children based on 12 RCTs (N=694, SOE: Insufficient).
  - Evidence for some psychosocial interventions and for longer-term treatment effects was limited (SOE: Low to Insufficient).
- Adolescents:
  - Studies reported mixed results for multicomponent and child-only interventions compared with usual care or waitlist control based on 2 RCTs (N=360, SOE: Low).
  - It is unclear whether multicomponent or child-only interventions are better at reducing disruptive behaviors in adolescents based on 2 RCTs (N=360, SOE: Insufficient).

Table 4 provides the summary of population and study characteristics for Key Question 1. In general, White children were more likely to be enrolled than children of other races and boys

were more likely to be enrolled than girls. There were more studies of parent-only and multicomponent interventions than of child-only interventions. Most studies were rated moderate risk of bias; downgrading was often due to unclear randomization methods, differences in prognostic variables at baseline between treatment groups, lack of blinding and high attrition. Additionally (not in table), eligibility for enrollment for most studies was based on parent report of problem behaviors rather than an official diagnosis of oppositional defiant disorder (ODD) or conduct disorder (CD) (we identified no studies in children with intermittent explosive disorder [IED]). The summary of findings for Eyberg Child Behavior Inventory (ECBI) intensity scale and the Child Behavior Checklist (CBCL) scores in studies of psychosocial interventions versus treatment as usual (TAU)/waitlist can be found in **Table ES-2** of the Executive Summary and in the Discussion section of the report.

Table 4. Summary statistics for Key Question 1

Category	Characteristics	Preschool Age (Under age 5) n = 44	School Age (Age 5 to 12) n = 71[a]	Adolescent (Age 13 to 17) n = 17
Study Design	RCT	43	64	17
	Cohort	0	1	0
	NRSI	1	5	0
	Mixed (RCT + NRSI)	0	1	0
Population Characteristics	Mean age, years	4.19	9.65	15.37
	Percent female	35.7	29.8	31.5
	Randomized	5,935	11,172	2,221
	Analyzed	4,725	10,639	2,050
Intervention Component	Child-only	0	12	8
	Parent-only	22	28	0
	Multicomponent (parent or teacher plus child)	22	40	10
Intervention	Incredible Years	10	5	0
	Positive Parenting Program	6	3	0
	Parent Child Interaction Therapy	15	6	0
	Multisystemic Therapy	0	0	5
	Brief strategic family therapy	0	0	1
	Parent Management Training	1	18	0
	Coping Power Program	0	3	0
	Tuning in to Kids	2	3	0
	Other	11	43	11
Outcome Measure	Child Behavior Checklist	14	30	9
	Eyberg Child Behavior Inventory	33	25	1
	Strengths and Difficulties Questionnaire	5	10	3
	Observation	1	2	0
	Other	3	33	15
Risk of Bias	High	5	20	6
	Moderate	35	51	11
	Low	4	0	0

Abbreviations: NRSI = nonrandomized study of interventions; RCT = randomized controlled trial
[a] One study contains two RCTs in one publication.[33]

3.1.2 Preschool Age Children

Forty-three RCTs[34-83] and one nonrandomized study of interventions (NRSI)[84] (in 51 total publications) assessed behavioral interventions in preschool-aged children with disruptive behaviors. Across the eight studies that reported the proportion of students who met clinical diagnoses, the range of students with ODD was 45 to 100 percent, and the range with CD 6 to 37

percent; an additional three trials enrolled only students diagnosed with disruptive behavior disorder, not otherwise specified.[37,41,53,55,65,70,72,82] Two trials each required students to have co-occurring attention-deficit/hyperactivity disorder (ADHD),[51,70] or to have been born premature.[34,74] One trial enrolled only children with developmental delay.[58] Refer to **Appendix D** for additional patient characteristics. Additionally, one trial required mothers to be diagnosed with major depression in addition to the child demonstrating disruptive behaviors.[56] Half of the studies included parent-only interventions and half included multicomponent interventions focused on both the parent and child. The most well-represented interventions were Parent-Child Interaction Therapy (PCIT) (34%, 15/44), Incredible Years (23%, 10/44), and Positive Parenting Plan (Triple P) (14%, 6/44).

Four studies were rated low risk of bias,[42,67,77,80] five studies were rated high risk of bias,[37,38,43,51,71] and the remainder were rated moderate risk of bias; methodological limitations included unclear randomization and allocation methods, lack of blinding, and high loss to followup. Refer to **Appendix E** for individual study risk of bias ratings.

Interventions with only a parent component. Twenty-two RCTs (in 27 publications)[36,40,42-45,47-49,51-54,60,63,66,67,69,71,73,76-78,80-82] and one observational study[84] compared a parent-only intervention with one or more of the following: another parent-only intervention,[36,48,49,51,52,54,56,60,63,66,84] minimal intervention, such as a workbook or brief website education,[36,48,69] waitlist,[40,42,43,47,49,51 1885,54,63,67,71,73,78,80-82] TAU,[44,45,76,77] or no treatment.[53]

Parent-only interventions included Triple P or a Triple P-based intervention,[43,44,49,51,60,63,67] Incredible Years,[36,40,42,47,48,52,73,80-82] and Tuning in to Kids (TIK).[45,78] Other parent-only interventions included positive behavior support,[84] group parenting discussions,[71] parental self-efficacy,[66] self-care with a safe and learning environment for the child,[54] positive parenting with sensitive discipline,[76,77] and skill-focused learning.[53,64,69]

Interventions that included a parent or teacher component and a child component. Twenty-two RCTs (in 25 publications) compared a multicomponent intervention, in which both the parent (or teacher) and child were involved in the trial. Thirteen trials compared a multicomponent intervention with TAU, waitlist, or an active control.[34,35,37,38,41,46,50,55,58,70,74,76,77,79,83] Eleven trials compared a multicomponent intervention with another multicomponent intervention;[35,39,41,46,50,56,57,59,62,65,68,70,72] two trials compared a multicomponent intervention with a parent-only intervention.[61,75]

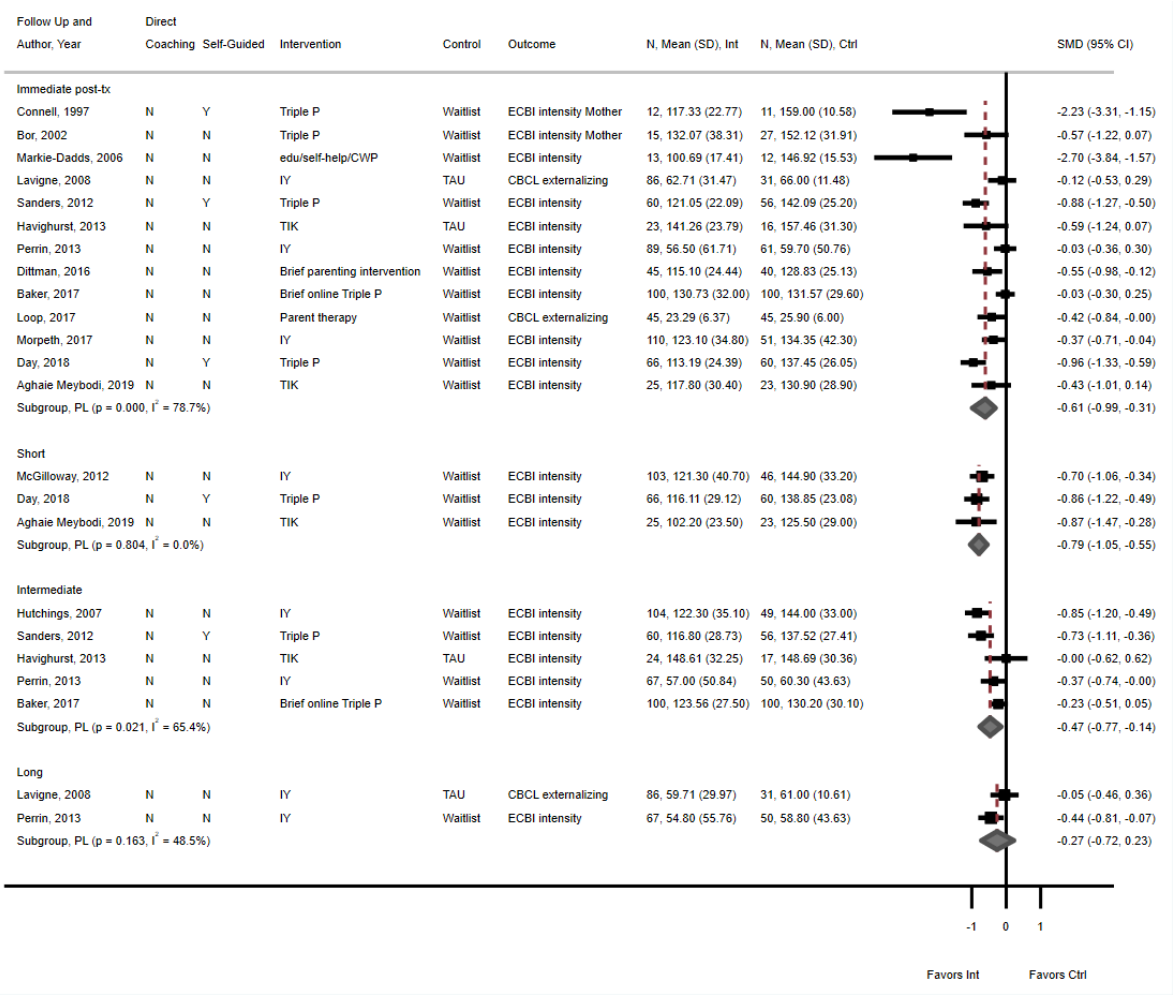
The multicomponent interventions used in most trials was PCIT.[34,35,37,38,41,46,50,55,57-59,62,65,68,72,74,83] Other multicomponent interventions included Child-Teacher Relationship Training,[79] New Forest Parenting Program,[70] Home Parent Support Program,[75] Positive Parenting and Sensitive Discipline,[76,77] Helping the Noncompliant Child,[61] and Family Therapy.[56]

3.1.2.1 Parent-Only Interventions

Pooled analysis found parent-only interventions moderately more effective than TAU/waitlist at reducing the severity of disruptive behaviors in school-aged children based on the ECBI intensity scale or the CBCL externalizing scale immediately post-treatment (13 RCTs, N=1222, standardized mean difference [SMD] -0.61, 95% CI -0.99 to -0.31, I^2=79%) (**Figure 2)**. Three separate analyses (1) removing the two outlier studies, (2) removing the studies rated high risk of bias and (3) removing the studies that may have incorrectly reported standard errors as standard

deviations did not appreciably lower the statistical heterogeneity. Findings were stable in longer term analyses, although not statistically significant in the long term. However, many studies were small (smallest N=23) with a suggestion of publication bias (Egger's test p=0.007) due to a lack of studies favoring TAU or waitlist.

Figure 2. Parent-only interventions versus TAU/waitlist on ECBI intensity and CBCL externalizing scales



Abbreviations: CBCL = Child Behavior Checklist; CI = confidence interval; Ctrl=control; ECBI = Eyberg Child Behavior Inventory; Int=intervention; IY = Incredible Years; N = no; PL = profile likelihood; SD = standard deviation; SMD = standard mean difference; TAU = treatment as usual; TIK = Tuning in to Kids; Y = yes

Pooled analysis of parent-only trials versus TAU/waitlist also found moderately greater improvement on the ECBI problem scale compared with TAU/waitlist immediately post-treatment (9 RCTs, N=879, SMD -0.72, 95% CI -1.28 to -0.32, I^2=78%) **(Appendix F, Figure F-1).**[43-45,51,54,63,67,73,80] Results were similar for other timepoints. Although Egger's test was not conducted on problem scores as there were only 9 studies, these are the same studies reporting ECBI intensity and CBCL problem scores above with continued concern for publication bias.

3.1.2.2 Incredible Years

3.1.2.2.1 Description of Studies

Eight RCTs included a parent-only Incredible Years or Incredible Years-based intervention.[36,40,42,47,48,52,73,80-82] Six RCTs compared Incredible Years versus a waitlist control,[40,42,47,73,80-82] one study compared Incredible Years with TAU,[36,48] and the remaining study compared an Incredible Years intervention with another parent-only intervention.[52]

3.1.2.2.2 Detailed Analysis

Incredible Years versus TAU/waitlist. Pooled analysis found Incredible Years similar to TAU/waitlist in reducing disruptive behaviors in preschool-aged children on the ECBI intensity scale and the CBCL externalizing scale (3 RCTs, N=428, SMD -0.18, 95% CI -0.43 to 0.08, I^2=7%) immediately post-treatment (**Appendix F, Figure F-2**).[48,73,80]

ECBI problem scores were slightly improved across all timepoints with Incredible Years compared with waitlist immediately post-treatment (2 RCTs, N=311, SMD -0.31, 95% CI -0.58 to -0.04) (**Appendix F, Figure F-3).** Longer followup times also favored Incredible Years.[73,80]

Several studies provided additional behavioral outcomes of interest and are included in **Appendix F, Table F-1**. In most instances, Incredible Years was associated with more improved outcomes than TAU/waitlist.

Incredible Years versus other parent-only interventions. Two trials compared an intervention based on Incredible Years with another Incredible Years-based intervention. There were few differences in outcomes between parent-only interventions when both treatment arms included an Incredible Years-based intervention See **Appendix F, Table F-2** for details.

3.1.2.3 Positive Parenting Plan (Triple P)

3.1.2.3.1 Description of Studies

Five RCTs compared a Triple P intervention or a Triple P-based intervention with waitlist.[43,44,49,51,63,67] Two of these studies[49,51,63] and one additional study[60] also compared a Triple P intervention with another parent-only intervention.

3.1.2.3.2 Detailed Analysis

Triple P versus waitlist. Pooled analysis of five trials found moderately greater improvement in ECBI intensity score than waitlist (5 RCTs, N=507, MD -20.91, 95% CI -35.79 to -6.76, I^2=86%)[43,44,51,63,67] immediately post-treatment (**Appendix F, Figure F-4**).

Removing the trial of brief, low-intensity Triple P (intervention 8 weeks long, number of sessions not reported)[67] increased the pooled estimate and reduced the statistical heterogeneity (4 RCTs, N=307, MD -25.28, 95% CI -37.27 to -16.36, I^2=52%, large effect) immediately post-treatment (**Appendix F, Figure F-5**).

The same 5 RCTs also found moderately improved ECBI problems scores versus waitlist (N=507, MD -4.94, 95% CI -8.46 to -2.14, I^2=77%) immediately post-treatment (**Appendix F, Figure F-6**). Removing the trial of low-intensity Triple P, slightly increased the treatment effect but greatly reduced the statistical heterogeneity (4 RCTs, N=307, MD -5.72, 95% CI -8.42 to -4.12, I^2=19%) (**Appendix F, Figure F-7).** There was no difference between Triple P versus waitlist in the short term based on one study (N=126).[67]

Additional outcomes reported in one trial are presented in **Appendix F, Table F-3** and indicate moderately more students were no longer in the ECBI intensity clinical range after treatment with standard-intensity, online Triple P compared with internet as usual immediately post-treatment (RR 3.76, 95% CI 1.94 to 7.28).[44]

Triple P versus another parent-only intervention. Three trials compared a Triple P intervention with another Triple P-based intervention,[49,51,60,63] Findings on the ECBI intensity and problem scores were mixed across studies and across outcomes with no clear benefit from one method/intensity of Triple P delivery versus a different method/intensity (**Appendix F, Table F-4**).

3.1.2.4 Tuning in to Kids

3.1.2.4.1 Description of Studies and Detailed Analysis

Tuning in to Kids versus TAU or waitlist. Pooled analysis of two trials that compared TIK with TAU or waitlist found slightly lower ECBI Intensity scores with TIK (2 RCTs, N=87, MD -14.53, 95% CI -28.84 to -0.36, I^2=0%) post-treatment, which was sustained in the short term in one RCT but not in the long term in the other RCT (**Appendix F, Figure F-8).**[45,78] ECBI problem scores were slightly, though not statically significantly improved with TIK versus TAU immediately post-treatment (N=36, MD -3.41, 95% CI -8.80 to 1.98) but were not different from TAU in the intermediate term (N=39, MD -0.68, 95% CI -6.57 to 5.21) based on findings from one study.[45]

Tuning in to Kids versus another parent-only intervention. No study compared TIK with another parent-only intervention.

3.1.2.5 Other Parent-Only Interventions

3.1.2.5.1 Description of Studies and Detailed Analysis

Other parent-only interventions versus TAU/waitlist. Four RCTs that enrolled preschool children included other parent-only interventions compared with TAU/waitlist, but provided insufficient evidence on any specific intervention from which to draw conclusions.[53,54,66,71] See **Appendix F, Table F-5** for details.

Other parent-only interventions versus other parent-only interventions. One RCT (N=464) enrolled parents of 4-year-old children with high levels of disruptive behavior (at least the 80th percentile on the Strength and Difficulties Questionnaire [SDQ] for a Finnish population).[64,69] The interventions consisted of the Strongest Family Smart Website (an 11-session, internet-based parent training program with weekly telephone coaching by a healthcare professional) or an education control (access to a website that provided a brief introduction to positive parenting methods along with one 45-minute telephone call with a healthcare professional to provide positive parenting tips). The goals of the Strongest Family intervention were to encourage positive parenting, strengthen parent-child bonds, reduce conflict, and encourage social behavior. CBCL externalizing scores were slightly lower across timepoints with Strongest Families compared with education control (**Appendix F, Table F-6**). Data for other comparisons of parent-only interventions was insufficient. See **Appendix F** for additional details.

3.1.2.6 Multicomponent Interventions

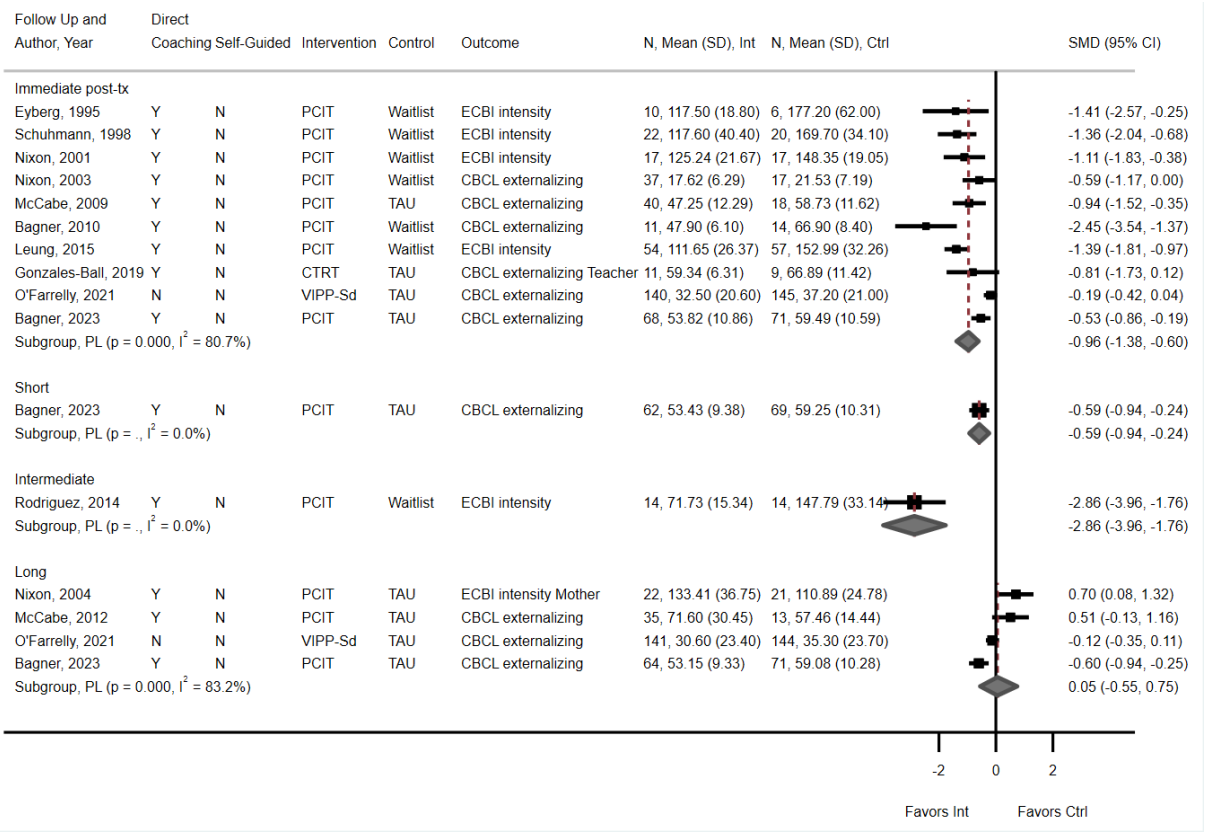
3.1.2.6.1 Description of Studies and Detailed Analysis

Multicomponent interventions versus TAU/waitlist. The primary multicomponent intervention employed in preschool children with disruptive behavior was PCIT (16 RCTs), which is a parent management training program that emphasizes relationship building with involvement of both the parent and the child. See **Appendix G** for a more complete description of PCIT. One trial used Child-Teacher Relationship Training in Head Start to improve Child-Teacher relationships through learning and practicing skills to build children's self-esteem, set limits, facilitating creativity and decision-making.[79] One trial used a Healthy Start, Happy Start intervention that was a home-based positive parenting and sensitive discipline video-feedback intervention versus TAU.[76,77]

Pooled analysis of multicomponent interventions versus TAU or waitlist indicated substantially lower scores on the ECBI intensity and CBCL externalizing scales immediately post-treatment (N=726, SMD -0.96, 95% CI -1.38 to -0.60, I^2=81%) (**Figure 3).** The high statistical heterogeneity of 81 percent may be due to the different interventions, control groups, and outcomes. Two separate analyses, (1) removing the studies rated high risk of bias and (2) removing the study that may have incorrectly reported standard errors as standard deviations, did not appreciably lower the statistical heterogeneity. Findings were stable in the short and intermediate term, however, only one study reported these timepoints; there was no effect in long-term analysis of four studies. Additionally, most studies were small (smallest N=16) leaving open the possibility of publication bias (Egger's test p=0.012) for this comparison immediately post-treatment. There was low-strength evidence of no difference between multicomponent interventions and TAU or waitlist in the long term (SOE: Low) and insufficient evidence at other timepoints.

3.1 Results, Key Question 1. Psychosocial interventions for improving psychosocial outcomes

Figure 3. Multicomponent interventions versus TAU/waitlist ECBI intensity and CBCL externalizing scores



Abbreviations: CBCL = Child Behavior Checklist; CI = confidence interval; Ctrl = control; ECBI = Eyberg Child Behavior Inventory; Int = intervention; N = no; PCIT = Parent-Child Interaction Therapy; SD = standard deviation; SMD = standardized mean difference; TAU = treatment as usual; VIPP-Sd = Video-feedback Intervention to promote Positive Parenting and Sensitive Disciple; Y = yes

3.1.2.7 Parent-Child Interaction Therapy

Limiting the above meta-analysis of all multicomponent interventions to trials of PCIT also found substantially lower ECBI intensity and CBCL externalizing scores compared with TAU or waitlist immediately post-treatment and slightly decreased the statistical heterogeneity (8 RCTs, N=479, SMD -1.09, 95% CI -1.53 to -0.74, I^2=67%) (**Appendix F, Figure F-9).**[34,35,37,38,41,55,58,83] Although scores favored PCIT in the short and intermediate term, there were no differences between groups in the long term.

Pooled analysis of five trials of PCIT also found substantially lower ECBI problem scores versus TAU/waitlist (N=251, SMD -1.23, 95% CI -1.58 to -0.95, I^2=0%) immediately post-treatment (**Appendix F, Figure F-10)**.[34,35,37,38,83] One RCT found more children were no longer in the ECBI intensity clinical range immediately post-treatment compared with waitlist (N=111, RR 3.82, 95% CI 2.34 to 6.22) and more children were no longer in the clinical range on the ECBI problem scale with PCIT than waitlist (N=84, RR 2.04, 95% CI 1.41 to 2.96).[83]

Additional selected outcomes in PCIT trials are found in **Appendix F, Table F-7**. One trial reported lower ECBI scores following both standard PCIT (12, 1 to 2-hours face-to-face sessions) and abbreviated PCIT (5 face-to-face sessions and 5, 30-minute telephone consultation along with videotapes to be watched at home) with both groups receiving a 1-hour in-person booster session 1 month after treatments end compared with waitlist **(Appendix F, Table F-7)**.[41]

This trial also reported that substantially more children were no longer in the clinical range on the ECBI immediately post-treatment with both standard and abbreviated PCIT compared with waitlist, although the results were not statistically significant with abbreviated treatment versus waitlist. Another RCT compared both culturally sensitive PCIT (for Mexican Americans) and standard PCIT to TAU and found the active interventions associated with substantially lower ECBI intensity scores immediately post-treatment.[35] However, results were not statistically significant for standard PCIT versus TAU. ECBI intensity results were similar at 2-year followup **(Appendix F, Table F-7)**.[46] One trial that enrolled parents of children aged 18 to 60 months who were born premature also found improved ECBI intensity scores immediately post-treatment.[34] Another trial reported a greater likelihood of children no longer being in the clinical range for ECBI intensity or ECBI problem scores following PCIT compared with waitlist immediately post-treatment (N=111, 87% vs. 23%, RR 3.82, 95% CI 2.34 to 6.22; N=84, 84% vs. 41%, RR 2.04, 95% CI 1.41 to 2.96, respectively).[83]

3.1.2.8 Other Multicomponent Interventions

See **Appendix F, Tables F-8 and F-9** for information on other multicomponent interventions. Two trials found multicomponent interventions not different from TAU/waitlist on reducing disruptive behaviors. In comparisons of different multi-component interventions, results tended to slightly favor the interventions with modified or enhanced treatments over standard treatments, although these differences often did not reach statistical significance. Additionally, many of the trials were small and estimates were imprecise.

3.1.3 School Age Children

3.1.3.1 Description of School Age Included Studies

Sixty-two RCTs (in 71 publications)[33,85-155] assessed behavioral interventions for disruptive behavior disorders (DBD) in school age children. Participants in one RCT[89] that completed 156 weeks post-treatment were re-randomized to a booster treatment or enhanced usual care in the same setting as the index RCT.[155] **Table 4** provides the summary statistics for school age children in Key Question 1. Across 13 trials, the diagnosis at baseline was CD only (3 RCTs),[104,130,135] ODD only (10 trials)[92,94,95,100,103,110,121,124,144,151] or DBD only (1 trial).[118] One RCT[93] enrolled only children with both CD and ODD. Six RCTs[33,86-88,106,127] reported children as having either CD or ODD (range 63.5% to 100%) but did not provide specifics for each. One RCT reported comorbid ADHD and ODD.[124] Where reported, other comorbid conditions included ADHD (24 RCTs)[33,86,87,89,91,92,97-99,102,103,109,113-116,122-124,126,127,131,132,134,135,139,143,145,149] (range 4.7% to 100%), autism spectrum disorder (ASD) (3 RCTs)[123,136,139] (range 2.5% to 100%), bipolar spectrum disorder (2 RCTs)[86,92] (range 69.9% to 72%), or depressive disorder (2 RCTs)[86,92] (range 30% to 62%). One trial reported that all participants had CD, ODD, or ADHD.[120] ASD was excluded in 10 RCTs.[85,98,102-104,115,124,128-130,134,135,146] The summary of findings for ECBI and CBCL scores in studies of psychosocial interventions versus TAU/waitlist can be found in **Table ES-2** of the Executive Summary and in the Discussion section of the report.

No studies were rated low risk bias. Twenty RCTs (in 21 publications)[85,94,95,98-101,108,118-121,128,129,138,140-142,145,151,154] were rated high risk of bias and the remainder were rated moderate risk of bias. See **Appendix E** for risk of bias ratings.

3.1 Results, Key Question 1. Psychosocial interventions for improving psychosocial outcomes

Interventions that included a parent component and a child component were described in 36 RCTs (in 39 publications)[85,86,88,89,91-93,95,97,102-106,108-110,115,116,119,121,122,124,125,127-130,134-136,138,149,151,153-156] and compared a multicomponent intervention with one or more of the following: treatment as usual or waitlist,[85,86,88,92,93,95,102-105,115,116,121,122,136,138,149,151,154] another multicomponent, parent, or child only intervention.[89,91-93,103,104,108,109,115,121,127-129,149,151,153,155]

Interventions with only a child component were evaluated. Twelve RCTs compared a child-only intervention with one or more of the following: treatment as usual or waitlist,[93,100,110,118,120,140,141,144,148,152] or a child-only control.[100,118,146]

Twenty-four RCTs (in 26 publications)[33,93,94,96,98,99,101,107,110-115,117,123,126,131-133,137,139,143,145,147,150] compared a parent-only intervention with one or more of the following: treatment as usual or waitlist,[93,94,96,98,99,101,110,111,113-115,117,126,137,139,143] or parent-only and child-only interventions.[33,93,107,110,123,131-133,145,147,150] Additional information on specific interventions and comparators is available in **Appendix H** and in the sections below.

