Behavioral Management for Children and Adolescents: Assessing the Evidence

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Objective: **Behavioral management services for children and adolescents are important components of the mental health service system. Behavioral management is a direct service designed to help develop or maintain prosocial behaviors in the home, school, or community. This review examined evidence for the effectiveness of family-centered, school-based, and integrated interventions.** ***Methods:*** **Literature reviews and individual studies published from 1995 through 2012 were identified by searching PubMed, PsycINFO, Applied Social Sciences Index and Abstracts, Sociological Abstracts, Social Services Abstracts, Published International Literature on Traumatic Stress, the Educational Resources Information Center, and the Cumulative Index to Nursing and Allied Health Literature. Authors chose from three levels of evidence (high, moderate, and low) based on benchmarks for the number of studies and quality of their methodology. They also described the evidence of service effectiveness.** ***Results:*** **The level of evidence for behavioral management was rated as high because of the number of well-designed randomized controlled trials across settings, particularly for family-centered and integrated family- and school-based interventions. Results for the effectiveness of behavioral management interventions were strong, depending on the type of intervention and mode of implementation. Evidence for school-based interventions as an isolated service was mixed, partly because complexities of evaluating group interventions in schools resulted in somewhat less rigor.** ***Conclusions:*** **Behavioral management services should be considered for inclusion in covered plans. Further research addressing the mechanisms of effect and specific populations, particularly at the school level, will assist in bolstering the evidence base for this important category of clinical intervention. (*Psychiatric Services* 65:580–590, 2014; doi: 10.1176/appi.ps.201300253)**

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Problem behavior early in life can be related to later development of negative outcomes, such as school dropout, academic problems, violence, delinquency, and substance use; in addition, early childhood delinquent behavior may predict criminal activity in adulthood (1–7). Therefore, interventions designed to address problem behavior and increase prosocial behavior are important for children and adolescents and for families, teachers, school officials, community members, and policy makers. This article provides an assessment of behavioral management interventions for children and adolescents who have behavior problems.

This article reports the results of a literature review that was undertaken as part of the Assessing the Evidence Base Series (see box on next page). For purposes of this series, the Substance Abuse and Mental Health Services Administration (SAMHSA) has described behavioral management as a direct service that is designed to help a child or adolescent develop or maintain prosocial behaviors in the home, school, or community. Examples of these behaviors include demonstrating positive, nonaggressive relationships with parents, teachers, and peers; showing empathy and concern for others; and complying with rules and authority figures. Table 1 presents a description of the service and its components. Behavioral management interventions are individualized to the person's needs.

The treatment literature includes a variety of behavioral management interventions that are designed to address problem behaviors (for example, externalizing or acting-out behaviors) of children and adolescents when implemented in various settings. Given the breadth and variations of these interventions, behavioral health policy makers, providers, and family members may benefit from a brief review of specific behavioral management interventions and their value as covered services in a benefit package.

The purposes of this article are to describe behavioral management services and highlight specific behavioral management interventions that are implemented in community settings, rate the level of evidence (methodological quality) of existing studies, and describe the effectiveness of these services on the basis of the research. We identify three models of behavioral management interventions that can be implemented, depending on the intervention setting and the needs of children or groups of children and their families. To facilitate use by a broad audience of mental health services personnel and policy makers, we provide an overall assessment of research quality and briefly highlight key findings. The results will provide state mental health directors and staff, policy officials, purchasers of health services, and community health care administrators with a simple summary of the evidence for a range of behavioral management services and implications for research and practice.

Description of behavioral management

Behavioral management for children and adolescents is a general category of intervention that is often incorporated as part of a variety of clinical practices that differ by setting and populations of focus. These interventions share common goals, which are listed in Table 1. Behavioral management interventions for children and adolescents included in this review address various problem behaviors, including noncompliance at home or at school, disruptive behavior, aggressive behavior, rule breaking, and delinquent behaviors. For purposes of this article, clinical components of behavioral management interventions for children were compiled from various practice-relevant sources (8–11).

Behavioral management is grounded in social learning theory and applied behavior analysis. Social learning theory asserts that people learn within a social context, primarily by observing and imitating the actions of others, and that learning is also influenced by being rewarded or punished for particular behaviors (12). Based on the principles of social learning theory, applied behavior analysis uses general learning principles, direct observation, objective measurement, and analytic assessment to shape behavior and solve problems that are clinically significant for an individual or family (11). The approach often is used for children with autism spectrum disorders; however, applied behavior analysis principles and techniques can be used more generally with behavioral management interventions for various child behavior problems.

Examples of specific behavioral management treatment activities include observing and documenting child behaviors, identifying antecedents of behaviors, utilizing motivating factors in reinforcement strategies, developing behavioral plans to address identified problem behaviors, coordinating interventions across different settings in which children function, and training other individuals in a child's life to

About the AEB Series

The Assessing the Evidence Base (AEB) Series presents literature reviews for 13 commonly used, recovery-focused mental health and substance use services. Authors evaluated research articles and reviews specific to each service that were published from 1995 through 2012 or 2013. Each AEB Series article presents ratings of the strength of the evidence for the service, descriptions of service effectiveness, and recommendations for future implementation and research. The target audience includes state mental health and substance use program directors and their senior staff, Medicaid staff, other purchasers of health care services (for example, managed care organizations and commercial insurance), leaders in community health organizations, providers, consumers and family members, and others interested in the empirical evidence base for these services. The research was sponsored by the Substance Abuse and Mental Health Services Administration to help inform decisions about which services should be covered in public and commercially funded plans. Details about the research methodology and bases for the conclusions are included in the introduction to the AEB Series (26).

