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Early Intervention in Pediatrics Offices for Emerging Disruptive Behavior in Toddlers

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Abstract

Background—This study provides preliminary data about a parenting intervention for families of preschoolers with early ADHD/ODD symptoms carried out in two diverse primary care pediatric offices.

Method—Parents of toddlers completed behavioral screening questionnaires at well-child visits. Eligible parents participated in a 10-week parenting education group using the Incredible Years Program. Mothers completed several outcome measures at three time points - before participating in the group, immediately after the group ended, and six months thereafter. These measures assessed changes in parenting practices, parenting stress, and child symptoms. Parent and provider satisfaction were also assessed.

Results—Mothers reported improvements in parenting skills and decreases in stress. They also reported decreases in child aggression and increases in compliance. Mothers and providers reported high levels of satisfaction.

Conclusions—Results support the benefits and feasibility of providing parenting education groups to parents of toddlers in pediatric practice settings.

Keywords

pediatrics; intervention; parenting; parenting education; disruptive behavior; ADHD; ODD

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) and Oppositional Defiant Disorder (ODD) are among the most frequently diagnosed disorders in childhood; prevalence estimates for school-age children ranging from 3–18% (American Psychiatric Association,

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1994; Baumgartel, Wolraich, & Dietrich, 1994; Esser, Schmidt, & Woerner, 1990; Kroes et al., 2001; Pope & Bierman, 1999; Vuchinich, Bank, & Patterson, 1992). A number of studies suggest that ADHD and ODD symptoms such as hyperactivity, impulsivity, and aggressiveness often emerge in early childhood and remain stable thereafter (Landy & Peters, 1992; Smith et al., 2004; von Stauffenberg et al., 2007). Barkley (1998) has indicated that at least 50% of preschool children with ADHD symptoms will exhibit problematic symptoms into adolescence. Lavigne et al. (1998) found that a majority of preschoolers maintained a diagnosis of ADHD, ODD, or Conduct Disorder (CD) for 1–3 years after their initial assessment. In a comprehensive review, moderately high levels of stability (at least 50%) have been predicted for more than 2 years (Campbell, 1995).

Recent research also suggests that early externalizing symptoms predict diagnoses of ADHD and ODD later in childhood. In one study, over 67% of mothers of children with ADHD traced the onset of their child's symptoms to before 4 years of age (Connor, 2002; Harvey et al., 2009). In a large prospective study, 47% of children with elevated ADHD/ODD behaviors at 3 years were found to have symptoms of ADHD at 5 years (Auerbach et al., 2003). In contrast, none of the preschoolers without behavior problems had clinically significant problems at age 5 (Hill et al., 2004). Children who exhibit early externalizing symptoms are also at higher risk for other psychological and social problems (Barkley, 1998; Danforth, Barkley, & Stokes, 1991; DuPaul et al., 2001). Having a diagnosis of ADHD is one of the strongest predictors of a diagnosis of Conduct Disorder before the age of 10 (Lahey & Loeber, 1997). Children with ADHD and ODD are at elevated risk for co-occurring internalizing symptoms such as depression and anxiety (Biederman et al., 1996; Leober et al., 2000; Pierce, Ewing, & Campbell, 1999; Wilens et al., 2002).

Notably, parents of pre-school children displaying ADHD and ODD symptoms report higher levels of stress and more frequent use of negative parenting strategies (e.g., coercive discipline) than other parents (Burke, Loeber, & Birmaher, 2002; Cunningham & Boyle, 2002; DuPaul et al., 2001; Fisher, 1990). Undeniably, the genetic underpinnings of ADHD are quite strong (Thapar, Hervas, & McGuffin, 1995). However, negative parenting practices may contribute to co-occurring diagnoses of ADHD and ODD. They may also lead to more severe impairments in the school, social, and home arenas among children with ADHD and play a direct causal role in the development of ODD (Patterson, 1998; Stromshak et al., 2000).

Stimulant medication is often the first-line treatment for school-age children with ADHD and recent research indicates that stimulants are effective for preschoolers (Wigal et al., 2006; Vitiello et al, 2007). At the same time, there is continued uncertainty about the effects of stimulants upon developing CNS structures and guidelines have suggested the cautious use of these medications with pre-schoolers (Connor, 2002). Furthermore, studies suggest that long term adherence to stimulant treatment is remarkably low (Concannon & Tang, 2005; Habel, Schaefer, & Levine, 2005; Thiruchelvam & Charach, 2001). As such, behavioral treatment has been recommended as the first choice for preschoolers (Conners et al., 2001). Parenting education programs are an important option in this category given the negative parent-child interaction patterns typically associated with early onset symptoms of ADHD and ODD (Barkley, 1998; Dupaul et al., 2001). The Incredible Years Program (IYP) by Webster-Stratton is one such program; the efficacy of the IYP for children with disruptive behavior has been documented extensively (Hartman, Stage, & Webster-Stratton, 2002; Scott et al, 2001; Taylor et al., 1998; Webster-Stratton, 1997).