Six NRSIs (in 9 publications)[156-165] assessed behavioral interventions for DBD in school age children, described in **Appendix H**.

3.1.3.2 Parent-Only Parent Management Training Versus TAU or Waitlist

In pooled estimates across parent-only PMT programs, such programs were generally associated with lower scores for measures of child behavior at most timepoints. Such programs conferred a small improvement in pooled CBCL Externalizing or ECBI Intensity scores immediately post-treatment versus TAU or waitlist. Moderate improvement was seen in the short-term and small improvement persisted at intermediate and long terms. ECBI problem scores were moderately improved immediately post-treatment with a small improvement persisting into short term for PMT versus TAU or waitlist, however long term, no differences were seen between groups. Estimates for all measures were imprecise.

3.1.3.2.1 Description of Studies

Parent-only Parent Management Training programs (programs without a child-treatment component) were compared with TAU or waitlist in 16 RCTs (17 publications).[93,94,96,98,99,101,110-115,117,126,137,139,143] All PMT programs are intended to support and enhance parenting skills and included general components related to psychoeducation and focused parenting skills training. Treatment protocols were considered to be sufficiently similar to justify grouping these programs together. The following general PMT interventions used in the studies below are detailed in **Appendix G**: Incredible Years and TIK. Other interventions for this section are briefly described in **Appendix H**.

Incredible Years parent training versus waitlist. Six RCTS compared Incredible Years with waitlist[93,94,99,110,115,117] and one RCT compared Incredible Years with TAU.[96] Concomitant diagnoses were poorly reported across trials. Three trials enrolled only children with ODD,[93,94,110] ODD was the most common diagnosis in another trial (82%)[115] and ADHD was common (51%) in another.[99] An additional RCT predominately enrolled children with ODD (58%).[112]

PMT-Oregon model versus treatment as usual. Three RCTs (in four publications) compared a manualize program, Parent Management Training Program-Oregon Model (PMTO), with

TAU.[98,101,113,114] One trial enrolled parents of children who were in foster care who exhibited severe levels of behavioral problems defined as a mean number of more than five different types of problem behavior each day; comorbidities or concomitant diagnoses were not reported.[101] The majority of children in the second trial had ADHD (75%) with concomitant diagnoses of ODD (67%) and CD (49%).[98] The third RCT reported that a minority of children had ADHD (38%) but did not report other conditions.[113] Attrition in two trials was high.[98,101]

Other parent-only parent management training programs versus waitlist or treatment as usual. Five RCTs[111,126,137,139,143] reported on other parent-only PMT interventions. A pilot trial compared individual delivery of TIK to parents with waitlist.[139] TIK is generally delivered in a group setting as described in **Appendix G**.

One RCT compared a manualized PMT program delivered at home with both waitlist and TAU.[126] Therapist feedback on video recordings of skills practice was provided. The program included principles of PCIT and Helping the Noncompliant Child which are described in **Appendix G**. The trial enrolled children with a diagnosis ADHD with most receiving related pharmacotherapy (93%) and having a DBD diagnosis was common (ODD [47%] and CD [8%]).

One trial, conducted in South Africa, compared a Parenting for Lifelong Health for Young Children PMT program, which was designed to reduce harsh parenting and enhance positive parenting, with TAU.[137] Information on child diagnoses or comorbidities at baseline was not reported.

A brief PMT program, which consisted of 3 weekly, 2-hour group sessions and two digital video discs (DVD)s, called 1-2-3 Magic, with waitlist was compared in one RCT.[143] While all children had ADHD, most had additional diagnoses (70%, specific diagnoses not provided), and most were taking stimulant medications (68%) with a higher proportion in the 1-2-3 Magic group receiving such medication versus waitlist (79% vs. 59%).

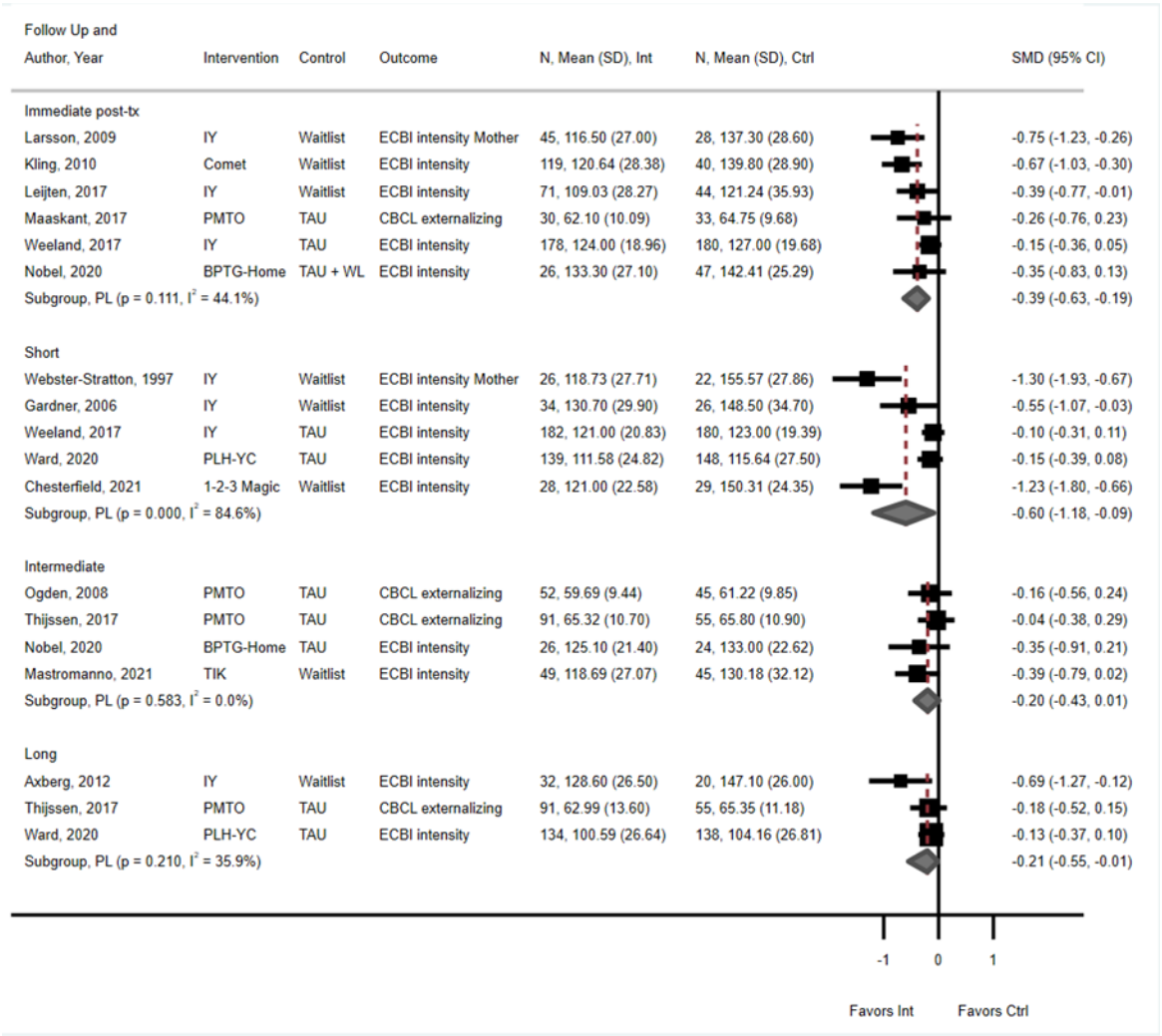
One trial compared two ways of delivering the Swedish PMT program (Comet PMT) to waitlist.[111] Participants were randomized to receive the group program from trained staff members, to a self-administered version of the program , or to a waitlist. The same written material and homework schedules were provided to both active treatment groups. Authors did not provide information on comorbid conditions or concomitant mental health diagnoses or medications at baseline.

3.1.3.2.2 Detailed Analysis

Pooled results: CBCL externalizing, ECBI intensity, or ECBI problem scores across parent-only PMT interventions. Fourteen of the 16 RCTs provided information on either CBCL Externalizing or ECBI Intensity and contributed to pooled estimates (**Figure 4**). Parent-only PMT overall was associated with a small improvement in scores immediately post-treatment (6 RCTs, N=841, SMD -0.39, 95% CI -0.63 to -0.19, I^2= 44%)[96,99,101,111,115,126] versus TAU or waitlist. A moderate improvement favoring PMT was seen short-term versus TAU or waitlist (5 RCTS, N=814, SMD -0.60 95% CI -1.18 to -0.09, I^2=85%).[93,96,117,137,143] However, substantial heterogeneity was noted likely in part due to two small trials, one of which enrolled only children with ODD[93] and the other enrolled only those with ADHD.[143] It is unclear whether type of PMT contributed to this heterogeneity. Small improvements that favored PMT over TAU or waitlist persisted into intermediate term (4 RCTs, N=390, SMD -0.20, 95% CI -0.43 to 0.01), I^2=0%)[98,113,126,139] and long-term (3 RCTs, N=470, SMD -0.21, 95% CI -0.55 to -0.01, I^2=36%).[94,98,137]

3.1 Results, Key Question 1. Psychosocial interventions for improving psychosocial outcomes

Figure 4. Comparison of parent-only PMT with TAU/waitlist: CBCL externalizing or ECBI intensity scores



Abbreviations: BPTG-Home = Behavioral Parent Training Groningen at Home; Ctrl = control; CBCL = Child Behavior Checklist; ECBI = Eyberg Child Behavior Inventory; IY= Incredible Years; Int = intervention; PLH-YC = Parenting for Lifelong Health for Young Children; PMTO = Parent Management Training-Oregon Model; SD = standard deviation; SMD = standardized mean difference; TAU = treatment as usual

Pooled results: ECBI intensity separated by treatment: Incredible Years and PMT using the Oregon model. Across the six trials that compared Incredible Years with TAU or waitlist, ECBI Intensity scores were lower with Incredible Years immediately post-treatment (3 RCTs, N=546, SMD -0.33, 95% CI -0.78 to -0.03, I^2= 61%)[96,99,115] but were similar in the short term (3 RCTs, N=470, SMD -0.57, 95% CI -1.42 to 0.16, I^2=86%).[93,96,117] One small long-term trial rated high risk of bias found moderately lower scores with Incredible Years (1 RCT, N=52, SMD -0.69, 95% CI -1.27 to -0.12).[94] All estimates were imprecise (**Appendix H, Figure H-1**). In contrast, scores were similar in the three trials of PMT-Oregon Model versus TAU immediately post-treatment, (1 RCT, N=63, SMD -0.26, 95% CI -0.76 to 0.23),[101] at intermediate term (2 RCTs, N=243, SMD -0.09, 95 % CI -0.40 to 0.21, I^2= 0%),[98,113] and long term (1 RCT, N=146, SMD -0.18, 95% CI -0.52 to 0.15) (**Appendix H, Figure H-2**).[98]

ECBI problem scores. Eight RCTs reported ECBI Problem scores. Parent-only PMT interventions were associated with lower scores compared with TAU or waitlist in pooled estimates across all time frames. A moderate improvement was seen intermediately post-treatment (4 RCTS, N=423, SMD -4.58 95% CI -6.26 to -2.37, I^2=0%),[99,111,115,126] a small improvement short term (3 RCTs, N=287, SMD -2.75, 95% CI -5.44 to -1.09, I^2=0%),[117,137,143] and a moderate improvement in one trial at intermediate term (1 RCT, N=50, SMD -5.10, 95% CI -8.90 to -1.30).[126] Long term, a small improvement is noted in pooled estimates (2 RCTs, N=313, SMD -2.38, 95% CI -10.44 to 4.07, I^2=81%),[94,137] however, when results were confined to the large, moderate quality trial,[137] there was no difference between PMT and TAU (1 RCT, N=272, MD -0.23, 95% C -2.28 to 1.82) (**Appendix H, Figure H-3**).

3.1.3.3 Parent-Only Parent Management Training Versus Other Active Treatment Interventions or Child-Only Intervention

Online and self-help manual versions of Triple P may provide similar improvements in ECBI Intensity (36-252 scale) and ECBI Problem scores (0-36 scale) immediately post-treatment and at intermediate term in one RCT. While internet and group delivery of the Swedish COMET PMT yielded similar ECBI Intensity scores short and intermediate term, scores were slightly lower long term for parents receiving group delivery, however, there were no differences between in the ECBI Problem Scores at any time point. Evidence for the following comparisons was insufficient: Parent only versus child-only Incredible Years, Group Triple-P with additional examples in multiple session versus a single session.

3.1.3.3.1 Description of Studies

Seven RCTs compared parent-only Parent Management Training programs (programs without a child-treatment component) with control groups other than TAU or waitlist.[33,93,107,110,123,133,147] Parent-only Incredible Years was compared with a child-only Incredible Years in two RCTs.[93,110] Four other RCTs compared different methods of intervention delivery of the same parent-only PMT program.[33,107,123,147] One trial compared different parent-only PMT programs.[133] The following general PMT interventions used in the studies below are detailed in **Appendix G**: Incredible Years and Triple P. The Swedish PMT program (Comet PMT) and other programs compared in this section are described in **Appendix H**.

3.1.3.3.2 Detailed Analysis

Four of the seven RCTs reported primary outcomes of interest.[93,107,123,147] Other trials[33,110,133] and outcomes are reported in **Appendix H**. ECBI Intensity raw scores (26 to 252 scale) were reported in four trials.[93,107,123,147] In the trial that enrolled only children with ODD[93] scores were similar for the parent only and child only Incredible Years interventions short term (N=53, MD -2.97, 95% CI -16.98 to 11.04) and long term (N=50, MD 1.55 95% CI -16.83 to 19.93). Two RCTs compared different methods for delivering group, parent-only Triple-P.[107,147] Both methods were conducted in group settings and the intervention was consistent with Triple-P Level 3 (**Appendix D**). One trial combined Triple P Discussion Groups with sufficient exemplar training and compared it to a single-session, Triple P Dealing with Disobedience Discussion Group.[147] Triple-P with sufficient exemplar training was associated with slight lowering of ECBI Intensity Scores immediately post-treatment (N=62, MD -18.99, 95% CI -30.90 to -7.08) and at intermediate term (N=57, MD -15.71, 95% CI -31.36 to -0.06). The other RCT compared online

delivery of Triple P to provision of Every Parent's Self-help Workbook based on Triple-P.[107] No differences between the online and self-help versions of Triple P were seen on ECBI Intensity Scores immediately post-treatment (N=174 MD -0.82, 95% CI 8.24 to 6.60) or at intermediate term (N=159, MD -3.23 95% CI -11.88 to 5.42). The Swedish PMT program (Comet PMT) was evaluated in one trial that compared internet and group delivery of the program.[123] There were no differences in ECBI Intensity raw scores between internet and group delivery of Comet at short (N=161 MD 8.10 95% CI -0.47 to 16.67) or intermediate term (N=161, MD 8.77 95% CI -0.61 to 18.15)), however group delivery was associated with slightly lower scores long term (N=161, MD 11.92 95% CI 2.80 to 21.04) Across trials, estimates at all times were imprecise. (**Appendix H, Table H-1).**

ECBI Problem scores (0-36 scale) were reported in three trials.[107,123,147] Triple-P with sufficient exemplar training was associated substantial decrease scores immediately post-treatment (N=62, MD -3.82 95% CI -7.13 to -0.51) which did not persist to intermediated term (N=67, MD -3.60 95% CI -7.58 to 0.38) compared with single-session Triple P.[147] There were no differences between the online and self-help versions of Triple P were seen on ECBI Problem Scores immediately post-treatment or at intermediate term in the other Triple P trial.[107] ECBI Problem Scores were similar between internet and group delivery of Comet PMT methods in one trial (N=161) at all times— short term (MD 0.22, 95% CI -1.87 to 2.31), intermediate term (MD 0.56, 95% CI -1.84 to 2.96), and long term (MD 2.00, 95% CI -0.31 to 4.31).[123] Across trials, estimates at all times were imprecise. **(Appendix H, Table H-1).**

Other reported outcomes and trial details are described in **Appendix H.**

3.1.3.4 Parent-Only Self-Help Interventions and Mindfulness-Based Interventions

3.1.3.4.1 Description of Studies and Detailed Analysis

Self-help interventions. Two RCTs (in 3 publications)[131,132,145] (total N=259 randomized) evaluated self-help programs for parents of school age children with primarily ODD and comorbid ADHD.

One RCT[145] compared a manualized, online self-help behavioral parent training intervention (plus psychoeducation) with a waitlist control group. Children whose parents received the self-help intervention showed a larger improvement (i.e., decrease) in ECBI intensity scores (N=101, MD -9.50, 95% CI -17.45 to -1.55) post-treatment compared with those randomized to waitlist but the difference may not be clinically significant.

The second RCT (in two publications)[131,132] compared two self-guided interventions, behavioral parent training (i.e., behavior modification techniques) versus non-behavioral parent training (e.g., communication skills, conflict resolution methods). Participants in the self-guided behavioral parent training group reported greater improvement (i.e., a larger decrease) in CBCL externalizing scores post-treatment compared with those who received nonbehavioral parent training (N=110, MD -3.74, 95% CI -7.20 to -0.28);[131] it is unclear if this difference is clinically meaningful.

Mindfulness-based interventions. One RCT[150] compared a Mindfulness-Based Positive Behavior Support protocol comprised of 1) mindfulness-based training plus 2) positive behavior support training, versus each component of that intervention alone, for parents of primarily male school-age children with autism and disruptive and aggressive behaviors. This trial did not report

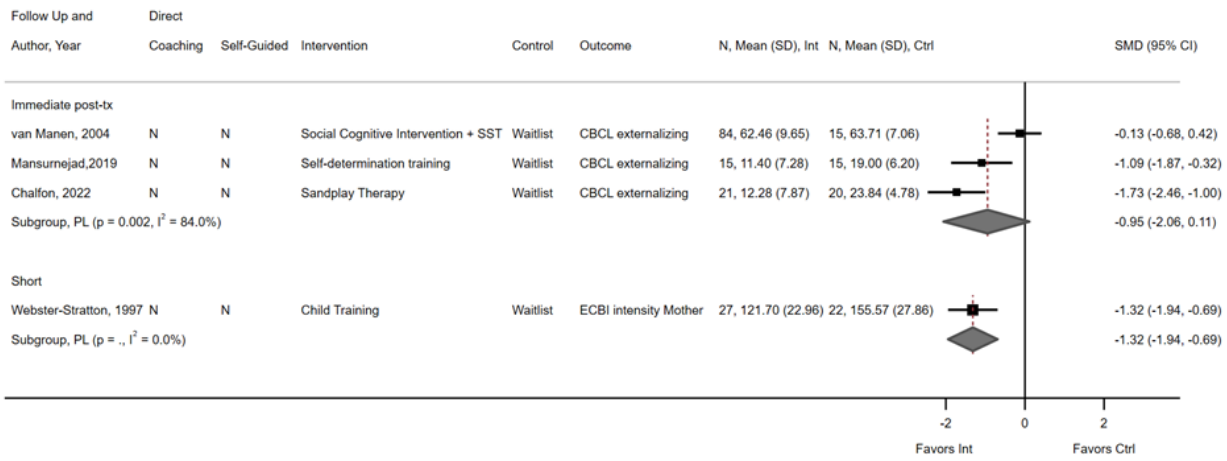
primary outcomes of interest. Posttreatment, children of mothers in all three treatment groups showed similar reductions in the mean number of daily disruptive behavior events and aggressive events; this improvement persisted long term for Mindfulness-Based Positive Behavior Support and Mindfulness-Based Training alone (**Appendix H, Table H-2**).

3.1.3.5 Child-Only Interventions

Eleven RCTs[93,100,110,118,120,140-142,146,148,152] compared a child-only intervention with one or more of the following: waitlist,[93,110,118,120,142,148,152] no treatment,[140] an undefined control group[100] or another child-only intervention, specifically a Specific Skills Training intervention.[118,146] Child-only interventions included cognitive behavioral therapy (CBT)-based interventions,[120,140,152] play therapy,[100,141] Specific Skills Training interventions,[93,110,118,146,148] and mindfulness training.[142]

Only three trials could be pooled.[118,140,141] Pooled analysis of any child-only interventions versus TAU or waitlist indicated similar scores on the CBCL externalizing scale immediately post-treatment (3 RCTs, N=170, SMD -0.95, 95% CI -2.06 to 0.11, I^2=84%) (**Figure 5).** The high statistical heterogeneity of 84 percent may be due to the different interventions and outcome scales. All trials were rated high risk of bias.

Figure 5. Child-only interventions versus waitlist: CBCL externalizing scores



Abbreviations: CBCL = Child Behavior Checklist; Crtl = control; ECBI = Eyberg Child Behavior Inventory; Int = intervention; PL = profile likelihood; SD = standard deviation; SST = Specific Skills Training

3.1.3.6 Child-only Specific Skills Training

3.1.3.6.1 Description of Studies

Five RCTS[93,110,118,146,148] (total N=412) evaluated different types of Specific Skills Training interventions delivered to school age children with disruptive behaviors. Across the RCTs, children's diagnoses according to DSM criteria were: ODD or CD (2 RCTs),[93,146] ODD, CD or DBD-NOS (1 RCT),[118] and ODD only (1 RCT).[110] One trial[148] included children with clinical levels of disruptive behaviors but did not provide information on specific diagnoses. Two trials[93,110] included children with comorbid ADHD, but the authors did not provide the proportion with a diagnosis; the remaining three trials[118,146,148] were unclear regarding inclusion or exclusion of children with comorbid ADHD. In general, children with learning disabilities or autism were excluded.

3.1 Results, Key Question 1. Psychosocial interventions for improving psychosocial outcomes

Four RCTs (N=312)[93,110,118,148] compared child-only Specific Skills Training interventions with waitlist controls. Specific interventions included: (1) the child-training program (i.e., Dinosaur School) component of the Incredible Years (2 RCTs);[93,110] (2) Social Cognitive Intervention Program (1 RCT);[118] (3) Social Skills Training program (1 RCT);[118] and (4) Self-management Training and Regulation Strategy (1 RCT).[148]

Two RCTs[118,146] compared a child-only Specific Skills Training intervention with a different child-only intervention. One trial[118] compared Social Cognitive Intervention Program versus Social Skills Training (this trial also included a waitlist arm) and the other trial[146] compared a Social Skills Training program that uses computer assistance in addition to therapist-led individual therapy, versus a supportive, solution- and resource-activation treatment, which did not use computer assistance.

See **Appendix H** for details regarding the specific interventions.

3.1.3.6.2 Detailed Analysis

Specific Skills Training versus waitlist. Each RCT reported a different measure of disruptive behavior (**Appendix H, Table H-3**). Two of the four trials reported primary outcomes of interest. In one trial, Incredible Years Child Training was associated with a moderate improvement in ECBI intensity scores compared with waitlist over the short term (N=49, MD -33.87, 95% CI -48.47 to -19.27);[93] in this trial, similar proportions of children in both groups scored in the non-clinical range (i.e., "recovered") on the CBCL externalizing scale. A second RCT reported similar CBCL externalizing T-scores post-treatment for children who received Social Cognitive Intervention Program (N=57, MD -0.40, 95% CI -6.39 to 5.59) and Social Skills Training (N=55, MD -2.10, 95% CI -7.01 to 2.79) compared with those in a waitlist control.[118] In the long term, children in the intervention groups continued to show similar improvement, however, there was no comparison with the children in the control group at this timepoint. Outcomes reported by the other two trials are summarized in **Appendix H, Table H-3**.[110,148] One trial reported that children who received Self-management Training and Regulation Strategy showed greater short-term improvement in Elementary School Success Profile-Teacher-rated disruptive behavior subscale scores versus waitlist, but it is unclear if the difference is clinically meaningful.[148] One RCT that compared Incredible Years Child Training with a waitlist control reported that similar proportions of children in both groups scored in the non-clinical range (i.e., "recovered") on the ECBI intensity scales at followup.

Specific Skills Training versus other child-only interventions. One trial compared Social Cognitive Intervention Program versus Social Skills Training[118] and reported similar CBCL externalizing T-scores for children in both groups post-treatment (N=82, MD 1.71, 95% CI -2.55 to 5.97) and long term at 52 weeks (N=82, MD -0.64, 95% CI -5.36 to 4.08). The proportion of children no longer meeting diagnostic criteria for CD, ODD or DBD-not otherwise specified was also similar between groups (**see Appendix H for details).**

One RCT[146] that compared a computer-assisted Social Skills Training program versus a resource-activation treatment that did not use computer assistance reported similar improvement between children in both groups on several measures of disruptive behavior post-treatment. None of the outcomes were primary outcomes of interest and are summarized in **Appendix H**.

3.1.3.7 Child-Only CBT-Based Interventions

3.1.3.7.1 Description of Studies and Detailed Analysis

Three RCTs[120,140,152] (total N=450) compared weekly child-only CBT-based interventions (delivered in a group setting) versus waitlist or no intervention for the treatment of disruptive disorders in school age participants. One trial indicated that participants met a DSM diagnosis for disruptive behaviors.[120] Specific CBT-based interventions included self-determination training,[140] Tuning Your Temper,[152] and a culturally sensitive CBT protocol specifically adapted to the Puerto Rican culture.[120] See **Appendix H** for details regarding the specific interventions.

Each RCT reported a different measure of disruptive behavior. Only one trial reported a primary outcomes of interest.[140] CBCL externalizing scores were lower (i.e., improved) immediately postintervention for children who received self-determination training compared with no treatment (scale unclear, N=30, MD -7.60, 95% CI -12.44 to -2.76). Across the other two trials, scores on other measures of child disruptive behavior were similar between the groups (**see Appendix H for details**).

3.1.3.8 Child-Only Play Therapy

3.7.2.8.1 Description of Studies and Detailed Analysis

Two RCTs[100,141] evaluated Play Therapy for school-age children diagnosed with ODD (2 RCTs)[100] or with clinical-level symptoms of ODD or CD.[141] Children with intellectual disabilities were excluded and authors did not specify comorbid diagnoses. One RCT[100] randomized children to 8 weekly sessions of play therapy delivered individually, play therapy delivered in a group setting or to an undefined control group. The second RCT[141] compared 12, weekly sessions of individual sandplay therapy versus a waitlist control. See **Appendix H** for details regarding the specific interventions.

Compared with those in the control groups, children who received play therapy (individual, group and sandplay) showed substantially greater improvement in CBCL scores compared with control groups post-treatment and at short-term followup across both trials (**Appendix H, Table H-4**). Only the trial comparing sandplay therapy with waitlist reported a primary outcome of interest: CBCL externalizing scores (N=38, MD -11.56, 95% CI -15.79 to -7.33).[141] One of these RCTs[100] also compared play therapy delivered in two different formats: individual and group. Primary outcomes of interest were not reported. Children who received individual as opposed to group play therapy showed slightly less improvement in CBCL ODD subscale scores immediately post-treatment but by 8 weeks the scores between groups were similar (**Appendix H, Table H-4**). These trials were very small, and results should be interpreted cautiously.

3.1.3.9 Child-Only Mindfulness-Based Interventions

3.1.3.9.1 Description of Studies and Detailed Analysis

One RCT[142] (N=30) evaluated a group mindfulness-based intervention, “Mindfulness Matters", for the treatment of externalizing disorders in school age boys. The authors did not indicate that children had a DSM diagnosis for disruptive behaviors, but all were in the clinical range on the CBCL at baseline. A waitlist condition was used for the control group. This trial did not report primary outcomes of interest. At end of treatment, boys who received Mindfulness Matters showed a statistically significant improvement on both the CBCL rule breaking and

aggressive behaviors scales versus those in the waitlist group. This is a single small trial, and results should be interpreted cautiously. See **Appendix H** for intervention and outcome details.

3.1.3.10 Any Multicomponent Treatment Versus Treatment As Usual or Waitlist

Based on pooled analyses, multicomponent interventions (i.e., those including both parent and child) were in general, effective in reducing CBCL externalizing or ECBI Intensity scores immediately post-treatment compared with TAU or waitlist with stable findings in the intermediate and long term.