Table 1

Description of behavioral management for children and adolescents

Feature	Description
Service definition	Behavioral management is a direct service that is designed to help a child or adolescent develop or maintain prosocial behaviors in the home, school, or community. A behavioral management intervention program is based on personalized service plans that aim to increase the individual's abilities to relate to caregivers and other people.
Service goals	Help maintain children or adolescents in their homes, communities, or school settings; reduce the expression of problem behavior; increase the expression of prosocial behavior and overall well-being
Populations	Children, adolescents, and families
Settings of service delivery	Settings may vary and can include outpatient clinical facilities; homes; schools, including preschool and child care programs; and community facilities

address specific behavioral objectives or goals. Behavioral management services typically are delivered through an individualized plan that is based on a clinical assessment. An assessment identifies the needs of the child or adolescent and the family and establishes goals, intervention plans, discharge criteria, and a discharge plan. Behavioral management plans are implemented through teaching, training, and coaching activities that are designed to help individuals establish and maintain developmentally appropriate social and behavioral competencies. Services may involve coordination of other care or referral to complementary services.

Behavioral management interventions may be delivered by family members, teachers, professional therapists, or a team of individuals working in concert to address the needs of a child or adolescent. A behavioral management therapist collaborates with the child or adolescent and the family to develop specific, mutually agreed-upon behavioral objectives and interventions to alter or improve specific behaviors. The resulting behavioral management treatment plan may also include a risk management or safety plan to identify risks that are specific to the individual. In some cases, a contingency plan is developed to address specific risks should they arise. Behavioral management professionals work in partnership with family members or teachers to implement a behavioral plan and monitor the child's behavior and progress.

Three basic models of behavioral management interventions in the research literature are family-centered behavioral interventions, school-based behavioral interventions that can include services implemented across grades or classrooms or as individually targeted services, and integrated home-school programs. We focus on behavioral management interventions for children who are evidencing problem behavior and on interventions that include families and have some level of personalization that addresses the child's needs.

Family-centered behavioral interventions

Family-centered interventions emphasize the role of parents or other caregivers in helping to manage problem behaviors of children, and they frequently focus on parenting practices. The interventions can be clinic based or offered in community settings or in the home. Behavioral parent training interventions are among the more commonly used family-centered behavioral management models. These interventions specifically target individual children with identified behavior problems and their families and generally teach parents to increase positive interactions with children and reduce harsh and inconsistent discipline practices. Behavioral parent training programs are delivered in a variety of formats. For example, some behavioral parenting interventions may involve parents, children, or teachers, and some may be delivered only to parents. Behavioral parent training interventions also vary in the extent to which they are customized to specific needs of the child. For purposes of this article, we focus on behavioral parent training interventions that involve planning for specific behavior problems that are expressed by a child and working with the parent and child, rather than group-based parent training programs that do not involve the child or are not customized based on specific behavioral needs.

Two family-centered behavioral interventions that meet the criteria for this review are Parent-Child Interaction Therapy (PCIT) and the Incredible Years programs. PCIT uses live coaching of parents during parent-child interactions to help parents establish nurturing relationships with their children, clear parent-child communication and limit setting, and consistent contingencies for child behavior (13,14). The Incredible Years parent training and child training programs involve addressing problem behavior of children aged two to ten years who have a diagnosis of a disruptive behavior disorder or are exhibiting subclinical levels of problem behavior (15,16). During treatment, a therapist works with parents and children in group settings and uses vignettes, focused discussions, role plays, and problem-solving approaches to illustrate and discuss specific behavioral management techniques. Both of these interventions incorporate behavioral management strategies of rewarding prosocial behavior, limiting reinforcement of inappropriate behavior, and delivering appropriate consequences for misbehavior.

School-based behavioral interventions

School-based behavioral interventions specifically target problem behaviors that occur in the school setting, and they use teachers and school staff as interveners in the management of student behaviors. One model that is commonly used in school settings is Positive Behavior Support (PBS). This model describes strategies that are implemented with the whole school to improve behavior and school climate and to prevent or change patterns of problem behavior (17). Based on applied behavior analysis, person-centered planning (an approach designed to assist the individual in planning his or her life and supports, often to increase self-determination and independence), and inclusion principles, PBS aims to support behavioral success by implementing nonpunitive behavioral management techniques in a systematic and consistent manner (18,19). PBS models of intervention seek to prevent problem behavior by altering conflict-inducing situations before problems escalate while concurrently teaching appropriate alternative behaviors (8).

Specific school-based interventions developed based on the PBS model include Positive Behavioral Interventions and Supports (20) and Safe & Civil Schools (21). These school-based interventions implement behavioral management strategies and tailor the level of intervention for the unique needs of a child or adolescent. PBS interventions utilize three levels of treatment: a primary tier, applied to the entire school setting to prevent challenging behaviors; a secondary tier, targeting individuals who display emerging or moderate behavior problems; and a tertiary tier for students who evidence more significant behavior problems and require complex and individualized team-based support beyond what is delivered at the primary and secondary levels (10). Interventions at the tertiary level involve tailored behavioral management strategies

outlined in a behavioral management plan (22). To direct this review to treatment approaches for children with identified behavior problems, we focused on school-based behavioral management interventions that fall within the tertiary tier of intensity.