While the majority of efficacy studies have focused upon school-aged children, preliminary evidence suggests that the IYP may be effective for younger children (Brotman et al, 2003; Gross et al., 2003; Tucker at al., 1998) and as a preventive intervention (Reid, Webster-

Stratton, & Beauchaine, 2001). Targeting young children who are just beginning to display externalizing symptoms provides an ideal opportunity for change. For example, negative parent- child interaction patterns may not be rigidly set. Furthermore, recent research indicates that early parenting behaviors such as maternal verbosity may affect toddlers' compliance (Hakman & Sullivan, 2009). Parent-child synchrony during the toddler period has also been associated with children's self-control (Lindsey et al., 2009). Thus, techniques provided in parenting education programs such as the IYP may increase the positive management of symptoms and decrease their severity.

Pediatric practices are an ideal context to identify young children exhibiting early symptoms of ADHD and ODD. Pediatricians and nurse practitioners have frequent and consistent contact with families during the first four years of life (Perrin, 1999; Schor, 2004). They have also increasingly embraced an expanded role overseeing the developmental, emotional, and social well being of children (Green, 1994; AAP, 1997; Perrin, 1999; McMenamy & Perrin, 2002). Finally, they are called upon more than ever to provide mental health services such as formal behavioral screening, brief counseling, and prescribing psychotropic medications (Kelleher & Long, 1994; Schroeder, 1999). Indeed, more than 75% of office visits for ADHD are handled in pediatric primary care settings (Zarin et al., 1998).

The present study describes a combined screening and parenting education program, Parenting Resource and Education Project (PREP), for 2–3 year old children displaying early symptoms of ADHD and ODD. In two diverse pediatric practices, parents completed brief behavioral screening questionnaires at well-child visits. Eligible families that enrolled in PREP attended a 10-week parenting education program located in their pediatrician's office. They also completed several outcome measures at three time points - before the parenting program began, immediately after the program ended, and six months thereafter. These measures assessed parenting practices, parenting stress, and child symptoms. Parents and providers also completed questionnaires about their satisfaction with the program. Thus, the present study provides preliminary data about the efficacy and feasibility of the program in two diverse primary care pediatric offices.

METHODS

Participants

The study was conducted at two sites. The primary site was a 10-provider, 8 pediatricians and 2 nurse practitioners, practice located in a small city in central Massachusetts that serves families from a wide range of socioeconomic statuses. Over a 7-month period, 620 children between the ages of 2 and 3 were scheduled for well-child visits. Of these, 55% (n = 341) completed screening questionnaires and 17% (n = 59) met our criteria for elevated ADHD/ ODD symptoms. Forty-three families were successfully contacted; 42% (n=18) of families agreed to join PREP. The most common reasons for non-completion of screening questionnaires were appointment cancellations or inability to complete the screener in English. Reasons for non-participation in PREP included logistical difficulties (e.g., work conflicts) and inability to commit to a long-term project.

Regarding the 18 participating families at this site, 7 reported annual income below $25,000. Children of thirteen families were white, 1 was Asian, and 4 were Hispanic. Mothers of all but one family completed high school, and 8 completed college.

All caregivers for each child were invited to participate in PREP, but more than one parent participated in only 5 families. Three families dropped out over the course of the parenting education sessions.

Our second site was an urban health center in Boston that serves primarily low-SES families from diverse cultural and racial backgrounds. Over a 3.5 month period, 80 families were identified for screening. Of these, 74% (n = 59) completed the screener and 29% (n=17) met our criteria for elevated ADHD/ODD symptoms and were invited to enroll in PREP. Ten of these families were successfully contacted, and 50% (n=5) families enrolled in PREP. Reasons for non-completion of the screening questionnaire and non-participation in PREP paralleled those at our primary site.

Regarding the 5 participating families at this site, 4 reported annual income below $25,000. Children of 4 families were African-American, and 1 was white. Mothers of all families completed high school, and 3 completed college.

None of the 5 families at our second site had more than one parent participate in PREP. All families completed the parenting group and the post-intervention assessment; one was lost to follow-up thereafter. Thus, the final sample from both sites was the primary caregivers of 23 children.

Measures

Screening questionnaire—Our 10 minute screening measure consisted of 5 subscales of the Infant Toddler Social-Emotional Assessment (ITSEA) (Carter & Briggs-Gowan, 2000). The ITSEA assesses social-emotional problems and competencies of 12–48 month-old children, and has solid reliability (ICC = .82, test-retest, externalizing problems; UCC = .78 test-retest, attention competency) and construct validity (r = .71 with CBCL 2/3) (Carter et al., 2003). The subscales we used were Aggression, Hyperactivity/Impulsivity, Peer Aggression, Compliance, & Attention Skills. Families were eligible for PREP if their child scored at or above the 80th percentile on any of the five subscales. The screening questionnaire was re-administered post-intervention and at the 6 month follow-up assessment as an outcome measure.