3.1.3.10.1 Description of Studies

Fifteen RCTs contributed to pooled analyses across various multicomponent psychological interventions (i.e., interventions that involve both parent and child), comparing these with either TAU or waitlist.[85,88,93,95,102,104,106,115,116,130,136,138,144,154,155] Eight trials assessed various Parent Management Training (PMT) interventions.[85,88,93,102,104,115,136,154] Three RCTs evaluated PCIT[102,136,154] and two RCTs evaluated Incredible Years.[93,115] One RCT evaluated Triple P and TIK;[104] These interventions are described in depth in **Appendix G**. Two small trials[85,88] conducted by the same author group, enrolled mother/child pairs recruited from women's domestic violence centers and assessed a Project Support PMT intervention that focused on teaching child management skills to mothers who had experienced intimate partner violence and providing them with instrumental and emotional support.

Two RCTs evaluated multicomponent Specific Skills Training interventions.[95,116] One of these trials[116] employed the Utrecht Coping Power Program, an adaptation of the Coping Power Program that targets children with more significant emotional and behavioral difficulties, both of which are described in **Appendix G**. The other trial[95] employed a reciprocal skills training program based on cognitive behavioral and family therapy principles that included teaching families anger management and communication skills. Other interventions were reported in single trials. The Stop Now and Plan (SNAP™) intervention was reported in one RCT[106] which is a standardized, multisystemic program comprised of group and individual components and includes teaching and reinforcement of self-control/problem-solving skills in the children and teaching effective child management techniques for parents.[106] Regulation Focused Psychotherapy, a manualized psychodynamic intervention that combines child and parent training and aims to improve the child's ability to manage their emotions and impulses, was employed in one trial.[144]

Multicomponent group psychotherapy was evaluated in one RCT that enrolled children with early-onset conduct problems.[138] The program included parenting skills relevant to children's cognitive and emotional development as well as those related to enhancing the parent-child relationship, self-control and problem solving. This trial looked at the long-term impact of the program as children became adolescents. Another RCT employed psychoanalytic child psychotherapy that was designed to be manualized, shorter, and more intense than usual child psychotherapy.[130] Parent and child components were run concurrently. One RCT compared conduct of a multicomponent modular treatment program (MTP) in different settings (child's environment versus clinic setting).[89] MTP consisted of child CBT and skills training, ADHD medication, PMT, parent-child and family therapy, teacher consultations and school programming, peer relations, and community development and crisis management. The same

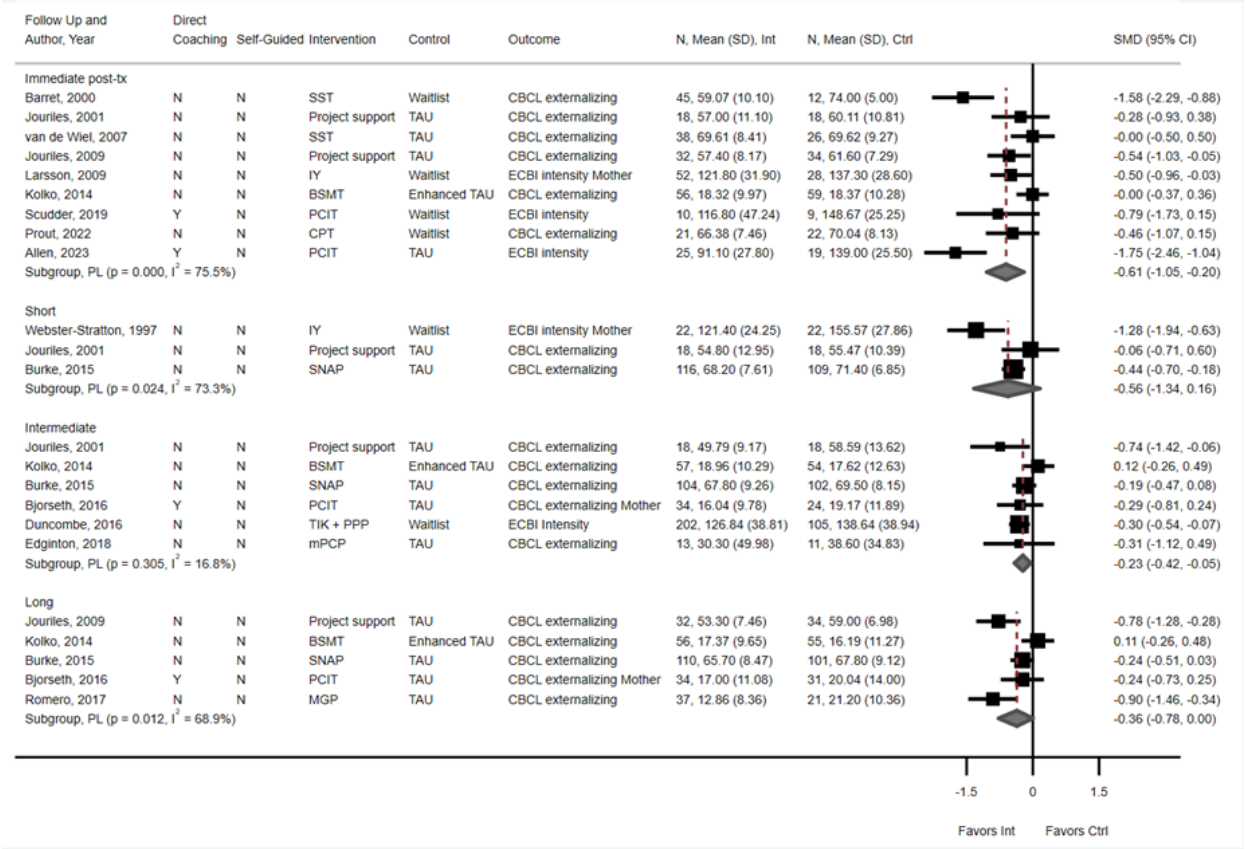
authors subsequently re-randomized those who had completed the trial to an age-appropriate booster treatment or enhanced usual care. Data for this later trial are reported in this section.[155]

3.1.3.10.2 Detailed Analysis

Pooled results: CBCL externalizing, ECBI intensity, or ECBI problem scores.

Multicomponent interventions were associated with a moderate decrease in CBCL externalizing or ECBI Intensity scores immediately post-treatment in pooled analyses (9 RCTs, N=524, SMD -0.61, 95% CI -1.05 to -0.20, I^2=75%)[85,88,95,115,116,136,144,154,155] versus TAU or waitlist. Sensitivity analyses excluding two outlier RCTs reduced effect size as well as heterogeneity (7 RCTs, N=423, SMD -0.29, 95% CI -0.55 to -0.07, I^2=11%)[85,88,115,116,144,154,155] at this time point. No differences between multicomponent interventions were seen across three RCTs (N=305, SMD -0.56, 95% CI -1.34 to 0.16, I^2=73%) in the short term.[85,93,106] However, small decreases in CBCL externalizing or ECBI Intensity scores favoring multicomponent interventions were seen at intermediate term (6 RCTs, N=742, SMD -0.23, 95% CI -0.42 to -0.05, I^2=17%)[85,102,104,106,130,155] and long term (5 RCTs, N=511, SMD -0.36, 95% CI -0.78 to 0.00, I^2=69%) (**Figure 6**).[85,102,106,138,155]

Figure 6. Comparison of multicomponent interventions with TAU or waitlist



Abbreviations: BSMT = Booster Session of Modular Treatment; CBCL = Child Behavior Checklist; CI = confidence interval; CPT = Combined Parent and Child Training; Ctrl = control; ECBI = Eyberg Child Behavior Inventory; Int = intervention; IY = Incredible Years; MGP = multicomponent group psychotherapy; mPCP = manualized psychoanalytic child psychotherapy; PCIT = Parent–Child Interaction Therapy; PMT = Parent Management Training; PPP = Positive Parenting Program; SD = standard deviation; SMD = standardized mean difference; SNAP = Stop Now and Plan; SST = Specific Skills Training; TAU = treatment as usual; TIK = Tuning in to Kids

3.1.3.11 Multicomponent Treatment: Parent Management Training versus treatment as usual or waitlist

3.1.3.11.1 Description of Studies

Various forms of multicomponent, involving both parent and child, Parent Management Training (PMT) were compared with either TAU or waitlist in 10 RCTs.[85,88,93,102-105,115,136,154] Parent management programs assist parents learning new skills and techniques for improving their interaction with their child in order to improve child behavior. Programs generally focus on positive reinforcement (praise, rewards) of positive behaviors, boundary setting regarding behaviors and removing attention for inappropriate behaviors. Common parent management programs include PCIT, TIK, Triple P, Helping the Noncompliant Child (HNC), and Incredible Years (see **Appendix G**).

Three RCTs evaluated PCIT[102,136,154] and two RCTs evaluated Incredible Years.[93,115] One RCT evaluated TIK versus Triple P;[104] another RCT also evaluated TIK.[105] One RCT evaluated collaborative problem solving.[103] These interventions are described in depth in **Appendix G**. Other, less commonly used interventions, are briefly mentioned here and described in **Appendix H**.

Project support parent management training was employed in two small (N=36 and 66 families) trials[85,88] conducted by the same author group that recruited mother/child pairs from women's domestic violence centers. The Project Support PMT intervention included training as well as instrumental and emotional support to improve child conduct and reduce maternal psychiatric symptoms. In the smaller trial (N=36), the child's mean age was 5.7 years. Age was not reported in the larger trial (N=66).

PCIT parent training was used in three RCTs (N range 23 to 81, total 159) compared with TAU (details not provided)[102,136] or waitlist.[154] Children in the three RCTs were predominantly male (50% to 89%) and predominantly White (65% and 89%) in trials reporting this.[136,154] Differences between active treatment versus TAU/waitlist is noted in the larger of these RCTs for White (56% vs. 76%) and Black participants (23% vs. 8%).[136] Child age varied; one trial reported a mean of 5.8 years,[102] another a mean of 7 years[136] and the third provided a range of 2.5 to 7 years.[154] Two trials were in children with ASD[136,154] and the third excluded children with ASD. In one trial of children with ASD, 54 percent of children were prescribed medications (not specified) for behavioral issues at baseline.[102]

Two multi-arm RCTs compared multicomponent (i.e., parent and child) Incredible Years parent management training with waitlist, as well as to a parent-only and a child-only intervention[93] or parent-only interventions.[115] Comparisons of the multicomponent with the parent- or child-only interventions are described in other sections. One trial (N=44)[93] enrolled children who met DSM-IIIR criteria for ODD and for CD. In the other trial (N=85)[115] most children had an ODD diagnosis (82%) and 35 percent had a diagnosis of ADHD.

Other parent management training versus waitlist. Three RCTs compared various types of PMT to waitlist or compared PMT to TAU.[103-105] These programs are described in **Appendix H.**

One RCT (N=134)[103] in children at a mean age of 10 years with diagnosed ODD compared manualized PMT with waitlist. Most children also had a diagnosis of ADHD (68%) and anxiety disorder (63%); 25 percent were on stable doses of ADHD stimulant medications. Attrition was substantial with post-treatment data available for 66 percent of participants and for 43 percent at 6 months.

3.1 Results, Key Question 1. Psychosocial interventions for improving psychosocial outcomes

A three-arm, cluster RCT[104] randomized schools to one of two multisystemic PMT programs, Triple P or TIK or to waitlist. Large proportions of children randomized to Triple P and TIK did not receive allocated treatments (22% and 24%) and loss to followup (questionnaires were not returned) in all arms was substantial (34%, 25% and 37% for Triple P, TIK and waitlist respectively). Authors used imputation for intention to treat analyses.

Another cluster RCT from the same author group[105] randomized 37 schools to an expanded TIK or waitlist. Expanded TIK included universal school programs. Baseline assessment was done in 231 children, however 22 of the 113 children (19%) in the TIK group did not receive the intervention and attrition across both groups was substantial (26% for TIK, 36% for waitlist). Authors imputed scores for intention to treat analyses.

3.1.3.11.2 Detailed Analysis

Pooled results: CBCL externalizing, ECBI intensity, or ECBI problem scores.
Multicomponent PMT (that involved both parent and child) was associated with moderately improved CBCL externalizing or ECBI Intensity scores immediately post-treatment in pooled analyses (5 RCTs, N=239, SMD -0.73, 95% CI -1.29 to -0.21, $I^2 = 64\%$) (**Appendix H, Figure H-4**).[85,88,115,136,154] Two small trials[136,154] had the largest effect sizes and contributed to the heterogeneity. Both trials were in children with ASD who had disruptive behaviors, had similar treatment length, and involved direct parent coaching and used PCIT. Reasons for heterogeneity are unclear. When these two trials were pooled together, PMT was associated with substantial improvement in scores (2 RCTs, N=63, SMD -1.38 95% CI -2.43 to -0.14, I^2=61%).[136,154] Removal of these two trials reduced the effect size and heterogeneity across the remaining three RCTs, (3 RCTs, N=182, SMD 0.47, 95% CI -0.77 to -0.14, I^2=0 %).[85,88,115] The pooled SMD indicates no difference between treatments in the short term, but substantial heterogeneity across the two small RCTs[85,93] is noted, with one trial reporting a large improvement in ECBI intensity with PMT versus waitlist (1 RCT, N=44, SMD -1.28, 95% CI -1.94 to -0.63)[93] and the other reporting similar CBCL externalizing scores between PMT and TAU (1 RCT, N=36, SMD -0.06 95% CI -0.71 to 0.60).[85] Differences in PMT methods and/or comparators between the trials may contribute to the statistical heterogeneity.

PMT was associated with a small improvement in the intermediate term (3 RCTs, N=401, SMD -0.34, 95% CI -0.65 to -0.12, $I^2 = 0\%$)[85,102,104] compared with TAU or waitlist. One trial[104] compared two PMT methods (TIK and Triple P) to waitlist. Pooled analyses in **Appendix H, Figure H-4** combined these two groups versus waitlist. Pooled estimates were similar, and conclusions did not change when only participants who received TIK were analyzed (3 RCTs, SMD -0.31, 95% CI -0.67 to -0.07) or when only the participants who received Triple P were analyzed (3 RCTs, SMD -0.38, 95% CI -0.69 to -0.14). Long-term CBCL scores were similar between PMT and TAU across two trials (2 RCTs, N=131, SMD -0.50, 95% CI -1.15 to 0.14)[88,102] (**Appendix H, Figure H-4**).

Pooled estimates immediately post treatment indicated that PMT with direct parent coaching and PMT without direct coaching as reported above may both improve scores compared to TAU or waitlist. There are insufficient numbers of studies to evaluate any differential effect of direct coaching of parents directly versus no direct coaching, however. Both trials were in children with ASD and had similar length of treatment. Differences in the effect estimates may also be impacted by the type of PMT (e.g., PCIT, Incredible Years, project support) and unknown patient population characteristics and not necessarily attributed to use of coaching (**Appendix H, Figure H-5**).

Two small RCTs,[88,102] whose CBCL externalizing scores are represented in **Appendix H, Figure H-4**, also reported ECBI Intensity raw scores. No differences between PMT and TAU were observed at any time except for one trial[102] that found PMT associated with a small improvement in scores long term, though estimates are imprecise (**Appendix H, Table H-5**).

Three RCTs reported ECBI Problem scale scores[115,136,154] and found PMT associated with a moderate improvement compared with TAU or waitlist in pooled analysis (3 RCTs, N=170, MD -5.37, 95% CI -8.92 to -2.24, I^2=0%) immediately post-treatment (**Appendix H, Figure H-6**).

Other outcomes. For studies not reporting CBCL externalizing, ECBI Intensity or ECBI Problem scores, other reported measures of behavior are summarized in **Appendix H, Table H-5**. Results for most measures suggest that PMT may be associated with improved scores for various measures of child behavior than TAU or waitlist.

3.1.3.12 Multicomponent Parent Management Versus Controls Other Than TAU/Waitlist

Multicomponent parent management versus controls other than waitlist or treatment as usual. Scores on child behavior measures were similar for studies comparing multicomponent PMT interventions with a different multicomponent PMT intervention and for studies comparing variations in how the multicomponent PMT was delivered with the exception of a small improvement in scores seen with use of PCIT delivery via ebook versus traditional delivery. Scores on behavioral measures were similar for comparisons of multicomponent Incredible Years and Incredible Years that included parent or child alone.

3.1.3.12.1 Description of Studies

Seven RCTs[93,104,108,109,115,127,153] compared various forms of multicomponent interventions (Parent Management Training [PMT] that involves both parent and child) with a variation on the intervention, another multicomponent intervention or to the same intervention delivered only to the parent or child. The following general PMT interventions used in the studies below are detailed in **Appendix G**: PCIT, TIK, Triple P, HNC, and Incredible Years. Other interventions are listed below and briefly described in **Appendix H**.

One trial (N=45) compared PCIT with Family Creative Therapy,[109] which involves parent, child, and siblings with a focus on interaction and communication in the family as a whole.

Two trials compared forms of technologically enhanced PMT with more traditional PMT delivery. One of the trials[108] compared technology-enhanced HNC with traditionally delivered HNC in families meeting criteria for low income (<150% of the Federal poverty level). Enhanced HNC provided parent support via smartphones. In the second trial,[153] enhanced PCIT consisted of a multimedia e-book that included imbedded videos and interactive features consistent with the CDI phase of PCIT.

One trial[127] in children with conduct problems and high levels of callous-unemotional traits compared PMT plus a novel emotional engagement strategy involving reciprocated eye gazing between parent and child to PMT plus child-centered play.

A three-arm RCT cluster-randomized trial compared two multisystemic interventions; one to represent a more emotionally based approach (TIK) and the other to represent a more behavior-focused approach (Triple P) as well as to waitlist in children deemed at risk for CD.[104] Authors

defined multisystemic interventions as those that included parent, child, and teacher. Only the parent management components/programs (Triple P, TIK) are reported here. Large proportions of trial participants did not receive allocated treatments (Triple P 22% and TIK 24%) and loss to followup (questionnaires were not returned) was substantial (34% and 25%, respectively).

Two trials[93,115] compared multicomponent Incredible Years (parent and child) to delivery of Incredible Years to the parent only; one of these trials also compared multicomponent Incredible Years with Incredible Years delivered to the child only and to the parent only.[93] A description of Incredible Years can be found in **Appendix G**.

3.1.3.12.2 Detailed Analysis

Pooled results: CBCL externalizing, ECBI intensity or ECBI problem scores. Four RCTs that compared different forms of Multicomponent PMT (that involves both parent and child) reported CBCL Externalizing and ECBI Intensity Scores.[104,108,109,153] Immediately post-treatment, there were no differences between treatment groups (3 RCTs, N=236, SMD -0.18, 95% CI -0.54 to 0.10, I^2= 0%)[108,109,153] (**Appendix H, Figure H-8**). All three RCTs used direct coaching. Two of these trials[108,153] compared technology enhanced PMT with traditionally delivered PMT and trial one compared PCIT with different PMT forms (PCIT vs. Family Creative Therapy).[109]

Enhanced PCIT (additional use of a multimedia e-book) was associated with a small improvement in scores short term versus traditional PCIT (1 RCT, N=178, SMD -0.34, 95% CI -0.64 to -0.04),[153] however, at intermediate term, scores were similar for comparisons of different forms of PMT across two other RCTs (2 RCTs, N=245, SMD 0.02, 95% CI -0.59 to 0.38, I^2=47%).[104,109] One trial used direct coaching[109] and the other did not.[104] No conclusions regarding use of direct coaching versus not using it can be made.

Two trials, both employing direct coaching, found no difference in ECBI Problem Scores between Helping the Noncompliant Child delivery (enhanced vs. traditional delivery)[108] or type (PCIT vs. Family Creative Therapy)[109] immediately post-treatment (2 RCTs, N=58, pooled MD -0.57, 95% CI -1.20 to 0.14, I^2= 0%). Similarly, there was no difference at intermediate term in one trial, (1 RCT, N=43, MD -0.31, 95% CI -0.93 to 0.32) comparing PCIT with Family Creative Therapy (**Appendix H, Figure H-9**).[109]

In addition to reporting CBCL Externalizing scores (**Appendix H, Figure H-8**), one trial[109] reported moderate improvement in ECBI Intensity scores with PCIT versus Family Creative Therapy (**Appendix H, Table H-6**) immediately post-treatment but this was not sustained to intermediate term. Two trials that compared multicomponent Incredible Years to Incredible Years delivery to the parent or only to the child also reported ECBI Intensity.[93,115] No differences in scores were seen immediately post-treatment in one trial (N=97, MD 5.30, 95% CI -6.42 to 17.02)[115] or long term when multicomponent PMT was compared with intervention delivery to the parent only in pooled analysis of two RCTs (N=136, SMD -0.12, 95% CI -0.64 to 0.27, I^2= 0%).[93,115] Similarly there was no difference between the multicomponent Incredible Years and Incredible Years involving the child only[93] in the short term or long term (**Appendix H, Table H-6**).

Other outcomes. For studies that did not report CBCL externalizing, ECBI Intensity or ECBI Problem scores, other reported behavior measures are summarized below. There were no differences between any of the various multicomponent PMT interventions and intervention

delivery to the child or parent alone for any measure. Similarly, there were no differences in SDQ conduct scores for comparisons of two adjunctive treatments (emotional engagement and child-centered free play) to PMT or when TIK and Triple P were compared (**Appendix H, Table H-6**).

3.1.3.13 Multicomponent Interventions: Family Therapy

3.1.3.13.1 Description of Studies and Detailed Analysis

Three RCTs[86,138,151] and one NRSI (in 2 publications)[158,160] compared family therapy with TAU. One RCT also compared two different family therapy delivery methods.[151] See **Appendix H** for intervention details.

Only one RCT[138] reported a primary outcome of interest and compared a multicomponent (parent, child, and teacher) group psychotherapy intervention to an undefine control group in children with clinical levels of CDs (CBCL externalizing scale T-scores ≥70). At a 5-year followup (at study entry, mean child age was 8 years), children of families in the program had lower CBCL externalizing scores than those in the control group (N=58, MD -8.34, 95% CI -13.33 to -3.35).[138]

Outcomes for the other two RCTs are detailed in **Appendix H, Table H-7**. Briefly, one RCT[86] (N=165) that compared multifamily psychoeducational psychotherapy versus TAU for the treatment of school age children with mood disorders and comorbid ODD or CD and ADHD found similar scores between the groups at 52 weeks on measures of disruptive behavior. The other RCT[151] (26 schools, N=594) compared two variations of a culturally sensitive multiple family group therapy (one delivered by parents and peers and the other by community health workers, all trained by the study team) versus a bolstered TAU. Children who received family therapy reported lower (i.e., improved) ODD symptom scores post-treatment compared with TAU. When compared with one another, the parent and peer delivered and the community health worker delivered versions of the intervention were equally effective in reducing ODD symptoms.

In addition, one NRSI[158] (N=320) compared multiple family group therapy versus TAU for the treatment of primarily Latino (53%) or Black (30%) children diagnosed with ODD or CD; those who received the family therapy intervention showed improved Iowa Conners Rating Scale ODD subscale scores post-treatment and intermediate term compared with TAU (**Appendix H, Table H-7**).

3.1.3.14 Multicomponent Interventions: Specific Skills Training

3.1.3.14.1 Description of Studies

Three RCTs (in five publications)[95,116,122,128,129] and two NRSIs (in three publications)[162,163,165] evaluated multicomponent Specific Skills Training interventions for the treatment of school age children with disruptive behaviors. Interventions included the Coping Power Program (1 RCT in 2 publications[116,122] and 2 NRSIs, across 3 publications);[162,163,165] Reciprocal Skills Training (1 RCT);[95] and a CBT-based social competence training program (1 RCT in 2 publications).[128,129] Comparators included TAU or waitlist (2 RCTs in 3 publications[95,116,122] and 2 NRSIs in 3 publications[162,163,165]); a child-only intervention (1 RCT in 2 publications);[128,129] or another multicomponent therapy (1 NRSI).[162]

Four studies (2 RCTs and 2 NRSIs)[95,116,122,162,163,165] compared multicomponent Specific Skills Training with TAU or waitlist. Specific interventions included: the Coping Power

Program/Utretch Coping Power Program in three studies (1 RCT[116,122] and 2 NRSIs[162,163,165]) and Reciprocal Skills Training in one RCT.[95] The interventions are described in detail in **Appendix G**. The RCTs included children diagnosed with DBD and comorbid ADHD (63%)[116,122] or ODD (36% had comorbid ADD).[95] In the NRSIs, children were diagnosed with ODD (primarily) or CD; about a quarter of the children in both studies had comorbid ADHD. Both NRSIs are from similar author groups and it is unclear if there is overlap between the two study populations; one study[165] included a third treatment arm (Beyond the Clouds). For the purposes of this report, these study populations were treated as belonging to two separate studies.

Two studies evaluated multicomponent Specific Skills Training interventions compared to a child-only intervention (1 RCT, in 2 publications; CBT-based social competence training program versus an educational group play intervention)[128,129] or to another multicomponent therapy (1 NRSI; Coping Power Program versus Beyond the Clouds).[162] The RCT enrolled school aged boys diagnosed with ODD (77%), CD (3%), or mixed disorder of conduct and emotions or hyperkinetic CD (20%) and who displayed overt peer-related aggressive behavior. The NRSI[162] also included a TAU arm and is described above.

See **Appendix H** for details regarding the specific interventions and comparators.

3.1.3.14.2 Detailed Analysis

The coping power program versus treatment as usual. One RCT (in two publications)[116,122] found that children who received the Utrecht Coping Power Program had similar CBCL externalizing T-scores post-treatment as those who received TAU (N=64, MD -0.01, 95% CI -4.46 to 4.44).[116] At a 5-year followup,[122] children in both groups had similar National Youth Survey Questionnaire Delinquency scores and similar rates of substance use in general (**Appendix H, Table H-8)**.

Results across two NRSIs (in three publications)[162,163,165] showed improved disruptive behavior symptoms in children who received the Coping Power Program versus TAU. Children who received the Coping Power Program had lower CBCL externalizing T-scores compared with those who received TAU post-treatment and long term at 52 weeks, but not at 261 weeks. In one NRSI (all analyses controlled for the use of medication during the treatment)[163] (**Appendix H, Table H-8**). Of note, by the longest followup in the latter study, children were now adolescents (age 15 to16 years). Similarly, in the second NRSI,[165] scores post-treatment on the rule breaking and aggression subscales of the CBCL were lower in children who received the Coping Power Program versus TAU (**Appendix H, Table H-8**).
[162]

Reciprocal skills training versus waitlist. In one RCT[95] (N=51) compared to waitlist, children in the reciprocal skills training group had lower T-scores on the CBCL externalizing scale post-treatment (N=57, MD -14.93, 95% CI -19.02 to -10.84); both treatment settings (hospital and clinic) were equally effective in reducing scores compared with waitlist (**Appendix H, Table H-9**). Reciprocal skills training was associated with a greater likelihood of achieving remission (i.e., no longer meeting the DSM-IV criteria for ODD) compared with waitlist. However, there were many differences in potentially prognostic baseline characteristics between randomized groups, indicating these results must be interpreted with caution **(see Appendix H for details).**

One RCT[128,129] found that children who received social competence training had lower externalizing scores on the CBCL post-treatment (MD -0.15, 95% CI -0.25 to -0.05)[128] and at intermediate followup (43 weeks; MD -0.12, 95% CI -0.25 to 0.01)[129] and were more likely to

achieve clinically significant improvements compared to those who participated in group play (**Appendix H, Table H-10**).

In one NRSI[162] children who received the Coping Power Program had lower scores on the aggressive behavior and rule-breaking subscales of the CBCL post-treatment compared with children who received a generic multicomponent program called Beyond the Clouds; this difference between groups persisted long term (52 weeks) for the rule-breaking scores only (**Appendix H, Table H-10**). The proportion of non-responders was similar between groups.

3.1.3.15 Multicomponent Interventions: Collaborative Problem Solving

Three RCTs,[92,103,149] involving similar author groups, evaluated Collaborative Problem Solving for the treatment of school age children with ODD. Comparators included PMT (multicomponent or parent-only) in all three trials and waitlist in one trial.[103]

3.1.3.15.1 Description of Studies and Detailed Analysis

Collaborative problem solving versus waitlist. One RCT[103] compared Collaborative Problem Solving with waitlist for the treatment of school age children diagnosed with ODD. All the children (99%) had at least one additional comorbid disorder, and 83 percent had a second comorbid condition. The most prevalent comorbid diagnoses included ADHD and an anxiety disorder (i.e., generalized anxiety, social anxiety, or separation anxiety disorder). Collaborative Problem Solving is described in detail in **Appendix G**. The waitlist condition was discontinued and waitlist participants were subsequently reassigned randomly to the two active conditions due to the worsening clinical state of the children. Due to this rerandomization, only the short-term results (1 week post-treatment) of the original randomization are presented.