Integrated behavioral interventions

Integrated interventions combine school- and family-centered treatment components to create cohesive programs that address child behaviors in school and home settings. Three integrated programs are assessed in this review: Fast Track, Child Life and Attention Skills (CLAS), and the Adolescent Transitions Program (ATP). The Fast Track program is a long-term intervention that is designed to prevent antisocial behavior and psychiatric disorders among children identified as demonstrating disruptive behavior by parents and teachers. It uses a combination of parent behavioral management training, child social cognitive skills training, tutoring or mentoring, individualized home visits, and a classroom curriculum (23). The CLAS program is designed to reduce inattention symptoms and improve organizational and social skills among children with attention-deficit hyperactivity disorder (ADHD), inattentive type, through a combination of teacher consultation, parent training, and child skills training (24). ATP is a community-wide, family-centered intervention delivered through schools that takes a multilevel approach to addressing adolescent behavior problems (25). Similar to the three-tiered system of intervention described with school-based PBS, ATP uses tiered universal, selected, and indicated interventions to address different groups of children and families, depending on the child's level of symptom expression. That is, universal interventions are designed for all parents and children in a school setting, selected interventions are for families and children at elevated risk, and indicated interventions are for families of children with early signs of problem behavior that do not yet meet clinically diagnosable levels of a mental disorder. The indicated level of intervention entails a variety of family treatment services, including brief family intervention, a school monitoring system, parent groups, behavioral family therapy, and case management services. These components vary depending on the individual needs of the child and family.

Methods

Search strategy

To provide a summary of the evidence and effectiveness for behavioral management, we conducted a survey of major databases: PubMed (U.S. National Library of Medicine and National Institutes of Health), PsycINFO (American Psychological Association), Applied Social Sciences Index and Abstracts, Sociological Abstracts, Social Services Abstracts, Published International Literature on Traumatic Stress, the Educational Resources Information Center, and the Cumulative Index to Nursing and Allied Health Literature.

We reviewed meta-analyses, research reviews, and individual studies from 1995 through 2012. We also examined bibliographies of major reviews and meta-analyses. We used combinations of the following search terms: behavioral management, behavior management, behavioral management therapy, behavior specialist, mental health, substance abuse, children, and adolescents. Additional citations were gathered from reference sections of articles. We used an independent consensus process when reviewing abstracts found through the literature search to determine whether a study used a behavioral management approach, on the basis of the conceptual definition of behavioral management provided above.

Inclusion and exclusion criteria

This review included U.S. and international studies in English of the following types: randomized controlled trials (RCTs), quasi-experimental studies, and review articles, such as meta-analyses and systematic reviews. The focus of this review was on clinical intervention approaches for children or adolescents who presented with problem behaviors or elevated risk at the beginning of the intervention. Included in the search were studies of family-focused parent training interventions that involved individualization based on the needs of the child and that involved the child and family members. Also included were studies of interventions in which the child or adolescent was selected for inclusion on the basis of the presence of problem behaviors that were targeted for change during the active treatment period.

Some populations and intervention programs were excluded to ensure basic similarities of the participants, interventions, and outcome measures and to be able to draw conclusions about whether the behavioral management intervention itself (as opposed to other intervention components) was associated with the outcomes. Studies that focused on children with autism spectrum disorders or other pervasive developmental disorders, intellectual disabilities, or fetal alcohol spectrum disorder were excluded. There is a large body of literature on behavioral management interventions for children with autism spectrum disorders and developmental disabilities, which we believe would be more appropriately reviewed in a separate article. Also excluded were universal preventive interventions that are not part of a multitiered program, because of our focus on individualized clinical intervention approaches. Universal preventive interventions address all individuals in a population, regardless of symptom severity or level of risk; as a result, the strategies and approaches used are distinct from those of more targeted interventions and more appropriately reviewed in a separate article. Finally, we excluded intervention models that may incorporate behavioral management components but are not exclusively behavioral management interventions or do not explicitly focus on child and adolescent behavior problems, such as Homebuilders, Multisystemic Therapy, Functional Family Therapy, individual cognitive-behavioral therapy, and behavioral management interventions in residential treatment centers and psychiatric hospitals.

Strength of the evidence

The methodology used to rate the strength of the evidence is described in detail in the introduction to this series (26). The research designs of the studies identified by the literature search were examined. Three levels of

evidence (high, moderate, and low) were used to indicate the overall research quality of the collection of studies. Ratings were based on predefined benchmarks that considered the number and quality of the studies. If ratings were dissimilar, a consensus opinion was reached.

In general, high ratings indicate confidence in the reported outcomes and are based on three or more RCTs with adequate designs or two RCTs plus two quasi-experimental studies with adequate designs. Moderate ratings indicate that there is some adequate research to judge the service, although it is possible that future research could influence initial conclusions. Moderate ratings are based on the following three options: two or more quasi-experimental studies with adequate design; one quasi-experimental study plus one RCT with adequate design; or at least two RCTs with some methodological weaknesses or at least three quasi-experimental studies with some methodological weaknesses. Low ratings indicate that research for this service is not adequate to draw evidence-based conclusions. Low ratings indicate that studies have nonexperimental designs, there are no RCTs, or there is no more than one adequately designed quasi-experimental study.

We accounted for other design factors that could increase or decrease the evidence rating, such as how the service, populations, and interventions were defined; use of statistical methods to account for baseline differences between experimental and comparison groups; identification of moderating or confounding variables with appropriate statistical controls; examination of attrition and follow-up; use of psychometrically sound measures; and indications of potential research bias.

Effectiveness of the service

We described the effectiveness of the service—that is, how well the outcomes of the studies met the service goals. We compiled the findings for separate outcome measures and study populations, summarized the results, and noted differences across investigations. We considered the quality of the research design in our conclusions about the strength of the evidence and the effectiveness of the service.

Results and discussion

Level of evidence

Five reviews of family-centered behavioral interventions (16,27–30), two reviews of school-based behavioral interventions (9,19), and one review of integrated behavioral interventions (25) were identified. Twelve RCTs that had been published after the previous reviews had been conducted were also identified. Their topics were family-centered behavioral interventions (31–34), school-based behavioral interventions (35–37), and integrated behavioral interventions (23,24,38–40). Tables 2 and 3 summarize the reviews and the RCTs, respectively.

Participants who received behavioral management interventions included children in preschool, elementary, middle, and high school grades. Studies included a range of racial-ethnic groups and rural and urban populations. Across studies, children who received behavioral management interventions typically were described as exhibiting problem behaviors or externalizing behaviors.

