Comparative Effectiveness Review
Number 154

Effective Health Care Program

Psychosocial and Pharmacologic Interventions for Disruptive Behavior in Children and Adolescents

Executive Summary

Background

Disruptive behavior disorders (DBDs) are a group of related psychiatric disorders of childhood and adolescence marked by temper tantrums, interpersonal aggression, and defiance. These disorders and related symptoms may manifest in young children as significant behavioral problems at home and difficulties at school. Children with disruptive behaviors in early childhood often experience persistent impairment[1] and are at increased risk for negative developmental outcomes, including substance abuse problems; school problems; and delinquent, violent, and antisocial or criminal behaviors in adolescence.[2-14]

DBDs are among the most common child and adolescent psychiatric disorders, with recent estimates indicating that 3.5 percent of children ages 3–17 years had behavioral or conduct problems in the period 2005–11.[15] Examples of DBDs include oppositional defiant disorder (ODD), conduct disorder (CD), attention deficit hyperactivity disorder (ADHD) (as categorized in the fourth edition *Diagnostic and Statistical Manual of Mental Disorders*,[16] reclassified as a neurodevelopmental disorder in the fifth edition[17]), and DBD not otherwise specified.[18-22] Estimates suggest that disruptive behaviors that are problematic but do not meet formal diagnostic criteria may be more common than those meeting formal clinical diagnostic criteria.[2] The etiology of DBDs is unknown, but

Effective Health Care Program

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

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

AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care • www.ahrq.gov
Effective Health Care

temperamental, biological, and environmental factors are associated with increased risk.

Although DBD-specific preventive interventions have been developed, practical considerations, including training requirements and cost, pose challenges to broad implementation.[23,24] General outpatient psychotherapy and psychotropic medication management, either alone or in combination with one another, are the interventions most commonly used in the treatment of DBDs.[18,25-28] Psychosocial interventions, including but not limited to psychotherapy, have been developed for some patient subgroups and for some symptoms/symptom clusters. Examples of these interventions include child-level interventions such as cognitive-behavioral therapy (CBT), parent-level interventions such as the Positive Parenting Program (Triple P), and multicomponent interventions such as multisystemic therapy (MST). A wide range of psychotropic medications, including anticonvulsants, antipsychotics, mood stabilizers, and stimulants, have been used to manage children with disruptive behaviors, and their use has increased substantially in recent years. Increasing use has primarily, but not exclusively, been accounted for by increasing use of atypical antipsychotic medications. However, decisional uncertainty exists around the safety and effectiveness of these medications for these childhood disorders.[29]

Scope and Key Questions

DBD symptoms are often present in the absence of a specific DBD diagnosis. Studies that are intended to assess treatments for conditions such as ADHD, for example, are likely to report changes in disruptive behaviors as outcomes. For this reason, and because a review of ADHD currently exists,[30] we focused the current review on studies in which the aim of treatment is specifically a disruptive behavior, with or without a DBD diagnosis, and assessed psychosocial and pharmacologic treatment approaches. We specifically excluded studies of populations of children with ADHD unless the specific focus of treatment was on the non-ADHD disruptive behavior. We also sought studies of concomitant treatment with psychosocial and/or pharmacologic interventions (i.e., combinations of pharmacologic agents or psychosocial interventions, or medications used in conjunction with psychosocial interventions). We evaluated evidence addressing the following Key Questions (KQs).

Key Questions

KQ1: In children under 18 years of age treated for disruptive behaviors, are any psychosocial interventions more effective for improving short-term and long-term psychosocial outcomes than no treatment or other psychosocial interventions?

KQ2: In children under 18 years of age treated for disruptive behaviors, are alpha-agonists, anticonvulsants, beta-blockers, central nervous system stimulants, first-generation antipsychotics, second-generation (atypical) antipsychotics, and selective serotonin reuptake inhibitors more effective for improving short-term and long-term psychosocial outcomes than placebo or other pharmacologic interventions?

KQ3: In children under 18 years of age treated for disruptive behaviors, what is the relative effectiveness of any psychosocial interventions compared with the pharmacologic interventions listed in KQ2 for improving short-term and long-term psychosocial outcomes?

KQ4: In children under 18 years of age treated for disruptive behaviors, are any combined psychosocial and pharmacologic interventions listed in KQ2 more effective for improving short-term and long-term psychosocial outcomes than individual interventions?

KQ5: What are the harms associated with treating children under 18 years of age for disruptive behaviors with either psychosocial or pharmacologic interventions?

KQ6a: Do interventions intended to address disruptive behaviors and identified in KQs 1–4 vary in effectiveness based on patient characteristics, including sex, age, racial/ethnic minority, family history of disruptive behavior disorders, family history of mental health disorders, history of trauma, and socioeconomic status?

KQ6b: Do interventions intended to address disruptive behaviors and identified in KQs 1–4 vary in effectiveness based on characteristics of the disorder, including specific disruptive behavior or disruptive behavior disorder (e.g., oppositional defiant disorder, conduct disorder, aggression), concomitant psychopathology (e.g., attention deficit hyperactivity disorder or substance abuse), related personality traits and symptom clusters, presence of comorbidities (other than concomitant psychopathology), age of onset, and duration?

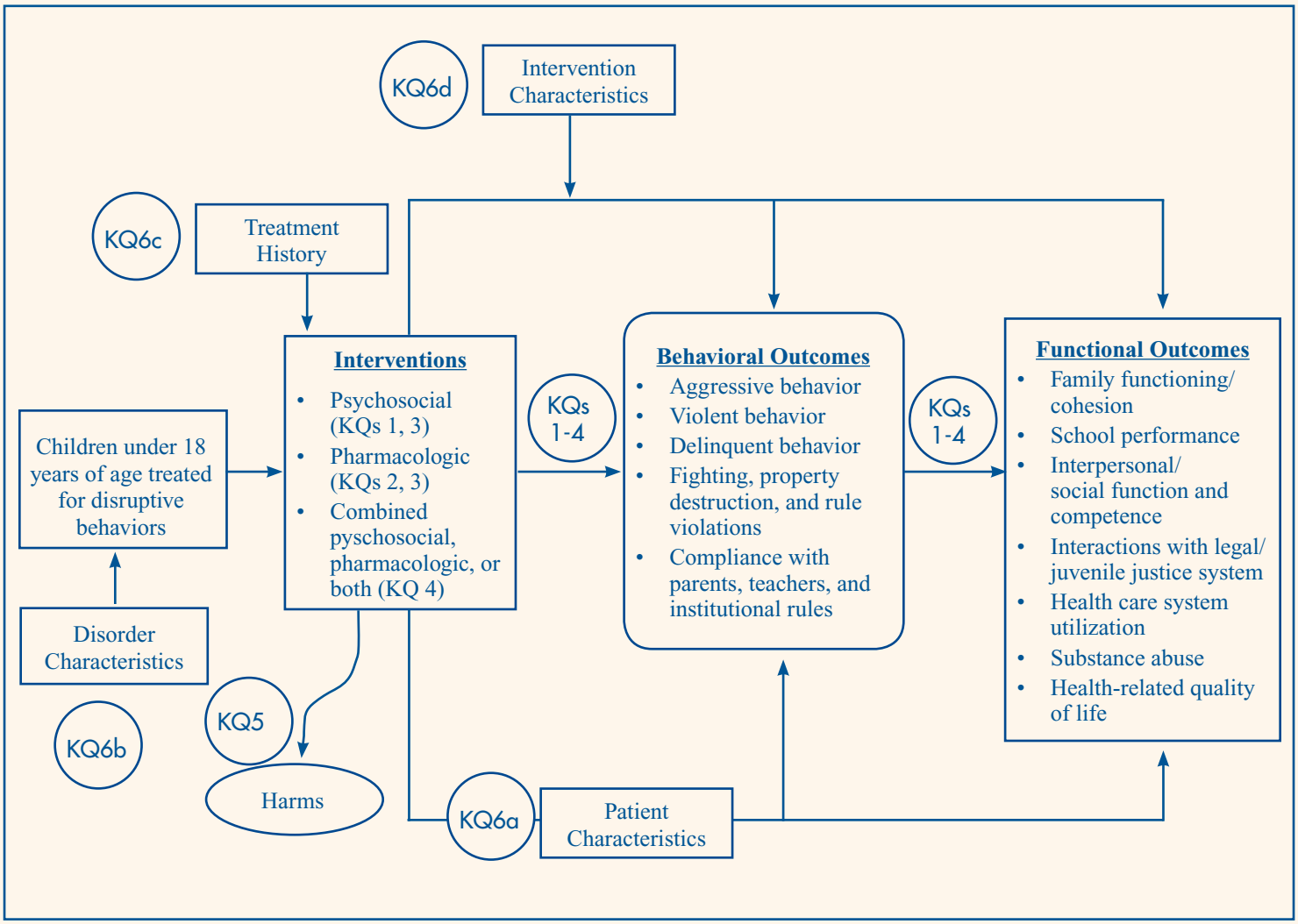
KQ6c: Do interventions intended to address disruptive behaviors and identified in KQs 1–4 vary in effectiveness based on treatment history of the patient?