Collaborative Problem Solving was associated with a large improvement in Behavior Assessment System for Children-2 (BASC-2) T-scores short term (1 week post-treatment) compared with waitlist in ITT analyses (N=123, MD -12.83, 95% CI -22.00 to -3.66). Almost half of the children who received Collaborative Problem Solving (48%, 22/46) were in remission (i.e., ODD diagnosis-free) at short term followup compared with no child in the waitlist group (0%, 0/11, $p<0.01$).

Collaborative problem solving versus multicomponent PMT and versus parent-only PMT. Three trials, involving similar author groups, compared Collaborative Problem Solving with PMT delivered to the parent only (1 RCT)[92] or modified to include the child (i.e., multicomponent) (2 RCTs).[103,149] One of the latter trials also included a waitlist arm; the results are summarized above.[103] Collaborative Problem Solving and PMT are described in detail in **Appendix G**. All three trials enrolled children with a diagnosis of ODD. In two trials,[103,149] almost all children (96% to 99%) had at least one additional comorbid disorder and many had a second comorbid condition; the most prevalent comorbid diagnoses included ADHD and an anxiety disorder (i.e., generalized anxiety, social anxiety, or separation anxiety disorder). The third trial specifically included children with concurrent "affective dysregulation", defined as at least subthreshold features of either severe major depression or juvenile bipolar disorder.[92]

None of the trials reported primary outcomes of interest. Across all three trials,[92,103,149] regardless of outcome measure or timing, children who received Collaborative Problem Solving showed similar improvement as those who received parent-only or multicomponent (i.e., involved the child) PMT (**Appendix H, Table H-11**). The one exception was the likelihood of

remission on the Clinical Global Impression Improvement scale at short term (16 weeks) in one trial[92] that found a moderately greater likelihood with Collaborative Problem Solving versus parent-only PMT. For the reasons stated above (in the section versus waitlist), we did not report the intermediate-term followup data for the trial that included a waitlist arm.[103]

3.1.3.16 Multicomponent interventions: Multisystemic Therapy

3.1.3.16.1 Description of Studies

Two RCTs[106,119] and one NRSI[157] evaluated the Stop Now and Plan (SNAP™) Under 12 Outreach Program in school age children. Details regarding the SNAP™ intervention as well as the comparator interventions are in **Appendix H.** Boys comprised the majority of the study populations (75% to 100%); one RCT[106] and the NRSI[157] enrolled only boys. For entry, all studies required that children score in the clinical range on the "offending" behaviors scales (rule-breaking, aggressive, conduct, delinquency) of the CBCL or TRF and/or, in one RCT[119] and the NRSI,[157] have had police contact within 6 months of referral. Only one study reported race, with 76 percent of children African American.[106]

3.1.3.16.2 Detailed Analysis

Stop Now and Plan (SNAP™) versus standard services or waitlist. One RCT compared SNAP™ with standard services which also included "wraparound" services (high intensity, multidisciplinary services providing 10 or more service hours per week).[106] SNAP™ was associated with lower T-scores at short-term followup (N=225, MD -3.20, 95% CI -5.09 to -1.31) and similar T-scores at intermediate (N=206, MD -1.70, 95% CI -4.08 to 0.68) and long-term (N=211, MD -2.10, 95% CI -4.48 to 0.28) followup on the CBCL externalizing scale compared with standard services (**Appendix H, Table H-12**). By the end of the study, similar proportions of boys in both groups had contact with the juvenile probation department; however, authors indicated that boys who received SNAP™ had significantly fewer charges compared with those who received standard services (data not provided; the number of charges ranged from 1 to 7 across all boys) **(Appendix H, Table H-12).**

One NRSI compared SNAP™ with a waitlist control.[157] Additional services were available to families of both groups and included academic tutoring, clinical and community services, school support, individual and group support for both child and parent, among others. According to multivariate analyses (N=209), when adjusted for age, child welfare, and time between pre- and post-assessment, boys who received SNAP™ had lower CBCL total, rule-breaking, aggressive and conduct scale scores compared with boys in the waitlist group (p values ranged from 0.01 to 0.02).

Stop Now and Plan (SNAP™) versus a nonclinical recreation program. One RCT[119] compared SNAP™ with Cool Runners Club, a non-clinical activity/recreation program that consisted of arts and crafts and cooperative game activities with timing and duration identical to SNAP™. After 13 weeks of treatment, children who received SNAP™ had lower scores on the CBCL Delinquency (mean 4.9 vs. 8.4, p=0.006) and Aggression (mean 15.5 vs. 19.0, p=0.05)

subscales compared with those who received the Cool Runner's Club intervention. The authors did not report adequate data for the calculation of the mean difference between groups.

3.1.3.17 Multicomponent Interventions That Were Multimodal or Modular

3.1.3.17.1 Description of Studies

One NRSI compared a multicomponent multimodal treatment with treatment as usual.[156] One RCT (2 publications) compared conduct of a multicomponent modular treatment program in different settings (child's environment versus clinic setting).[89,91] The same authors subsequently rerandomized those who had completed the trial to a booster treatment or enhanced usual care.[155] Interventions are briefly described below and detailed in **Appendix H**.

3.1.3.17.2 Detailed Analysis

Multicomponent multimodal intervention. There was insufficient evidence from one NRSI rated high risk of bias (N=135) that compared a multimodal treatment program (individualized and group therapy for children and individual parent training) with TAU[156] provided by community health services.

Multimodal treatment was associated with improvement on the on CBCL Externalizing Problems score versus TAU immediately post-treatment (unadjusted MD -3.0, 95% CI -5.5 to 0.45) and at 52 weeks post-treatment (unadjusted MD -4.95, 95% CI 0.9 to -1.81), however, the clinical importance of this difference is unclear and there was no difference between groups based on ANCOVA analyses adjusted for age, gender, and repeated measures (p =0.55). Authors noted that baseline CBCL scores predicted higher level externalizing scale scores at 2 years but did not provide data.

Multicomponent modular intervention. One index RCT (N=144)[89] and a related companion publication[91] compared conduct of a MTP in the child's home, school and/or community settings (not further specified) with delivery of the same program in an outpatient clinic, although session content for some modules differed by setting. The seven modules were: (1) child CBT/skills training; (2) child medication for ADHD; (3) PMT; (4) parent-child/family therapy; (5) school/teacher consultation; (6) peer relations/community activities development; (7) case/crisis management. The completion rate (receipt of ≥ 15 service hours) was higher for children who received a home, school, or community setting versus a clinic setting (93.1% vs. 73.6%); noncompleters were significantly more likely to be African American than completers (78.9% vs. 48.3%). Participants who had completed the above index RCT (N=129)[89] through 156 weeks post-treatment were re-randomized to an age-appropriate booster treatment or enhanced usual care[155] in the same setting as the index RCT (i.e., community or clinic). Enhanced usual care consisted of a written summary of the 156-week evaluation from the index trial, referrals and treatment recommendations based on an outline of the child's diagnoses and individualized goals. A large proportion of children had comorbid ADHD (70%). Direct coaching was not reported in either trial.

CBCL externalizing scores. Raw CBCL externalizing scores were similar between the MTP delivered in the child's environment/community and MTP delivered in an outpatient clinic at all time points in one RCT[89] and related companion paper[91] (**Appendix H, Table H-13**). Raw CBCL externalizing scores were also similar between children/families receiving booster therapy

and those receiving enhanced TAU at all time points (**Appendix H, Table H-14**). Other outcomes are reported in **Appendix H**.

3.1.3.18 Other Multicomponent Interventions for School Age Children

Eight RCTs (in 9 publications)[87,97,110,124,125,130,134,135,144] and two NRSIs[162,164] evaluated a different multicomponent intervention for the treatment of disruptive behaviors in school age children; each intervention below stands alone and trials are grouped by whether the comparator was TAU or waitlist (6 RCTs[87,97,110,124,130,144] and 2 NRSI[162,164]) or another active intervention (3 RCTs in 4 publications)[110,125,134,135] that involved the parent/caregiver only (2 RCTs, in 3 publications),[110,134,135] the child only (1 RCT),[110] or both the child and parent and/or the child's teacher (2 RCTs).[110,125]

Multicomponent interventions versus treatment as usual or waitlist. Eight studies compared a multicomponent intervention with TAU or waitlist; multicomponent interventions included: manualized psychoanalytic child psychotherapy (1 RCT),[130] regulation focused psychotherapy (1 RCT),[144] telephone-assisted self-help intervention (1 RCT),[97] office-based nurse-administered behavioral intervention (1 RCT),[87] mindfulness-based intervention (1 RCT),[124] multicomponent variations of the Incredible Years program (1 RCT),[110] Beyond the Clouds (1 NRSI),[162] and a variety of manualized parent-child focused evidence-based programs (1 NRSI).[164] Only one study reported a primary outcome of interest, an RCT[130] that compared manualized psychoanalytic child psychotherapy versus TAU for school-age children with clinical levels of CD on the SDQ conduct subscale. At the 17-week followup, individuals who received psychotherapy had similar scores on the CBCL externalizing scale (adjusted for baseline scores) compared with TAU (N=24, adjusted mean difference -2.25, 95% CI -8.34 to 3.84). Across the other five RCTs (N range, 43 to 163) that compared a multicomponent intervention versus TAU or waitlist, results varied with roughly half reporting that the intervention resulted in improved scores on measures of disruptive behavior and the other half reporting that scores were similar between groups.[87,97,110,124,144] Both NRSIs (N=74 and 2,763) reported improvement in disruptive behavior symptoms in children who received the intervention versus TAU. **Appendix H** provides detailed summaries of all studies and outcomes.

Multicomponent intervention versus a parent-only intervention. Two RCTs (N=97 and 103) compared a multicomponent intervention with a parent-only intervention. Neither trial reported primary outcomes of interest. One RCT (in 2 publications; N=97)[134,135] compared a Swedish PMT program (i.e., KOMET) combined with the child-component of the Coping Power Program versus the PMT program alone and reported similar scores between groups on all measures of disruptive behavior at all timepoints. The second RCT[110] compared several multicomponent variations of the Incredible Years program (i.e., parent plus teacher, child plus teacher, parent plus child plus teacher) versus Incredible Years Parent-only Training and found that children who received the multicomponent protocols were more likely to show clinically significant improvement (i.e., moved from clinical [>142] to nonclinical range [<142]) on the mother-reported ECBI intensity scale post-treatment and long term compared with the parent-only protocol. Only children in the clinical range at baseline were included in the analysis and sample sizes were not reported for this subgroup. **Appendix H** provides detailed summaries of all studies and outcomes.

Multicomponent intervention versus a child-only intervention. One RCT[110] compared several multicomponent variations of the Incredible Years program (i.e., parent plus teacher, child plus teacher, parent plus child plus teacher) versus Incredible Years Child-only Training and found that more children who received Parent plus Teacher Training and Child plus Teacher Training showed clinically significant improvement (i.e., moved from clinical [>142] to nonclinical range [<142]) post-treatment and long term compared with the those who received Child-only Training, but the differences were not statistically significant; for those who received Parent plus Child plus Teacher Training, the likelihood was similar. Only children in the clinical range at baseline were included in the analysis and sample sizes were not reported for this subgroup. **Appendix H** provides detailed summaries of all studies and outcomes.

Multicomponent intervention versus another multicomponent intervention. Two RCTs compared a multicomponent intervention with another multicomponent intervention. Neither trial reported primary outcomes of interest.

One RCT (N=30)[125] compared Decision Rule Based Treatment with Sequential Treatment. Children who received Decision Rule Based Treatment had similar scores on the Disruptive Behavior Disorder Rating Scale and a similar likelihood of remission in conduct problem disorder compared with those who received Sequential Treatment post-treatment and at the 24-week followup

One RCT[110] compared several multicomponent variations of the Incredible Years program (i.e., parent plus teacher, child plus teacher, parent plus child plus teacher) versus each other and found that more children who received Parent plus Teacher Training and Child plus Teacher Training showed clinically significant improvement (i.e., moved from clinical [>142] to nonclinical range [<142]) post-treatment and long term compared with the those who received the Parent plus Child plus Teacher program, but the differences were not statistically significant. Only children in the clinical range at baseline were included in the analysis and sample sizes were not reported for this subgroup.

Appendix H provides detailed summaries of all studies and outcomes.

3.1.4 Adolescents

3.1.4.1 Description of Included Studies

Seventeen RCTs (in 18 publications)[166-183] assessed behavioral interventions for DBD in adolescents. Across 11 trials, the diagnosis at baseline was CD only (3 RCTs),[170,180,183] DBD only (1 RCT),[167] ODD only (1 RCT),[181] and either CD (range 25.8% to 82.0%) or ODD (range 4.0% to 74.2%) (5 RCTs);[168,173-175,179] one trial[172] enrolled adolescents with CD or ODD but did not provide proportions of each diagnosis. The remaining six trials did not indicate that adolescents had a formal diagnosis but all participants scored in the clinical range on a variety of validated disruptive behavior measures.[166,171,176,178,182] Four trials evaluated adolescents with specific concomitant disorders: CD and comorbid major depression disorder (MDD),[180] CD and comorbid substance-dependence,[175] ODD and comorbid attention deficit hyperactivity disorder (ADHD),[181] and DBD and comorbid ASD.[171] Across other trials that reported this information, the proportion of adolescents with comorbid depression disorders ranged from 8.2 to 80.3 percent (4 RCTs)[168,173,174,179] and with ADHD ranged from 30.0 to 41.0 percent (2 RCTs.)[168,175] ASD was often an exclusion criterion. Many of the adolescents enrolled in these trials had involvement with the criminal justice system; across eight trials, the proportion of adolescents

with a history of arrest ranged from 34.5 to 100 percent.[167,168,170,172-175,177,182] A history of substance use and/or abuse was also common among study populations. **Table 4** provides the summary statistics for adolescents in Key Question 1. The summary of findings for ECBI and CBCL scores in studies of psychosocial interventions versus TAU/waitlist can be found in **Table ES-2** of the Executive Summary and in the Discussion section of the report.

A little more than half of the studies included multicomponent interventions (59%, 10/17),[166-176] (either multisystemic therapy or family therapy interventions), and the remainder included a variety of child-only interventions (41%, 7/10).

Ten trials (11 publications)[166-171,177,179-182] were considered moderate risk of bias and seven trials[172-176,178,183] were considered high risk of bias. See **Appendix E** for risk of bias ratings.

3.1.4.2 Interventions That Included a Parent Component and a Child Component

Ten RCTs (in 11 publications)[166-176] compared a multicomponent intervention with one or more of the following: TAU[166-174] or a child-only intervention (2 RCTs).[175,176]

Multicomponent interventions included Multisystemic Therapy[166-171] and family therapy interventions, which included Family Mode Deactivation Therapy,[173,174] Parenting with Love and Limits,[172] Family Behavioral Therapy,[175] and Brief Strategic Family Therapy.[176]

3.1.4.2.1 Description of Studies

Description of multisystemic studies. Five RCTs (in 6 publications)[166-171] compared Multisystemic Therapy with TAU. Multisystemic Therapy is an intensive family- and community-based intervention for young people with serious antisocial behavior. (See **Appendix G** for more information on Multisystemic Therapy.) TAU varied and included Youth Offending Teams (i.e., multiagency teams comprised of police, probation service, social service, education and health service designed to prevent offending/reoffending),[167,168] and/or medical, social and education services (e.g., medication, speech and language therapy, occupational therapy, behavioral therapy, individual counseling, family therapy, school-based interventions).[166,168,170,171]

Description of family therapy studies. Five RCTs evaluated family therapy interventions for the treatment of conduct/behavior problems in adolescents.[172-176] See **Appendix I** for more information on these interventions.

Three RCTs compared family therapy with TAU.[172-174] Two of these trials[173,174] evaluated Family Mode Deactivation Therapy; all adolescents in these trials had several comorbid problems and had a history of childhood abuse (almost half [45%-48%] suffered from PTSD and some had a history of suicidal ideation).For the purposes of this report, these RCTs are treated as separate trials; however, the trials were not well described and there is potential/likely overlap in the study populations. The third trial evaluated the Parenting with Love and Limits manualized group therapy program.

Two RCTs compared family therapy with a child-only intervention.[175,176] One trial[175] evaluated Family Behavior Therapy which followed the typical format used in behavior therapy and was compared with Individual Cognitive Problem-Solving therapy adapted to be more purely cognitive. The second trial[176] evaluated Brief Strategic Family Therapy (based on the structural family therapy tradition) and was compared with a participatory-learning group, led by a facilitator. All participants in this trial were Hispanic.

3.1.4.2.2 Detailed Analysis

Results across specific multicomponent interventions varied. In general, outcomes were similar between adolescents who received Multisystemic Therapy versus TAU. Family therapy interventions resulted in greater improvement in adolescents' disruptive behaviors compared with TAU, but results were mixed compared with an active child-only intervention.

Multisystemic therapy versus TAU. Three trials reported CBCL externalizing scores[166,167,170] which were similar for adolescents who received Multisystemic therapy compared with TAU. Two trials reported results immediately post-treatment, one used T-scores (N=104, MD -0.30, 95% CI -4.16 to 3.56)[167] and the other used raw scores (N=256, MD -1.61, 95% CI -4.34 to 1.12),[166] and the third reported results at short term (9 weeks) (N=156, MD 2.20, 95% CI -3.49 to 7.89).[170] Other outcomes related to behavior or quality of life reported by the trials included BASC-2,[171] SDQ conduct scale[168,169] diagnostic status[168] and SF-36 scales[169] (**Appendix I, Table I-1**). In general, results were similar for adolescents who received Multisystemic Therapy versus TAU at all timepoints across these outcome measures. Three RCTs[167,168,170] reported outcomes related to involvement with the criminal legal system (**Appendix I, Figure I-1 and Table I-2**) and two[168,170] reported rates of out-of-home placement/care and school participation (**Appendix I, Table I-2**). Again, in general, results were similar between the groups at all timepoints across these outcomes.

Family therapy. All three trials of family therapy found family therapy associated with large improvements on the CBCL externalizing scale (T-scores) compared with TAU (**Appendix I, Table I-3**); the trial of Parenting with Love and Limits[172] reported results immediately post-treatment N=38, MD -15.26**,** 95% CI -22.05 to -8.47) and the two trials of Family Mode Deactivation Therapy[173,174] reported results at short-term followup (4 weeks) (N=122, MD -22.02, 95% CI -25.98 to -18.06; N=not reported, MD -24.00 (95% CI not calculable), $p<0.05$). One of the latter trials[174] did not provide sample sizes by treatment group so a confidence interval could not be calculated, but the difference is similar to the other Family Mode Deactivation Therapy trial and likely also statistically significant. Other outcomes reported by the trials, including involvement with the juvenile court/legal system, time in detention, and incidents of physical aggression, can be found in **Appendix I, Table I-3**. In general, family therapy was associated with a reduction in these events.

3.1.4.3 Child-only Interventions

3.1.4.3.1 Description of Studies

Seven RCTs[177-183] compared a child-only intervention with one or more of the following: TAU,[177-179] health psychoeducation/intensive health promotion,[178,182] CBT,[183] Social Skills Training,[183] life skills/academic tutoring[180] and an unstructured support group.[181] All active comparator treatments also involved the child only. Child-only interventions included CBT alone[177] or in combination with Social Skills Training,[183] Mindfulness training,[178] Psychodynamic therapy,[179] Preventing HIV/AIDS Among Teens in Juvenile Justice (the PHAT life),[182] Adolescent Coping with Depression Course,[180] and group Reality Therapy.[181]

3.1.4.3.2 Detailed Analysis

Seven RCTs[177-183] evaluated a different child-only intervention for the treatment of disruptive behaviors in adolescents; each intervention below stands alone and trials are grouped by whether the comparator was TAU/waitlist or another active child-only treatment.

Results varied across the specific child-only interventions compared with TAU or waitlist: Psychodynamic Therapy, Social Skills Training, and a combination of CBT and Social Skills training resulted in improved behavioral outcomes in adolescents; Mindfulness-based Training resulted in similar outcomes; and results for CBT varied across trials (1 favored CBT, the other found CBT similar to TAU). In general, outcomes were similar between adolescents who received a child-only intervention versus another child-only intervention; the exception was Preventing HIV/AIDS Among Teens in Juvenile Justice (the PHAT life) intervention which resulted in a greater reduction in disruptive behaviors in clinically aggressive (but not in non-clinically aggressive) adolescents. Details regarding the trials, interventions and comparators can be found in **Appendix I**.

Child-only interventions versus treatment as usual or waitlist. Four trials compared a child-only intervention with TAU or waitlist.[177-179,183]

Only one RCT[178] (N=96) reported a primary outcome of interest and compared a mindfulness-based intervention (based primarily on the adolescent mindfulness-based intervention for enhancing emotional regulation program) versus TAU provided in a residential institution for youth. Authors indicated that CBCL externalizing scores were similar between the two groups immediately post-treatment but did not provide raw data for further analysis. Across the remaining three RCTs,[177,179,183] two found that the interventions evaluated (inpatient psychodynamic therapy[179] and CBT, Social Skills Training, and a combination of both[183]) resulted in improvement in behaviors compared with waitlist as measured by a variety of outcomes. The third trial,[177] which compared inpatient individualized CBT with TAU for the treatment of adolescent male violent offenders, reported similar outcomes between the groups on several measures. Details regarding the trials, interventions and comparators can be found in **Appendix I**.

Child-only interventions versus another child-only intervention. Five trials compared a child-only intervention with another active child-only intervention.[178,180-183] Details regarding the trials, interventions and comparators can be found in **Appendix I**.

Only two trials reported primary outcomes of interest. One RCT[180] (N=93) compared an Adolescent Coping With Depression course to a life skills/tutoring intervention for adolescents with a diagnosis of CD and comorbid Major Depressive Disorder as well as a variety of other disordered behaviors (e.g., substance abuse or dependence, ADHD, anxiety, history of inpatient or residential treatment, history of prior arrest). All adolescents referred for the study were under the supervision of an intake, probation, or parole officer but were not in custody at the time of enrollment. CBCL externalizing scores (scale unclear) were similar between participants who received Adolescent Coping With Depression versus life skills/tutoring immediately post-treatment (MD -4.0, 95% CI -9.57 to 1.57) and at 6 months (MD -0.60, 95% CI -7.02 to 5.82), but those in the intervention arm showed less improvement at 12 months than adolescents who received life skills/tutoring (MD 6.8, 95% CI 1.29 to 12.31). The likelihood of remission (i.e., cessation of CD diagnosis) was similar between adolescents in both groups at all timepoints (**Appendix I)**. The second RCT[178] (N=100) compared a mindfulness-based intervention with a

health psychoeducation condition; this trial also included a TAU arm and details of the mindfulness training intervention are described above. Authors indicated that CBCL externalizing scores were similar between the two groups immediately post-treatment but did not provide raw data for further analysis.

Across the remaining three RCTs,[181-183] results were mixed (**Appendix I**). One small trial[183] (N=12) compared a combination of CBT and Social Skills Training versus CBT alone and Skills Training alone for adolescents diagnosed with CD and found that all three interventions resulted in similar scores post-treatment on measures of delinquent behavior. One RCT[182] (N=310) compared Preventing HIV/AIDS Among Teens in Juvenile Justice (the PHAT life) intervention to an intensive health promotion control in primarily Black (90%) male (67%) juvenile offenders on probation and found that among clinically aggressive juvenile offenders (N=71), but not among non-clinically aggressive offenders (N=239), participants in the Preventing HIV/AIDS intervention group showed a slightly greater improvement in behavior scores than those in the control group at 6 months but not at 12 months. At 12 months, the likelihood of incarceration was significantly lower for adolescents randomized to the Preventing HIV/AIDS intervention One RCT[181] (N=42) compared group reality therapy to an unstructured supportive session control group in adolescents diagnosed with ODD and comorbid ADHD. Participants receiving group reality therapy showed more improvement 1 week after completion of treatment but not at 5 weeks post-treatment.

Family therapy versus child-only interventions. Two trials compared a family therapy intervention with a child-only intervention for the treatment of behavior disorders in primarily male (range 75% to 82%) adolescents.[175,176] Details regarding the trials, interventions and comparators can be found in **Appendix I.**

One trial reported primary outcomes of interest and compared Family Behavior Therapy versus Individual Cognitive Problem Solving in adolescents with dually diagnosed conduct-disordered and substance dependence.[175] Scores on both the ECBI intensity (N=56; post-treatment: MD -19.63, 95% CI -41.43 to 2.17; 26 weeks: MD 7.58, 95% CI -12.97 to 28.13) and problem scales (N=56; post-treatment: MD -3.37, 95% CI -8.24 to 1.50; 26 weeks: MD -3.30; 95% CI -8.77 to 2.17) were similar between adolescents in both groups through 26 weeks; the proportion of participants abstinent from drug use was also similar in both groups (**Appendix I, Table I-4**).

The second trial compared Brief Strategic Family Therapy with a participatory learning group control intervention in Hispanic adolescents.[176] Brief Strategic Family Therapy was associated with a significant reduction in behavior problems immediately post-treatment compared with the participatory learning group intervention based on both the Revised Behavior Problem Checklist CD scale and socialized aggression scale scores; in addition, more participants who received Brief Strategic Family Therapy showed reliable change on both scales, to include movement into the nonclinical range, versus those randomized to the participatory learning group (**Appendix I, Table I-4**).

3.1.4.4 Interventions with only a Parent Component

There were no studies that met inclusion criteria that evaluated a parent-only intervention for the treatment of disruptive behaviors in adolescents.

3.1.4.5 Network Meta-Analysis and Indirect Comparisons for Psychosocial Interventions

A network meta-analysis of psychosocial interventions for DBD behaviors was attempted for each age category (i.e., preschool, school age, and adolescent) but could only be completed for intervention comparisons in preschool-aged children. In school-aged children, there was inconsistency between the direct versus indirect comparison of multicomponent interventions versus child-only interventions indicating that a network meta-analysis would not be valid. There were too few studies per comparator and followup timepoint to conduct a network analysis (or indirect comparisons) for intervention comparisons in adolescents (**Appendix A**).

Preschool. The network meta-analysis for preschool comparisons immediately post-treatment included 24 randomized trials (13 trials of parent-only interventions versus TAU/waitlist, 10 trials of Multicomponent interventions [parent plus child] and 1 trial of a parent-only intervention versus a multicomponent intervention) (**Appendix J, Figure J-1**). Pairwise comparisons and network meta-analysis comparisons resulted in similar findings for each comparison: Multicomponent interventions versus TAU/waitlist (pairwise SMD -0.96, 95% CI -1.38 to -0.6; network SMD -0.96, 95% CI -1.31 to -0.61), Parent-only comparisons versus TAU/Waitlist (pairwise SMD -0.61, 95% CI -0.99 to -0.31; network SMD -0.61, 95% CI -0.91 to -0.32), and a multicomponent intervention versus a parent-only intervention (pairwise -0.24, 95% CI -0.91 to 0.42; network SMD -0.35, 95% CI -0.78 to 0.08) (**Appendix J, Table J-1**). An indirect comparison was also conducted between multicomponent interventions versus parent-only interventions using TAU/waitlist as the common comparator (23 trials) and results were similar to the pairwise, and network analyses (indirect SMD -0.35, 95% CI -0.87 to 0.17), although not statistically significant. Indirect analyses at other time points also favored multicomponent interventions over parent-only interventions in the intermediate term but favored parent-only interventions in the short- and long-term followups; therefore, it is unclear whether multicomponent interventions or parent-only interventions are more effective in reducing DBD behaviors in preschool children. There were no child-only psychosocial interventions in this age category.

School Age. Due to inconsistency between direct and indirect comparisons of multicomponent interventions versus child-only interventions, a network meta-analysis could not be conducted. Immediately post-treatment the pairwise and indirect comparisons differed for multicomponent versus child-only interventions (pairwise, 1 trial, SMD -0.60, 95% CI -1.02 to -0.18; indirect, 12 trials, SMD 0.35, 95% CI -0.82 to 1.51) indicating no clear benefit of multicomponent over child-only interventions in this age category (**Appendix J, Table J-2**). For multicomponent versus parent-only interventions, while the direction of estimates differed, both pairwise and indirect analysis indicated no difference between multicomponent and parent-only interventions (pairwise, 1 trial, SMD 0.18, 95% CI -0.22 to 0.58; indirect, 16 trials, -0.16, 95% CI -0.64 to 0.32). No trial compared a parent-only intervention with a child-only intervention to provide pairwise data; an indirect comparison (10 studies) favored parent-only interventions over child-only interventions but was not statistically significant (SMD 0.51, 95% CI -0.60 to 1.61) immediately post-treatment. Similarly, no other indirect comparisons were statistically significant at other timepoints.