Overall, given the strength of the research designs in more than three RCTs, the level of evidence for the various types of behavioral management interventions was rated as high. However, the complexities of evaluating school-based interventions have resulted in somewhat less rigor in that area of behavioral management research. Reviews and individual studies of family-based and integrated family- and school-based behavioral management interventions included in this review used strong RCT designs, and several included intent-to-treat analyses.

RCTs of family-centered behavioral interventions (as defined for this article) have been examined in multiple review articles (27–30) and individual studies. Across both types of publications, the evaluations examining the effects of PCIT and Incredible Years behavioral parenting programs had adequate statistical power to detect treatment effects, used well-designed RCTs, utilized interventions with treatment manuals and fidelity data, and measured clinical outcomes with reliable and valid assessment instruments. Findings for both programs have also been replicated in multiple RCTs conducted by independent investigators.

Researchers have noted that most studies evaluating the effectiveness of tertiary-level school-based interventions have included students with significant disabilities in self-contained classrooms, which limits the generalizability of the evidence to general education students in typical classroom settings (37,41). Researchers also noted that studies in this body of literature generally have small samples, lack RCTs, use single-subject or within-group research designs, do not always use standardized behavioral management protocols, and are limited in their ability to report whether school personnel were implementing the interventions with fidelity (37,41–43). However, in this review we included three studies of tertiary-level school-based interventions using RCTs (35–37). Researchers indicated various limitations of the design (which varied across studies), including the lack of fidelity measures of team implementation of the intervention, attrition over time, limited measurement of interrater reliability of observational data, lack of validated assessment measurement, and lack of statistical analyses to account for school-level differences.

Integrated behavioral management intervention studies included in this review used strong RCT designs, had adequate statistical power to detect treatment effects, and used intent-to-treat analyses (23–25). One limitation is that these integrated behavioral management interventions have been studied primarily by program developers. The literature would be strengthened if these RCTs were replicated by independent researchers and demonstrated similar results.

Effectiveness of the service

Family-centered behavioral interventions. Family-centered parent training interventions have been reviewed extensively and have demonstrated strong effects in reducing and preventing problem behaviors across a range of ages and populations when compared with wait-list control groups (16,28–30). Reviews found PCIT to be

Table 2

Summary of review articles of behavioral management for children and adolescents included in the review[a]

Intervention and study	Focus of review	Studies reviewed	Outcomes measured	Major findings
Family centered				
Brestan and Eyberg, 1998 (27)	Psychosocial interventions for child and adolescent conduct disorder, including PCIT and Incredible Years	PCIT, 1 RCT and 2 quasi-experimental studies; Incredible Years, 5 RCTs	Problem behavior, parent-child relationship, parenting skills	Families receiving PCIT reported that the treatment was more effective than families in control conditions, and PCIT was rated a "probably efficacious treatment." A limitation of the literature cited was that the same research team conducted many of the evaluations of PCIT. Families receiving Incredible Years rated their children as having fewer problems after treatment, compared with families in control conditions. They also reported having better attitudes about their children and better parenting skills.
Thomas and Zimmer-Gembeck, 2007 (28)	Family-based interventions for children (meta-analysis)	PCIT, 9 RCTs, 2 quasi-experimental studies, 2 single-cohort studies; includes 13 studies from 8 cohorts and 3 research groups	Problem behavior, parent stress, parenting behavior	For PCIT, medium to large effect sizes were observed in single-cohort studies for the change in children's pretreatment to posttreatment behavior. In comparisons with wait-list control groups, medium and large effects were found favoring PCIT for reports by mothers and fathers of negative child behavior. No significant effect was found for observed negative child behaviors.
Eyberg et al., 2008 (16)	Psychosocial treatments for child and adolescent disruptive behavior, including ODD and CD	PCIT, 2 RCTs; Incredible Years, 3 RCTs	Disruptive behavior and symptoms of ODD and CD, such as noncompliance, aggression, disruptive classroom behavior, and delinquent behavior	PCIT was found superior to wait-list control conditions in reducing disruptive behavior of young children. Incredible Years met criteria as a "probably efficacious treatment" for children with disruptive behavior.
Kaslow et al., 2012 (29)	Family-based interventions for mental disorders among children and adolescents	PCIT, 9 RCTs; Incredible Years, 3 RCTs	Externalizing behavior, oppositional behavior, ADHD symptoms	RCTs of PCIT found reductions in problem behavior, including ODD behaviors, compared with wait-list control groups, 3 to 6 years after the intervention. Positive effects in reducing oppositional behavior were shown, compared with treatment as usual, in diverse populations, including preschool students, Mexican-American and Chinese-American families, and child welfare populations. Incredible Years was shown in RCTs to decrease oppositional problem behaviors and ADHD symptoms, compared with control conditions.
Njoroge and Yang, 2012 (30)	Psychosocial treatments for psychiatric disorders of preschool-age children	PCIT, 3 single-cohort studies	Behavioral difficulties, disruptive behavior problems	Studies indicated improvements with PCIT in preschool students' disruptive behaviors.
School based				
Safran and Oswald, 2003 (9)	Use of Positive Behavior Support, including the most intensive (tertiary) level of intervention	Tertiary level of Positive Behavior Support, 1 quasi-experimental study, 1 single-cohort study, 1 case study	Behavior problems	Intervention had some positive effects on reducing individual chronic behavior problems; however, literature cited was limited in the lack of RCTs.
Goh and Bambara, 2012 (19)	School-based, individualized Positive Behavior Support among school-age children (meta-analysis)	Positive Behavior Support: 83 single-participant design studies with experimental control	Problem behavior	Overall, the interventions had moderate effect sizes for reducing problem behavior and increasing use of appropriate skills. The interventions demonstrated maintenance of overall behavior change, from 1 week to up to 2 years.
Integrated family- and school-based				
Dishion and Kavanagh, 2000 (25)	Adolescent Transitions Program to address problem behavior and substance use among children	Adolescent Transitions Program: 4 RCTs	Delinquent behavior, smoking, parent-child conflict, antisocial behavior, parenting, substance use	Implementation of the intervention led to reductions in delinquent behavior in school and smoking, less antisocial behavior, and improved parenting practices.