Our screener performed well in the study. Internal consistency was satisfactory for all 5 subscales (α = .67 – .87), as was retest reliability over a one month period (ICC = .66 –.78). Furthermore, the overall externalizing scale of our measure correlated significantly with parent reports on the externalizing problem scale of the CBCL/1.5–5 (r=.46, p<.01).

Demographic questionnaire—Participants completed a demographic questionnaire assessing family structure, income and education levels, and preliminary health information about the child and family.

Achenbach Child Behavior Checklist (CBCL 2/3)—The parent form of the CBCL 2/3 consists of 118 items assessing child behavior in several domains. This study will report data on the following domains: Total Problems, Externalizing, and Internalizing. The CBCL has strong psychometric properties (Achenbach & Rescorla, 2000): interclass correlations were .84 for test-retest reliability and .98 for interrater agreement.

The LIFT Parenting Practices Interview (PPI)—The PPI is a 43-item questionnaire adapted by Webster-Stratton (1998) from the Oregon Social Learning Center's Discipline questionnaire and revised for preschoolers. Exploratory factor analysis isolated 4 parenting domains consisting of items related to: (1) Harsh parenting: (2) Inconsistent discipline; (3) Appropriate discipline; and (3) Positive parenting strategies.

The internal reliabilities for the three domains are adequate (α = .57 – .73) and these domains have also displayed reasonable stability over time (r = .50 – .77) (ref). The PPI has been used extensively in studies of the IYP.

Parenting Stress Index (PSI)—The PSI short form consists of 25 items assessing the degree of perceived stress among parents related to parenting roles. The PSI is organized according to child and parent characteristics (Baydar, Reid, & Webster-Stratton, 2003). The PSI demonstrates adequate retest reliability, Chronbach's alpha ranging from .65 – .85, and internal consistency, Chronbach's alpha ranging from .80 – .91 (Abidin, 1983).

Parent Satisfaction Questionnaire (PSQ)—The PSQ is a 40-item Likert scale questionnaire assessing topics such as parents' satisfaction with the attention paid to child behavior and development in the parenting group and the difficulty of the intervention. The measure has been used extensively be Webster-Stratton in her evaluations of the IYP, and has been shown to have sound internal consistency (Webster-Stratton & Hammond, 1997). Participants in the present study completed a shortened version of the PSQ once during their involvement in PREP at the end of the parenting education sessions

Pediatrician Satisfaction Questionnaire (PedSQ)—The PedSQ is a 12-item Likert scale questionnaire assessing topics such as the degree to which the screening procedures provide useful information and/or disrupts the flow of well-child visits, and whether the screening procedures and/or parenting education program impact the time and effort demands related to managing patients' behavioral problems. The PedSQ was designed for use with PREP and is piloted in this study. Ten providers, 8 pediatricians and 2 nurse practitioners, completed the PedSQ shortly after the screening and parenting education sessions had been completed in their practice.

Procedures

All of the procedures were reviewed and approved by the Institutional Review Board at Tufts University School of Medicine.

Description of PREP screening and intervention protocol—On a weekly basis, a member of the pediatric office nursing staff notated all 2 and 3 year-old children who had a scheduled well child visit. Upon arrival at the practice for the well-child visit, receptionists gave parents the screening questionnaire and asked them to complete it while waiting for their appointments.

Parents of children who displayed high levels of ADHD or ODD symptoms were invited to participate in PREP. These families were contacted by mail by their primary care pediatrician and asked for permission to have PREP staff contact them. If they agreed, PREP was explained by a research assistant by telephone. Interested families were invited to meet on an individual basis with a research assistant to further review the content of the program and to complete demographic forms and informed consent documents. All caregivers for the child were invited to attend the initial meeting and participate in PREP. If only one caregiver could participate in the project, the family was still eligible for PREP.

Participating parents attended a 10-week parenting education group that met for 2 hours each week in the evening at the pediatric office. Each meeting began with a small dinner for participants, and families were given a small stipend to offset childcare costs. In families where only one caregiver participated, a workbook summarizing program content was provided for the co-parent.

The curriculum of the group session consisted of the IYP BASIC program. This program focuses upon strengthening parent skills through 4 modules: play, praise and reward, effective limit setting, and handling misbehavior. Concepts of the program are introduced through videotaped vignettes and are explicated through group discussion. Weekly homework assignments allow parents opportunities to try out concepts presented in the

meeting. Parenting education sessions were run by a nurse practitioner with experience in group counseling, and were co-led by a doctoral student in Clinical Psychology. Both the leader and co-leader completed training in the IYP program.

Description of assessment protocol—Participants completed all outcome measures 3 times during their enrollment in PREP - at a pre-intervention interview, post-intervention within one week of the end of the parenting group, and 6 months after the end of the parenting group. Participants were able to complete the assessment packet at home after it was mailed to them or at the pediatric practice with a research assistant present. Each assessment packet took about 70 minutes to complete. Participants received $40 for each packet completed.