3.1.4.6 Comparison of Trials of Preschool Plus School-Age Children With Versus Without A Formal Diagnosis of a Disruptive Behavior Disorder

Trials of preschool and school-age children where at least 50 percent had a formal diagnosis of ODD and/or CD and trials with less than 50 percent with a formal diagnosis of a disruptive behavior disorder (or the trials did not report DBD diagnoses) were compared to see if there were different responses to treatment versus usual care or waitlist. With multicomponent interventions, both children with and children without a formal diagnosis had greater improvement on ECBI intensity or CBCL externalizing scores than control children, although the magnitude of effect was larger in children without a diagnosis (**Appendix J, Figure J-2).** This finding was not a statistically significant difference, however (confidence intervals overlapped).

When separating the analysis by age group, in preschool children, there was no difference between multicomponent interventions and usual care when stratified by having or not having a diagnosis of a disruptive behavior disorder (SMD -0.97 for both groups) (**Appendix J, Figure J-3).**

However, in school-age children the difference was more pronounced (SMD -0.90 without a diagnosis versus -0.25 with a diagnosis), although this difference was not statistically significant (**Appendix J, Figure J-4).**

Evidence was limited for parent-only interventions, interventions in adolescents, and for ECBI problem scores due to too few trials. While there were no statistically significant differences based on diagnoses, additional research is needed in adolescents overall and research is needed in preschool and school-age children to confirm these findings.

3.1.4.7 Summary of Findings for Key Question 1

Table 5. Summary of findings and strength of evidence for interventions versus TAU/waitlist

Intervention	Outcome Immediately Postintervention	Number Studies; Study Design; Participants (n)	Findings; Effect Size; Direction of Effect	SOE
Parent-only (preschool)	ECBI intensity/ CBCL externalizing	13 RCTs (1,222)	SMD −0.61, 95% CI −0.99 to −0.31; moderate effect favors intervention	Moderate
Multicomponent (preschool)	ECBI intensity/ CBCL externalizing	10 RCTs (784)	SMD -0.96, 95% CI −1.39 to −0.60; large effect favors intervention	Moderate
Parent-only (school-age)	ECBI intensity/ CBCL externalizing	6 RCTs (841)	SMD -0.39, 95% CI −0.63 to −0.19; small effect favors intervention	Low
Multicomponent (school-age)	ECBI intensity/ CBCL externalizing	9 RCTs 524	SMD -0.61, 95% CI −1.05 to −0.20; moderate effect favors intervention	Moderate
Child-only (school-age)	ECBI intensity/ CBCL externalizing	3 RCTs (170)	SMD -0.96, 95% CI −2.06 to 0.11; no effect	Low
Multicomponent (adolescent)	ECBI intensity/ CBCL externalizing	2 RCTs (360)	Could not be pooled; No effect	Low

Abbreviations: CBCL = Child Behavior Checklist; ECBI = Eyberg Child Behavior Inventory; RCT = randomized controlled trial; SMD = standard mean difference; SOE = strength of evidence; TAU = treatment as usual.

3.2 Key Question 2. Which pharmacologic interventions are effective for improving psychosocial outcomes compared to placebo or other pharmacologic interventions?

3.2.1 Overall Key Findings

- Children with persistent DBD symptoms following stimulant treatment receiving add-on risperidone (2 RCTs; N=194) or risperidone maintenance (1 RCT; N=335) were more likely to have symptom response compared to placebo but none of the individual study risk estimates were statistically significant. (SOE: Low)
- There were small improvements in global function based on Clinical Global Impressions – Severity (CGI-S) or Clinical Global Impressions – Improvement (CGI-I) scores in four trials (N=458) of stimulant plus add-on risperidone (2 trials), risperidone alone (1 trial), quetiapine alone (1 trial) and risperidone maintenance (1 trial) (SOE: Insufficient).
- Absolute response rates were higher with divalproex versus placebo as either an add-on or standalone treatment in three small RCTs (N=65), but risk estimates were imprecise and not statistically significant (SOE: Insufficient).
- Two RCTs (N=371) of stimulants both found higher response rates and greater likelihood of a reduction in teacher-rated disruptive behaviors compared with placebo (SOE: Insufficient).

3.2.2 Description of Studies

Nineteen RCTs (in 24 publications) assessing the effectiveness of pharmacologic interventions for treatment of disruptive behaviors were identified (**Appendix D**).[184-207] Duration of followup among 19 trials ranged from four to 24 weeks (mean 9 weeks, median 8 weeks); one trial[201] assessed outcomes at 6 months.

Race and/or ethnicity was at least partially reported in 11 trials.[184-188,192,198,201,204-206] One small (N=20) study enrolled mostly Hispanic (60%) or Black (25%) children (these groups were mutually exclusive in this study) and a White minority (15%).[192] In the other 10 trials, most enrolled children were White, with proportions ranging from 36 to 87 percent; the proportion of Black children ranged from 6 to 35 percent and the proportion of Hispanic children ranged from 6 to 36 percent. Eight trials reported data for mixed/other race children, with proportions ranging from 2 to 11 percent. Race/ethnicity data for other groups (e.g. Asian, Hawaiian/Pacific Islander, American Indian or Alaska Native) were infrequently reported and represented small proportions of the study populations (**Appendix D**).

All the trials enrolled children or adolescents with a clinical diagnosis at time of study entry, though diagnoses varied. Five trials[192,197,198,204,205] enrolled participants with single diagnosis of CD or ODD, three trials[191,195,203] enrolled those with comorbid ADHD and ODD, six trials[187,188,193,196,201,206] enrolled children and adolescents based on a single diagnosis (ADHD, CD, ODD, DBD not otherwise specified, or Disruptive Mood Dysregulation Disorder) plus scale scores, and in five trials[184-186,190,199] participants had comorbid conditions (generally ADHD + ODD or CD) and met scale score thresholds. Participants in five trials[184,186,190,196,206] had partial or no response to previous pharmacologic and/or nonpharmacologic treatment, and three trials[199,205,206] included some inpatient treatment. Details on specific study inclusion criteria appear in **Appendix D** and in **Appendix K, Table K-1**. Specific interventions and comparators

can be found in **Appendix K, Table K-2**; other study characteristics are summarized in **Table 6**. Five trials were rated low risk of bias,[184,187,193,196,206] two trials were rated high risk of bias,[192,195] and the remainder were rated moderate risk of bias. Methodologic limitations of studies with moderate or high risk of bias included unclear randomization and allocation concealment, lack of detail regarding blinding of outcome assessors, unclear or high loss to followup, and no intention to treat analysis; full details on risk of bias assessments for individual studies appear in **Appendix E**.

Table 6. Characteristics of RCTs of pharmacologic interventions

	Study Characteristics	Antipsychotics	Anticonvulsants	Antidepressants	Stimulants	Other Drugs
Study design[a]	RCT	10 (in 13 publications)[184,185,188,193-197,199-203]	4[185,186,192,205]	1[206]	2 (in 3 publications)[189,198,204]	3 (in 4 publications)[187,190,191,207]
Age group	Preschool	1[203]	0	0	0	0
	School-age	7 (in 10 publications)[184,185,193-197,200-202]	2[185,186]	1[206]	2 (in 3 publications)[189,198,204]	3 (in 4 publications)[187,190,191,207]
	Adolescent	2[188,199]	2[192,205]	0	0	0
Population	Total N	975	138	49	391	536
	Mean age	9.7 years	12.4 years	11.6 years	10.5 years	10.0 years
	Percent female	19%	21%	33%	26%	20%
Outcomes[b]	CGI-I	1[193]	0	0	0	0
	CGI-S	4[188,193,196,201]	1[205]	1[206]	1[204]	1[191]
	OAS/R-MOAS	3[185,188,199]	2[185,186]	0	0	0
	CBCL	3[185,193,197]	1[185]	0	1[208]	1[208]
	Response	3[184,199,201]	3[186,192,205]	0	3[195,198,204]	2[190,195]
	Other	1[203]	0	0	1[204]	3[190,191,207]
Risk of bias	High	3[195,199,203]	1[192]	0	0	0
	Moderate	4[185,188,197,201]	3[185,186,205]	0	3[198,204,208]	0
	Low	3[184,193,196]	0	1[206]	0	1[187]

Abbreviations: CBCL = Child Behavior Checklist; CGI-I = Clinical Global Impressions – Improvement; CGI-S = Clinical Global Impressions – Severity; OAS/R-MOAS = Overt Aggression Scale/Retrospective Modified Overt Aggression Scale; RCT = randomized controlled trial.

[a] One study included multiple drug classes

[b] Some studies reported multiple outcome measures.

3.2.3 Detailed Analysis

3.2.3.1 Pharmacologic Interventions Versus Placebo

3.2.3.1.1 Antipsychotics Versus Placebo

Six RCTs (in 9 publications) compared an antipsychotic with placebo (**Appendix K, Table K-3**).[184,185,188,193,194,196,200-202] Sample size ranged widely from 19 to 335 (total N=652). Five trials (in 8 publications[184,185,193,194,196,200-202]) compared risperidone with placebo, and the other trial compared quetiapine[188] with placebo. Duration of followup ranged from 4 to 10 weeks in five of the trials; the remaining study[201] had a 6-month followup.

The five trials[184,185,193,196,201] of risperidone were conducted in school age children (mean age 8-10 years), and the quetiapine trial was conducted in adolescents (mean age 14 years).[188] Study inclusion criteria varied in terms of clinical diagnoses (**Appendix K, Table KQ-1**); most children enrolled across all the trials had comorbid DBD and ADHD, apart from one small trial

(N=19)[193] that specifically excluded children with ADHD. None of the trials enrolled treatment-naïve children.

Although five of the six trials assessed risperidone, treatment intent and administration varied. Three trials (N=278)[184,185,196] were designed to assess add-on risperidone in children with persistent symptoms following stimulant treatment plus psychosocial interventions. One trial (N=20)[193] of risperidone and one trial of quetiapine (N=19)[188] required a pre-randomization wash-out of psychoactive medications and did not permit concomitant use during the trial phase. The remaining trial (N=335) included children with symptom response to risperidone during a 12-week treatment period, followed by randomization to 6 months of either risperidone maintenance treatment or placebo.[201]

Due to the heterogeneity among the studies, we did not conduct meta-analysis but instead results are summarized narratively.

Response to treatment. Two RCTs[184,185] of stimulant treatment plus add-on risperidone and one trial[201] of risperidone maintenance reported treatment response, though the definition of response varied among the studies (**Appendix K, Table K-3**). One trial used a composite measure of a ≥25 percent reduction in Nisonger Child Behavior Rating Form Conduct Problem and Oppositional Behavior subscale scores (combined into one Disruptive Behaviors-Total score) and a CGI-I score ≤2.[184] One trial used a single measure of a Retrospective Modified Overt Aggression Scale score <15.[185] The remaining trial[201] reported the proportion with symptom recurrence at 6 months, which was defined as an increase in CGI-S of ≥2 points or Nisonger Child Behavior Rating Form Conduct Problem subscale ≥7 points at two consecutive visits a week apart.

In the two trials (N=194)[184,185] of stimulant treatment plus add-on risperidone or placebo, the proportion of children with study-defined treatment response was higher in the risperidone groups versus placebo, though neither of the risk estimates (RR 1.12, 95% CI 0.94 to 1.34[184] and RR 2.12, 95% CI 0.80 to 5.61[185]) were statistically significant at 4- to 9-week followup (**Appendix K, Table K-3**). The third trial (N=335)[201] reported the risk of symptom recurrence following 6 months of risperidone maintenance versus placebo (risperidone withdrawal) in children who had previously shown symptom response after 12 weeks of risperidone treatment. In the study, symptom recurrence was less likely in children maintained on risperidone compared with those who had risperidone withdrawn (27% versus 42%; RR 0.65, 95% CI 0.48 to 0.87).

Global function. Four RCTs (N=458) reported the effect of antipsychotics on global function based on CGI-S scores (**Appendix K, Table K-3**).[188,193,196,201] Two trials conducted in school-age children favored risperidone alone[193] or as add-on treatment to a stimulant[196] over placebo on CGI-S scores, as did the study of quetiapine (conducted in adolescents) at 7- to 10-week followup.[188] The fourth trial[201] found a small difference in CGI-S scores between risperidone maintenance and placebo at 6-month followup (mean change from baseline 0.6 [SD 1.2] vs. 1.2 [SD 1.4]; p<0.001).

One trial[193] reported lower CGI-I scores with risperidone (1.80 [SE 0.33]) than placebo (3.60 [SE 0.45]; p=0.002) at 10 weeks.

Aggression. One trial (N=26) of treatment with a stimulant plus add-on risperidone[185] and one trial (N=19) of quetiapine[188] versus placebo reported change in aggressive behavior based on Overt Aggression Scale (OAS) or Retrospective Modified Overt Aggression Scale (R-MOAS)

scores (**Appendix K, Table K-3**). In the trial reporting changes in R-MOAS scores, there was a significant effect on R-MOAS scores with add-on risperidone treatment at 8-week followup (effect size 1.32; p=0.003).[185] The second trial found no difference between quetiapine and placebo in OAS scores at 7-week followup.[188]

Change in the CBCL Aggressive Behavior subscale T-score favored risperidone over placebo based on one trial of add-on risperidone (N=26)[185] and one trial of risperidone alone (N=20)[193] In one trial, add-on risperidone was associated with greater improvements in scores than placebo at 8 week followup (least squares mean difference -9.11, 95% CI -14.86 to -36; p=0.023),[185] while the second trial reported lower scores with risperidone but the between-group difference was not statistically significant at 10 week-followup (mean change from baseline -24.2 [SE 5.7] vs. -11.5 [4.5]; p=0.11).[193]

Mental health. One RCT of add-on risperidone versus placebo reported that children treated with risperidone were more likely to have improvement in Child Depression Rating Scale scores compared with placebo at 8 weeks followup (LSM difference -7.72, 95% CI -13.58 to -1.67; p=0.02)[185] (**Appendix K, Table K-3; Appendix D**).

3.2.3.2 Anticonvulsants

Three small RCTs (N=65) compared valproic acid derivatives (divalproex/divalproex sodium) with placebo (**Appendix K, Table K-4; Appendix D**).[185,186,192] Two 8-week trials assessed add-on divalproex in school-age children with comorbid ADHD and ODD or CD and inadequate response to stimulants and family therapy.[185,186] The third RCT was a 12-week crossover trial (6 weeks divalproex and 6 weeks placebo) that included adolescents with an ODD or CD diagnosis and persistent (≥1 year) symptoms; treatment history was not described in the trial.[192]

Response to treatment. All three trials assessed response to treatment though definitions of response varied. In the two trials of add-on divalproex, one (N=23)[185] used a measure of R-MOAS score of less than 15 to define response, and the second trial (N=27) defined response as a reduction in R-MOAS score of at least 40 percent and a total R-MOAS score of 10 or less.[186] The trial of adolescents (N=15) defined response as at least 70 percent reduction in MOAS and Symptom Checklist-90 anger-hostility scores.[192] Absolute response rates in all three trials were higher with divalproex (range 43% to 86%) than placebo (range 15% to 33%), but risk estimates were imprecise and not statistically significant (**Appendix K, Table K-4**).

Other outcomes. Evidence on other outcomes was limited **(Appendix K, Table K-4**). The effect of add-on divalproex on aggression was mixed based on the two trials conducted in children with comorbid ADHD and ODD or CD. One trial[186] found no difference between add-on divalproex and placebo in R-MOAS mean score at 8-week followup (p=0.80), but the other trial, conducted in a similar population with the same duration of followup found a significant effect favoring add-on divalproex for CBCL aggressive behavior subscale scores (p=0.02) and marginal significance for R-MOAS score (p=0.046).[185] The same study found divalproex associated with a small effect on CBCL rule-breaking subscale score that was marginally

insignificant (p=0.053). Depressive symptoms, based on Children's Depression Rating Scale scores, were also not different between divalproex and placebo groups (p=0.15).

3.2.3.3 Antidepressants

One trial[206] comparing treatment with citalopram versus placebo enrolled 49 school-aged children (**Appendix D**). The study included children with an initial diagnosis of severe mood dysregulation, later reclassified according to DSM-5 criteria as disruptive mood dysregulation disorder. In the trial 98 percent (48/49) of the population met disruptive mood dysregulation disorder criteria; 82 percent (40/49) had a comorbid ODD or CD diagnosis, and 90 percent had comorbid ADHD. All participants underwent a medically supervised withdrawal of existing medications, followed by open-label stimulant (methylphenidate) treatment. If symptoms consistent with Severe Mood Dysregulation persisted after up to 5 weeks of stimulant treatment, participants were randomized to adjunctive citalopram or placebo.

Treatment response, defined as CGI-I score 2 or less, occurred in 35 percent (8/23) of those taking citalopram and 8 percent (2/26) of those in the placebo group at 8-weeks followup (RR 1.39, 95% CI 0.37 to 5.23). There was no difference between groups in aggression response based on CGI-S scores (mean 3.1 vs. 3.9; p=0.85), or in depressive symptoms based on Children's Depression Rating Scale scores (mean 28.6 vs. 30.1; p=0.99).

3.2.3.4 Stimulants

Two trials (N=371) of school-age children, assessed the effect of stimulant treatment versus placebo on DBD behaviors (**Appendix K, Table K-5**).[198,204] One trial[198] compared methylphenidate and the other trial[204] compared extended-release mixed amphetamine salts with placebo. The trials enrolled children with a CD or ODD diagnosis, and in both a high proportion (69% and 79%) of children had a comorbid ADHD diagnosis or met clinical criteria for ADHD. One[204] of the trials excluded children with a history of nonresponse to stimulants.

Both trials found stimulant use associated with higher rates of global treatment response relative to placebo based on clinician assessment, but response definitions varied. In the trial of methylphenidate (N=74), response was defined as "improved," "much improved," or "completely well" based on clinician assessment of symptoms; the assessment method was not reported and it is unclear if a validated scale was used to determine response.[198] In that trial, use of methylphenidate was associated with a large increase in likelihood of response (RR 5.74) compared with placebo but this estimate was imprecise (95% CI 2.46 to 13.40). In the trial of extended-release mixed amphetamine salts (N=297), response was based on CGI-I scores of "much" or "very much" improved. Doses of extended-release mixed amphetamine salts ranging from 10 to 40 mg were all associated with higher response rates than placebo, though only at doses of 20, 30, and 40 mg per day were response rates statistically significant (RRs 2.08 to 2.29).[204] Teacher-rated disruptive behavior was reported in both trials, with both finding stimulant use associated with small improvements in disruptive behaviors versus placebo.

3.2.3.5 Nonstimulants

Three trials (in 4 publications; N=534) compared treatment with nonstimulants (atomoxetine[190,191,207] or extended-release guanfacine[187]) versus placebo (**Appendix K, Table K-6**). Duration of followup was 6 weeks in one trial and 9 weeks in the other two trials. All three trials enrolled school-age children with ADHD and either a diagnosis of ODD or oppositional symptoms.

Oppositional behavior based on parent- or teacher-rated scale score was reported in all three trials. Based on different scales and outcome measures, nonstimulant treatment was consistently associated with greater improvement in oppositional subscale scores compared to placebo across all three studies at 6- to 9-week followup (**Appendix K, Table K-6**). One trial (N=180)[207] reported parent-rated quality of life using the German language *Revidierter KINDer Lebensqualita¨tsfragebogen* (KINDL-R) score (scale 0 to 100). KINDL-R total scores at baseline were 63.4 (SD 12.67) in the atomoxetine group and 61.8 (SD 13.02) in the placebo group. At 9-week followup, scores had increased by 2.6 (SD 16.41) points in the atomoxetine group and decreased by 1.6 (SD 14.29) points in the placebo group. Although the between-group difference was statistically significant (p=0.02), the clinical significance of this finding is unclear due to the small absolute differences in scale scores with large standard deviations and the short duration of followup.

3.2.3.6 Head-to-Head Trials of Pharmacologic Interventions

See **Appendix K** for detailed findings for head-to-head comparisons of pharmacologic interventions. Briefly, there were no clear differences in response or measures of aggression in three head-to-head trials comparing risperidone with clozapine (N=24),[197] quetiapine (N=22),[199] or aripiprazole (N=40),[203] in one trial (N=36) that compared methylphenidate plus add-on risperidone or add-on divalproex,[185] or in one trial (N=37) that compared methylphenidate versus atomoxetine.[195] One trial (N=58) that compared high-dose versus a low-dose divalproex found a higher-dose associated with greater improvement in CGI-S and CGI-I scores in an adolescent population with CD housed in a juvenile correctional facility.[205]

3.2.3.7 Summary of Findings for Key Question 2

Table 7. Summary of findings for RCTs of pharmacologic interventions

Comparison	Outcome	Number of Studies (N)	Findings Effect Size	SOE
Antipsychotics vs. placebo	Treatment response	3 RCTs (N=529)	Children with persistent DBD symptoms following stimulant treatment receiving add-on risperidone (2 RCTs; N=194) or risperidone maintenance (1 RCT; N=335) were more likely to have symptom response compared to placebo but none of the individual study risk estimates were statistically significant.	Low
	Aggression[a]	2 RCTs (N=45)	No clear difference between add-on risperidone or quetiapine and placebo based on mixed results from 2 trials.	Insufficient
Anticonvulsants vs. placebo	Treatment response	3 RCTs (N=65)	Absolute response rates were higher with divalproex versus placebo as either an add-on or standalone treatment in 3 small but risk estimates were imprecise and not statistically significant.	Insufficient
	Aggression	2 RCTs (N=50)	Mixed results from two trials, one finding no difference (p=0.80) and the other finding a marginal difference (p=0.046) between divalproex and placebo	Insufficient
Antidepressants vs. placebo	Treatment response	1 RCT (N=49)	RR 1.39, 95% CI 0.37 to 5.23	Insufficient
	Aggression	No studies	NA	Insufficient
Stimulants vs. placebo	Treatment response	2 RCTs (N=371)	Not pooled; RR 5.74, 95% CI 2.46 to 13.40 (methylphenidate vs. placebo) and RR 2.01, 95% CI 1.30 to 3.11 (extended-release mixed amphetamine salts vs. placebo)	Insufficient
	Aggression	No studies	NA	Insufficient
Nonstimulants vs. placebo	Treatment response	3 RCTs (N=534)	Atomoxetine (2 trials) and extended-release guanfacine (1 trial) were associated with greater improvement in various oppositional subscale scores compared to placebo	Insufficient
	Aggression	No studies	NA	Insufficient

Abbreviations: CI = confidence interval; NA = not applicable; RCT = randomized controlled trial; RR = relative risk; SOE = strength of evidence.

[a] Measures of aggression in these studies were OAS, MOAS, or R-MOAS scale scores

3.3 Key Question 3. In children under 18 years of age diagnosed with disruptive behaviors, what is the relative effectiveness of psychosocial interventions alone compared with pharmacologic interventions alone for improving short-term and long-term psychosocial outcomes?

3.3.1 Overall Key Findings

- One small RCT (N=35) was insufficient to determine the benefits of methylphenidate compared with PCIT on disruptive behavior (SOE: Insufficient).

3.3.2 Detailed Analysis

Literature searches identified one RCT (N=35) conducted in preschool children comparing the effectiveness of PCIT with methylphenidate (**Appendix D**).[209]

Eighteen children were randomized to weekly PCIT sessions. The total number of sessions was dependent on parental progress towards meeting mastery criteria according to the PCIT manual (mean 13.4 sessions, range 3 to 37 sessions over 22.3 weeks). Of the 18 children included in the effectiveness analysis, five completed treatment (28%) and 13 dropped out. Seventeen children received methylphenidate at doses ranging from 7.5 to 22.5 mg/day for a mean 13 weeks (range 0 to 25 weeks); mean methylphenidate dose was not reported. Ten (59%) of the children randomized to methylphenidate completed treatment. The study was rated as having a high risk of bias due to numerous limitations (**Appendix E**) including the high number of non-completers and the large variance in duration of treatment for both PCIT and methylphenidate, which may have affected outcomes. In addition, the study was underpowered to detect between-group differences.

At the end of treatment, mother-rated ECBI intensity scores were lower for the children who received methylphenidate (mean 123 [SD 34.7]) than those whose parents received PCIT (mean 154). Though the between-group difference was statistically significant (p=0.02) the validity of this finding is questionable due to the methodologic limitations described above.

3.3.3 Summary of Findings for Key Question 3

Table 8. Summary of findings for RCTs of psychosocial interventions versus pharmacologic interventions

Comparison	Outcome	Number of Studies (N)	Findings Effect Size	SOE
Psychosocial intervention (PCIT) vs. pharmacologic intervention (methylphenidate)	Disruptive behavior	1 RCT (N=35)	Mother-rated ECBI-I score: 123 (SD 34.7) vs. 154 (SD 26.5); p=0.02	Insufficient

Abbreviations: ECBI-I = Eyberg Child Behavior Inventory-intensity scale; PCIT = Parent-Child Interaction Therapy; RCT = randomized controlled trial; SD = standard deviation; SOE = strength of evidence.

3.4 Key Question 4. In children under 18 years of age diagnosed with disruptive behaviors, are combined psychosocial and pharmacologic interventions more effective for improving short-term and long-term psychosocial outcomes compared to either psychosocial or pharmacologic interventions alone?

3.4.1 Overall Key Findings

- One NRSI (N=144) of combined psychosocial and pharmacologic treatment (multimodal psychotherapy plus either methylphenidate, risperidone, quetiapine, lithium carbonate or valproic acid) versus psychosocial intervention alone was insufficient to draw conclusions on the benefits of combined treatment versus monotherapy (SOE: Insufficient).

3.4.2 Detailed Analysis

One NRSI (N=144) compared the effectiveness of multimodal psychotherapy plus a pharmacologic intervention with multimodal psychotherapy alone in school-age children (mean age 10 years) with a diagnosis of ODD or CD based on DSM-IV-TR criteria and a CBCL externalizing score greater than 63 at baseline (**Appendix D**).[210] The study enrolled a consecutive sample of children and parents, all of whom received a weekly multimodal psychosocial intervention that included separate child psychotherapy and parent training. Children deemed eligible for pharmacologic interventions (n=55) were prescribed methylphenidate, a second-generation antipsychotic (i.e., risperidone or quetiapine), or a mood stabilizer (i.e., lithium carbonate or valproic acid). The study was rated high risk of bias, due to study design, and the lack of blinding for outcome assessors (**Appendix E**).

Regression analysis that included age, gender, diagnosis (ODD or CD), comorbidities, and socioeconomic status (SES), found the addition of pharmacologic treatment to psychosocial interventions associated with lower CBCL aggression subscale scores at 12 months compared with psychosocial interventions alone (beta coefficient -0.343; $p<0.01$; **Appendix D**). No association was found between the addition of pharmacologic treatment and CGI-I score, CBCL rule-breaking subscale score, and callous unemotional traits; other outcome measures were not reported.

3.4.3 Summary of Findings for Key Question 4

Table 9. Summary of findings for RCTs of combined psychosocial and pharmacologic interventions alone versus psychosocial interventions alone

Comparison	Outcome	Number of studies (N)	Findings Effect size	SOE
Psychosocial + pharmacologic intervention vs. pharmacologic intervention alone	Aggression	1 NRSI (N=144)	CBCL aggression subscale score: beta coefficient -0.343; p<0.01 after adjustment for age, gender, diagnosis, comorbidities, and socioeconomic status	Insufficient

Abbreviations: CBCL = Child Behavior Checklist; NRSI = nonrandomized study of interventions; RCT = randomized controlled trial; SOE = strength of evidence.

3.5 Key Question 5. What are the harms associated with treating children under 18 years of age for disruptive behaviors with either psychosocial, pharmacologic or combined interventions?

3.5.1 Key Findings

- There were no differences in any adverse event in two RCTs (N=271) of psychosocial interventions versus usual care or another psychosocial intervention (SOE: Insufficient).
- Pharmacologic therapy was associated with a large increase in likelihood of study withdrawal due to adverse events relative to placebo based on six trials (N=911; SOE: Moderate).
- The risk of experiencing any adverse event with pharmacologic interventions was increased compared with placebo based on three trials (n=729), with no clear between-group differences in two smaller trials (n=74; total N=803; SOE: Low).
- Serious adverse events were reported in six RCTs (N=945) but occurred infrequently, with no clear differences between intervention and control groups across studies (SOE: Low).
- Three RCTs (N=447) found risperidone use associated with an increased risk of weight gain compared with placebo (SOE: Low).
- No studies of combined interventions reported harms (SOE: Insufficient).