KQ6d: Do interventions intended to address disruptive behaviors and identified in KQs 1–4 vary in effectiveness based on characteristics of the treatment, including duration, delivery, timing, and dose?

Analytic Framework

The analytic framework (Figure A) illustrates how a psychosocial (KQs 1, 3), pharmacologic (KQs 2, 3), or combined (KQ4) intervention for children under 18 years of age treated for disruptive behaviors may result in changes to one or more behavioral outcomes (KQs 1–4), functional outcomes (KQs 1–4), or harms (KQ5). Behavior outcomes include aggressive behavior; violent behavior; delinquent behavior; fighting, property destruction, and rule violations; and compliance with parents, teachers, and institutional rules. Functional outcomes include family functioning/cohesion; school performance; interpersonal/social function and competence; interactions with legal/juvenile justice system; health care system utilization; substance abuse; and health-related quality of life. Patient characteristics (KQ6a), disorder characteristics (KQ6b), treatment history (KQ6c), and treatment characteristics (KQ6d) may change intervention treatment effects.

Figure A. Analytic framework



Methods

Literature Search Strategy

To ensure comprehensive retrieval of relevant studies, we used the following key databases: the MEDLINE® medical literature database (via the PubMed® interface), EMBASE, the Cochrane Central Register of Controlled Trials, and PsycInfo®. We used the Comparative Effectiveness Plus interface for the Iowa Drug Information Service (IDIS) database to identify regulatory information from the following sources: Food and Drug Administration (FDA) approval packages, FDA Advisory Committee Reports, boxed warnings, clinical practice guidelines, Agency for Healthcare Research and Quality (AHRQ) Evidence Reports and Comparative Effectiveness Reviews, and National Institute for Health and Clinical Excellence (NICE) Clinical Guidelines or Technology

Appraisal Guidance. We also searched other sources (e.g., Clinicaltrials.gov, meeting abstracts, FDA) for context and relevant data, as well as ongoing trials.

Search strategies (presented in Appendix A of the full report) included broad terms for psychosocial interventions and pharmacologic agents, as well as including interventions by name (e.g., "Parent-Child Interaction Therapy," "Incredible Years®," and "Triple P - Positive Parenting Program®" [Triple P]). We used hand searching of recent systematic reviews and other relevant publications to identify additional studies not captured by the database searches. The randomized controlled trials (RCTs) included to assess efficacy were used to assess harms. AHRQ contracts with the Scientific Resource Center (SRC) to obtain information from drug manufacturers. We requested scientific information packets and regulatory information from SRC for individual pharmacologic agents. We received responses from 3 of the 20 requests and confirmed that the studies referenced in the information packets were included in our literature searches.

Inclusion and Exclusion Criteria

Eligible studies had to be published in English in or after 1994, focus on the treatment of disruptive behavior, and include children exhibiting disruptive behaviors as a primary problem (e.g., CD, ODD, and intermittent explosive disorder). We excluded studies published before 1994 because our preliminary search found that in articles published 20 or more years ago, the study populations were inadequately described, rendering a large number of the older studies unusable for this review. We excluded studies of preventive interventions for an at-risk population because our review was focused on studies of individuals who met a clinical threshold for a DBD. We required that eligible studies include a comparison group (i.e., controlled trials, cohort studies). We excluded studies of disruptive behavior secondary to other conditions (e.g., treatment of substance abuse, developmental delay, intellectual disability, and pediatric bipolar disorder). In the case of ADHD, we excluded studies of ADHD-related disruptive behaviors but included studies of non–ADHD-related disruptive behaviors in populations of children with ADHD if the children were identified as also having another DBD. Our quantitative analysis further excluded studies that did not report baseline and end-of-treatment means and standard deviations using one of the three most commonly used outcome measures. Explicit inclusion and exclusion criteria are documented in the abstract screening form and full-text screening form (Appendix B of the full report) and described in more detail in the full report.

Study Selection

Two reviewers independently assessed each abstract. If one reviewer concluded that the article could be eligible based on the abstract, we retained it for review of the full text. Two reviewers independently assessed the full text of each included study, with any disagreements adjudicated by a senior reviewer.

Data Extraction and Synthesis

We extracted data from included studies into evidence tables that report study design, descriptions of the study populations (for applicability), description of the interventions, and baseline and outcome data on constructs of interest. Data were initially extracted by one team member and reviewed for accuracy by a second.

Data are presented in summary tables and analyzed qualitatively in the text. We also employed Bayesian multivariate mixed-treatment (network) meta-analytic methods using data on a subset of included studies (n = 28) that met additional criteria for inclusion in the meta-analysis. These additional criteria were that a study was an RCT that employed one or more of the three most prevalent measures of child disruptive behavior in this literature, and reported means and standard deviations at baseline and end of treatment on these measures. To account for the large number of specific interventions employed by the constituent studies, we classified each arm of each included study as an intervention with only a child component, an intervention with only a parent component, or a multicomponent intervention. Multicomponent interventions were defined as those that included two or more of a child component, parent component, or other component (e.g., teacher component, family together component). We considered study treatment arms not identified as one of these three classes as wait-list control or treatment as usual.

Recognizing that these treatment categories are broad and encompass a range of specific interventions, each specific intervention was modeled as a random effect, allowing for variation in treatment effect within each class because of factors not explicitly modeled.

Our primary outcomes for analysis and strength of evidence were parent reports of child disruptive behaviors as assessed using the most common validated measures, such as subscales of the Eyberg Child Behavior Inventory (ECBI) and the Child Behavior Checklist (CBCL).

Risk-of-Bias Assessment of Individual Studies

We used the Cochrane Risk of Bias Tool[31] to assess risk of bias for RCTs of effectiveness. Reviewers rated six items from five domains of potential sources of bias (i.e., selection, reporting, performance, detection, and attrition) and one item for other sources of bias. To assess risk of bias for study designs other than RCTs, we used the RTI Item Bank[32] for nonrandomized controlled studies, and the AMSTAR (A Measurement Tool to Assess Systematic Reviews) tool[33] for systematic reviews and meta-analyses. To assess the risk of bias associated with the reporting of harms, we used an adapted version of the McMaster Assessment of Harms Tool.[34] Appendix C of the full report includes questions used in each tool. Two team members independently assessed each included study, with discrepancies resolved through discussion to reach consensus and/or adjudication by a senior reviewer. The results of these assessments were then translated to low, moderate, or high risk-of-bias designations, as described in the full report. Risk-of-bias ratings are in Appendix C of the full report.

Strength of the Body of Evidence

Two senior investigators graded the body of evidence for key intervention/outcome pairs using methods based on the "Methods Guide for Effectiveness and Comparative Effectiveness Reviews."[35] The team reviewed the final strength-of-evidence (SOE) designation. The possible grades were:

- High: High confidence that the evidence reflects the true effect. Further research is unlikely to change estimates.
- Moderate: Moderate confidence that the evidence reflects the true effect. Further research may change confidence in the estimate of effect and may change the estimate.
- Low: Low confidence that the evidence reflects the true effect. Further research is likely to change confidence in the estimate of effect and is likely to change the estimate.
- Insufficient: Evidence is either unavailable or does not permit a conclusion.