[a] Articles are in chronological order by intervention type. Review articles sometimes included citations for interventions not described in this article. Only studies of interventions included in this article are described in the table. Abbreviations: ADHD, attention-deficit hyperactivity disorder; CD, conduct disorder; ODD, oppositional defiant disorder; PCIT, Parent-Child Interaction Therapy; RCT, randomized controlled trial

Table 3

Individual studies of behavioral management for children and adolescents included in the review[a]

Intervention and study	Sample	Comparisons	Outcomes measured	Major findings
Family centered				
Bagner et al., 2010 (31)	28 children ages 18–60 months with externalizing problems; born prematurely	PCIT versus wait-list control	Behavior and emotional problems, disruptive behavior, child compliance, parenting stress, parental discipline practices, parenting skills	Compared with the control group at follow-up, children in the PCIT group had fewer attention problems, internalizing and externalizing problems, and aggressive and disruptive behaviors, and mothers had more positive parenting skills and less reported stress. Intent-to-treat analyses indicated that children in the PCIT group had fewer disruptive behaviors, compared with the control group at follow-up.
Berkovits et al., 2010 (32)	30 children ages 3–6 years with subclinical behavior problems	Abbreviated PCIT versus written materials about PCIT	Behavior problems, parenting locus of control, parental discipline practices, parent satisfaction with intervention	Scores for behavior problems, parenting locus of control, parenting discipline practices, and satisfaction with intervention were not significantly different between study conditions at follow-up.
Lau et al., 2011 (33)	54 Chinese-American children ages 5–12 years with behavior problems	Incredible Years versus wait-list control	Internalizing and externalizing problems, parenting stress, parenting behavior	Intent-to-treat analyses indicated that the Incredible Years group had lower levels of internalizing and externalizing problems, less negative discipline, and greater positive involvement. No significant differences in parenting stress were found between groups.
Webster-Stratton et al., 2011 (34)	99 children ages 4–6 years with ADHD or ADHD and ODD	Incredible Years versus wait-list control	Parenting behavior, internalizing and externalizing problems at home and school, ADHD symptoms, conduct problems, positive social behavior, parent-child interaction, classroom observations of child behavior, problem solving, emotional vocabulary, parent satisfaction with program	Compared with the control group, participants in Incredible Years had higher levels of social competence, emotion regulation, positive parent-child interaction, problem-solving ability, and feeling identification; they also had lower levels of externalizing problems.
School based				
Metropolitan Area Child Study Research Group, 2002 (35)	1,500 high-risk children from 4 schools across "inner city" and "urban poor" sites, K–6th grade	No-treatment control group versus level A (general enhancement classroom program) versus level B (general enhancement classroom program plus small-group peer skills training) versus level C (general enhancement classroom program plus small-group peer skills training plus family intervention)	Aggressive behavior, academic achievement	Children who received the most intensive intervention (level C) in an urban poor school improved in aggressive behavior more than those in all other conditions. In an inner-city school, level C children's aggression level was higher than in the control and level A groups, suggesting that the family component of the intervention—rather than the classroom or small-group component—is relevant in decreasing or increasing aggression. The level C intervention had significant effects on aggressive behavior when it was delivered to children during the early school years in the urban poor school. None of the interventions were effective in preventing aggression among older elementary school children. For achievement level, the level C intervention was not significantly different from the control group in either school context.

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Table 3

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Intervention and study	Sample	Comparisons	Outcomes measured	Major findings
Iovannone et al., 2009 (36)	245 children at risk for behavior problems, K–8th grade, from 5 public schools	Tertiary school-based interventions versus usual school intervention	Social skills, academic engaged time	Children in the treatment group had significantly higher social skills scores and academic engaged time than children in the comparison group.
Forster et al., 2012 (37)	100 children with externalizing problems, in 1st and 2nd grade in 38 schools	Tertiary Positive Behavior Support intervention versus universal prevention program	Externalizing behavior, student on-task behavior, teacher praise and reprimands, positive and negative peer nominations	The Positive Behavior Support group had fewer externalizing problems and teacher reprimands and more teacher praise than the comparison group.
Integrated family- and school-based				
Dishion et al., 2002 (38)	672 children and families, 6th–9th grade	Adolescent Transitions Program versus control group	Substance use	Compared with the control group, random assignment to the Adolescent Transitions Program was associated with a reduced incidence of substance use by the first year of high school, when the analysis controlled for prior use of substances in middle school.
Conduct Problems Prevention Research Group, 2007 (23) and 2011 (40); Jones et al., 2010 (39)[b]	891 children at risk for behavior problems in matched schools across 4 sites, K–10th grade	Fast Track versus control group	Diagnostic symptoms of CD, ODD, and ADHD; antisocial behavior; services utilization	In 3rd grade, assignment to Fast Track did not result in a significant main effect for symptoms or diagnoses of CD, ODD, or ADHD; the positive effect of the intervention increased as the severity of initial risk increased. In 9th grade, children in the intervention had lower antisocial behavior scores than children in the control group. Among those at highest risk, random assignment to the intervention prevented externalizing disorders over 12 years, compared with the control group. Youths assigned to the intervention had less use of general medical, pediatric, and emergency department services than youths in the control group.
Pfiffner et al., 2007 (24)	69 children ages 7–11 years with ADHD, predominantly inattentive type	CLAS program versus control group	Inattention, cognitive tempo, functional impairment	Children randomly assigned to CLAS had fewer inattention and sluggish cognitive tempo symptoms and improved social and organizational skills, compared with those in the control group.