3.5.2 Detailed Analysis

3.5.2.1 Psychosocial Interventions

Two trials (N=271)[153,180] of psychosocial interventions reported no incidence of adverse events. Adverse event rates were not reported in any other studies of psychosocial interventions.

3.5.2.2 Pharmacologic Interventions

Seventeen of the RCTs included in Key Question 2 reported harms associated with pharmacologic interventions for treatment of disruptive behaviors (**Appendix Table KQ 5-1**; **Appendix D**).[184-188,190,191,193,195-197,199,201,203-206]

3.5.2.3 Withdrawals Due To Adverse Events

Twelve RCTs[185,187,190,191,193,195-197,199,201,203,204] reported withdrawal due to adverse events, including two studies[196,199] that reported no withdrawals in either group (**Appendix L, Table L-1**). Six of the trials that reported seven comparisons of pharmacologic intervention with placebo provided data for meta-analysis (**Appendix L, Figure L-1).**[185,187,190,191,193,204] When pooled, any pharmacologic intervention was associated with a greater risk of study withdrawal due to adverse events compared with placebo (N=911; RR 3.44, 95% CI 1.36 to 8.75; I^2=0%). Subgroup analyses stratified according to drug class were imprecise and not statistically significant for antipsychotics (2 trials[185,193] [N=47]; RR 2.80, 95% CI 0.33 to 23.55), anticonvulsants (1 trial[185] [N=25]; RR 2.94, 95% CI 0.16 to 55.31), stimulants (1 trial[204] N=308; RR 7.10, 95% CI 0.43 to 117), and nonstimulants (3 trials[187,190,191] [N=531]; RR 3.29, 95% CI 0.94 to 11.55), though all

consistently indicated an increased risk of withdrawal with the use of pharmacologic interventions after followup ranging from four to 16 weeks.

Evidence for other comparisons is limited. Risperidone used was associated with a lower rate of withdrawals due to adverse events when compared with clozapine[197] (N=24; RR 0.20, 95% CI 0.01 to 3.77), aripiprazole[203] (N=40; RR 0.50, 95% CI 0.10 to 2.43), or divalproex sodium[185] (N=34; RR 0.89, 95% CI 0.14 to 5.60) based on one trial each. Withdrawal rates were similar between groups in one study comparing methylphenidate with atomoxetine (N=37; RR 0.98, 95% CI 0.19 to 5.17).[195]

3.5.2.4 Any Adverse Event

The risk of any adverse event with pharmacologic interventions was reported in five placebo-controlled trials that reported mixed results (**Appendix L, Table L-1**).[186,187,191,201,206] Two trials[187,191] found nonstimulant use associated with a higher risk of any adverse event after 9—week followup (N=394; pooled RR 1.51, 95% CI 1.09 to 2.60) but heterogeneity was high (I^2=66%). Risk of any adverse event was also increased with 6 months risperidone continuation compared with placebo (RR 1.32, 95% CI 1.02 to 1.70) based on one trial (N=335).[201] There was no difference between divalproex and placebo in risk of any adverse event in one small trial (N=27),[186] nor was there a difference between citalopram and placebo mean number of adverse events (14.3 vs. 11.5; p=0.14) in one trial (N=49)[206]

One head-to-head trial (N=37) reported the risk of any adverse event, finding similar event rates between methylphenidate (46.7%) and atomoxetine (54.5%; RR 0.86, 95% CI 0.44 to 1.66).[195]

3.5.2.5 Serious Adverse Events

Serious adverse events were reported in six RCTs (N=1,045), but were infrequent with no clear differences between groups **(Appendix L, Table L-1**).[184,185,201,204-206] Three trials (N=253) reported no serious adverse events in either intervention or control groups.[184,185,205] In the other three trials (N=692), rates of serious adverse events ranged from 0 to 4 percent in intervention groups and 0 to 3 percent in control groups.[201,204,206] One trial each of mixed amphetamine salts,[204] and citalopram[206] reported one patient in active intervention groups with suicidal ideation or attempt versus no patients in corresponding placebo arms. The third trial reported similar rates of serious adverse events between risperidone (3% [6/172]) and placebo (3% [5/163]) but did not describe the specific serious events.[201]

3.5.2.6 Other Adverse Events

Other specific adverse events, reported in 10 trials, are summarized in **Appendix L, Table L-1.**[185,187,188,190,196,197,199,201,204,206] Three trials (N=447)[188,196,201] found risperidone use associated with an increased risk of weight gain compared with placebo using different outcome measures. There was no consistent difference in risk of extrapyramidal symptoms in two trials (N=363) comparing risperidone[201] or quetiapine[188] with placebo.

One head-to-head trial (N=22)[199] found children randomized to risperidone were more likely to experience an increase in body mass index compared to quetiapine (60% [6/10] vs. 25% [3/12]), with no difference between groups in risk of extrapyramidal symptoms or prolactin-related adverse events.

Evidence from other comparisons was too limited to draw conclusions.

3.5.2.7 Combined Interventions

No studies reported harms of combined interventions.

3.5.3 Summary of Findings for Key Question 5

Table 10. Summary of findings for RCTs of reporting adverse events

Comparison	Outcome	Number of studies (N)	Findings Effect Size	SOE
Psychosocial interventions	Withdrawals due to adverse events	No studies	NA	Insufficient
	Any adverse event	2 RCTs (N=271)	No adverse events reported in either trial	Insufficient
	Serious adverse events	No studies	NA	Insufficient
Pharmacologic interventions	Withdrawals due to adverse events	6 RCTs (N=911)	Pharmacologic interventions vs. placebo: RR 3.44, 95% CI 1.36 to 8.75; I^2=0%	Moderate
	Any adverse event	5 RCTs (N=803)	Risk of was increased compared with placebo based on three trials (n=729), with no clear between-group differences in two smaller trials (n=74).	Low
	Serious adverse events	6 RCTs (N=1,045)	No clear differences between pharmacologic interventions and placebo or another pharmacologic intervention.	Low
Combined interventions	Withdrawals due to adverse events	No studies	NA	Insufficient
	Any adverse event	No studies	NA	Insufficient
	Serious adverse events	No studies	NA	Insufficient

Abbreviations: CI = confidence interval; NA = not applicable; RCT = randomized controlled trial; RR = relative risk; SOE = strength of evidence.

3.6 Key Question 6. Do interventions for disruptive behavior vary in effectiveness and harms based on patient, clinical, or treatment characteristics or treatment history?

3.6.1 Key Findings

- Analysis of DBD intervention studies did not reveal consistent associations between treatment outcomes and patient characteristics based on 12 RCTs (Key Question 6a; N=2,477) or clinical characteristics based on 10 RCTs (Key Question 6b; N=2,403) (SOE: Insufficient).
- Evidence on the effect of treatment history (Key Question 6c; N=180) and treatment characteristics (Key Question 6d; N=137) and treatment outcomes was insufficient based on one study each (SOE: Insufficient).
- No studies reported on the association between patient characteristics, clinical characteristics, treatment history, or treatment characteristics and harms (SOE: Insufficient).

Analysis of DBD intervention studies did not reveal consistent associations between patient characteristics or clinical characteristics (e.g., age, gender, maternal mental health, parent race/ethnicity, SES, maternal education, number of caregivers) and outcomes (**Appendix M**). Seven studies[42,76,96,111,119,169,211] of psychosocial interventions found no interaction based on analyses of patient characteristics, while five studies[47,48,91,104,113] found significant associations for some patient characteristics, but were heterogenous in terms of interventions and outcomes; no patient characteristics were consistently associated with treatment effectiveness (Key Question 6a). There was also no clear association between clinical characteristics and outcomes in six studies[47,48,76,96,104,169] of psychosocial interventions, while four studies[91,121,182,211] found an association between some clinical characteristics (comorbid ADHD diagnosis, DBD severity) and intervention effectiveness (Key Question 6b). One study each tested for associations between treatment history[191] or treatment characteristics[91] (**Appendix M**). Regarding treatment history, one study of a pharmacologic intervention reported no interaction between treatment history and outcomes (Key Question 6c).[191] The association between treatment characteristics and outcomes was assessed in one study[91] comparing a psychosocial intervention delivered in two different settings (Key Question 6d). The study found a consistent, significant association for hours of child CBT delivered for CBCL Externalizing scores and number of ODD/CD symptoms at both 6-month (immediately post-treatment) and 3-year followup, suggesting that more exposure to CBT for the child is associated with greater improvement in DBD symptoms. The study also found that more hours of parent management training may be associated with better treatment outcomes, though this effect was not consistent across timepoints and outcome measures. See **Appendix M** for specific findings for Key Question 6.

3.7 Contextual Questions

Numerous studies have found DBD diagnostic disparities based on patient characteristics, including gender, race, and SES.[7-13] In general, studies found that boys are more likely than girls, Black and Hispanic children are more likely than White children, and children with low SES are more likely that those with higher SES to receive a DBD diagnosis (Contextual Question 1). Evidence on treatment disparities was more limited but suggests Black or Hispanic children and children with low SES are less likely to receive DBD treatment relative to White children and children with higher SES (Contextual Question 2).[14] We did not identify any studies directly addressing how these DBD diagnostic and treatment disparities affect behavioral or functional outcomes (Contextual Question 3). See **Appendix N** for specific findings for each contextual question regarding disparities in the diagnosis and treatment of disruptive behavior and disruptive behavior disorders in children and adolescents, as well as how disparities in the diagnosis and treatment affect behavioral and functional outcomes.

4. Discussion

4.1 Findings In Relation to Decisional Dilemmas

The primary decisional dilemma for this review was to determine if psychosocial interventions and pharmacological interventions are helpful in the reduction of disruptive behaviors in preschool and school-age children and adolescents and, if so, what type of interventions (i.e., interventions that included both the parent and child or interventions that included only the parent or only the child) are most helpful. Additional analyses new to this review examined: (1) the potential benefit of the therapist directly coaching the parent in real time (i.e., while interacting with the child) versus delayed coaching, (2) the potential effectiveness of self-help or self-directed interventions versus therapist-guided interventions, and (3) whether outcomes differed based on whether the child had a formal diagnoses of a disruptive behavior disorder (DBD) or not.

Randomized and nonrandomized studies were limited to those that enrolled only children and adolescents who met criteria for a diagnosis of a DBD, predominately oppositional defiant disorder (ODD) and conduct disorder (CD), and/or had parent-reported scores on validated measures of disruptive behavior (not due to attention-deficit/hyperactivity disorder [ADHD] or other condition) in the clinical range or children who demonstrated substantial disruptive behavior. Most included studies required scores in the clinical range on a specific measure of disruptive behavior rather than a formal diagnosis. No studies in children with intermittent explosive disorder (IED) (also considered a disruptive behavior disorder) were identified. Although some evidence was of moderate strength, most of the evidence was rated low strength or insufficient due to study quality, heterogeneity of interventions and outcomes, too few studies of a particular intervention, conflicting results for some intervention comparisons, and few studies reporting long-term results.

The prior review concluded that having a parent component in psychosocial interventions (either alone or with the child) resulted in a greater likelihood of reducing disruptive behaviors than interventions that included only the child without the parent. For this review, there were no studies that met inclusion criteria of child-only interventions in preschool children and no studies in adolescents of parent-only interventions. Whereas the prior review analyzed all age groups together, this review analyzed studies in preschoolers, school-aged children, and adolescents separately as, based on clinical input from our internal experts, Key Informants, and the Technical Expert Panel (TEP), we suspected that the interventions and responses to the interventions may differ based on child age/developmental stage. Results for comparisons to treatment as usual or waitlist on our primary outcome scales (Eyberg Child Behavior Inventory [ECBI] intensity and problem scales, Child Behavior Checklist [CBCL] externalizing scale) for all age groups are in the Summary of Findings **Table 11**. See the full strength of evidence ratings for other outcomes comparisons of interventions in **Appendix O.**

Table 11. Summary of findings table for ECBI and CBCL scores in studies of psychosocial interventions versus TAU/waitlist

Age Category	Intervention-Type vs. TAU/Waitlist Timeframe[a]	ECBI Intensity Scores/ CBCL Externalizing Scores	ECBI Problem Scores
Preschool	Parent-only Posttreatment	Moderate effect ++	Moderate effect ++
	Parent-only Short term	Moderate effect +	Large effect +

Age Category	Intervention-Type vs. TAU/Waitlist Timeframe[a]	ECBI Intensity Scores/ CBCL Externalizing Scores	ECBI Problem Scores
	Parent-only Intermediate term	Small effect +	Small effect +
	Multicomponent Posttreatment	Large effect ++	Large effect +
	Multicomponent Long term	No effect +	Insufficient evidence
School-age	Parent-only Posttreatment	Small effect +	Moderate effect +
	Parent-only Short term	Moderate effect +	Small effect +
	Parent-only Intermediate term	Small effect +	Insufficient evidence
	Parent-only Long term	Small effect +	Small effect +
	Multicomponent Posttreatment	Moderate effect ++	Moderate effect +
	Multicomponent Short term	Moderate effect +	No evidence
	Multicomponent Intermediate term	Small effect +	No evidence
	Multicomponent Long term	Small effect +	No evidence
	Child-only Posttreatment	Large effect +	No evidence
Adolescent	Multicomponent Multisystemic Therapy Posttreatment	No effect +	No evidence
	Multicomponent Multisystemic Therapy Short term	No effect +	No evidence
	Multicomponent Family Therapy Short term	Large effect +	No evidence
	Child-only	No evidence	No evidence

Abbreviations: CBCL = Child Behavior Checklist; CI = confidence interval; ECBI = Eyberg Child Behavior Inventory; MD = mean difference; RCT = randomized controlled trial; SMD = standardized mean difference; SOE = strength of evidence; TAU = treatment as usual

+ = low strength of evidence; ++ = moderate strength of evidence

[a] Short term: ≤24 weeks; intermediate term: 25-47 weeks; long term: ≥48 weeks

We attempted to determine if interventions that included direct and immediate coaching to the parent by the therapist (often through an earpiece worn by the parent while the parent and child interacted together) performed better than interventions without immediate feedback. There was insufficient evidence to draw a conclusion regarding the superiority of immediate, direct coaching or coaching based on past parent-child interactions. We also attempted to determine if self-help interventions were as successful as therapist-driven interventions and found evidence to support the use of self-help interventions in preschool and school-aged children, although the evidence was insufficient to determine whether therapist-led interventions or self-help interventions lead to a greater reduction in disruptive behaviors. We sought to determine if children with a formal diagnosis of a disruptive behavior responded differently to treatment than children without a formal diagnosis (or diagnoses were not reported), we analyzed postintervention treatment effects versus treatment as usual or waitlist in parent-only intervention

and multicomponent interventions in preschool and school-age children. There was a slightly lower reduction in parent-rated disruptive behavior in trials of multicomponent interventions in preschool and school-aged children combined when 50 percent or more children were reported to have a formal diagnosis of a DBD versus treatment as usual or waitlist than in trials where fewer than 50 percent had a diagnosis or diagnoses were not reported, however, this difference was not statistically significant.

4.2 Implications For Clinical and Policy Decisions

Findings from this review indicate that psychosocial interventions provide greater reductions in parent-reported disruptive behavior than no treatment or usual care in preschool and school-aged children immediately post-treatment. Because long-term evidence was often lacking, treatment should include routine followup to ensure sustainability of benefits.

Interventions were generally more successful in preschool and school-age children compared with adolescents, which supports early treatment. Additionally, results did not differ based on the presence or absence of a formal disruptive behavior diagnosis, indicating that treatment may be helpful in children who score above the clinical threshold on behavioral instruments without a DBD diagnosis.

Additional efforts are be needed to ensure Black and non-Hispanic White children are appropriately diagnosed and treated for DBDs, which includes addressing barriers, such as lack of parent education about the condition and access to culturally-competent care.

Select children may also benefit from pharmacotherapy when psychosocial interventions alone are inadequate.

4.3 Strengths of This Review

This review appears to provide the most comprehensive synthesis of evidence to date related to the comparative effectiveness of psychosocial and pharmacologic interventions for the treatment of DBDs in children and adolescents. Important strengths of this review include our categorization of the magnitude of effects to the extent possible for specific outcomes using the system described in our previous reviews[212] to facilitate interpretation of results across trials and interventions by providing a level of consistency and objective benchmarks for comparison. We also often reported standardized mean differences to facilitate reporting the magnitude of effect for consistency across measures. Another strength is our focus on parent-reported child outcomes, whether or not the child no longer met criteria for a DBD or scale scores were no longer in the clinical range, and criminal/legal outcomes.

4.4 Limitations of The Evidence Base

While there was moderate strength evidence that, when pooled, multicomponent and parent-only psychosocial interventions in preschool children and multicomponent interventions in school-aged children are better than usual care or waitlist at reducing disruptive behaviors when assessed immediately post-treatment, not all interventions demonstrated benefit and benefit was often not sustained or not reported in the long term. There was substantial heterogeneity across age groups regarding criteria for enrollment, methods of enrollment, in the enrolled population (e.g., primary diagnosis, concomitant diagnoses) and other characteristics as well as substantial heterogeneity in psychosocial treatments (and how they were delivered) and outcome measures reported which made it challenging to draw definitive conclusions. Studies also did not report the

representativeness of the enrolled sample to the population of children and adolescents with disruptive behaviors. Other factors that limited our ability to draw firm conclusion regarding the comparative effectiveness and harms of different interventions included:

- There were fewer trials that enrolled adolescents
- There were few trials that directly compared intervention types (multicomponent versus parent-only or child-only interventions, parent-only versus child-only)
- There were few trials of some psychosocial interventions
- There were few trials in each drug category (e.g., antipsychotics, anticonvulsants, stimulants) and many were not designed to assess effectiveness in children and adolescents with DBD.
- There were no studies in children or adolescents with intermittent explosive disorder
- Study sample sizes were often small to very small
- Attrition was high in many studies and some studies only reported data on children who completed the trial
- Many trials assessed unique interventions that could not be pooled
- White children and male children were more likely to be enrolled in studies, which may not reflect the client characteristics in some clinical practices
- Clinical practices may enroll more patients with multiple mental health conditions, whereas some studies excluded children with lower intellectual abilities or moderate to severe health challenges.

4.5 Limitations of the Review

Challenges and limitations of the review are at least in part linked to the limitations of the evidence base. As noted above, there was substantial heterogeneity for interventions and outcomes, which made pooling of studies and meaningful synthesis across studies challenging – and thus a challenge to drawing conclusions about the benefits of different interventions. Trials in children and adolescents with less severe disruptive behaviors were not included, but children with a diagnosis of a DBD or those who probably met criteria for a disruptive behavior diagnosis based on parent report of disruptive behaviors were the focus. By targeting children with more severe disease, we hoped to identify treatments that work for the most disruptive children. Although studies that included children with co-occurring conditions (e.g., ADHD, ASD, developmental delay) were not excluded, we did exclude studies in which the disruptive behaviors seemed as likely due to other conditions, or the study reported only outcomes related to the other conditions (e.g., ADHD-specific measures). Not including these studies may have had an impact on our findings.

This review focused on child-specific outcomes as these were felt to be most important for primary clinical decision making and to provide more robust, meaningful synthesis across studies and to enhance the ability to compare across interventions and age groups. There are many outcomes that may be important to parents and caregivers, but reporting of these outcomes was less consistent, sparser and measure mores more heterogeneous, making drawing conclusions difficult.

4.6 Future Research

Aside from Incredible Years and Parent-Child Interaction Therapy (PCIT) in preschool children, additional studies are needed for other interventions in preschool and for all

interventions in school-aged children and adolescents. Especially helpful would be randomized head-to-head trials of different interventions, both within parent-only (e.g., Incredible Years, Triple P) parent-plus-child or multicomponent interventions (e.g., PCIT, Helping the Noncompliant Child), and child-only interventions (e.g., Specific Skills Training, CBT) and across intervention types (e.g., a parent-only intervention versus a multicomponent intervention, a multicomponent intervention versus a child-only intervention) in preschool and school-aged children. Desperately needed are trials in adolescents, where there is a paucity of evidence for all types of interventions. Additionally, trials should also follow and report outcomes for children and adolescents at least a year beyond the conclusion of treatment to determine if treatment gains are sustainable and report outcomes from all study participants, not only study completers. Large, randomized trials are needed to parse out any differential treatment benefits and harms based on patient, clinical, and treatment characteristics and treatment history. Evidence is also needed on the effects on functional and behavioral outcomes due to disparities in diagnosis and treatment of disruptive behavior and DBDs.

4.7 Conclusions

Multicomponent psychosocial interventions (parent or teacher plus child) and parent-only psychosocial interventions were better than treatment as usual or waitlist at reducing parent report of child disruptive behaviors for preschool and school-age children immediately post-treatment. In these children, direct and indirect comparisons of multicomponent, parent-only, and child-only interventions generally found no or only minor differences in reducing disruptive behaviors, although effectiveness differed by specific psychosocial intervention. Results of multicomponent interventions and child-only interventions were mixed in adolescents and studies in adolescents were few. Pharmacotherapy may be helpful in reducing disruptive behaviors in some children who have inadequate response to psychosocial interventions alone, but pharmacotherapy was associated with an increased risk of experiencing any adverse event. For all age groups, evidence for some psychosocial interventions and all pharmacological interventions was limited, as was reporting of long-term outcomes. Additional research is needed to aid the clinician in selecting the intervention most likely to reduce disruptive behaviors well beyond treatment completion.

References

1. Audit Commission for Local Authorities in England and Wales. Children in Mind: Child and Adolescent Mental Health Services [briefing]: Audit Commission; 1999.
2. Ghandour RM, Sherman LJ, Vladutiu CJ, et al. Prevalence and Treatment of Depression, Anxiety, and Conduct Problems in US Children. J Pediatr. 2019 03;206:256-67.e3. doi: 10.1016/j.jpeds.2018.09.021. PMID: 30322701.
3. Epstein R, Fonnesbeck C, Williamson E, et al. AHRQ Comparative Effectiveness Reviews. Psychosocial and Pharmacologic Interventions for Disruptive Behavior in Children and Adolescents. Rockville (MD): Agency for Healthcare Research and Quality (US); 2015.
4. Agency for Healthcare Research and Quality. Methods Guide for Effectiveness and Comparative Effectiveness Reviews. Rockville, MD; 2018. https://effectivehealthcare.ahrq.gov/products/collections/cer-methods-guide. Accessed August 19 2022.
5. Hardy RJ, Thompson SG. A likelihood approach to meta-analysis with random effects. Stat Med. 1996 Mar 30;15(6):619-29. doi: 10.1002/(sici)1097-0258(19960330)15:6<619::Aid-sim188>3.0.Co;2-a. PMID: 8731004.
6. Higgins JP, Thompson SG, Deeks JJ, et al. Measuring inconsistency in meta-analyses. Bmj. 2003 Sep 6;327(7414):557-60. doi: 10.1136/bmj.327.7414.557. PMID: 12958120.
7. Ballentine KL. Understanding racial differences in diagnosing ODD versus ADHD using critical race theory. Fam Soc. 2019 Jul;100(3):282-92. doi: 10.1177/1044389419842765. PMID: 2019-49030-005.
8. Cameron M, Guterman NB. Diagnosing conduct problems of children and adolescents in residential treatment. Child youth care forum. 2007 Feb;36(1):1-10. doi: 10.1007/s10566-006-9027-6. PMID: 2007-07705-001.
9. Fadus MC, Ginsburg KR, Sobowale K, et al. Unconscious bias and the diagnosis of disruptive behavior disorders and ADHD in African American and Hispanic youth. Academic Psychiatry. 2020 Feb;44(1):95-102. doi: 10.1007/s40596-019-01127-6. PMID: 31713075.
10. Mandell DS, Ittenbach RF, Levy SE, et al. Disparities in diagnoses received prior to a diagnosis of autism spectrum disorder. J Autism Dev Disord. 2007 Oct;37(9):1795-802. doi: 10.1007/s10803-006-0314-8. PMID: 17160456.
11. Mizock L, Harkins D. Diagnostic bias and conduct disorder: Improving culturally sensitive diagnosis. Child Youth Serv. 2011 Jul;32(3):243-53. doi: 10.1080/0145935X.2011.605315. PMID: 2011-21795-006.
12. Nguyen L, Huang LN, Arganza GF, et al. The influence of race and ethnicity on psychiatric diagnoses and clinical characteristics of children and adolescents in children's services. Cultur Divers Ethnic Minor Psychol. 2007 Jan;13(1):18-25. doi: 10.1037/1099-9809.13.1.18. PMID: 17227173.
13. Bitsko RH, Claussen AH, Lichstein J, et al. Mental Health Surveillance Among Children - United States, 2013-2019. MMWR Suppl. 2022 Feb 25;71(2):1-42. doi: 10.15585/mmwr.su7102a1. PMID: 35202359.
14. Malhotra K, Shim R, Baltrus P, et al. Racial/Ethnic Disparities in Mental Health Service Utilization among Youth Participating in Negative Externalizing Behaviors. Ethn Dis. 2015;25(2):123-9. PMID: 26118137.
15. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Test Revision (DSM-5-TR): American Psychiatric Publishing; 2022.

16. Kim-Cohen J, Caspi A, Rutter M, et al. The caregiving environments provided to children by depressed mothers with or without an antisocial history. Am J Psychiatry. 2006 Jun;163(6):1009-18. doi: 10.1176/ajp.2006.163.6.1009. PMID: 16741201.

17. Loeber R, Farrington DP. Young children who commit crime: epidemiology, developmental origins, risk factors, early interventions, and policy implications. Dev Psychopathol. 2000 Autumn;12(4):737-62. doi: 10.1017/s0954579400004107. PMID: 11202042.

18. Youngstrom E, Weist MD, Albus KE. Exploring violence exposure, stress, protective factors and behavioral problems among inner-city youth. Am J Community Psychol. 2003 Sep;32(1-2):115-29. doi: 10.1023/a:1025607226122. PMID: 14570441.

19. Gorman-Smith D. The social ecology of community and neighborhood and risk for antisocial behavior. Conduct and oppositional defiant disorders: Epidemiology, risk factors, and treatment.: Lawrence Erlbaum Associates Publishers; 2003. p. 117-36.

20. Pisano S, Muratori P, Gorga C, et al. Conduct disorders and psychopathy in children and adolescents: aetiology, clinical presentation and treatment strategies of callous-unemotional traits. Ital. 2017 Sep 20;43(1):84. doi: 10.1186/s13052-017-0404-6. PMID: 28931400.

21. Sameroff A, Seifer R, McDonough SC. Contextual Contributors to the Assessment of Infant Mental Health. Handbook of infant, toddler, and preschool mental health assessment.: Oxford University Press; 2004. p. 61-76.

22. Nock MK, Kazdin AE, Hiripi E, et al. Lifetime prevalence, correlates, and persistence of oppositional defiant disorder: results from the National Comorbidity Survey Replication. J Child Psychol Psychiatry. 2007 Jul;48(7):703-13. doi: 10.1111/j.1469-7610.2007.01733.x. PMID: 17593151.

23. Lillig M. Conduct Disorder: Recognition and Management. Am Fam Physician. 2018 11 15;98(10):584-92. PMID: 30365289.

24. Mak W, Rosenblatt A. Demographic Influences on Psychiatric Diagnoses Among Youth Served in California Systems of Care. J Child Fam Stud. 2002 2002/06/01;11(2):165-78. doi: 10.1023/A:1015173508474.

25. Aggarwal A, Marwaha R. Oppositional Defiant Disorder. StatPearls. Treasure Island (FL): StatPearls Publishing. Copyright © 2024, StatPearls Publishing LLC.; 2024.

26. Mohan L, Yilanli M, Ray S. Conduct Disorder. StatPearls. Treasure Island (FL): StatPearls Publishing. Copyright © 2024, StatPearls Publishing LLC.; 2024.

27. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. Bmj. 2021 Mar 29;372:n71. doi: 10.1136/bmj.n71. PMID: 33782057.

28. U.S. Preventive Services Task Force. U.S. Preventive Services Task Force Procedure Manual. 2015. https://www.uspreventiveservicestaskforce.org/uspstf/procedure-manual. . Accessed Feb 26 2024.