Applicability

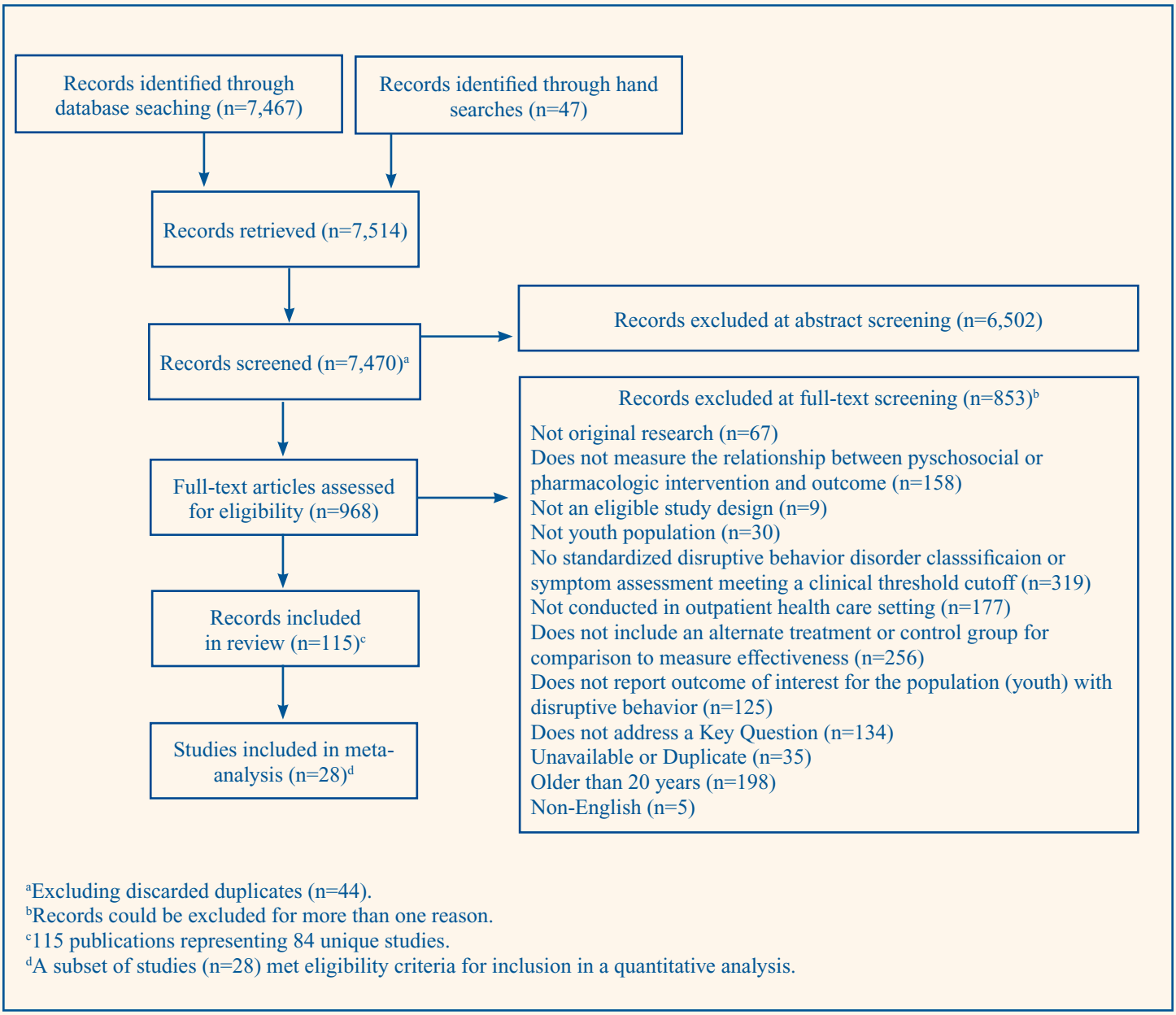
We assessed applicability by identifying potential population, intervention, comparator, outcome, timing, and setting (PICOTS) factors likely to affect the generalizability of results (i.e., applicability to the general population of children and adolescents being treated for disruptive behaviors). We considered factors related to difficulties identifying the target population, the availability of interventions, characteristics of the population such as socioeconomic status and family environment that may be associated with disruptive behaviors, and setting of the intervention as particularly likely to affect applicability.

Results

Article Selection

We identified 7,470 nonduplicative titles or abstracts with potential relevance, with 968 proceeding to full-text review. We excluded 853 studies at full-text review and included 84 unique studies (115 publications) in the review (Figure B). We present findings by intervention and outcome area where possible under each KQ. Sixty-six studies addressed psychosocial interventions (KQ1); 13 addressed pharmacologic interventions (KQ2). In addition to studies of effectiveness, we identified five additional studies that exclusively addressed KQ5 (n = 4) and KQ6 (n = 1). Studies of psychosocial interventions were heterogeneous. We categorized interventions as child focused, parent focused, or multicomponent (i.e., 2 or more of a child, parent, or other type of intervention component). Pharmacologic interventions were antipsychotics, antiepileptics, and two groups of drugs typically used to treat ADHD (stimulants and nonstimulants).

Figure B. Literature flow diagram



[a]Excluding discarded duplicates (n=44).
[b]Records could be excluded for more than one reason.
[c]115 publications representing 84 unique studies.
[d]A subset of studies (n=28) met eligibility criteria for inclusion in a quantitative analysis.

KQ1. Effectiveness of Psychosocial Interventions Compared With Other Psychosocial Interventions or No Treatment

Sixty-six studies (59 RCTs and 7 non-RCTs) addressed the effectiveness of psychosocial interventions.

Preschool Children

Twenty-three studies (10 high, 11 moderate, and 2 low risk of bias) evaluated psychosocial interventions for preschool children (under age 5). The active treatment arm in 14 studies consisted of interventions that included only a parent component, and 9 studies were multicomponent. No studies in this age group were of interventions that included only a child component. Most (17 of 23) studies assessed one of three interventions: Incredible Years® (IY) (n = 5), Parent-Child Interaction Therapy (PCIT) (n = 7), or Triple P (n = 5). The six other studies each evaluated a distinct intervention.

Three of the five IY studies evaluated only the parent-training component and reported significant improvements on multiple validated measures in the active treatment versus control arms. Among studies reporting outcomes using the ECBI Intensity scale, effect sizes ranged from 0.70 to 0.89. Outcomes did not differ between groups in the other two studies.

All studies assessing Triple P (n = 5) and PCIT (n = 7) reported significantly improved disruptive behaviors as measured by the ECBI Intensity and/or Problem scales in the active treatment versus control arms. Individual Triple P studies reported different measures of clinical significance, with estimates including 23 to 70 percent of children in the treatment arms experiencing clinically significant reliable change on parent reports of child disruptive behavior, 33 to 40 percent of children in the treatment arms remaining above the clinical cutoff on the ECBI Intensity scale, or 25 to 30 percent still meeting diagnostic criteria for DBD.

Individual PCIT studies also reported different measures of clinical significance, with PCIT effects reported as 67 to 100 percent of children in treatment arms experiencing clinically significant change, 56 to 68 percent still meeting ODD diagnostic criteria, or effect sizes for PCIT ranging from 0.83 to more than 3.0.

School-Age Children

Twenty-nine studies (9 high, 19 moderate, and 2 low risk of bias) evaluated psychosocial interventions for school-age children (ages 5–12 years) with disruptive behaviors. The active treatment arm of 1 study was an intervention with only a child component, 11 studies were of interventions with only a parent component, and 18 were studies of multicomponent interventions. Approximately half of the studies (15/29) assessed one of five programs: IY (n = 7), the Parent Management Training Oregon (PMTO™) model (n = 2), Coping Power Program (n = 2), Stop Now and Plan™ Under 12 (SNAP Under 12) Outreach Project (n = 2), and a modular intervention (n = 2). The other studies each assessed a different intervention.

Three of the studies examining the IY intervention examined only the parent-training component in comparison with control. Two of these reported that the treatment arm experienced significantly reduced ECBI Intensity and Problem scales versus control arms (range of reduction on ECBI Intensity scale, 14% to 20% for treatment vs. 4% to 5% for control; range of reduction on ECBI Problem scale, 40% to 47% for treatment vs. 14% to 20% for control). One study reported no difference between groups on the CBCL Externalizing subscale.

The other four IY program studies examined multiple combinations of the child, parent, and teacher training programs with one another and with control arms. Given multiple group comparisons and multiple outcome measures, results are inconsistent and difficult to summarize succinctly. Two studies reported that the arm with only parent training resulted in greater improvement in child disruptive behavior than control: one study used the ECBI Intensity scale and CBCL Aggression subscale; the other study used the ECBI Intensity scale and CBCL Total Problems scale. Two studies reported that combined parent and child training resulted in significantly reduced disruptive behaviors compared with control, but results were inconsistent across measures, with one study showing significant reductions on the CBCL Aggression subscale but not on the ECBI Intensity scale, and the other study showing significant reductions on both the CBCL Total Problems scale and the ECBI Intensity scale. Finally, one study using teacher-reported aggression as the outcome reported that the combined parent and child training resulted in greater improvement than either the parent training only or control, but that there was no difference between the parent training only and control arms.