[a] Articles are in chronological order by intervention type. Abbreviations: ADHD, attention-deficit hyperactivity disorder; CD, conduct disorder; CLAS, Child Life and Attention Skills; ODD, oppositional defiant disorder; PCIT, Parent-Child Interaction Therapy;

[b] Multiple publications based on the same randomized controlled trial

effective in reducing disruptive behavior of young children. Eyberg and colleagues (16) reviewed two well-designed RCTs with wait-list control groups and indicated that PCIT was superior in reducing disruptive behavior of children aged three to six years. The comparison groups in the two studies were not active controls or placebo treatment conditions, which resulted in a "probably efficacious" rating for PCIT (16). A meta-analysis of PCIT included 13 studies from eight cohorts and three research groups (28). The researchers compared children who received PCIT with children in nonclinical comparison groups and concluded that mothers of children who received PCIT reported greater declines in problem behaviors. There were large effects for positive behaviors observed in the classroom.

Adaptations and abbreviated versions of PCIT and the Incredible Years program showed preliminary positive effects in various populations, including Mexican-American families (44), Chinese families (33,45), African-American families (46), children in Head Start (47,48), and children identified in pediatric medical settings (31,32,49). Various forms of the Incredible Years program implemented

Evidence for the effectiveness of behavioral management for children and adolescents: high

Overall, positive outcomes found in the literature:
- Reduced externalizing behavior
- Fewer inattention symptoms
- Improved social and organizational skills

for children with significant needs reduced problem behaviors among children with a diagnosis of ADHD (34) and oppositional defiant disorder (50) six months after the intervention. Overall, compared with control groups, these family-centered parent training programs had strong effects in reducing externalizing behaviors (immediately after the intervention and at follow-up) among children across a range of ages.

School-based interventions. Research findings were mixed on the effectiveness of tertiary-level school-based interventions. Two meta-analyses of tertiary-level interventions that used functional behavioral assessments found that these interventions were effective in reducing problem behavior across a range of disabilities and grades (9,19). However, these results should be interpreted with caution, because the studies evaluated in these reviews had methodological limitations (for example, single-participant research designs and small samples). Two RCTs with elementary school students found effects in reducing externalizing behavior, compared with control groups, at the end of the intervention (36) and at the follow-up 14 months after the pretest (37), as indicated by self-reported scores on standardized instruments and observer ratings of student behavior. Compared with students in control groups, students in the intervention group also evidenced higher ratings of self-reported social skills; improvements were also seen in time engaged in academic activities, as measured by independent observational assessment (36). These positive effects were not replicated in a rigorous RCT that examined the effects of a three-tiered, schoolwide aggression intervention in early- and late-grade elementary schools in an inner city and in an urban poor community (35). Researchers found that compared with the control condition, the tertiary-level intervention had significant effects on aggressive behavior when it was delivered to children during the early school years in the urban poor community. Aggressive behavior was measured through a composite of standardized assessment instruments. However, none of the interventions were effective in preventing aggression among older elementary school children.

Integrated behavioral management interventions. Integrated interventions demonstrated promising findings in preventing and reducing problem behaviors among diagnosed and at-risk children. The Fast Track program had a significant impact on lowering the likelihood of diagnosis of conduct disorder and externalizing behavior among children identified as being at the highest risk of antisocial behavior; however, the intervention did not have an impact on the resulting diagnoses of children who had moderate baseline risk levels (23). In a recent article that assessed the impact on the onset of various disorders of random assignment to the Fast Track intervention, researchers found that the intervention implemented over a ten-year period prevented externalizing psychiatric disorders among the highest risk group, including during the two years after the intervention ended (40). In another study, youths who had participated in the Fast Track program had reduced use of professional general medical, pediatric, and emergency department services for health-related problems, compared with youths in a control group, ten years after the first year of the intervention (39). These findings indicate that this program could be very beneficial and cost-effective if targeted to high-risk children.

The CLAS program also demonstrated significant positive results; children receiving this intervention showed decreased inattention symptoms and increased social and organizational skills compared with peers who were assigned randomly to a control group (24). For families randomly assigned to ATP, adolescents had lower rates of antisocial behavior and substance use, and families reported stronger parent-child interactions and parenting practices, compared with those in control conditions (25,38). Overall, the effectiveness of integrated behavioral management interventions can be characterized as relatively strong.

Conclusions

Evidence is promising regarding the effectiveness of specific behavioral management interventions. Although these effects vary depending on setting and intervention type and some studies had methodological limitations, a number of reviews and subsequent studies have reported positive results of these interventions for improving child behavior in multiple settings. The level of evidence is in the high range, particularly among family-centered and integrated family-school program models (see box on this page). The benefits of integrated family-school models include service access for families. If implemented early, such interventions may assist in early detection and treatment of problem behaviors before they become more severe. Children and adolescents have been shown to benefit from these interventions, and given the importance of early intervention to reduce the potentially negative consequences of disruptive behavior later in life, these findings are encouraging. In addition, integrated family-school approaches appear to allow strategies that are implemented in the home to be reinforced in school settings, thus providing an additional level of collaboration and support between the school and family.

For policy makers and payers (for example, state mental health and substance use directors, managed care companies, and county behavioral health administrators), the findings of this review suggest a number of benefits to the implementation of behavioral management interventions. Detection and intervention at early stages of problem behavior generally are less costly than intensive services for severe problem behavior. Implementation of effective

treatment when children exhibit early signs of problem behavior may prevent future engagement in criminal activity, substance use, and juvenile justice system involvement. It may also reduce the need for costly emergency services or residential treatment. There has been limited research examining the long-term outcomes of behavioral management interventions; however, some studies—such as those investigating Fast Track (39,40)—have shown positive long-term results into young adulthood. There could be considerable cost savings if these interventions demonstrate long-lasting impacts; thus, future research should continue to examine the long-term outcomes of these types of behavioral management programs.