Analyses—To examine change over time, we conducted repeated measures ANOVAs for each dependent measure. All analyses were based on intent-to-treat, meaning that participants who did not complete follow-up assessments were assumed to maintain symptoms at pre-intervention levels. Given that only a few families had more than one parent participate, even when more than one parent was involved (5 out of 23 families), analyses included data only from the mother.

Tukey post hoc tests were used to examine statistically significant change between the pre-intervention interview and the post-intervention interview, and between the pre-intervention interview and the 6-month follow-up interview. Cohen's effect sizes and standard p values are reported for each test. To account for multiple comparisons, we controlled for a false discovery rate (FDR) of alpha = .05 (Benjamini & Hochberg, 1995). The FDR controls the expected proportion of incorrectly rejected null hypotheses (type 1 errors). Using this method, a probability (a_i) is calculated for each test indicating the chance that rejecting its null hypothesis will result in a Type I error. The value a_i is then compared to alpha to determine significance.

RESULTS

Parent Outcomes

Mothers reported high levels of satisfaction with the program. All mothers who completed the Parent Satisfaction Questionnaire at the end of the 10 sessions (n = 19) reported that their overall feeling about the program was "positive" or "very positive." Seventy-nine percent (n = 15) reported being "satisfied" or "greatly satisfied" with their child's progress, and 100% of mothers reported that they would "recommend" or "strongly recommend" the program to a friend. Furthermore, 94% (n = 18) considered the approach used to change child behavior was "appropriate" or "very appropriate," and 85% (n = 16) felt "confident" or "very confident" about their abilities to manage future behavioral problems on their own. Ninety-four percent (n = 18) also felt that the parenting program helped them with personal and/or family problems.

Mothers also reported significant improvements in their parenting skills. After intervention, mothers displayed improvement on four of five parenting measures (see Table 1). Parenting stress ($p < .005$), use of harsh discipline ($p = .02$) and inconsistent use of discipline declined, and use of positive parenting techniques ($p < .005$) increased. Change was still apparent on these measures at 6-month follow-up, by which time the use of appropriate discipline displayed an increase as well ($p = .03$).

Child Symptoms

After intervention, mothers reported that children displayed improvement on six of seven behavioral measures (see Table 2). Competencies, such as compliance ($p < .005$) and attention skills ($p = >01$), increased. Internalizing symptoms decreased ($p = .01$), as did several externalizing scales, including the Externalizing domain on the CBCL ($p < .005$) and the ITSEA scales, Activity Level ($p = .01$) and Aggression ($p < .005$). Change was still apparent on these measures at 6-month follow-up with one exception: the increase in attention skills from the pre-intervention assessment fell to a level just below statistical significance ($p = .08$).

Pediatric Staff Satisfaction

Pediatricians and nurse practitioners also described a high level of satisfaction with the screening and intervention protocols. Specifically, all 10 providers surveyed reported little or no negative impact on their collateral workload (e.g., paperwork, phone calls) and few or no additional burdens on office space. All providers reported little to no negative impact on the flow of their workload (e.g., running behind schedule). The majority claimed little to no burden on their schedules (9 of 10) and on the workload of support staff (7 of 10). In addition, 7 of 10 providers reported “moderate” to “significant” changes with regards to the parent group improving overall care by offering a needed service. For example, in a follow-up discussion with a group of providers, one stated “We receive so many questions about parenting and child development. Having a young child that displays challenging behaviors can be really stressful. It was really nice to have a resource to offer to these families.”

DISCUSSION

The Surgeon General’s Conference on Children’s Mental Health (1999) has cited the prevention of mental health problems among youths as a national priority. We have described a combined screening and parenting education program, Parenting Resource and Education Project (PREP), consistent with this priority. PREP was designed to capitalize upon the multiple opportunities for observation and conversation between pediatricians, nurse practitioners, and parents during the first several years of life. Through systematic screening during pediatric well-child visits at 2 and 3 years of age, we identified parents who reported early symptoms of ADHD and ODD in their children. In response, we integrated into a new context, the primary care pediatric office, an empirically validated parenting education program, the Incredible Years Program (IYP), for these parents.

Many prior studies of IYP include school-aged children already diagnosed with ADHD and/or ODD (Hartman et al., 2002; Scott et al, 2001; Taylor et al., 1998; Webster-Stratton, 1997, and a few recent studies support the efficacy of IYP for preschoolers (Brotman et al, 2003; Gross et al., 2003; Tucker at al., 1998) and for children who do not have any mental health diagnosis (Reid, Webster-Stratton, & Beauchaine, 2001). The results of PREP are consistent with those in other reports. The mothers in our study reported less stress in their parenting roles and notable improvements in their parenting skills, including less frequent use of harsh and inconsistent discipline and more frequent use of positive parenting techniques. Mothers also reported improvement in their children’s behaviors after the intervention; specifically, they saw their children as more compliant and attentive. They reported decreases in children’s aggressive and hyperactive behaviors as well as in internalizing symptoms. Importantly, 9 of the 10 significant changes in both the parent and child domains were maintained through the 6 month post-intervention follow-up.