The two studies comparing PMTO with treatment as usual both reported significant reductions from baseline to end of treatment, one study reporting 10 percent versus 7 percent change in mean CBCL Externalizing subscale scores and the other reporting 15 percent versus 8 percent mean change in ECBI Intensity scale scores for treatment and control arms, respectively. One of the two studies examining the Coping Power Program reported a 35-percent reduction in Parent Daily Report (PDR) scores at end of treatment over baseline, relative to 17-percent reduction in the comparison arm, but did not report significant differences between groups on other measures of child disruptive behavior; the other study of this intervention did not report significant between-group differences. The two studies evaluating the SNAP ORP both reported significant differences between treatment and control arms on the CBCL Aggression subscale, with percent change from baseline to end of treatment ranging from 10 to 16 percent in the treatment arms relative to 2 to 6 percent in the control arms. Significant changes were also seen on other CBCL subscales. The two studies examining the modular intervention essentially tested its portability and did not include a control arm.

Teenage Children

Fourteen studies (5 high, 5 moderate, and 4 low risk of bias) assessed psychosocial interventions for adolescents (ages 13–17 years) with disruptive behaviors. The active treatment arm of 1 study included only a child component, and 13 studies were of multicomponent interventions. The 13 multicomponent intervention studies included 5 studies of Multisystemic Therapy (MST), 3 studies of Brief Strategic Family Therapy® (BSFT), and 1 study of each of 6 different multicomponent interventions.

Four of the five MST studies reported that MST was associated with greater reductions in disruptive behaviors in comparison with control arms, but studies used different outcome measures, making it difficult to report summary effects succinctly. One study defined criminal offenses as its primary outcome measure and reported that the proportion with offenses decreased more significantly over time for teenagers in the MST versus control arm ($p < 0.001$) but did not report significant between-group differences over time on the CBCL Externalizing subscale. One study reported small effect-size differences between MST and treatment as usual on a number of measures, with a 0.12 difference favoring MST in effect sizes for CBCL Externalizing subscale scores (MST effect size, 0.56; tau effect size, 0.44). One study reported significant improvements in MST completers versus individual therapy completers on multiple outcome measures, including child disruptive behaviors as assessed with the Symptom Checklist-90-Revised (SCL-90-R) ($p < 0.05$), family relations as assessed with the 30-item Family Adaptability and Cohesion Evaluation Scale (FACES-II) ($p < 0.05$), and observational measures of parent-child relations ($p < 0.001$). Finally, one study examined differences between MST and treatment as usual on a number of measures, with effect sizes for parent-reported child disruptive behaviors on the CBCL Externalizing subscale of $d = 0.47$ and $d = 0.28$, respectively ($p < 0.05$).

The three studies of BSFT each reported significant improvements in disruptive behaviors. One study reported reliable improvement of 43 percent in BSFT versus 11 percent in control groups on a CD symptom measure and improvement of 36 percent in BSFT versus 11 percent in control arms on a measure of social aggression. The other two BSFT studies, one examining girls referred for bullying behavior and the other examining boys referred for bullying behavior, both reported significant mean differences in an index score of adolescent risk-taking behavior of −9.3 for BSFT relative to controls ($p < 0.001$) for girls and −6.3 for BSFT relative to controls ($p < 0.001$) for boys.

Meta-Analysis

Results from our Bayesian multivariate mixed treatment (network) meta-analysis on the subset of studies from the qualitative review that met the additional criteria (described previously) for being included in our meta-analysis ($n = 28$) were generally consistent with results from our qualitative synthesis. We defined intervention categories that classified each study arm of each included study as including only a child component, including only a parent component, a multicomponent intervention, or control. Multicomponent interventions were defined as those that included two or more of a child component, parent component, or other component (e.g., teacher component, family together component). All interventions categorized as multicomponent interventions included a parent component. Control arms were defined to include treatment as usual or wait-list control arms. Recognizing that these treatment categories are broad and encompass a range of more specific interventions, we modeled each specific intervention as a random effect. Results from our quantitative analysis indicated that the probability of being best was 43 percent for both multicomponent interventions and for interventions with only a parent component. The probability of being best was 14 percent for interventions with only a child component. The marginal posterior probabilities of remaining above the clinical cutpoint (i.e., exhibiting significant disruptive behavior) at end of treatment on the specific measures included in our meta-analysis (ECBI, CBCL) were nominally higher for the comparison group relative to each intervention group, with multicomponent interventions showing the lowest proportion of children still above the clinical cutpoint post-treatment. Although we considered age-by-treatment interactions, there was not enough balance among the age and treatment combinations to include them in the final model.

KQ2. Effectiveness of Pharmacologic Agents Compared With Other Agents or Placebo

Thirteen studies (12 RCTs and 1 non-RCT) of pharmacologic interventions met criteria for inclusion. No studies were of drugs with an FDA indication for DBD. We considered one RCT to have low risk of bias, seven RCTs to have moderate risk of bias, and four RCTs to have high risk of bias. We considered one nonrandomized study to have high risk of bias. These studies fall into four major categories: antipsychotic or antiepileptic drugs (typically targeted to aggression), and a group of drugs comprising both stimulants and nonstimulants (typically used in children with comorbid ADHD). Only one study was federally funded; the rest were industry sponsored or partially funded by a pharmaceutical company.

Studies of antipsychotics had mixed results over the short term. Three RCTs (all high risk of bias) addressed risperidone (as initial treatment, to augment stimulants, or as maintenance treatment) compared with placebo. Two studies were small, with 20 and 25 participants, and one was large ($n = 355$). All were short term (1 to 6 months). In one study, aggression scores and Clinical

Global Impressions-severity (CGI-S) ratings decreased significantly in the risperidone arm compared with placebo (mean aggression change of −1.9 vs. −0.7; p = 0.0007 and mean CGI-S change of −2.46 vs. −1.06; p = 0.01). Another RCT of risperidone as a stimulant adjunct also assessed aggression and reported no significant group differences at followup, and the third RCT, of maintenance with risperidone, reported increases in conduct problems and severity in both groups (increases in Nisonger conduct problem ratings of 5.0 [9.5] in the treatment group and 8.8 [11.2] in placebo), with no significant group differences.

One RCT with high risk of bias (n = 46) assessed aripiprazole compared with ziprasidone and reported no significant group differences in aggression, and another RCT comparing quetiapine and placebo (n = 19) reported no significant parent-rated changes in aggression but clinician-rated changes on the CGI-S (mean followup score of 3.4 for the treatment group vs. 5.0 for placebo; effect size, 1.6; 95% confidence interval, 0.9 to 3.0; p = 0.007).

Results were also mixed in three small RCTs (n = 121) of valproic acid, an antiepileptic, with two placebo-controlled studies favoring the intervention (53% to 86% in the treatment arms vs. 8% to 25% in placebo arms considered much improved on the Clinical Global Impressions-improvement (CGI-I) scale or Overt Aggression Scale; p <0.01) and another with no significant difference demonstrated.

Two RCTs (1 moderate and 1 high risk of bias) examined the nonstimulant ADHD medication atomoxetine. Both studies reported that atomoxetine was more effective than placebo in reducing ODD symptoms in children with comorbid ADHD and ODD (oppositional behavior score mean change, −2.7 vs. −0.3 in 1 study; in a second study, 48.3% to 55.7% of atomoxetine participants improved by at least 30% compared with 35.6% of the placebo group). Parent-rated quality of life improved significantly in the atomoxetine group (mean change, 2.6 points) compared with placebo (mean change, −1.6 points) in one RCT.

One RCT of guanfacine extended release with moderate risk of bias reported significant reductions in ODD symptoms compared with placebo (least-square mean change from baseline, −10.9 for guanfacine extended release vs. −6.8 for placebo; p <0.001; effect size, 0.59), again among children with comorbid ADHD and ODD. One RCT with high risk of bias reported that treatment with an extended-release formulation of mixed amphetamine salts significantly improved ODD symptoms compared with placebo (mean change of −0.23 to −0.43 among amphetamine dosage groups vs. −0.30 in placebo group; p = 0.024). Another RCT reported that methylphenidate treatment reduced CD symptoms compared with placebo as rated by parents and teachers. Duration of all studies was short, with a range of 4 to 9 weeks, and no studies reported functional outcomes beyond statistically significant shifts on scales, commonly the Overt Aggression Scale and CGI.