Studies need to be replicated by independent investigators in ethnically and racially diverse populations to confirm the strength of the evidence base and generalizability of the results. The level of evidence is somewhat dependent on the implementation setting assessed, and research findings are mixed on the effectiveness of school-based interventions that are not integrated with family interventions. There is a need for further research to examine for whom and under what conditions tertiary school-based interventions are effective, and research suggests that starting early in development may be a particularly effective approach.

For decision makers, research has established the value of behavioral management approaches to address problem behavior, and we recommend that behavioral management be considered as part of covered services. However, additional research is needed to examine the effects of behavioral management interventions implemented in school settings, given various methodological limitations in the literature. Current limitations of research conducted in this area are related to generalizability, measurement, study design, and long-term outcomes. Also, as researchers have highlighted, interventions that are designed to address the behavioral needs of children in school settings should examine not only the treatment effects but also the conditions under which an intervention in a school setting is most effective (35). Factors such as symptom severity, school characteristics, and the child's race, ethnicity, language (including language fluency of the parents), and sex are important moderating variables to examine when determining the effects of a school-based intervention. In addition, future research on behavioral management interventions should specifically examine the various treatment components included in the intervention to determine whether there are "key ingredients" associated with particular outcomes that are effective without commercial packaging or whether the specific combinations of practices contained in these intervention packages are required to produce the reported results.

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References

1. Ensminger ME, Slusarcick AL: Paths to high school graduation or dropout: a longitudinal study of a first-grade cohort. Sociology of Education 65:95–113, 1992
2. Moffitt TE: Adolescence-limited and life-course-persistent antisocial behavior: a developmental taxonomy. Psychological Review 100:674–701, 1993
3. Loeber R, Farrington DP: Young children who commit crime: epidemiology, developmental origins, risk factors, early interventions, and policy implications. Development and Psychopathology 12:737–762, 2000
4. Snyder H: Epidemiology of official offending; in Child Delinquents: Development, Intervention, and Service Needs. Edited by Loeber R, Farrington DP. Thousand Oaks, Calif, Sage, 2001
5. Broidy LM, Nagin DS, Tremblay RE, et al: Developmental trajectories of childhood disruptive behaviors and adolescent delinquency: a six-site, cross-national study. Developmental Psychology 39:222–245, 2003
6. Dodge KA, Pettit GS: A biopsychosocial model of the development of chronic conduct problems in adolescence. Developmental Psychology 39:349–371, 2003
7. Bradshaw CP, Schaeffer CM, Petras H, et al: Predicting negative life outcomes from early aggressive-disruptive behavior trajectories: gender differences in maladaptation across life domains. Journal of Youth and Adolescence 39:953–966, 2010
8. Carr EG, Horner RH, Turnbull AP, et al: Positive Behavior Support for People With Developmental Disabilities: A Research Synthesis. Washington, DC, American Association on Mental Retardation, 1999
9. Safran SP, Oswald K: Positive behavior supports: can schools reshape disciplinary practices? Exceptional Children 69:361–373, 2003
10. Gresham FM: Current status and future directions of school-based behavioral interventions. School Psychology Review 33: 326–343, 2004
11. Fisher W, Groff R, Roane H: Applied behavior analysis: history, principles, and basic methods; in Handbook of Behavior Analysis. Edited by Fisher W, Piazza C, Roane H. New York, Guilford, 2011
12. Bandura A: Social Learning Theory. Englewood Cliffs, NJ, Prentice Hall, 1977
13. Herschell A, Calzada E, Eyberg S, et al: Parent-Child Interaction Therapy: new directions in research. Cognitive and Behavioral Practice 9:9–16, 2002
14. Brinkmeyer M, Eyberg S: Parent-Child Interaction Therapy for oppositional children; in Evidence-Based Psychotherapies for Children and Adolescents. Edited by Kazdin A, Weisz J. New York, Guilford, 2003
15. Webster-Stratton CH, Reid M: The Incredible Years parents, teachers, and children training series: a multifaceted treatment approach for young children with conduct problems; in Evidence-Based Psychotherapies for Children and Adolescents. Edited by Kazdin AE, Weisz JR. New York, Guilford, 2003
16. Eyberg SM, Nelson MM, Boggs SR: Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. Journal of Clinical Child and Adolescent Psychology 37:215–237, 2008
17. Kutash K, Duchnowski A, Lynn N: School-Based Mental Health: An Empirical Guide for Decision-Makers. Tampa, University of South Florida, Louis de la Parte Florida Mental Health Institute, Research and Training Center for Children's Mental Health, 2006. Available at rtckids.fmhi.usf.edu/rtcpubs/study04/SBMHfull.pdf. Accessed Sept 6, 2013
18. Educational environments for students with disabilities: applying positive behavioral support in schools; in Twenty-Second Annual Report to Congress on the Implementation of the Individuals With Disabilities Education Act. Washington, DC, US Department of Education, 2000. Available at www2.ed.gov/about/reports/annual/osep/2000/chapter-3.pdf. Accessed Sept 6, 2013
19. Goh AE, Bambara LM: Individualized positive behavior support in school settings:

a meta-analysis. Remedial and Special Education 33:271–286, 2012

20. Sugai G, Horner R: The evolution of discipline practices: school-wide positive behavior supports. Child and Family Behavior Therapy 24:23–50, 2002

21. Sprick RS, Garrison M: Interventions: Evidence-Based Behavioral Strategies for Individual Students. Eugene, Ore, Pacific Northwest Publishing, 2008