Despite the enormous potential for primary care pediatricians and nurse practitioners to be involved in the identification and early treatment of behavioral problems (Bauer & Webster-

Stratton, 2006), the IYP program has rarely been incorporated in the pediatric context. Thus, the present study also provides important information about the feasibility of implementing parenting education programs in primary care pediatric offices. First, all of the mothers reported that participating in PREP was a positive experience and that they would recommend the program to a friend. The majority of mothers were also satisfied with their child's progress and felt confident about their abilities to manage future behavior problems.

Second, the 10 providers involved in this study also reported high levels of satisfaction with PREP. All of them reported that the screening procedures had little to no negative impact on their collateral workload and upon the flow of patients through their office. PREP also did not create any additional burdens upon their office space, and the majority did not think that the workload of their office staff was negatively impacted. The majority of providers believed that the parent groups improved overall patient care at their practice by offering a needed service.

Third, it is important to highlight that PREP was implemented in two diverse pediatric offices in very diverse communities. One was a large 10 provider private practice in a small central MA city that serves families from a wide variety of backgrounds; the other was an urban health center that serves families from a central Boston neighborhood. Small adaptations were needed at both locations to achieve successful screening rates. One consideration in implementing any group intervention is the volume of eligible participants. If the number is too small, the lag time between enrolling the first parents and beginning the intervention may become unacceptably long. Almost half of our sample reported an annual income of under $25,000 and 40% were Black, Hispanic, or Asian. Unfortunately, one of the reasons for non-participation at both sites was limited English fluency. The ability to run groups in Spanish and other languages is vitally important to increase the availability of parenting education to families in need. Our success in carrying out a series of parenting education groups in these two very different practices with a very diverse sample provides initial evidence supporting the feasibility of implementing programs such as PREP in a range of pediatric settings.

There are a number of limitations to this study. Most notably, the absence of a comparison groups precludes our ability to make statements about direct effects of PREP upon parent and child behaviors. Sample bias may also be present in that non-participating families may have been systematically different (e.g., SES, the severity of their child's symptoms) from families that enrolled in PREP. While the results are robust, the small sample size might limit generalizability. Furthermore, our results are based solely upon data from parent reports. An observational measure of parent-child interaction would better assess changes in parent and child behaviors. All of these limitations are being addressed in our current randomized controlled trial of our screening and intervention protocol in 10 diverse pediatric practices across Massachusetts.

CONCLUSIONS

This study contributes initial data about the efficacy and feasibility of PREP in two diverse pediatric offices. Despite the promising nature of these findings, it is important to note that the results are preliminary and that this pilot study is not a true test of the long-term viability of PREP. Although the project took place in a real-world community setting, several supports were in place to maximize the program's success. The group leaders were a trained nurse practitioner and psychologists that were part of our research team, and the majority of planning/set-up for the weekly group meetings was also done by research staff. Furthermore, parents were offered dinner before group meetings and a small childcare stipend. They were

also reimbursed for completing assessments. All of these factors must be considered when evaluating the ability of a program to be transferred to a naturalistic setting.

Our long-term goal is to demonstrate the effectiveness of a routine screening and intervention protocol in pediatric practice settings. An effectiveness study will need to build upon the positive foundation established by our current data and address significant pragmatic considerations and barriers to the long-term viability of the program. For example, viable reimbursement mechanisms do not currently exist for both the screening and intervention components. We have begun discussions with major third-party payers in Massachusetts to explicitly authorize reimbursement for parenting education groups. Additional training is needed to provide pediatric staff with the skills and confidence to independently run parent groups. By continuing to provide positive data about the efficacy of our program and by addressing the aforementioned barriers, we hope to ensure sustainability of parenting education programs in pediatric primary care.

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References

Abidin, RR. Parenting stress index: Manual. Charlottesville, VA: Pediatric Psychology Press; 1983.

Achenbach, TM.; Rescorla, LA. Manual for the ASEBA preschool forms and profiles. Burlington, VT: University of Vermont Research Center for Children, Youth, and Families; 2000.

American Academy of Pediatrics. Guidelines for health supervision III. East Grove, IL: AAP; 1997.

American Psychiatric Association. Diagnosis and statistical manual of mental disorders. 4. Washington, DC: American Psychiatric Press; 1994.

Auerbach JG, Atzaba-Poria N, Berger A, Landau R. Emerging developmental pathways to ADHD: Possible path markers in early infancy. Neural Plasticity 2003;52:29–43.

Barkley, RA. Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment. 2. New York: Guilford Press; 1998.