KQ3. Effectiveness of Psychosocial Interventions Compared With Pharmacologic Interventions

No head-to-head studies were identified that directly compared psychosocial with pharmacologic interventions for DBD.

KQ4. Effectiveness of Combined Psychosocial and Pharmacologic Interventions Compared With Individual Interventions

No head-to-head studies were identified that assessed the comparative effectiveness of combination interventions.

KQ5. Harms of Psychosocial or Pharmacologic Interventions

Harms of psychosocial interventions are not reported in the literature. The pharmacologic treatment studies in this report were generally small and short term, with typically no followup post-treatment. Studies were powered for effectiveness and not for detection of harms, so harms may be underrepresented in the published literature. Generally, harms reported in included studies were mild or moderate and immediate in nature. Nonetheless, there was significant loss to followup in several pharmacologic studies, some of which was likely due to adverse events. We therefore sought harms data from other sources that might include more extensive and longer term data, including other systematic reviews and FDA package labeling. It is important to note that harms of atypical antipsychotics have been studied extensively, including in recent AHRQ reviews, and the high relative risk of metabolic outcomes is a known adverse effect, particularly for atypical antipsychotics.

In effectiveness studies included in this report, frequently occurring adverse events associated with risperidone included weight gain, sedation, and somnolence. In the largest risperidone study (n = 527), the percent of participants experiencing weight gain ranged from 1.2 to 6.5 across risperidone phases and was 0.6 percent in the placebo arm. Somnolence occurred in 1.7 to 11.6 percent

of children receiving risperidone and in 1.2 percent of children receiving placebo. At least 35 percent of children in the acute, continuation, and maintenance risperidone dosing phases and those receiving placebo experienced an adverse event, and extrapyramidal symptoms occurred in less than 2 percent of participants in each phase. Sedation was the most frequently reported harm in a study comparing aripiprazole (sedation occurring in 50% of children) and ziprasidone (sedation occurring in 57% of children), while harms were generally reported more often in the placebo group in an RCT comparing quetiapine and placebo. Decreased mental alertness, diminished emotional expression, and diminished facial expression occurred significantly more frequently in the placebo group than with quetiapine (p values ≤0.03).

Adverse events associated with mixed amphetamine salts included sleep delay, insomnia, and anorexia, with mean weight loss ranging from 1.1 to 3.3 pounds across dosage groups. One study of methylphenidate also reported delayed sleep but did not present harms data. Atomoxetine was most frequently associated with fatigue (21.3% to 35% of children in slow- and fast-titration groups and 10.2% of placebo group), nausea (19.7% to 21.7% of treatment groups and 5.1% of placebo), and headache (14.8% to 25% of treatment groups and 15.3% of placebo) in one RCT and with anorexia (33.6% of treatment group) and somnolence (29.9% of treatment group) in another. Guanfacine was associated with somnolence (50.7% of treatment group and 5.1% of placebo) and headache (22.1% of treatment group and 17.9% of placebo).

Also provided in the main report is a summary of FDA labeling data, as well as prior reviews of harms associated with the included drugs. Rates of harms from those sources were typically higher than rates of harms reported in the short-term effectiveness studies and may provide a more complete picture of potential harms. They do not, however, place the harms data in the context of tradeoffs with effectiveness.

KQ6. Factors That Modify Effectiveness of Interventions

We identified 24 studies (37 publications) that addressed KQ6. This question was divided into subquestions about variations in intervention effectiveness due to (a) patient characteristics, (b) characteristics of the disorder, (c) patient treatment history, and (d) treatment characteristics. It is unclear if studies identified as examining these questions were adequately powered to answer them.

We identified 12 studies examining variations in psychosocial intervention effectiveness due to patient characteristics. In general, results were inconsistent, although some evidence exists that the child's sex, maternal characteristics such as depression and anger, and other family functioning variables are associated with the effectiveness of some psychosocial interventions.

Results were inconsistent regarding the effects of baseline severity. One study of preschool children reported that greater severity of behavior problems was associated with greater improvements, but no effect of baseline severity was reported in another study. In a study of school-age children, concomitant developmental delay was associated with less effectiveness of the intervention. In two studies including adolescents, lower levels of psychopathology were associated with better disruptive behavior outcomes. No studies examined whether the effectiveness of psychosocial interventions varied by patient treatment history. Dose of intervention was examined as a treatment characteristic that might mediate intervention effectiveness, but results appear to be inconsistent, with two studies reporting more improvements when parents attended a higher number of training sessions or completed more homework than when they did not and one study reporting no differences in outcomes among children who attended more CBT sessions than those who attended fewer sessions. For psychosocial interventions that include a parent component, either alone or in combination with other components, there is some evidence suggesting that improved parenting practices partially mediate effectiveness. Improvements in child outcomes were associated with positive parenting changes in three studies of preschool children and in three of four studies of school-aged children.

Few studies of pharmacologic interventions reported moderator or mediator analyses. One RCT assessing mixed amphetamine salts reported that changes in aggression ratings were higher for those children with greater baseline ODD severity. One study indicated that atomoxetine was more effective in patients who had previously been treated with a stimulant than in patients who had not.

Discussion

Key Findings

Sixty-six studies examined the effectiveness of psychosocial interventions for children with disruptive behaviors. About half of the studies (n = 25) were conducted in the United States; the remaining studies were

conducted in Australia (n = 11), Canada (n = 4), Germany (n = 3), Ireland (n = 2), Israel (n = 2), Italy (n = 1), Netherlands (n = 5), Norway (n = 4), Puerto Rico (n = 1), Sweden (n = 3), and the United Kingdom (n = 5). Twenty-three studies examined psychosocial interventions with preschool-age children, 29 studies examined psychosocial interventions with school-age children, and 14 studies examined psychosocial interventions with adolescents. Interventions in each study's active treatment arm were categorized as including only a child component (n = 2), only a parent component (n = 25), or multiple components (n = 39). Multicomponent interventions were defined as those that included two or more of a child component, parent component, or other component (e.g., teacher component, family together component). All interventions categorized as multicomponent included a parent component. Most of the studies examining psychosocial interventions that met criteria for this review used parent reports of child disruptive behaviors as the primary outcome, most commonly the ECBI or CBCL. Seventeen of the 23 studies examining psychosocial interventions for preschool-age children assessed one of three programs (IY, PCIT, and Triple P). In general, studies provided consistent evidence that each of these interventions resulted in significantly greater improvement on parent reports of child disruptive behavior than controls. Most of the studies examining psychosocial interventions for school-age children examined one of the following programs: IY, PMTO, Coping Power Program, SNAP Under 12, or a modular intervention. In general, included studies provided consistent evidence that IY, PMTO, and SNAP Under 12 resulted in significantly greater improvement on parent reports of child disruptive behaviors than controls. Eight of the 14 studies examining psychosocial interventions for adolescents assessed either MST or BSFT. In general, these studies provided consistent evidence that each of these interventions resulted in significantly greater improvement on parent reports of child disruptive behavior than controls.

Results from our Bayesian multivariate mixed-treatment (network) meta-analysis were generally consistent with our qualitative synthesis. Results indicated that the probability of having the largest effect was the same for multicomponent interventions (43%) and interventions with only a parent component (43%). The probability of having the largest effect was 14 percent for interventions with only a child component. The marginal posterior probabilities of remaining above the clinical cutpoint (i.e., exhibiting significant disruptive behavior) at end of treatment on the specific measures included in our meta-analysis (ECBI, CBCL) were nominally higher for the comparison group relative to each intervention group, with multicomponent interventions showing the lowest proportion of children still above the clinical cutpoint post-treatment. Although we considered age-by-treatment interactions, there was not enough balance among the age and treatment combinations to include them in the final model.

Despite a fairly robust literature on psychopharmacologic drugs as a whole, we identified only 13 studies evaluating short-term outcomes of pharmacologic interventions for inclusion in our review. Medical studies fall into four major categories; antipsychotic or antiepileptic drugs (typically targeted to aggression in children)[36] and a group of drugs comprising both stimulants and nonstimulants typically used in children with comorbid ADHD. Of the 12 RCTs, one was assessed as low risk of bias and only one was federally funded. The duration of studies was short, with a range of 4 to 9 weeks. Studies of antipsychotic medications and valproic acid, an antiepileptic medication, had mixed results over the short term. Two RCTs of atomoxetine suggested that it was more effective at reducing ODD symptoms than placebo. One RCT of guanfacine extended release also reported significant reductions over placebo in ODD symptoms. Two RCTs reported that stimulants were more effective than placebo at reducing ODD and CD symptoms.