29. Viswanathan M, Ansari MT, Berkman ND, et al. AHRQ Methods for Effective Health Care. Assessing the Risk of Bias of Individual Studies in Systematic Reviews of Health Care Interventions. Methods Guide for Effectiveness and Comparative Effectiveness Reviews. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008.

30. Furlan AD, Malmivaara A, Chou R, et al. 2015 Updated Method Guideline for Systematic Reviews in the Cochrane Back and Neck Group. Spine (Phila Pa 1976). 2015 Nov;40(21):1660-73. doi: 10.1097/brs.0000000000001061. PMID: 26208232.

31. Higgins JP, Thomas J, Chandler J, et al. Cochrane handbook for systematic reviews of interventions version 6.2: John Wiley & Sons; 2021.

32. Cohen J. Statistical power analysis for the behavioral sciences. 2nd edition. Hillsdale (NJ). Lawrence Erlbaum Associates, Inc.; 1988.

33. Dadds MR, Thai C, Mendoza Diaz A, et al. Therapist-assisted online treatment for child conduct problems in rural and urban families: two randomized controlled trials. J Consult Clin Psychol. 2019b Aug;87(8):706-19. doi: 10.1037/ccp0000419. PMID: 31204839.

34. Bagner DM, Sheinkopf SJ, Vohr BR, et al. Parenting intervention for externalizing behavior problems in children born premature: an initial examination. J Dev Behav Pediatr. 2010 Apr;31(3):209-16. doi: 10.1097/DBP.0b013e3181d5a294. PMID: 20375736.

35. McCabe K, Yeh M. Parent-child interaction therapy for Mexican Americans: a randomized clinical trial. J Clin Child Adolesc Psychol. 2009 Sep;38(5):753-9. doi: 10.1080/15374410903103544. PMID: 20183659.

36. Lavigne JV, Lebailly SA, Gouze KR, et al. Treating oppositional defiant disorder in primary care: a comparison of three models. J Pediatr Psychol. 2008b Jun;33(5):449-61. doi: 10.1093/jpepsy/jsm074. PMID: 17956932.

37. Schuhmann EM, Foote RC, Eyberg SM, et al. Efficacy of parent-child interaction therapy: interim report of a randomized trial with short-term maintenance. J Clin Child Psychol. 1998 Mar;27(1):34-45. doi: 10.1207/s15374424jccp2701_4. PMID: 9561935.

38. Eyberg SM, Boggs SR, Algina J. Parent-child interaction therapy: a psychosocial model for the treatment of young children with conduct problem behavior and their families. Psychopharmacol Bull. 1995;31(1):83-91. PMID: 7675994.

39. Cummings JG, Wittenberg JV. Supportive expressive therapy--parent child version: an exploratory study. Psychotherapy (Chic). 2008 Jun;45(2):148-64. doi: 10.1037/0033-3204.45.2.148. PMID: 22122414.

40. Hutchings J, Gardner F, Bywater T, et al. Parenting intervention in sure start services for children at risk of developing conduct disorder: pragmatic randomised controlled trial. BMJ. 2007 Mar 31;334(7595):678. doi: 10.1136/bmj.39126.620799.55. PMID: 17350966.

41. Nixon RD, Sweeney L, Erickson DB, et al. Parent-child interaction therapy: a comparison of standard and abbreviated treatments for oppositional defiant preschoolers. J Consult Clin Psychol. 2003 Apr;71(2):251-60. doi: 10.1037/0022-006x.71.2.251. PMID: 12699020.

42. McGilloway S, Mhaille GN, Bywater T, et al. A parenting intervention for childhood behavioral problems: a randomized controlled trial in disadvantaged community-based settings. J Consult Clin Psychol. 2012 Feb;80(1):116-27. doi: 10.1037/a0026304. PMID: 22148879.

43. Connell S, Sanders MR, Markie-Dadds C. Self-directed behavioral family intervention for parents of oppositional children in rural and remote areas. Behav Modif. 1997 Oct;21(4):379-408. doi: 10.1177/01454455970214001. PMID: 9337598.

44. Sanders MR, Baker S, Turner KM. A randomized controlled trial evaluating the efficacy of triple p online with parents of children with early-onset conduct problems. Behav Res Ther. 2012 Nov;50(11):675-84. doi: 10.1016/j.brat.2012.07.004. PMID: 22982082.

45. Havighurst SS, Wilson KR, Harley AE, et al. "Tuning into Kids": reducing young children's behavior problems using an emotion coaching parenting program. Child Psychiatry Hum Dev. 2013 Apr;44(2):247-64. doi: 10.1007/s10578-012-0322-1. PMID: 22820873.

46. McCabe K, Yeh M, Lau A, et al. Parent-child interaction therapy for mexican americans: results of a pilot randomized clinical trial at follow-up. Behav Ther. 2012 Sep;43(3):606-18. doi: 10.1016/j.beth.2011.11.001. PMID: 22697448.

47. Gardner F, Hutchings J, Bywater T, et al. Who benefits and how does it work? moderators and mediators of outcome in an effectiveness trial of a parenting intervention. J Clin Child Adolesc Psychol. 2010;39(4):568-80. doi: 10.1080/15374416.2010.486315. PMID: 20589567.

48. Lavigne JV, Lebailly SA, Gouze KR, et al. Predictor and moderator effects in the treatment of oppositional defiant disorder in pediatric primary care. J Pediatr Psychol. 2008a Jun;33(5):462-72. doi: 10.1093/jpepsy/jsm075. PMID: 17956931.

49. Sanders MR, Bor W, Morawska A. Maintenance of treatment gains: a comparison of enhanced, standard, and self-directed triple p-positive parenting program. J Abnorm Child Psychol. 2007 Dec;35(6):983-98. doi: 10.1007/s10802-007-9148-x. PMID: 17610061.

50. Nixon RD, Sweeney L, Erickson DB, et al. Parent-child interaction therapy: one- and two-year follow-up of standard and abbreviated treatments for oppositional preschoolers. J Abnorm Child Psychol. 2004 Jun;32(3):263-71. doi: 10.1023/b:jacp.0000026140.60558.05. PMID: 15228175.

51. Bor W, Sanders MR, Markie-Dadds C. The effects of the triple p-positive parenting program on preschool children with co-occurring disruptive behavior and attentional/hyperactive difficulties. J Abnorm Child Psychol. 2002 Dec;30(6):571-87. doi: 10.1023/a:1020807613155. PMID: 12481972.

52. Webster-Stratton C. Advancing videotape parent training: a comparison study. J Consult Clin Psychol. 1994 Jun;62(3):583-93. doi: 10.1037//0022-006x.62.3.583. PMID: 8063985.

53. McGrath PJ, Lingley-Pottie P, Thurston C, et al. Telephone-based mental health interventions for child disruptive behavior or anxiety disorders: randomized trials and overall analysis. J Am Acad Child Adolesc Psychiatry. 2011 Nov;50(11):1162-72. doi: 10.1016/j.jaac.2011.07.013. PMID: 22024004.

54. Markie-Dadds C, Sanders MR. A controlled evaluation of an enhanced self-directed behavioural family intervention for parents of children with conduct problems in rural and remote areas. Behav Change. 2006;23(1):55-72. doi: 10.1375/bech.23.1.55.

55. Nixon RDV. Changes in hyperactivity and temperament in behaviourally disturbed preschoolers after parent–child interaction therapy (PCIT). Behav Change. 2001;18(3):168-76. doi: 10.1375/bech.18.3.168.

56. Sanders MR, McFarland M. Treatment of depressed mothers with disruptive children: a controlled evaluation of cognitive behavioral family intervention. Behav Ther. 2000 2000/12/01/;31(1):89-112. doi: 10.1016/S0005-7894(00)80006-4.

57. Garcia D, Barnett ML, Rothenberg WA, et al. A Natural Helper Intervention to Address Disparities in Parent Child-Interaction Therapy: A Randomized Pilot Study. J Clin Child Adolesc Psychol. 2022 Dec 16;52(3):343-59. doi: 10.1080/15374416.2022.2148255. PMID: 36524764.

58. Bagner DM, Berkovits MD, Coxe S, et al. Telehealth treatment of behavior problems in young children with developmental delay: a randomized clinical trial. JAMA Pediatr. 2023 Mar 01;177(3):231-9. doi: 10.1001/jamapediatrics.2022.5204. PMID: 36622653.

59. Fleming GE, Neo B, Briggs NE, et al. Parent training adapted to the needs of children with callous-unemotional traits: a randomized controlled trial. Behav Ther. 2022 11;53(6):1265-81. doi: 10.1016/j.beth.2022.07.001. PMID: 36229121.

60. Prinz RJ, Metzler CW, Sanders MR, et al. Online-delivered parenting intervention for young children with disruptive behavior problems: a noninferiority trial focused on child and parent outcomes. J Child Psychol Psychiatry. 2022 02;63(2):199-209. doi: 10.1111/jcpp.13426. PMID: 33829499.

61. Parent J, Anton MT, Loiselle R, et al. A randomized controlled trial of technology-enhanced behavioral parent training: sustained parent skill use and child outcomes at follow-up. J Child Psychol Psychiatry. 2022 09;63(9):992-1001. doi: 10.1111/jcpp.13554. PMID: 34888861.

62. Graziano PA, Ros-Demarize R, Hare MM. Condensing parent training: a randomized trial comparing the efficacy of a briefer, more intensive version of parent-child interaction therapy (I-PCIT). J Consult Clin Psychol. 2020 Jul;88(7):669-79. doi: 10.1037/ccp0000504. PMID: 32352803.

63. Day JJ, Sanders MR. Do parents benefit from help when completing a self-guided parenting program online? A randomized controlled trial comparing triple p online with and without telephone support. Behav Ther. 2018 11;49(6):1020-38. doi: 10.1016/j.beth.2018.03.002. PMID: 30316482.

64. Sourander A, McGrath PJ, Ristkari T, et al. Two-year follow-up of internet and telephone assisted parent training for disruptive behavior at age 4. J Am Acad Child Adolesc Psychiatry. 2018 09;57(9):658-68.e1. doi: 10.1016/j.jaac.2018.07.001. PMID: 30196869.

65. Comer JS, Furr JM, Miguel EM, et al. Remotely delivering real-time parent training to the home: an initial randomized trial of Internet-delivered parent-child interaction therapy (I-PCIT). J Consult Clin Psychol. 2017 Sep;85(9):909-17. doi: 10.1037/ccp0000230. PMID: 28650194.

66. Loop L, Mouton B, Stievenart M, et al. One or many? Which and how many parenting variables should be targeted in interventions to reduce children's externalizing behavior? Behav Res Ther. 2017 05;92:11-23. doi: 10.1016/j.brat.2017.01.015. PMID: 28187306.

67. Baker S, Sanders MR, Turner KMT, et al. A randomized controlled trial evaluating a low-intensity interactive online parenting intervention, triple p online brief, with parents of children with early onset conduct problems. Behav Res Ther. 2017 04;91:78-90. doi: 10.1016/j.brat.2017.01.016. PMID: 28167330.

68. Niec LN, Barnett ML, Prewett MS, et al. Group parent-child interaction therapy: a randomized control trial for the treatment of conduct problems in young children. J Consult Clin Psychol. 2016 Aug;84(8):682-98. doi: 10.1037/a0040218. PMID: 27018531.

69. Sourander A, McGrath PJ, Ristkari T, et al. Internet-assisted parent training intervention for disruptive behavior in 4-year-old children: a randomized clinical trial. JAMA Psychiatry. 2016 Apr;73(4):378-87. doi: 10.1001/jamapsychiatry.2015.3411. PMID: 26913614.

70. Forehand R, Parent J, Sonuga-Barke E, et al. Which Type of Parent Training Works Best for Preschoolers with Comorbid ADHD and ODD? A Secondary Analysis of a Randomized Controlled Trial Comparing Generic and Specialized Programs. J Abnorm Child Psychol. 2016 11;44(8):1503-13. doi: 10.1007/s10802-016-0138-8. PMID: 26909683.

71. Dittman CK, Farruggia SP, Keown LJ, et al. Dealing with disobedience: an evaluation of a brief parenting intervention for young children showing noncompliant behavior problems. Child Psychiatry Hum Dev. 2016 Feb;47(1):102-12. doi: 10.1007/s10578-015-0548-9. PMID: 25863790.

72. Eyberg S, Boggs S, Jaccard J. Does maintenance treatment matter? J Abnorm Child Psychol. 2014;42(3):355-66. doi: 10.1007/s10802-013-9842-9. PMID: 24413969.

73. Perrin EC, Sheldrick RC, McMenamy JM, et al. Improving parenting skills for families of young children in pediatric settings: a randomized clinical trial. JAMA Pediatr. 2014 Jan;168(1):16-24. doi: 10.1001/jamapediatrics.2013.2919. PMID: 24190691.

74. Rodriguez GM, Bagner DM, Graziano PA. Parent training for children born premature: a pilot study examining the moderating role of emotion regulation. Child Psychiatry Hum Dev. 2014;45(2):143-52. doi: 10.1007/s10578-013-0385-7. PMID: 23681677.

75. Lees D, Frampton CM, Merry SN. Efficacy of a home visiting enhancement for high-risk families attending parent management programs: a randomized superiority clinical trial. JAMA Psychiatry. 2019 03 01;76(3):241-8. doi: 10.1001/jamapsychiatry.2018.4183. PMID: 30673062.

76. O'Farrelly C, Watt H, Babalis D, et al. A brief home-based parenting intervention to reduce behavior problems in young children: a pragmatic randomized clinical trial. JAMA Pediatr. 2021a;175(6):567-76. doi: 10.1001/jamapediatrics.2020.6834. PMID: 33720329.

77. O'Farrelly C, Barker B, Watt H, et al. A video-feedback parenting intervention to prevent enduring behaviour problems in at-risk children aged 12-36 months: The healthy start, happy start RCT. Health Technol Assess. 2021b;25(29):1-84. doi: 10.3310/HTA25290. PMID: 34018919.

78. Aghaie Meybodi F, Mohammadkhani P, Pourshahbaz A, et al. Improving parent emotion socialization practices: piloting tuning in to kids in iran for children with disruptive behavior problems. Family Relations: An Interdisciplinary Journal of Applied Family Studies. 2019 Dec;68(5):596-607. doi: 10.1111/fare.12387.

79. Gonzales-Ball TL, Bratton SC. Child-teacher relationship training as a Head Start early mental health intervention for children exhibiting disruptive behavior. International Journal of Play Therapy. 2019 Jan;28(1):44-56. doi: 10.1037/pla0000081.

80. Morpeth L, Blower S, Tobin K, et al. The effectiveness of the incredible years pre-school parenting programme in the United Kingdom: a pragmatic randomised controlled trial. Child Care Pract. 2017 Apr;23(2):141-61. doi: 10.1080/13575279.2016.1264366.

81. Seabra-Santos MJ, Gaspar MF, Azevedo AF, et al. Incredible years parent training: what changes, for whom, how, for how long? Journal of Applied Developmental Psychology. 2016 May-Jun;44:93-104. doi: 10.1016/j.appdev.2016.04.004.

82. Homem TC, Gaspar MF, Santos MJS, et al. Incredible years parent training: does it improve positive relationships in portuguese families of preschoolers with oppositional/defiant symptoms? J Child Fam Stud. 2015 Jul;24(7):1861-75. doi: 10.1007/s10826-014-9988-2.

83. Leung C, Tsang S, Sin TC, et al. The efficacy of parent–child interaction therapy with Chinese families: Randomized controlled trial. Res Soc Work Pract. 2015;25(1):117-28. doi: 10.1177/1049731513519827.

84. Agazzi H, Hayford H, Thomas N, et al. A nonrandomized trial of a behavioral parent training intervention for parents with children with challenging behaviors: In-person versus internet-HOT DOCS. Clin Child Psychol Psychiatry. 2021 Oct;26(4):1076-88. doi: 10.1177/13591045211027559. PMID: 34156883.

85. Jouriles EN, McDonald R, Spiller L, et al. Reducing conduct problems among children of battered women. J Consult Clin Psychol. 2001 Oct;69(5):774-85. doi: 10.1037//0022-006x.69.5.774. PMID: 11680554.

86. Boylan K, Macpherson HA, Fristad MA. Examination of disruptive behavior outcomes and moderation in a randomized psychotherapy trial for mood disorders. J Am Acad Child Adolesc Psychiatry. 2013 Jul;52(7):699-708. doi: 10.1016/j.jaac.2013.04.014. PMID: 23800483.

87. Kolko DJ, Campo JV, Kelleher K, et al. Improving access to care and clinical outcome for pediatric behavioral problems: a randomized trial of a nurse-administered intervention in primary care. J Dev Behav Pediatr. 2010a Jun;31(5):393-404. doi: 10.1097/DBP.0b013e3181dff307. PMID: 20495474.

88. Jouriles EN, McDonald R, Rosenfield D, et al. Reducing conduct problems among children exposed to intimate partner violence: a randomized clinical trial examining effects of project support. J Consult Clin Psychol. 2009 Aug;77(4):705-17. doi: 10.1037/a0015994. PMID: 19634963.

89. Kolko DJ, Dorn LD, Bukstein OG, et al. Community vs. clinic-based modular treatment of children with early-onset ODD or CD: a clinical trial with 3-year follow-up. J Abnorm Child Psychol. 2009 Jul;37(5):591-609. doi: 10.1007/s10802-009-9303-7. PMID: 19221871.

90. Kolko DJ, Pardini DA. ODD dimensions, ADHD, and callous-unemotional traits as predictors of treatment response in children with disruptive behavior disorders. J Abnorm Psychol. 2010b Nov;119(4):713-25. doi: 10.1037/a0020910. PMID: 21090875.

91. Shelleby EC, Kolko DJ. Predictors, moderators, and treatment parameters of community and clinic-based treatment for child disruptive behavior disorders. J Child Fam Stud. 2015 Mar;24(3):734-48. doi: 10.1007/s10826-013-9884-1. PMID: 25750506.

92. Greene RW, Ablon JS, Goring JC, et al. Effectiveness of collaborative problem solving in affectively dysregulated children with oppositional-defiant disorder: initial findings. J Consult Clin Psychol. 2004 Dec;72(6):1157-64. doi: 10.1037/0022-006x.72.6.1157. PMID: 15612861.

93. Webster-Stratton C, Hammond M. Treating children with early-onset conduct problems: a comparison of child and parent training interventions. J Consult Clin Psychol. 1997 Feb;65(1):93-109. doi: 10.1037//0022-006x.65.1.93. PMID: 9103739.

94. Axberg U, Broberg AG. Evaluation of "the incredible years" in sweden: the transferability of an american parent-training program to sweden. Scand J Psychol. 2012 Jun;53(3):224-32. doi: 10.1111/j.1467-9450.2012.00955.x. PMID: 22621727.

95. Barrett P, Turner C, Rombouts S, et al. Reciprocal skills training in the treatment of externalising behaviour disorders in childhood: a preliminary investigation. Behav Change. 2000;17(4):221-34. doi: 10.1375/bech.17.4.221.

96. Weeland J, Chhangur RR, van der Giessen D, et al. Intervention effectiveness of the incredible years: new insights into sociodemographic and intervention-based moderators. Behav Ther. 2017 01;48(1):1-18. doi: 10.1016/j.beth.2016.08.002. PMID: 28077214.

97. Dose C, Hautmann C, Buerger M, et al. Telephone-assisted self-help for parents of children with attention-deficit/hyperactivity disorder who have residual functional impairment despite methylphenidate treatment: a randomized controlled trial. J Child Psychol Psychiatry. 2017 Jun;58(6):682-90. doi: 10.1111/jcpp.12661. PMID: 27878809.

98. Thijssen J, Vink G, Muris P, et al. The Effectiveness of Parent Management Training-Oregon Model in Clinically Referred Children with Externalizing Behavior Problems in The Netherlands. Child Psychiatry Hum Dev. 2017 02;48(1):136-50. doi: 10.1007/s10578-016-0660-5. PMID: 27306883.

99. Leijten P, Raaijmakers MA, Orobio de Castro B, et al. Effectiveness of the incredible years parenting program for families with socioeconomically disadvantaged and ethnic minority backgrounds. J Clin Child Adolesc Psychol. 2017 Jan-Feb;46(1):59-73. doi: 10.1080/15374416.2015.1038823. PMID: 25985392.

100. Morshed N, Babamiri M, Zemestani M, et al. A comparative study on the effectiveness of individual and group play therapy on symptoms of oppositional defiant disorder among children. Korean J Fam Med. 2019 Nov;40(6):368-72. doi: 10.4082/kjfm.18.0045. PMID: 30625268.

101. Maaskant AM, van Rooij FB, Overbeek GJ, et al. Effects of PMTO in foster families with children with behavior problems: a randomized controlled trial. J Child Fam Stud. 2017;26(2):523-39. doi: 10.1007/s10826-016-0579-2. PMID: 28190946.

102. Bjorseth A, Wichstrom L. Effectiveness of parent-child interaction therapy (PCIT) in the treatment of young children's behavior problems. A randomized controlled study. PLoS ONE [Electronic Resource]. 2016;11(9):e0159845. doi: 10.1371/journal.pone.0159845. PMID: 27622458.

103. Ollendick TH, Greene RW, Austin KE, et al. Parent management training and collaborative & proactive solutions: a randomized control trial for oppositional youth. J Clin Child Adolesc Psychol. 2016 Sep-Oct;45(5):591-604. doi: 10.1080/15374416.2015.1004681. PMID: 25751000.

104. Duncombe ME, Havighurst SS, Kehoe CE, et al. Comparing an Emotion- and a Behavior-Focused Parenting Program as Part of a Multsystemic Intervention for Child Conduct Problems. J Clin Child Adolesc Psychol. 2016;45(3):320-34. doi: 10.1080/15374416.2014.963855. PMID: 25469889.

105. Havighurst SS, Duncombe M, Frankling E, et al. An emotion-focused early intervention for children with emerging conduct problems. J Abnorm Child Psychol. 2015 May;43(4):749-60. doi: 10.1007/s10802-014-9944-z. PMID: 25249470.

106. Burke JD, Loeber R. The effectiveness of the stop now and plan (SNAP) program for boys at risk for violence and delinquency. Prev Sci. 2015 Feb;16(2):242-53. doi: 10.1007/s11121-014-0490-2. PMID: 24756418.

107. Sanders MR, Dittman CK, Farruggia SP, et al. A comparison of online versus workbook delivery of a self-help positive parenting program. J Prim Prev. 2014 Jun;35(3):125-33. doi: 10.1007/s10935-014-0339-2. PMID: 24500106.

108. Jones DJ, Forehand R, Cuellar J, et al. Technology-enhanced program for child disruptive behavior disorders: development and pilot randomized control trial. J Clin Child Adolesc Psychol. 2014;43(1):88-101. doi: 10.1080/15374416.2013.822308. PMID: 23924046.

109. Abrahamse ME, Junger M, van Wouwe MA, et al. Treating child disruptive behavior in high-risk families: a comparative effectiveness trial from a community-based implementation. J Child Fam Stud. 2016;25:1605-22. doi: 10.1007/s10826-015-0322-4. PMID: 27110086.

110. Webster-Stratton C, Reid MJ, Hammond M. Treating children with early-onset conduct problems: intervention outcomes for parent, child, and teacher training. J Clin Child Adolesc Psychol. 2004 Mar;33(1):105-24. doi: 10.1207/s15374424jccp3301_11. PMID: 15028546.

111. Kling A, Forster M, Sundell K, et al. A randomized controlled effectiveness trial of parent management training with varying degrees of therapist support. Behav Ther. 2010 Dec;41(4):530-42. doi: 10.1016/j.beth.2010.02.004. PMID: 21035616.

112. Scott S, Sylva K, Doolan M, et al. Randomised controlled trial of parent groups for child antisocial behaviour targeting multiple risk factors: the SPOKES project. J Child Psychol Psychiatry. 2010 Jan;51(1):48-57. doi: 10.1111/j.1469-7610.2009.02127.x. PMID: 19732250.

113. Ogden T, Hagen KA. Treatment effectiveness of parent management training in Norway: a randomized controlled trial of children with conduct problems. J Consult Clin Psychol. 2008 Aug;76(4):607-21. doi: 10.1037/0022-006x.76.4.607. PMID: 18665689.

114. Hagen KA, Ogden T, Bjørnebekk G. Treatment outcomes and mediators of parent management training: a one-year follow-up of children with conduct problems. J Clin Child Adolesc Psychol. 2011;40(2):165-78. doi: 10.1080/15374416.2011.546050. PMID: 21391015.

115. Larsson B, Fossum S, Clifford G, et al. Treatment of oppositional defiant and conduct problems in young norwegian children : results of a randomized controlled trial. European Child & Adolescent Psychiatry. 2009 Jan;18(1):42-52. doi: 10.1007/s00787-008-0702-z. PMID: 18563473.

116. van de Wiel NM, Matthys W, Cohen-Kettenis PT, et al. The effectiveness of an experimental treatment when compared to care as usual depends on the type of care as usual. Behav Modif. 2007 May;31(3):298-312. doi: 10.1177/0145445506292855. PMID: 17438344.

117. Gardner F, Burton J, Klimes I. Randomised controlled trial of a parenting intervention in the voluntary sector for reducing child conduct problems: outcomes and mechanisms of change. J Child Psychol Psychiatry. 2006 Nov;47(11):1123-32. doi: 10.1111/j.1469-7610.2006.01668.x. PMID: 17076751.

118. van Manen TG, Prins PJ, Emmelkamp PM. Reducing aggressive behavior in boys with a social cognitive group treatment: results of a randomized, controlled trial. J Am Acad Child Adolesc Psychiatry. 2004 Dec;43(12):1478-87. doi: 10.1097/01.chi.0000142669.36815.3e. PMID: 15564817.

119. Augimeri LK, Farrington DP, Koegl CJ, et al. The SNAP™ under 12 outreach Project: effects of a community based program for children with conduct problems. J Child Fam Stud. 2007 2007/12/01;16(6):799-807. doi: 10.1007/s10826-006-9126-x.

120. Cabiya JJ, Padilla-Cotto, Lymaries, Gonzalez, Karelyn, Sanchez-Cestero, Jovette, Martinez-Taboas, Alfonso, Sayers, Sean. Effectiveness of a cognitive-behavioral intervention for Puerto Rican children. Interam J Psychol. 2008;42(2):195-202.

121. Wolff JC, Greene RW, Ollendick TH. Differential Responses of Children with Varying Degrees of Reactive and Proactive Aggression to Two Forms of Psychosocial Treatment. Child Fam Behav Ther. 2008 2008/02/28;30(1):37-50. doi: 10.1300/J019v30n01_03.

122. Zonnevylle-Bender MJS, Matthys W, van de Wiel NMH, et al. Preventive effects of treatment of disruptive behavior disorder in middle childhood on substance use and delinquent behavior. J Am Acad Child Adolesc Psychiatry. 2007 Jan;46(1):33-9. doi: 10.1097/01.chi.0000246051.53297.57. PMID: 17195727.

123. Engelbrektsson J, Salomonsson S, J Hgm, et al. Parent training via internet or in group for disruptive behaviors: a randomized clinical noninferiority trial. J Am Acad Child Adolesc Psychiatry. 2023 Feb 24;S0890-8567(23):00078-3. doi: 10.1016/j.jaac.2023.01.019. PMID: 36863414.

124. Muratori P, Conversano C, Levantini V, et al. Exploring the efficacy of a mindfulness program for boys with attention-deficit hyperactivity disorder and oppositional defiant disorder. Journal of Attention Disorders. 2021 09;25(11):1544-53. doi: 10.1177/1087054720915256. PMID: 32338110.

125. Wolff JC, Garcia A, Kelly LM, et al. Feasibility of decision rule-based treatment of comorbid youth: a pilot randomized control trial. Behav Res Ther. 2020 08;131:103625. doi: 10.1016/j.brat.2020.103625. PMID: 32353635.

126. Nobel E, Hoekstra PJ, Agnes Brunnekreef J, et al. Home-based parent training for school-aged children with attention-deficit/hyperactivity disorder and behavior problems with remaining impairing disruptive behaviors after routine treatment: a randomized controlled trial. European Child & Adolescent Psychiatry. 2020 Mar;29(3):395-408. doi: 10.1007/s00787-019-01375-9. PMID: 31332524.

127. Dadds MR, English T, Wimalaweera S, et al. Can reciprocated parent-child eye gaze and emotional engagement enhance treatment for children with conduct problems and callous-unemotional traits: a proof-of-concept trial. J Child Psychol Psychiatry. 2019a 06;60(6):676-85. doi: 10.1111/jcpp.13023. PMID: 30697730.