Bauer NS, Webster-Stratton C. Prevention of behavioral disorders in primary care. Current Opinion in Pediatrics 2006;18:654–660. [PubMed: 17099366]

Baumgartel A, Wolraich M, Dietrich M. Comparison of diagnostic criteria for attention deficit disorders in a German elementary school sample. Journal of the American Academy of Child and Adolescent Psychiatry 1995;34:629–638. [PubMed: 7775358]

Baydar N, Reid J, Webster-Stratton C. The role of mental health factors and program engagement in the effectiveness of a preventive parenting program for Head Start mothers. Child Development 2003;74:1433–1453. [PubMed: 14552407]

Benjamini Y, Hochberg Y. Controlling the false discovery rate: A practical and powerful approach to multiple testing. Journal of the Royal Statistical Society 1995;57:289–300.

Biederman JS, Faraone S, Milberger S, Guite S, Mick E, Chen L, Mennin D, Marrs A, Ouellette C, Moore P, Spencer T, Norman D, Wilens T, Kraus I, Perrin J. A prospective 4-year follow-up study of attention deficit-hyperactivity and related disorders. Archives of General Psychiatry 1996;53:437–446. [PubMed: 8624187]

Brotman LM, Klein RG, Kamboukos D, Brown EJ, Coard SI, Sosinsky LS. Preventive intervention for urban, low-income preschoolers at familial risk for conduct problems: A randomized pilot study. Journal of Clinical Child and Adolescent Psychology 2003;32:246–257. [PubMed: 12679283]

Burke JD, Loeber R, Birmaher B. Oppositional defiant disorder and conduct disorder: A review of the past 10 years, Part II. Journal of the American Academy of Child and Adolescent Psychiatry 2002;41:1275–1293. [PubMed: 12410070]

Campbell SB. Behavior problems in preschool children: A review of recent research. Journal of Child Psychiatry 1995;36:113–149.

Carter, AS.; Briggs-, Gowan MJ. Infant-toddler social and emotional assessment (ITSEA): Manual. Boston, MA: 2000.

Carter AS, et al. The Infant-toddler social emotional assessment (ITSEA): Factor structure, reliability, and validity. Journal of Abnormal Child Psychology 2003;31:495–514. [PubMed: 14561058]

Concannon P, Tang Y. Management of attention deficit hyperactivity disorder: A parental perspective. Journal of Pediatric Child Health 2005;12:625–630.

Conners, CK.; March, JS.; Frances, A.; Wells, KC.; Ross, R., editors. Journal of Attention Disorders. Vol. 4. 2001. Treatment of attention-deficit/hyperactivity disorder: expert consensus guidelines; p. S1-S128.

Connor D. Preschool attention deficit hyperactivity disorder: A review of prevalence, diagnosis, neurobiology, and stimulant treatment. Journal of Developmental and Behavioral Pediatrics 2002;23:S1–10. [PubMed: 11875284]

Cunningham CE, Boyle MH. Preschoolers at risk for attention-deficit hyperactivity disorder in preschoolers. Child Neuropsychology 2002;4:49–66.

Danforth JS, Barkley RA, Stokes TF. Observations of parent-child interactions with hyperactive children: research and clinical implications. Clinical Psychology Review 1991;11:703–727.

DuPaul GJ, McGoey KE, Eckert TL, van Brackle J. Preschool children with attention-deficit/hyperactivity disorder: Impairments in behavioral, social, and school functioning. Journal of the American Academy of Child and Adolescent Psychiatry 2001;40:508–515. [PubMed: 11349694]

Esser G, Schmidt MH, Woerner W. Epidemiology and course of psychiatric disorders in school-age children – results of a longitudinal study. Journal of Child Psychology & Psychiatry 1990;31:243–263. [PubMed: 2312652]

Fisher M. Parenting stress and the child with attention deficit hyperactivity disorder. Journal of Clinical Child Psychology 1990;19:337–346.

Green, M. Bright Futures: Guidelines for health supervision of infants, children, and adolescents. Arlington, VA: National Center for Education in Maternal and Child Health; 1994.

Gross D, Fogg L, Webster-Stratton C, Garvey C, Julion W, Grady J. Parent training of toddlers in day care in low-income urban communities. Journal of Consulting and Clinical Psychology 2003;71:261–278. [PubMed: 12699021]

Habel LA, Schaefer CA, Levine P, Bhat AK, Elliot G. Treatment with stimulants among youths in a large California health plan. Journal of Child and Adolescent Pharmacology 2005;15:62–77.

Hakman M, Sullivan M. The effect of task and maternal verbosity on compliance in toddlers. Infant and Child Development 2009;18:195–205.

Hartman RR, Stage SA, Webster-Stratton C. A growth curve analysis of parent training outcomes: Examining the influence of child risk factors (inattention, impulsivity, and hyperactivity problems), parental and family risk factors. Journal of Child Psychiatry and Psychology 2002;44:388–398.

Harvey E, Youngwirth S, Thakar D, Errazuriz P. Predicting ADHD and ODD from preschool diagnostic assessments. Journal of Consulting and Clinical Psychology 2009;77:342–354.