No head-to-head studies were identified that compared the effectiveness of combined psychosocial and medical interventions or that compared the effectiveness of psychosocial interventions with medical interventions.

No harms of psychosocial interventions were sought or reported. The pharmacologic treatment studies in this report were generally small and short term, with typically no followup post-treatment. Thus, harms reported in those studies were generally mild or moderate and fairly immediate in nature. Nonetheless, there was significant loss to followup in several studies, some of which was likely due to experiencing adverse events, and we therefore sought harms data from other sources that might include more extensive and longer term data, including other systematic reviews. It is important to note that harms of atypical antipsychotics have been studied extensively, including in recent AHRQ reviews. Adverse events associated with risperidone were generally mild across studies, with weight gain, sedation, and somnolence frequently reported. Sedation was frequently reported with aripiprazole and ziprasidone. Adverse events associated with mixed amphetamine salts included sleep delay,

insomnia, and anorexia. Atomoxetine was associated with anorexia and headache. Guanfacine was associated with somnolence and headache.

Although we identified studies that examined whether variations in intervention effectiveness due to (a) patient characteristics, (b) characteristics of the disorder, (c) patient treatment history, and (d) treatment characteristics could be found, it is not clear that the studies were adequately powered to answer these questions. Studies are relatively homogeneous with respect to child age, perhaps implicitly recognizing the potential for child age to modify the effectiveness of both psychosocial and pharmacologic interventions. Twelve studies were identified that examined variations in psychosocial intervention effectiveness due to patient characteristics. In general, results were inconsistent, although some evidence exists that the sex of the child, maternal characteristics such as depression and anger, and other family functioning variables are associated with the effectiveness of some psychosocial interventions.

The most commonly examined characteristic of DBD that might affect intervention effectiveness is baseline severity of child disruptive behaviors and/or the presence of comorbid psychiatric conditions. Results were inconsistent. Some studies suggested that difficult temperament in preschool children and psychopathy in teenagers modified the effectiveness of psychosocial interventions.

No studies examined whether the effectiveness of psychosocial interventions varied by patient treatment history, and one study reported that atomoxetine was more effective in patients who had previously been treated with a stimulant than it was in patients who had not.

Potential mediators of treatment effect were most thoroughly examined in the literature on psychosocial interventions. The variables most commonly examined include baseline severity of symptoms, intervention dose, and positive parenting. In general, there is some support that each of these variables may mediate intervention effectiveness, but results were inconsistent.

Existing Systematic Reviews

We located reviews published from 2005 to 2014 and evaluated each for relevance to our KQs using the review PICOTS (Appendix B of the full report). We identified 22 reviews assessing the effectiveness of psychosocial interventions and 2 reviews assessing the effectiveness of pharmacologic interventions. These reviews are described in the Discussion chapter of the full report.

Strength of Evidence

The evidence to answer KQs about interventions for children with disruptive behavior disorders was insufficient to moderate. Tables A and B (and Tables 49-51 in the full report) summarize the strength of the evidence and provide the assessment of the risk of bias, consistency of findings across trials, directness of the evidence, and precision of the estimate provided by the literature. To assess publication bias in the pharmacologic literature, we sought study protocols and data from regulatory sources and compared this information with the results in the published literature. We assessed strength of evidence for the effectiveness of interventions using the qualitative and quantitative approaches described in the Methods section.

Table A. Summary of evidence in studies addressing the effectiveness of psychosocial interventions targeting parenting practices on parent-reported changes in disruptive behaviors (KQ1)

Age Category	Intervention Category	Key Outcome(s)	SOE Grade	Findings
Preschool	Child-only	NA	Insufficient	No studies were identified.
(n = 23)	interventions (n = 0)			
	Parent-only interventions (n = 14)	Parent-rated disruptive behaviors	Moderate SOE for positive effects of intervention on child behavior	13 RCTs (5 high, 7 moderate, 1 low risk of bias) and 1 non-RCT with moderate risk of bias were identified. Parent reports of child disruptive behavior outcomes were consistently improved in parenting intervention arms compared with wait-list or treatment-as-usual controls. Differences between modified versions of the same intervention were typically not significant.
	Multicomponent interventions (n = 9)	Parent-rated disruptive behaviors	Moderate SOE for positive effects of intervention on child behavior	9 RCTs (5 high, 3 moderate, 1 low risk of bias) were identified. Parent reports of child disruptive behavior outcomes consistently improved in multicomponent intervention arms compared with wait-list or treatment-as-usual controls. Differences between modified versions of the same intervention were typically not significant.
School age (n = 29)	Child-only interventions (n = 1)	Parent-rated disruptive behaviors	Insufficient	1 RCT with moderate risk of bias reported improvement on parent reports of child disruptive behavior from baseline in both intervention and control groups but no between-group differences.
	Parent-only interventions (n = 11)	Parent-rated disruptive behaviors	Moderate SOE for positive effects of intervention on child behavior change	8 RCTs (2 high, 5 moderate, and 1 low risk of bias) and 3 non-RCTs with high risk of bias were identified. Parent reports of child disruptive behavior consistently improved in intervention groups vs. control, but differences between modified versions of the same intervention were not significant.
	Multicomponent interventions (n = 17)	Parent-rated disruptive behaviors	Low SOE for positive effects of intervention on child behavior change	15 RCTs (3 high, 11 moderate, 1 low risk of bias) and 2 non-RCTs (1 high, 1 moderate risk of bias) were identified. Parent reports of child disruptive behaviors improved from baseline in most active treatment arms but between-group changes were not consistently significantly different. The same effects as measured by multiple scales within an individual study were not always consistent.
Teenage (n = 14)	Child-only interventions (n = 1)	Parent-rated disruptive behaviors	Insufficient	1 study with high study limitations was identified.
	Parent-only interventions (n = 0)	NA	Insufficient	No studies were identified.
	Multicomponent interventions (n = 13)	Parent-rated disruptive behaviors	Moderate SOE for positive effects of intervention on child behavior change	12 RCTs (3 high, 5 moderate, 4 low risk of bias) and 1 RCT with high risk of bias were identified. Parent reports of child disruptive behaviors indicated improved outcomes in treatment arms vs. control arms in most studies. Differences between modified versions of the same intervention were typically not significant.

KQ = Key Question; NA = not applicable; RCT = randomized controlled trial; SOE = strength of evidence

Table B. Summary of evidence in studies addressing the effectiveness of pharmacologic interventions (KQ2)

Intervention	Key Outcome(s)	SOE Grade	Findings
Antipsychotics	Disruptive behaviors	Moderate SOE for the effectiveness of antipsychotics in achieving statistically significant improvements in measures of disruptive behaviors over the short term	3 of 3 RCTs reported significantly greater improvements in treatment group compared with control. Studies were funded by industry and should be replicated by groups without appearance of conflict.
	Aggression	Insufficient	There were inconsistent and imprecise outcomes and small numbers of participants (n = 64) in 3 short-term RCTs and 1 cohort study with medium study limitations. Aggression improved significantly in the treatment group vs. control in 1 RCT, there were no group differences in 1 RCT and 1 cohort study, and there was worsening of outcomes in both groups in 1 RCT with no group differences. SOE grade is insufficient due to conflicting results.
Stimulants (methylphenidate, amphetamine)	Disruptive behaviors	Low SOE for positive effects on disruptive behaviors	In 2 studies with high risk of bias that used different outcome measures, the treatment groups improved significantly more than placebo (p values ≤0.05).
Nonstimulants (atomoxetine, guanfacine)	Disruptive behaviors	Moderate SOE for positive effect on disruptive behaviors	3 RCTs had medium study limitations, adequate sample size (n = 537), and statistically significant change scores of 0.59 to 0.69.
Divalproex	Aggression	Low SOE for improvement or remission of aggressive behavior	Improvement in aggression was more than 3 times as likely in treated vs. untreated participants in 3 small RCTs with medium study limitations.
High-dose vs. low-dose divalproex	Aggression	Insufficient	In 1 study with medium study limitations, more participants in the high-dose arm than low-dose arm were considered much improved (53% vs. 8%; p <0.0008).