128. Goertz-Dorten A, Benesch C, Berk-Pawlitzek E, et al. Efficacy of individualized social competence training for children with oppositional defiant disorders/conduct disorders: a randomized controlled trial with an active control group. European Child & Adolescent Psychiatry. 2019 Feb;28(2):165-75. doi: 10.1007/s00787-018-1144-x. PMID: 29594368.

129. Giudice TD, Lindenschmidt T, Hellmich M, et al. Stability of the effects of a social competence training program for children with oppositional defiant disorder/conduct disorder: a 10-month follow-up. European Child & Adolescent Psychiatry. 2022 Mar 13doi: 10.1007/s00787-021-01932-1. PMID: 35279770.

130. Edginton E, Walwyn R, Twiddy M, et al. TIGA-CUB-manualised psychoanalytic child psychotherapy versus treatment as usual for children aged 5-11 with treatment-resistant conduct disorders and their primary carers: results from a randomised controlled feasibility trial. J. 2018 Nov;30(3):167-82. doi: 10.2989/17280583.2018.1532433. PMID: 30428772.

131. Hautmann C, Dose C, Duda-Kirchhof K, et al. Behavioral versus nonbehavioral guided self-help for parents of children with externalizing disorders in a randomized controlled trial. Behav Ther. 2018 11;49(6):951-65. doi: 10.1016/j.beth.2018.02.002. PMID: 30316493.

132. Hautmann C, Dose C, Hellmich M, et al. Behavioural and nondirective parent training for children with externalising disorders: first steps towards personalised treatment recommendations. Behav Res Ther. 2023;163:104271. doi: 10.1016/j.brat.2023.104271. PMID: 36931110.

133. Ghaderi A, Kadesjo C, Bjornsdotter A, et al. Randomized effectiveness trial of the family check-up versus internet-delivered parent training (iComet) for families of children with conduct problems. Sci Rep. 2018 07 31;8(1):11486. doi: 10.1038/s41598-018-29550-z. PMID: 30065246.

134. Helander M, Lochman J, Hogstrom J, et al. The effect of adding coping power program-sweden to parent management training-effects and moderators in a randomized controlled trial. Behav Res Ther. 2018 04;103:43-52. doi: 10.1016/j.brat.2018.02.001. PMID: 29448135.

135. Helander M, Enebrink P, Hellner C, et al. Parent management training combined with group-CBT compared to parent management training only for oppositional defiant disorder symptoms: 2-year follow-up of a randomized controlled trial. Child Psychiatry Hum Dev. 2023 Jan 28;54(4):1112-26. doi: 10.1007/s10578-021-01306-3. PMID: 35089501.

136. Allen K, Harrington J, Quetsch LB, et al. Parent-child interaction therapy for children with disruptive behaviors and autism: a randomized clinical trial. J Autism Dev Disord. 2023 Jan;53(1):390-404. doi: 10.1007/s10803-022-05428-y. PMID: 35076832.

137. Ward CL, Wessels IM, Lachman JM, et al. Parenting for lifelong health for young children: a randomized controlled trial of a parenting program in South Africa to prevent harsh parenting and child conduct problems. J Child Psychol Psychiatry. 2020 04;61(4):503-12. doi: 10.1111/jcpp.13129. PMID: 31535371.

138. Romero E, Rodriguez C, Villar P, et al. Intervention on early-onset conduct problems as indicated prevention for substance use: a seven-year follow up. Adicciones. 2017 Jun 28;29(3):150-62. doi: 10.20882/adicciones.722. PMID: 27749966.

139. Mastromanno BK, Kehoe CE, Wood CE, et al. A randomised-controlled pilot study of the one-to-one delivery of tuning in to kids: impact on emotion socialisation, reflective functioning, and childhood behaviour problems. Emotional and Behavioural Difficulties. 2021;26(4):359-74. doi: 10.1080/13632752.2021.1984208.

140. Mansurnejad Z, Malekpour M, Ghamarani A, et al. The effects of teaching self-determination skills on the externalizing behaviors of students with emotional behavioral disorders. Emotional and Behavioural Difficulties. 2019;24(2):196-203. doi: 10.1080/13632752.2019.1600247.

141. Chalfon MST, Ramos DG. Sandplay therapy in the treatment of children with oppositional defiant disorder and conduct disorder. Estudos de Psicologia 2022 Jun 3;39(ArtID e200223)doi: 10.1590/1982-0275202239e200223.

142. Heidary M, Hashemi Nosrat Abad T, Linden W. Mindfulness-based intervention and aggression and rule-breaking behaviours in elementary school boys: A proof of concept trial. J Psychol Couns Sch. 2022 Jun;32(1):15-22. doi: 10.1017/jgc.2021.11.

143. Chesterfield JA, Porzig-Drummond R, Stevenson RJ, et al. Evaluating a brief behavioral parenting program for parents of school-aged children with ADHD. Parent Sci Pract. 2021 Jul-Sep;21(3):216-40. doi: 10.1080/15295192.2020.1777783.

144. Prout TA, Rice T, Chung H, et al. Randomized controlled trial of regulation focused psychotherapy for children: a manualized psychodynamic treatment for externalizing behaviors. Psychother Res. 2022 06;32(5):555-70. doi: 10.1080/10503307.2021.1980626. PMID: 34583626.

145. de Jong SRC, van den Hoofdakker BJ, van der Veen-Mulders L, et al. The efficacy of a self-help parenting program for parents of children with externalizing behavior: a randomized controlled trial. European Child & Adolescent Psychiatry. 2022 Jul 07;07:07. doi: 10.1007/s00787-022-02028-0. PMID: 35794395.

146. Goertz-Dorten A, Dose C, Hofmann L, et al. Effects of computer-assisted social skills training in children with disruptive behavior disorders: a randomized controlled trial. J Am Acad Child Adolesc Psychiatry. 2022 11;61(11):1329-40. doi: 10.1016/j.jaac.2022.03.027. PMID: 35398192.

147. Palmer ML, Keown LJ, Sanders MR, et al. Enhancing outcomes of low-intensity parenting groups through sufficient exemplar training: a randomized control trial. Child Psychiatry Hum Dev. 2019 Jun;50(3):384-99. doi: 10.1007/s10578-018-0847-z. PMID: 30302577.

148. Thompson AM. A randomized trial of the Self-Management Training and Regulation Strategy for disruptive students. Res Soc Work Pract. 2014 Jul;24(4):414-27. doi: 10.1177/1049731513509691.

149. Murrihy RC, Drysdale SAO, Dedousis-Wallace A, et al. Community-delivered collaborative and proactive solutions and parent management training for oppositional youth: a randomized trial. Behav Ther. 2023 Mar;54(2):400-17. doi: 10.1016/j.beth.2022.10.005. PMID: 36858768.

150. Singh NN, Lancioni GE, Medvedev ON, et al. A Component Analysis of the Mindfulness-Based Positive Behavior Support (MBPBS) Program for Mindful Parenting by Mothers of Children with Autism Spectrum Disorder. Mindfulness. 2021;12(2):463-75. doi: 10.1007/s12671-020-01376-9. PMID: 32421103.

151. Brathwaite R, Ssewamala FM, Sensoy Bahar O, et al. The longitudinal impact of an evidence-based multiple family group intervention (Amaka Amasanyufu) on oppositional defiant disorder and impaired functioning among children in Uganda: analysis of a cluster randomized trial from the SMART Africa-Uganda scale-up study (2016-2022). J Child Psychol Psychiatry. 2022 11;63(11):1252-60. doi: 10.1111/jcpp.13566. PMID: 34989404.

152. Njardvik U, Smaradottir H, Ost LG. The effects of emotion regulation treatment on disruptive behavior problems in children: a randomized controlled trial. Res Child Adolesc Psychopathol. 2022 07;50(7):895-905. doi: 10.1007/s10802-022-00903-7. PMID: 35133557.

153. Jent JF, Rothenberg WA, Weinstein A, et al. Comparing traditional and ebook-augmented parent-child interaction therapy (PCIT): a randomized control trial of pocket PCIT. Behav Ther. 2021 11;52(6):1311-24. doi: 10.1016/j.beth.2021.02.013. PMID: 34656188.

154. Scudder A, Wong C, Ober N, et al. Parent-child interaction therapy (PCIT) in young children with autism spectrum disorder. Child Fam Behav Ther. 2019;41(4):201-20. doi: 10.1080/07317107.2019.1659542.

155. Kolko DJ, Lindhiem O, Hart J, et al. Evaluation of a booster intervention three years after acute treatment for early-onset disruptive behavior disorders. J Abnorm Child Psychol. 2014;42(3):383-98. doi: 10.1007/s10802-013-9724-1. PMID: 23494526.

156. Masi G, Milone A, Paciello M, et al. Efficacy of a multimodal treatment for disruptive behavior disorders in children and adolescents: focus on internalizing problems. Psychiatry Res. 2014 Nov 30;219(3):617-24. doi: 10.1016/j.psychres.2014.05.048. PMID: 25060833.

157. Lipman EL, Kenny M, Sniderman C, et al. Evaluation of a community-based program for young boys at-risk of antisocial behaviour: results and issues. J Am Acad Child Adolesc Psychiatry. 2008;17(1):12-9. PMID: 18392161.

158. Gopalan G, Chacko A, Franco L, et al. Multiple family groups for children with disruptive behavior disorders: child outcomes at 6-month follow-up. J Child Fam Stud. 2015a Sep;24(9):2721-33. doi: 10.1007/s10826-014-0074-6. PMID: 26321858.

159. Gopalan G, Small L, Fuss A, et al. Multiple family groups to reduce child disruptive behavior difficulties: moderating effects of child welfare status on child outcomes. Child Abuse Negl. 2015b Aug;46:207-19. doi: 10.1016/j.chiabu.2015.06.006. PMID: 26188424.

160. Acri M, Bornheimer LA, Jessell L, et al. The impact of caregiver treatment satisfaction upon child and parent outcomes. Child Adolesc Ment Health. 2016;21(4):201-8. doi: 10.1111/camh.12165. PMID: 27833456.

161. Coughlin M, Sharry J, Fitzpatrick C, et al. A controlled clinical evaluation of the parents plus children's programme: a video-based programme for parents of children aged 6 to 11 with behavioural and developmental problems. Clin Child Psychol Psychiatry. 2009 Oct;14(4):541-58. doi: 10.1177/1359104509339081. PMID: 19759073.

162. Muratori P, Milone A, Manfredi A, et al. Evaluation of improvement in externalizing behaviors and callous-unemotional traits in children with disruptive behavior disorder: a 1-year follow up clinic-based study. Adm Policy Ment Health. 2017b Jul;44(4):452-62. doi: 10.1007/s10488-015-0660-y. PMID: 26008901.

163. Muratori P, Milone A, Levantini V, et al. Six-year outcome for children with ODD or CD treated with the coping power program. Psychiatry Res. 2019 01;271:454-8. doi: 10.1016/j.psychres.2018.12.018. PMID: 30537668.

164. Vidal S, Connell CM. Treatment Effects of Parent-Child Focused Evidence-Based Programs on Problem Severity and Functioning among Children and Adolescents with Disruptive Behavior. J Clin Child Adolesc Psychol. 2019;48(SUP1):S326-S36. doi: 10.1080/15374416.2018.1469092. PMID: 29883195.

165. Muratori P, Polidori L, Chiodo S, et al. A Pilot Study Implementing Coping Power in Italian Community Hospitals: Effect of Therapist Attachment Style on Outcomes in Children. J Child Fam Stud. 2017a 2017/11/01;26(11):3093-101. doi: 10.1007/s10826-017-0820-7.

166. Asscher JJ, Deković M, Manders WA, et al. A randomized controlled trial of the effectiveness of multisystemic therapy in the Netherlands: post-treatment changes and moderator effects. J Exp Criminol. 2013 2013/06/01;9(2):169-87. doi: 10.1007/s11292-012-9165-9.

167. Butler S, Baruch G, Hickey N, et al. A randomized controlled trial of multisystemic therapy and a statutory therapeutic intervention for young offenders. J Am Acad Child Adolesc Psychiatry. 2011 Dec;50(12):1220-35.e2. doi: 10.1016/j.jaac.2011.09.017. PMID: 22115143.

168. Fonagy P, Butler S, Cottrell D, et al. Multisystemic therapy versus management as usual in the treatment of adolescent antisocial behaviour (START): a pragmatic, randomised controlled, superiority trial. Lancet Psychiatry. 2018 02;5(2):119-33. doi: 10.1016/S2215-0366(18)30001-4. PMID: 29307527.

169. Fonagy P, Butler S, Cottrell D, et al. Multisystemic therapy versus management as usual in the treatment of adolescent antisocial behaviour (START): 5-year follow-up of a pragmatic, randomised, controlled, superiority trial. Lancet Psychiatry. 2020 05;7(5):420-30. doi: 10.1016/S2215-0366(20)30131-0. PMID: 32353277.

170. Sundell K, Hansson K, Löfholm CA, et al. The transportability of multisystemic therapy to Sweden: short-term results from a randomized trial of conduct-disordered youths. J Fam Psychol. 2008 Aug;22(4):550-60. doi: 10.1037/a0012790. PMID: 18729669.

171. Wagner DV, Borduin CM, Mazurek MO, et al. Multisystemic therapy for disruptive behavior problems in youths with autism spectrum disorder: results from a small randomized clinical trial. Evidence-based Practice in Child and Adolescent Mental Health. 2019;4(1):42-54. doi: 10.1080/23794925.2018.1560237.

172. Sells SP, Early, Kristin Winokur, Smith, Thomas E. Reducing Adolescent Oppositional and Conduct Disorders: An Experimental Design Using the Parenting with Love and Limits® Model Professional Issues in Criminal Justice. 2011;6(3-4):9-30.

173. Swart J, Apsche J. Family mode deactivation therapy (FMDT): a randomized controlled trial for adolescents with complex issues. Int J Behav Consult Ther. 2014b;9(1):14-22. doi: 10.1037/h0101010.

174. Swart J, Apsche J. Mindfulness, mode deactivation, and family therapy: A winning combination for treating adolescents with complex trauma and behavioral problems. Int J Behav Consult Ther. 2014a;9(2):9-14. doi: 10.1037/h0100992.

175. Azrin NH, Donohue B, Teichner GA, et al. A controlled evaluation and description of individual-cognitive problem solving and family-behavior therapies in dually-diagnosed conduct-disordered and substance-dependent youth. J Child Adolesc Subst Abuse. 2001 2001/09/01;11(1):1-43. doi: 10.1300/J029v11n01_01.

176. Santisteban DA, Coatsworth JD, Perez-Vidal A, et al. Efficacy of brief strategic family therapy in modifying hispanic adolescent behavior problems and substance use. J Fam Psychol. 2003 Mar;17(1):121-33. doi: 10.1037/0893-3200.17.1.121. PMID: 12666468.

177. Larden M, Hogstrom J, Langstrom N. Effectiveness of an individual cognitive-behavioral intervention for serious, young male violent offenders: randomized controlled study with twenty-four-month follow-up. Front Psychiatry. 2021;12(670957)doi: 10.3389/fpsyt.2021.670957. PMID: 34408675.

178. Roux B, Perez-Pena M, Philippot P. A mindfulness-based intervention for adolescents with behavior disorders: controlled trial with partial randomization. Mindfulness. 2021 Nov;12(11):2794-809. doi: 10.1007/s12671-021-01743-0.

179. Salzer S, Cropp C, Jaeger U, et al. Psychodynamic therapy for adolescents suffering from co-morbid disorders of conduct and emotions in an in-patient setting: a randomized controlled trial. Psychol Med. 2014 Jul;44(10):2213-22. doi: 10.1017/S003329171300278X. PMID: 24229481.

180. Rohde P, Clarke GN, Mace DE, et al. An efficacy/effectiveness study of cognitive-behavioral treatment for adolescents with comorbid major depression and conduct disorder. J Am Acad Child Adolesc Psychiatry. 2004 Jun;43(6):660-8. doi: 10.1097/01.chi.0000121067.29744.41. PMID: 15167082.

181. Nayeri MF, Soltanifar A, Moharreri F, et al. A randomized controlled trial of group reality therapy in attention deficit hyperactivity disorder and oppositional defiant disorder in adolescents. Iran J Psychiatry Behav Sci. 2021;15(1)doi: 10.5812/IJPBS.68643.

182. Kendall AD, Emerson EM, Hartmann WE, et al. A two-week psychosocial intervention reduces future aggression and incarceration in clinically aggressive juvenile offenders. J Am Acad Child Adolesc Psychiatry. 2017 Dec;56(12):1053-61. doi: 10.1016/j.jaac.2017.09.424. PMID: 29173739.

183. Kumuyi DO, Akinnawo EO, Akpunne BC, et al. Effectiveness of cognitive behavioural therapy and social skills training in management of conduct disorder. S Afr J Psychiatr. 2022;28(0):1737. doi: 10.4102/sajpsychiatry.v28i0.1737. PMID: 35935458.

184. Aman MG, Bukstein OG, Gadow KD, et al. What does risperidone add to parent training and stimulant for severe aggression in child attention-deficit/hyperactivity disorder? J Am Acad Child Adolesc Psychiatry. 2014 Jan;53(1):47-60.e1. doi: 10.1016/j.jaac.2013.09.022. PMID: 24342385.

185. Blader JC, Pliszka SR, Kafantaris V, et al. Stepped treatment for attention-deficit/hyperactivity disorder and aggressive behavior: a randomized, controlled trial of adjunctive risperidone, divalproex sodium, or placebo after stimulant medication optimization. J Am Acad Child Adolesc Psychiatry. 2021 02;60(2):236-51. doi: 10.1016/j.jaac.2019.12.009. PMID: 32007604.

186. Blader JC, Schooler NR, Jensen PS, et al. Adjunctive divalproex versus placebo for children with ADHD and aggression refractory to stimulant monotherapy. Am J Psychiatry. 2009 Dec;166(12):1392-401. doi: 10.1176/appi.ajp.2009.09020233. PMID: 19884222.

187. Connor DF, Findling RL, Kollins SH, et al. Effects of guanfacine extended release on oppositional symptoms in children aged 6-12 years with attention-deficit hyperactivity disorder and oppositional symptoms: a randomized, double-blind, placebo-controlled trial. CNS Drugs. 2010 Sep;24(9):755-68. doi: 10.2165/11537790-000000000-00000. PMID: 20806988.

188. Connor DF, McLaughlin TJ, Jeffers-Terry M. Randomized controlled pilot study of quetiapine in the treatment of adolescent conduct disorder. J Child Adolesc Psychopharmacol. 2008 Apr;18(2):140-56. doi: 10.1089/cap.2006.0007. PMID: 18439112.

189. Connor DF, Spencer TJ. Short-term cardiovascular effects of mixed amphetamine salts extended release in children and adolescents with oppositional defiant disorder. CNS Spectr. 2005;10(S15):31-8. doi: 10.1017/S1092852900014127.

190. Dell'Agnello G, Maschietto D, Bravaccio C, et al. Atomoxetine hydrochloride in the treatment of children and adolescents with attention-deficit/hyperactivity disorder and comorbid oppositional defiant disorder: a placebo-controlled Italian study. European Neuropsychopharmacology. 2009 Nov;19(11):822-34. doi: 10.1016/j.euroneuro.2009.07.008. PMID: 19716683.

191. Dittmann RW, Schacht A, Helsberg K, et al. Atomoxetine versus placebo in children and adolescents with attention-deficit/hyperactivity disorder and comorbid oppositional defiant disorder: a double-blind, randomized, multicenter trial in Germany. J Child Adolesc Psychopharmacol. 2011 Apr;21(2):97-110. doi: 10.1089/cap.2009.0111. PMID: 21488751.

192. Donovan SJ, Stewart JW, Nunes EV, et al. Divalproex treatment for youth with explosive temper and mood lability: a double-blind, placebo-controlled crossover design. Am J Psychiatry. 2000 May;157(5):818-20. doi: 10.1176/appi.ajp.157.5.818. PMID: 10784478.

193. Findling RL, McNamara NK, Branicky LA, et al. A double-blind pilot study of risperidone in the treatment of conduct disorder. J Am Acad Child Adolesc Psychiatry. 2000 Apr;39(4):509-16. doi: 10.1097/00004583-200004000-00021. PMID: 10761354.

194. Gadow KD, Arnold LE, Molina BS, et al. Risperidone added to parent training and stimulant medication: effects on attention-deficit/hyperactivity disorder, oppositional defiant disorder, conduct disorder, and peer aggression. J Am Acad Child Adolesc Psychiatry. 2014 Sep;53(9):948-59.e1. doi: 10.1016/j.jaac.2014.05.008. PMID: 25151418.

195. Garg J, Arun P, Chavan BS. Comparative efficacy of methylphenidate and atomoxetine in oppositional defiant disorder comorbid with attention deficit hyperactivity disorder. Int J Appl Basic Med Res. 2015 May-Aug;5(2):114-8. doi: 10.4103/2229-516X.157162. PMID: 26097819.

196. Jahangard L, Akbarian S, Haghighi M, et al. Children with ADHD and symptoms of oppositional defiant disorder improved in behavior when treated with methylphenidate and adjuvant risperidone, though weight gain was also observed - results from a randomized, double-blind, placebo-controlled clinical trial. Psychiatry Res. 2017 May;251:182-91. doi: 10.1016/j.psychres.2016.12.010. PMID: 28213188.

197. Juarez-Trevino M, Esquivel AC, Isida LML, et al. Clozapine in the treatment of aggression in conduct disorder in children and adolescents: a randomized, double-blind, controlled trial. Clin Psychopharmacol Neurosci. 2019 Feb 28;17(1):43-53. doi: 10.9758/cpn.2019.17.1.43. PMID: 30690939.

198. Klein RG, Abikoff H, Klass E, et al. Clinical efficacy of methylphenidate in conduct disorder with and without attention deficit hyperactivity disorder. Arch Gen Psychiatry. 1997 Dec;54(12):1073-80. doi: 10.1001/archpsyc.1997.01830240023003. PMID: 9400342.

199. Masi G, Milone A, Stawinoga A, et al. Efficacy and safety of risperidone and quetiapine in adolescents with bipolar II disorder comorbid with conduct disorder. J Clin Psychopharmacol. 2015 Oct;35(5):587-90. doi: 10.1097/JCP.0000000000000371. PMID: 26226481.

200. Pandina GJ, Zhu Y, Cornblatt B. Cognitive function with long-term risperidone in children and adolescents with disruptive behavior disorder. J Child Adolesc Psychopharmacol. 2009 Dec;19(6):749-56. doi: 10.1089/cap.2008.0159. PMID: 20035593.

201. Reyes M, Buitelaar J, Toren P, et al. A randomized, double-blind, placebo-controlled study of risperidone maintenance treatment in children and adolescents with disruptive behavior disorders. Am J Psychiatry. 2006 Mar;163(3):402-10. doi: 10.1176/appi.ajp.163.3.402. PMID: 16513860.

202. Rundberg-Rivera EV, Townsend LD, Schneider J, et al. Participant satisfaction in a study of stimulant, parent training, and risperidone in children with severe physical aggression. Journal of Child & Adolescent Psychopharmacology. 2015 Apr;25(3):225-33. doi: 10.1089/cap.2014.0097. PMID: 25885012.

203. Safavi P, Hasanpour-Dehkordi A, AmirAhmadi M. Comparison of risperidone and aripiprazole in the treatment of preschool children with disruptive behavior disorder and attention deficit-hyperactivity disorder: a randomized clinical trial. J Adv Pharm Technol Res. 2016 Apr-Jun;7(2):43-7. doi: 10.4103/2231-4040.177203. PMID: 27144151.

204. Spencer TJ, Abikoff HB, Connor DF, et al. Efficacy and safety of mixed amphetamine salts extended release (adderall XR) in the management of oppositional defiant disorder with or without comorbid attention-deficit/hyperactivity disorder in school-aged children and adolescents: A 4-week, multicenter, randomized, double-blind, parallel-group, placebo-controlled, forced-dose-escalation study. Clin Ther. 2006 Mar;28(3):402-18. doi: 10.1016/j.clinthera.2006.03.006. PMID: 16750455.

205. Steiner H, Petersen ML, Saxena K, et al. Divalproex sodium for the treatment of conduct disorder: a randomized controlled clinical trial. J Clin Psychiatry. 2003 Oct;64(10):1183-91. doi: 10.4088/jcp.v64n1007. PMID: 14658966.

206. Towbin K, Vidal-Ribas P, Brotman MA, et al. A double-blind randomized placebo-controlled trial of citalopram adjunctive to stimulant medication in youth with chronic severe irritability. J Am Acad Child Adolesc Psychiatry. 2020 03;59(3):350-61. doi: 10.1016/j.jaac.2019.05.015. PMID: 31128268.

207. Wehmeier PM, Schacht A, Dittmann RW, et al. Effect of atomoxetine on quality of life and family burden: results from a randomized, placebo-controlled, double-blind study in children and adolescents with ADHD and comorbid oppositional defiant or conduct disorder. Qual Life Res. 2011 Jun;20(5):691-702. doi: 10.1007/s11136-010-9803-5. PMID: 21136299.

208. Shih H-H, Shang C-Y, Gau SS-F. Comparative efficacy of methylphenidate and atomoxetine on emotional and behavioral problems in youths with attention-deficit/hyperactivity disorder. J Child Adolesc Psychopharmacol. 2019;29(1):9-19. doi: 10.1089/cap.2018.0076. PMID: 30457349.

209. van der Veen-Mulders L, van den Hoofdakker BJ, Nauta MH, et al. Methylphenidate has superior efficacy over parent-child interaction therapy for preschool children with disruptive behaviors. Journal of Child & Adolescent Psychopharmacology. 2018 02;28(1):66-73. doi: 10.1089/cap.2017.0123. PMID: 29131677.

210. Masi G, Milone A, Manfredi A, et al. Combined pharmacotherapy-multimodal psychotherapy in children with disruptive behavior disorders. Psychiatry Res. 2016 Apr 30;238:8-13. doi: 10.1016/j.psychres.2016.02.010. PMID: 27086204.

211. Helander M, Asperholm M, Wetterborg D, et al. The Efficacy of Parent Management Training With or Without Involving the Child in the Treatment Among Children with Clinical Levels of Disruptive Behavior: A Meta-analysis. Child Psychiatry Hum Dev. 2022 Jul 05;05:05. doi: 10.1007/s10578-022-01367-y. PMID: 35790649.

212. Selph SS, Skelly AC, Jungbauer RM, et al. AHRQ Comparative Effectiveness Reviews. Cervical Degenerative Disease Treatment: A Systematic Review. Rockville (MD): Agency for Healthcare Research and Quality (US); 2023.

Abbreviations and Acronyms

Abbreviation	Term
ACE	adverse child experience
ADHD	attention-deficit/hyperactivity disorder
AHRQ	Agency for Healthcare Research and Quality
ASD	autism spectrum disorder
BPTG-Home	Behavioral Parent Training Groningen at Home
BSMT	Booster Session of Modular Treatment
CBCL	Child Behavior Checklist
CBT	cognitive behavioral therapy
CD	conduct disorder
CGI-I	Clinical Global Impressions – Improvement
CGI-S	Clinical Global Impressions – Severity
CI	confidence interval
CPT	Combined Parent and Child Training
Ctrl	control
DBD	disruptive behavior disorder
DSM	Diagnostic and Statistical Manual of Mental Disorders
ECBI	Eyberg Child Behavior Inventory
EPC	Evidence-based Practice Center
FDA	U.S. Food and Drug Administration
HNC	Helping the Noncompliant Child
IED	intermittent explosive disorder
Int	intervention
IY	Incredible Years
KQ	Key Question
MD	mean difference
MOAS	Modified Overt Aggression Scale
N	no
NRSI	nonrandomized study of interventions
ODD	oppositional defiant disorder
OR	odds ratio
PCIT	Parent-Child Interaction Therapy
PICOTS	Population, Intervention, Comparator, Outcome, Timing, and Setting
PL	profile likelihood
PLH-YC	Parenting for Lifelong Health for Young Children
PMTO	Parent Management Training-Oregon Model
RCT	randomized controlled trial
R-MOAS	Retrospective Modified Overt Aggression Scale
SD	standard deviation
SDQ	Strength and Difficulties Questionnaire
SE	standard error
SES	socioeconomic status
SMD	standardized mean difference
SNAP-IV	Swanson, Nolan and Pelham Teacher and Parent Rating Scale
SST	Specific Skills Training
TAU	treatment as usual
TEP	Technical Expert Panel
TIK	Tuning in to Kids
TOO	Task Order Officer
Triple P	Positive Parenting Plan
USPSTF	U.S. Preventive Services Task Force

Abbreviation	Term
Y	yes