Hill LG, Coie JD, Lochman JE, Greenberg MT. Effectiveness of early screening for externalizing problems: Issues of screening accuracy and utility. Journal of Consulting and Clinical Psychology 2004;72:809–820. [PubMed: 15482039]

Kelleher KJ, Long N. Barriers and new directions in mental health services research in the primary care setting. Journal of Clinical Child Psychology 1994;23:133–142.

Kroes M, Kalff AC, Kessels AG, Steyaert J, Feron FJ, van Someren AJ, Hurks PP, Hendriksen JG, van Zeben MC, Rozendaal N, Crolla IF, Troose J, Jolles J, Vles JS. Child psychiatric diagnoses in a population of Dutch school children aged 6 to 8 years. Journal of the American Academy of Child and Adolescent Psychiatry 2001;40:1401–1409. [PubMed: 11765285]

Lahey, BB.; Loeber, R. Attention – deficit/hyperactivity disorder, oppositional defiant disorder, conduct disorder, and adult antisocial behavior: A lifespan perspective. In: Stoff, D.; Breiling, J.; Maser, J., editors. Handbook of antisocial behaviors. New York, NY: Wiley; 1997. p. 15-59.

Landy, S.; Peters, RD. Toward an understanding of a developmental paradigm for aggressive conduct problems during the preschool years. In: Peters, R.; McMahon, R.; Quincy, V., editors. Aggression and violence throughout the lifespan. Newbury Park, CA: Sage; 1992. p. 1-30.

Lavigne JV, Arend R, Rosenbaum D, Binns H, Christoffel K, Gibbons R. Psychiatric disorders with onset in the preschool years: I. Stability and diagnoses. Journal of the American Academy of Child and Adolescent Psychiatry 1998;37:1246–1254. [PubMed: 9847496]

Lindsey EW, Cremeens PR, Colwell M, Caldera Y. The structure of parent-child synchrony in toddlerhood and children's communication, competence, and self-control. Social Development 2009;18:375–396.

Loeber R, Burke JD, Lahey BB, Winters A, Zera M. Oppositional defiant and conduct disorder: A review of the past 10 years, Part 1. Journal of the American Academy of Child and Adolescent Psychiatry 2000;34:348–358.

McMenamy J, Perrin EC. Integration of psychology into pediatrics: The past, the present, and the potential. Families, Systems, & Health 2002;20:18–30.

Patterson GR. Continuities – A search for causal mechanisms: Comment on special section. Developmental Psychology 1998;34:1263–1268. [PubMed: 9823510]

Perrin EC. Collaboration in primary care: A pediatrician's view. Journal of Pediatric Psychology 1999;24:453–458. [PubMed: 10554458]

Pierce E, Ewing LJ, Campbell S. Diagnostic status and symptomatic behavior of hard-to-manage preschool children in middle childhood and early adolescence. Journal of Clinical Child Psychology 1999;28:44–57. [PubMed: 10070606]

Pope AW, Bierman KL. Predicting adolescent peer problems and antisocial activities. Developmental Psychology 1999;35:335–346. [PubMed: 10082005]

Reid MJ, Webster-Stratton C, Beauchaine TP. Parent training in Head Start: A comparison of program response among African-American, Asian American, Caucasian, and Hispanic mothers. Prevention Science 2001;2:209–227. [PubMed: 11833925]

Report of the Surgeon General's Conference on Children's Mental Health: A National Action Agenda. Department of Health and Human Services Administration, Center for mental health services, National Institutes of Health, National Institute of Mental Health; 1999.

Schor EL. Rethinking well-child care. Pediatrics 2004;114:210–216. [PubMed: 15231930]

Schroeder C. Commentary: A view from the past and a look to the future. Journal of Pediatric Psychology 1999;24:447–452. [PubMed: 10554457]

Scott S, Splender Q, Doolan M, Jacobs B, Aspland H. Multicentre controlled trial of parenting groups for child antisocial behavior in clinical practice. British Medical Journal 2001;323:194–198. [PubMed: 11473908]

Smith CL, Calkins SD, Keane SP, Anastopoulos AD, Shelton TL. Predicting stability and change in toddler behavior problems: Contributions of maternal behavior and child gender. Developmental Psychology 2004;40:29–42. [PubMed: 14700462]

Stormshak EA, Bierman KL, McMahon RJ, Lengua LJ. Conduct Problems Prevention Research Group. Parenting practices and child disruptive behavior problems in early elementary school. Journal of Clinical Child Psychology 2000;29:17–29. [PubMed: 10693029]

Taylor TK, Schmidt F, Pepler D, Hodgins C. A comparison of eclectic treatment with Webster-Stratton's parents and children series in a children's mental health center: A randomized controlled trial. Behavior Therapy 1998;29:221–240.