KQ = Key Question; NA = not applicable; RCT = randomized controlled trial; SOE = strength of evidence

Applicability

The populations studied in both the psychosocial and pharmacologic literature were predominantly male. Approximately half of the studies of psychosocial interventions were of school-age children. We defined a study as focusing on school-age children if it had a sample with a mean age of 5 to 12 years. We established 5 years of age as the lower bound because this is the age at which children typically begin attending kindergarten in the United States. We established 12 years of age as the upper bound because 13 years is regarded as the beginning of adolescence in casual parlance. For precisely these reasons, the age group classification both has face validity in the United States and is somewhat arbitrary.

In addition to the age group definition, our definition of the target population included only children with disruptive behaviors who received treatment in health care settings. We did not restrict our study population to children meeting formal diagnostic criteria for DBD. Rather, we included children without a diagnosed DBD but with disruptive behaviors above a measure-specific threshold on well-validated measures of child disruptive behavior. This may limit applicability to real-world clinical settings.

Applicability of our findings is also limited by restricted access in real-world clinical settings to some of the interventions most commonly examined in the studies included in this review. A vast majority of studies were in the outpatient setting, and they were generally carried out at academic medical centers in the United States. Children served in these settings may differ in important ways from children in other clinical settings.

Many of the pharmacologic studies were very small, and results may not be broadly generalizable. None of the interventions has a specific indication for disruptive behaviors, although they are widely used for these conditions in the United States. Interventions included antipsychotic drugs, an antiepileptic drug, and ADHD drugs (both stimulants and nonstimulants). Of particular importance, all but three of the studies on pharmacologic interventions either were sponsored directly by pharmaceutical companies or were conducted by individuals who are highly supported by those companies. Similarly, many of the psychosocial interventions were evaluated by the developer.

The studies also did not address the effectiveness of psychosocial interventions delivered concurrently with pharmacologic interventions or the common concern of polypharmacy, and thus there may be limited ability to assess applicability in highly complex cases. In reality, many if not most children and adolescents receiving treatment for disruptive behaviors may have multiple codiagnoses and other complex challenges.

Research Gaps

Research needs are both substantive and methodological, and they include both conduct and reporting of research. Randomization and allocation procedures were not adequately described, and blinding was not attempted or addressed in much of the psychosocial literature (KQ1). Future research should also clearly describe the duration of time from baseline to post-treatment and post-treatment to followup, and more clearly describe results from mixed models. Because the psychosocial intervention developer is often the researcher, existing research must be replicated, as the lack of replication introduces the potential for a risk of bias analogous to that introduced by industry-sponsored trials of pharmaceutical interventions.

With no categories of drugs meeting the criteria for high SOE, more research needs to be conducted across the range of potential pharmacologic interventions (KQ2). Importantly, this research should be funded by independent parties, rather than primarily the pharmaceutical industry. Substantially more information is warranted on modifiers of effectiveness by subgroup and on harms of intervention. Longer term studies are essential, as children may remain on medications over substantial periods.

There is a need for specific head-to-head comparisons of psychosocial interventions, evaluation of the effectiveness of psychosocial interventions compared with pharmacologic interventions (KQ3), and evaluation of the effectiveness of combined psychosocial and pharmacologic interventions (KQ4). Parents need this information to make informed decisions about which treatments to seek for their children. Clinicians need answers to these questions to decide which interventions to be trained to deliver and to recommend to their patients. Policymakers need this information to determine how to incentivize providers to provide the care for which there is the most evidence of effectiveness.

Future research should also clearly identify the target population and address the portability of studied interventions from predominantly university research clinics to real-world clinical settings. In the United States, disruptive behaviors are more prevalent among children receiving publicly funded care, who are therefore likely to receive treatment in clinical settings such as community mental health centers. This group of young people may differ in important ways from the children receiving treatment in university-based research clinics. These

concerns are consistent with the growing body of literature about the challenges of implementing and disseminating best practices to real-world clinical settings with fidelity.

Limitations of the Evidence Base

There are a number of limitations of the evidence base for this review—some specific to the literature on psychosocial interventions, some specific to the literature on pharmacologic interventions, and some crosscutting.

One important limitation of the psychosocial intervention literature (KQ1) is that, although most included studies were RCTs, overall the literature suffered from a lack of clear identification of primary outcomes and of random-sequence generation and allocation-concealment procedures. In addition, there was frequently no attempt to achieve blinding. Although there are well-recognized and valid reasons that achieving this level of control in studies of these types of interventions is challenging, it brings potential risk of bias into the literature. The lack of clearly identified primary outcomes likely reflects a lack of consensus on the most important outcomes; there are few studies that measure similar outcomes for synthesis. Methodologically, outcomes such as direct observation by a blinded and independent observer are arguably the most valid. However, direct observations can be expensive and are not always logistically feasible. From the perspective of patient-centered outcomes research, we believe that there is a strong argument to be made in favor of the importance of parent-reported outcomes, even though in the absence of blinding they introduce a risk of bias, because most psychosocial interventions included a parent component. Further, results from mixed models are not always presented in a straightforward manner, making it very difficult to tease out effects of specific treatment approaches.

The issue of publication bias in psychological science is difficult to address, given the current lack of standards regarding the registration of study protocols in social sciences. We attempted to minimize the potential for bias introduced by the "file drawer effect" (i.e., nonpublication of studies with nonsignificant results) by expanding the literature search to include unpublished sources (e.g., meeting abstracts) and asking Key Informants about current research or developments in the field that may not yet be published.

Few studies focused on treating disruptive behaviors with pharmacologic interventions. The drugs used for this purpose are frequently used off label and without a research basis for their use in this particular set of disorders. Many of the studies include mixed populations and report outcomes of overlapping symptoms (e.g., of ADHD and DBD), making it difficult to discern the degree to which the mitigation of ADHD, for example, is in fact driving the results. Most of the studies in this section were small; larger studies are clearly needed. Because of the small number of studies on medication use for DBDs in children, we did not use a formal statistical approach to assess the possibility of publication bias, as it would be unlikely to be informative. We did, however, seek study protocols and records from the FDA and Clinicaltrials.gov to assess reporting as a component of the SOE assessment. We did not find evidence that reporting bias was likely.

Limitations applying equally to the literature on both psychosocial and pharmacologic interventions are difficulties inherent in identifying the target population and the potential for bias introduced by conflicts of interest. We included in our review both studies of children with a formal diagnosis of DBD and children without a formal diagnosis of DBD who scored above a clinical cutoff on a well-validated measure of child disruptive behaviors. A lack of detail in reporting by authors makes it challenging to characterize the populations in the studies.

Conflict of interest is a concern in this evidence base. Most of the studies evaluating a psychosocial intervention for a child disruptive behavior included in this review were conducted either by the developer of the intervention or by an "intellectual descendant" of the developer. Although it is understandable for this to be the case (as it is common to see industry-sponsored clinical drug trials), the strength of the evidence for this body of literature would be strengthened with more studies independently evaluating the interventions.

Finally, there are few direct comparisons of individual interventions and no studies evaluating the efficacy of both behavioral and pharmacologic interventions compared with pharmacologic or behavioral interventions alone (KQ3 or KQ4). Specific interventions were most often compared with a wait-list control group or treatment as usual (variably described).

Conclusions

This review generally suggests that psychosocial interventions for children with DBD that are either multicomponent interventions or interventions that include only a parent component appear likely to be more effective at reducing disruptive child behaviors than interventions that include only a child component or control conditions. Given that all of the multicomponent interventions included in this study contained a parent component in

combination with at least one other component (child component, family component, teacher component, other component), it seems reasonable to conclude that a parent component is important. Very few studies directly support the effectiveness of pharmacologic interventions for children with DBD, but small studies of antipsychotics and stimulants report positive effects in the very short term. No studies examined the effectiveness of these interventions in combination with one another. The most commonly reported outcomes are parent-reported outcomes. Long-term and functional outcomes were less consistently reported. There was variability in the duration of long-term followup and functional outcomes reported.