22. Sugai G, Horner RR: A promising approach for expanding and sustaining school-wide positive behavior support. School Psychology Review 35:245–259, 2006

23. Conduct Problems Prevention Research Group: Fast track randomized controlled trial to prevent externalizing psychiatric disorders: findings from grades 3 to 9. Journal of the American Academy of Child and Adolescent Psychiatry 46:1250–1262, 2007

24. Pfiffner LJ, Yee Mikami A, Huang-Pollock C, et al: A randomized, controlled trial of integrated home-school behavioral treatment for ADHD, predominantly inattentive type. Journal of the American Academy of Child and Adolescent Psychiatry 46: 1041–1050, 2007

25. Dishion TJ, Kavanagh K: A multilevel approach to family-centered prevention in schools: process and outcome. Addictive Behaviors 25:899–911, 2000

26. Dougherty RH, Lyman DR, George P, et al: Assessing the evidence base for behavioral health services: introduction to the series. Psychiatric Services, 2013; doi 10.1176/appi.ps.201300214

27. Brestan EV, Eyberg SM: Effective psychosocial treatments of conduct-disordered children and adolescents: 29 years, 82 studies, and 5,272 kids. Journal of Clinical Child Psychology 27:180–189, 1998

28. Thomas R, Zimmer-Gembeck MJ: Behavioral outcomes of Parent-Child Interaction Therapy and Triple P-Positive Parenting Program: a review and meta-analysis. Journal of Abnormal Child Psychology 35: 475–495, 2007

29. Kaslow NJ, Broth MR, Smith CO, et al: Family-based interventions for child and adolescent disorders. Journal of Marital and Family Therapy 38:82–100, 2012

30. Njoroge WF, Yang D: Evidence-based psychotherapies for preschool children with psychiatric disorders. Current Psychiatry Reports 14:121–128, 2012

31. Bagner DM, Sheinkopf SJ, Vohr BR, et al: Parenting intervention for externalizing behavior problems in children born premature: an initial examination. Journal of Developmental and Behavioral Pediatrics 31:209–216, 2010

32. Berkovits MD, O'Brien KA, Carter CG, et al: Early identification and intervention for behavior problems in primary care: a comparison of two abbreviated versions of parent-child interaction therapy. Behavior Therapy 41:375–387, 2010

33. Lau AS, Fung JJ, Ho LY, et al: Parent training with high-risk immigrant Chinese families: a pilot group randomized trial yielding practice-based evidence. Behavior Therapy 42:413–426, 2011

34. Webster-Stratton CH, Reid MJ, Beauchaine T: Combining parent and child training for young children with ADHD. Journal of Clinical Child and Adolescent Psychology 40:191–203, 2011

35. Metropolitan Area Child Study Research Group: A cognitive-ecological approach to preventing aggression in urban settings: initial outcomes for high-risk children. Journal of Consulting and Clinical Psychology 70:179–194, 2002

36. Iovannone R, Greenbaum PE, Wang W, et al: Randomized controlled trial of the Prevent-Teach-Reinforce (PTR) tertiary intervention for students with problem behaviors: preliminary outcomes. Journal of Emotional and Behavioral Disorders 17: 213–225, 2009

37. Forster M, Sundell K, Morris RJ, et al: A randomized controlled trial of a standardized behavior management intervention for students with externalizing behavior. Journal of Emotional and Behavioral Disorders 20:169–183, 2012

38. Dishion TJ, Kavanagh K, Schneiger A, et al: Preventing early adolescent substance use: a family-centered strategy for the public middle school. Prevention Science 3:191–201, 2002

39. Jones D, Godwin J, Dodge KA, et al: Impact of the Fast Track prevention program on health services use by conduct-problem youth. Pediatrics 125:e130–e136, 2010

40. Conduct Problems Prevention Research Group: The effects of the Fast Track preventive intervention on the development of conduct disorder across childhood. Child Development 82:331–345, 2011

41. Scott TM, Bucalos A, Liaupsin C, et al: Using functional behavior assessment in general education settings: making a case for effectiveness and efficiency. Behavioral Disorders 29:189–201, 2004

42. Simonsen B, Fairbanks S, Briesch A, et al: Evidence-based practices in classroom management: considerations for research to practice. Education and Treatment of Children 31:351–380, 2008

43. Thompson AM: A systematic review of evidence-based interventions for students with challenging behaviors in school settings. Journal of Evidence-Based Social Work 8:304–322, 2011

44. 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. Behavior Therapy 43:606–618, 2012

45. Leung C, Tsang S, Heung K, et al: Effectiveness of Parent-Child Interaction Therapy (PCIT) among Chinese families. Research on Social Work Practice 19: 304–313, 2009

46. Fernandez MA, Butler AM, Eyberg SM: Treatment outcome for low socioeconomic status African American families in Parent-Child Interaction Therapy: a pilot study. Child and Family Behavior Therapy 33: 32–48, 2011

47. Webster-Stratton C: Parent training in low-income families: promoting parental engagement through a collaborative approach; in Handbook of Child Abuse Research and Treatment. Edited by Lutzker J. New York, Plenum, 1998

48. Webster-Stratton C: Preventing conduct problems in Head Start children: strengthening parenting competencies. Journal of Consulting and Clinical Psychology 66: 715–730, 1998

49. McMenamy J, Sheldrick RC, Perrin EC: Early intervention in pediatrics offices for emerging disruptive behavior in toddlers. Journal of Pediatric Health Care 25:77–86, 2011

50. Webster-Stratton C, Reid MJ, Hammond M: Treating children with early-onset conduct problems: intervention outcomes for parent, child, and teacher training. Journal of Clinical Child and Adolescent Psychology 33:105–124, 2004