Thiruchelvam D, Charach A, Schacar RJ. Moderators and mediators of long-term adherence to stimulant medication in children with ADHD. Journal of the American Academy of Child and Adolescent Psychiatry 2001;40:922–928. [PubMed: 11501692]

Thapar A, Hervas A, McGuffin P. Childhood hyperactivity scores are highly heritable and show sibling competition effects: twin study evidence. Behavior Genetics 1995;25:537–544. [PubMed: 8540892]

Tucker S, Gross D, Fogg L, Delaney K, Lapporte R. The long-term efficacy of a behavioral parent training intervention for families with 2-year-olds. Research in Nursing & Health 1998;21:1–18.

Vitiello B, Abikoff H, Chuang S, McCracken J, Swanson J, McGough J, et al. Effectiveness of methylphenidate in the 10-month continuation phase of the preschoolers with ADHD treatment study. Journal of Child and Adolescent Psychopharmacology 2007;17:593–603. [PubMed: 17979580]

von Stauffenberg C, Campbell S. Predicting the early developmental course of symptoms of attention deficit hyperactivity disorder. Journal of Applied Developmental Psychology 2007;28:536–552.

Vuchunich S, Bank L, Patterson GR. Parenting, peers, and the stability of antisocial behavior in preadolescent boys. Developmental Psychology 1992;28:510–521.

Webster-Stratton C, Hammond M. Treating children with early-onset conduct problems: A comparison of child and parent training interventions. Journal of Consulting and Clinical Psychology 1997;65:93–109. [PubMed: 9103739]

Wigal T, Greenhill L, Chuang S, Vitiello B, Swanson J, Abikoff H, et al. Safety and tolerability of methylphenidate in preschool children with ADHD. Journal of the American Academy of Child and Adolescent Psychiatry 2006;45:1294–1303. [PubMed: 17028508]

Wilens TE, Biederman J, Brown S, Tanguay S, Monuteaux MC, Blake C, Spencer TJ. Psychiatric comorbidity and functioning in clinically referred preschool children and school-age youths with ADHD. Journal of the American Academy of Child and Adolescent Psychiatry 2002;41:262–268. [PubMed: 11886020]

Zarin DA, Tanielian TL, Suarez AP, Marcus SC. Treatment of attention-deficit hyperactivity disorder by different physician specialties. Psychiatric Services 1998;49:171. [PubMed: 9574998]

Table 1

Means and Standard Deviations for Parent Outcomes

			Assessment			p values			Effect Sizes	
Domain	**Scale**		**Pre- Intervention**	**Post- Intervention**	**6-Month Follow- Up**	**Overall Model**	**1 v 2**	**1 v 3**	**1 v 2**	**1 v 3**
Parenting Stress	PSI total score	M	85.79	65.20	69.55	0.00	0.00*	0.00*	−0.87	−0.64
		SD	13.24	31.71	31.92					
Negative Parenting	PPI Harsh Discipline	M	2.80	2.28	2.41	0.01	0.02*	0.03*	−0.74	−0.50
		SD	0.89	0.43	0.64					
	PPI Inconsistent Discipline	M	3.34	2.96	2.84	0.01	0.03*	0.01*	−0.46	−0.60
		SD	0.70	0.98	0.95					
Positive Parenting	PPI Appropriate Discipline	M	4.38	4.59	4.75	0.11	0.28	0.03*	0.21	0.39
		SD	0.98	1.00	0.92					
	PPI Positive Parenting	M	4.22	4.76	4.57	0.00	0.00*	0.03*	0.75	0.51
		SD	0.72	0.72	0.67					

*Note. Probability of false discovery (a_i) < .05

Table 2

Means and Standard Deviations for Child Outcomes.

			Assessment			p values			Effect Sizes	
Domain	**Scale**		**Pre- Intervention**	**Post- Intervention**	**6-Month Follow-Up**	**Overall Model**	**1 v 2**	**1 v 3**	**1 v 2**	**1 v 3**
Externalizing Problems	CBCL Externalizing	M	25.80	19.40	18.35	0.00	0.00	0.00	−0.76	−0.93
		SD	7.26	8.62	7.78					
	ITSEA Activity Level	M	2.20	2.00	1.89	0.00	0.01*	0.00*	−0.48	−0.69
		SD	0.44	0.38	0.43					
	ITSEA Aggression	M	2.11	1.77	1.76	0.00	0.00*	0.00*	−0.86	−0.85
		SD	0.39	0.38	0.42					
	ITSEA Peer Aggression	M	1.27	1.27	1.29	0.98	0.95	0.90	−0.02	0.03
		SD	0.59	0.37	0.47					
Internalizing Problems	CBCL Internalize	M	13.20	9.45	9.60	0.00	0.01*	0.01*	−0.59	−0.54
		SD	7.26	5.26	6.06					
Competencies	ITSEA Compliance	M	2.03	2.30	2.37	0.00	0.00*	0.00*	0.76	0.91
		SD	0.33	0.38	0.41					
	ITSEA Attention Skills	M	1.89	2.04	2.00	0.02	0.01*	0.08	0.41	0.30
		SD	0.39	0.34	0.36					

*Note. Probability of false discovery (a_i) < .05