References

1. Lahey BB, Loeber R, Burke J, et al. Adolescent outcomes of childhood conduct disorder among clinic-referred boys: predictors of improvement. J Abnorm Child Psychol. 2002 Aug;30(4):333-48. PMID: 12108765.
2. The Chance of a Lifetime: Preventing Early Conduct Problems and Reducing Crime. London: Sainsbury Centre for Mental Health; 2009. http://www.ohrn.nhs.uk/resource/policy/SCMHThechanceofalifetime.pdf. Accessed April 2, 2015.
3. Loeber R. Oppositional defiant disorder and conduct disorder. Hosp Community Psychiatry. 1991 Nov;42(11):1099-100, 102. PMID: 1743634.
4. Frick PJ, Kamphaus RW, Lahey BB, et al. Academic underachievement and the disruptive behavior disorders. J Consult Clin Psychol. 1991 Apr;59(2):289-94. PMID: 2030190.
5. Loeber R. Antisocial behavior: more enduring than changeable? J Am Acad Child Adolesc Psychiatry. 1991 May;30(3):393-7. PMID: 2055875.
6. Loeber R, Green SM, Lahey BB, et al. Differences and similarities between children, mothers, and teachers as informants on disruptive child behavior. J Abnorm Child Psychol. 1991 Feb;19(1):75-95. PMID: 2030249.
7. Loeber R, Lahey BB, Thomas C. Diagnostic conundrum of oppositional defiant disorder and conduct disorder. J Abnorm Psychol. 1991 Aug;100(3):379-90. PMID: 1918617.
8. Meier MH, Slutske WS, Heath AC, et al. Sex differences in the genetic and environmental influences on childhood conduct disorder and adult antisocial behavior. J Abnorm Psychol. 2011 May;120(2):377-88. PMID: 21319923.
9. Murrihy RC, Kidman AD, Ollendick TH. Clinical Handbook of Assessing and Treating Conduct Problems in Youth. New York: Springer Science Business Media; 2010.
10. Kutcher S, Aman M, Brooks SJ, et al. International consensus statement on attention-deficit/hyperactivity disorder (ADHD) and disruptive behaviour disorders (DBDs): clinical implications and treatment practice suggestions. Eur Neuropsychopharmacol. 2004 Jan;14(1):11-28. PMID: 14659983.
11. Lahey BB, Miller TL, Gordon RA, et al. Developmental epidemiology of the disruptive behavior disorders. In: Quay HC, Hogan AE, eds. Handbook of Disruptive Behavior Disorder. Dordrecht, Netherlands: Kluwer Academic Publishers; 1999.
12. Maughan B, Rowe R, Messer J, et al. Conduct disorder and oppositional defiant disorder in a national sample: developmental epidemiology. J Child Psychol Psychiatry. 2004 Mar;45(3):609-21. PMID: 15055379.
13. Loeber R, Burke JD, Lahey BB, et al. Oppositional defiant and conduct disorder: a review of the past 10 years, part I. J Am Acad Child Adolesc Psychiatry. 2000 Dec;39(12):1468-84. PMID: 11128323.
14. Burke JD, Loeber R, Birmaher B. Oppositional defiant disorder and conduct disorder: a review of the past 10 years, part II. J Am Acad Child Adolesc Psychiatry. 2002 Nov;41(11):1275-93. PMID: 12410070.
15. Perou R, Bitsko RH, Blumberg SJ, et al. Mental health surveillance among children--United States, 2005-2011. MMWR Surveill Summ. 2013 May 17;62 Suppl 2:1-35. PMID: 23677130.
16. American Psychiatric Association. Task Force on DSM-IV. Diagnostic and Statistical Manual of Mental Disorders : DSM-IV. 4th ed. Washington, DC: American Psychiatric Association; 1994.
17. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders: DSM-5. 5th ed. Arlington, VA: American Psychiatric Association; 2013.
18. Bonin EM, Stevens M, Beecham J, et al. Costs and longer-term savings of parenting programmes for the prevention of persistent conduct disorder: a modelling study. BMC Public Health. 2011;11:803. PMID: 21999434.
19. Kessler RC, Berglund P, Demler O, et al. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry. 2005 Jun;62(6):593-602. PMID: 15939837.
20. Russo MF, Loeber R, Lahey BB, et al. Oppositional defiant and conduct disorders - validation of the DSMIII-R and an alternative diagnostic option. J Clin Child Psychol. 1994 Mar;23(1):56-68.
21. Russo MF, Beidel DC. Comorbidity of childhood anxiety and externalizing disorders - prevalence, associated characteristics, and validation issues. Clin Psychol Rev. 1994;14(3):199-221.
22. U.S. Public Health Service, Office of the Surgeon General. Mental Health: A Report of the Surgeon General. Rockville, MD: National Institute of Mental Health; 1999.
23. August GJ, Bloomquist ML, Lee SS, et al. Can evidence-based prevention programs be sustained in community practice settings? The Early Risers' Advanced-Stage Effectiveness Trial. Prev Sci. 2006 Jun;7(2):151-65. PMID: 16555143.
24. Bloomquist ML, August GJ, Horowitz JL, et al. Moving from science to service: transposing and sustaining the Early Risers prevention program in a community service system. J Prim Prev. 2008 Jul;29(4):307-21. PMID: 18581235.
25. Knapp M, McDaid D, Parsonage M, eds. Mental Health Promotion and Mental Illness Prevention: The Economic Case. London: Department of Health; 2011.

26. Cooper WO, Arbogast PG, Ding H, et al. Trends in prescribing of antipsychotic medications for US children. Ambul Pediatr. 2006;6:79-83. PMID: 16530143.

27. Cooper WO, Federspiel CF, Griffin MR, et al. New use of anticonvulsant medications among children enrolled in the Tennessee Medicaid Program. Arch Pediatr Adolesc Med. 1997;151(12):1242-6. PMID: 9412601.

28. Cooper WO, Hickson GB, Fuchs C, et al. New users of antipsychotic medications among children enrolled in TennCare. Arch Pediatr Adolesc Med. 2004;158:753-9. PMID: 15289247.

29. Newcorn JH, Ivanov I. Psychopharmacologic treatment of attention-deficit/hyperactivity disorder and disruptive behavior disorders. Pediatr Ann. 2007 Sep;36(9):564-74. PMID: 17910204.

30. Charach A, Dashti B, Carson P, et al. Attention Deficit Hyperactivity Disorder: Effectiveness of Treatment in At-Risk Preschoolers; Long-Term Effectiveness in All Ages; and Variability in Prevalence, Diagnosis, and Treatment. Comparative Effectiveness Review No. 44. AHRQ Report No. 12-EHC003-EF. Rockville, MD: Agency for Healthcare Research and Quality; October 2011. www.ncbi.nlm.nih.gov/books/NBK82368/. Accessed April 2, 2015.

31. Higgins JP, Altman DG, Sterne JA. Chapter 8: Assessing the risk of bias in included studies. In: Higgins JP, Green S, eds. Cochrane Handbook for Systematic Reviews of Interventions. The Cochrane Collaboration; 2011.

32. Viswanathan M, Ansari MT, Berkman ND, et al. Assessing the risk of bias of individual studies in systematic reviews of health care interventions. In: Methods Guide for Effectiveness and Comparative Effectiveness Reviews. AHRQ Publication No. 10(14)-EHC063-EF. Rockville MD: Agency for Healthcare Research and Quality. January 2014. Chapters available at www.effectivehealthcare.ahrq.gov/.

33. Shea BJ, Grimshaw JM, Wells GA, et al. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. BMC Med Res Methodol. 2007;7:10. PMID: 17302989.

34. Chou R, Aronson N, Atkins D, et al. AHRQ series paper 4: assessing harms when comparing medical interventions: AHRQ and the effective health-care program. J Clin Epidemiol. 2010 May;63(5):502-12. PMID: 18823754.

35. Methods Guide for Effectiveness and Comparative Effectiveness Reviews. AHRQ Publication No. 10(14)-EHC063-EF. Rockville, MD: Agency for Healthcare Research and Quality. January 2014. Chapters available at www.effectivehealthcare.ahrq.gov.

36. Munshi KR, Oken T, Guild DJ, et al. The use of antiepileptic drugs (AEDs) for the treatment of pediatric aggression and mood disorders. Pharmaceuticals. 2010;3(9):2986-3004.

Full Report

This executive summary is part of the following document: Epstein R, Fonnesbeck C, Williamson E, Kuhn T, Lindegren ML, Rizzone K, Krishnaswami S, Sathe N, Ficzere CH, Ness GL, Wright GW, Raj M, Potter S, McPheeters M. Psychosocial and Pharmacologic Interventions for Disruptive Behavior in Children and Adolescents. Comparative Effectiveness Review No. 154. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2012-00009-I.) AHRQ Publication No. 15(16)-EHC019-EF. Rockville, MD: Agency for Healthcare Research and Quality; October 2015. www.effectivehealthcare.ahrq.gov/reports/final.cfm.

AHRQ Pub. No. 15(16)-EHC019-1-EF October 2015