BRIEF REPORT

The Role of Parent Characteristics in Community-Based Medication Treatment for Children with Disruptive Behavior Problems

Ann F. Garland · Lauren Brookman-Frazee ·
Emily Gray

Abstract Studies have documented increased psychoactive medication use rates among children, but little is known about what child and/or family characteristics predict medication treatment in community-based care. This study examines the role of parent characteristics in children's medication treatment, while accounting for other potential predictors. Participants included 213 children ages 4–13 with disruptive behavior problems. Medication treatment was assessed by parent report; potential predictors of medication treatment, including child characteristics and parent characteristics (e.g., education level, perceived strain and psychopathology) were assessed at service intake. Over 60 % of children used a psychoactive medication during the 16 month study period (most commonly stimulants). Parent education level and reported strain were significant predictors of children's medication treatment even when accounting for other significant predictors such as child diagnosis, age, race/ethnicity, etc. Results highlight the role that parent characteristics have in accessing community-based medication treatment for children with disruptive behavior problems.

A. F. Garland · L. Brookman-Frazee
Department of Psychiatry, University of California, San Diego, CA, USA

A. F. Garland (✉) · L. Brookman-Frazee
The Child and Adolescent Services Research Center (CASRC), Rady Children's Hospital, 3020 Children's Way, MC 5033, San Diego, CA 92123, USA
e-mail: agarland@ucsd.edu

E. Gray
Massachusetts General Hospital, Boston, MA, USA

Introduction

Reports of significant increases in psychoactive medication use among children have raised national attention (Comer et al. 2010; Olfson et al. 2002; Zito et al. 2003). While several medications have demonstrated efficacy and are recommended as best practices, there is considerable debate about increased utilization, with concerns about safety and effectiveness (Comer et al. 2010; Jensen et al. 1999; Riddle et al. 2005). More clinical research on intervention efficacy and safety is clearly needed, but to identify research-practice gaps, there is a complementary need for more practice-based clinical epidemiological research on psychopharmacological treatment in routine community-based settings (McLennan et al. 2006).

Research identifying predictors or correlates of delivery of children's psychoactive medication treatment is needed to understand forces influencing utilization trends. Consistent with research on other types of health care service utilization (e.g., Andersen et al. 1983), both clinical (e.g., diagnosis, symptom severity) and non-clinical (e.g., race/ethnicity, insurance coverage) factors predict children's psychoactive medication use. Although there are discrepancies across studies and for specific medications, in general, psychopharmacological treatment is more likely for children who are male, white, older, in foster care, have at least one psychiatric disorder, in particular disruptive externalizing behaviors, and have a disabled status qualifying them for federal assistance (Comer et al. 2010; dos Reis et al. 2005; Luby et al. 2007; Zito et al. 2008).

Parents obviously play a significant role in accessing mental health care for their children (Shin and Brown 2005), but the extent to which parent characteristics specifically influence the likelihood of medication treatment for their children is not known. A parent's perceived caregiver strain (e.g., economic, psychological, and/or social strain) is a significant predictor of entry into mental health care (Angold et al. 2002), but the role of parent strain in likelihood of medication treatment for the child once in care is unknown. Parental depression has been shown to reduce the likelihood of children's receipt of medication for treatment of ADHD (Leslie et al. 2007), but more research is needed on parental psychopathology and use of diverse psychoactive medications for children. The parent's education level may also be a significant predictor of children's psychoactive medication use.

The most common presenting problems represented among children receiving psychoactive medications are disruptive behavior problems, including ADHD, (DBPs) (Comer et al. 2010), and children with DBPs represent the vast majority of youth presenting to publicly funded outpatient mental health care (Garland et al. 2001). DBPs are often difficult to treat and given the frequent co-occurrence of a number of biological, functional, and psychosocial risk factors for development of these problems, multimodal interventions are recommended (Burke et al. 2002). Studies support the positive impact of stimulant medications in reducing ADHD symptoms among children with DBPs (MTA group 1999; Biederman et al. 2007; Kaplan et al. 2004); although the longer term benefits are questionable (Jensen et al. 2007). In a meta-analysis, positive outcomes for DBPs were also associated with Lithium and Risperidone (Ipser and Stein 2007). However, there is concern about adverse effects of atypical antipsychotics like Risperidone in children including significant weight gain and metabolic adverse effects (Varley and McClellan 2009).

Given the significantly rising rates of psychoactive medication use and concerns about potential adverse effects and/or limited long-term effectiveness, more research is needed to identify clinical and non-clinical factors associated with medication treatment among children in routine community-based care. The goals of this study are to (a) describe medication use for children with DBPs treated in community mental health clinics and, (b) specifically test how selected parent characteristics (e.g., education level, perceived caregiver strain, and severity of psychopathology symptoms) may influence the likelihood of any medication treatment, specific classes of medication treatment, and use of medications from multiple classes, while also accounting for other potential predictors such as child diagnosis, age, race/ethnicity, funding source, etc.

Methods

This study was part of a larger federally-funded longitudinal study of routine care for a representative sample of providers, children, and their parents; more detail on research methods and psychotherapy services is provided in Garland et al. 2010. Multiple methods (e.g., record review, participant interview) were used to collect data on services delivered and child/family characteristics, as described below.

Participants

Participating Clinics and Providers

The study was conducted in the six largest clinics providing publicly-funded care in one large Southwestern city. All clinics provided general mental health care to children and families and none specialized in any particular disorder or intervention model. Medication evaluation and management was provided by board eligible or board certified child and adolescent psychiatrists in four of the clinics, and by residents in a child psychiatry fellowship under faculty supervision in two of the largest clinics.

Child and Parent Participants

Inclusion criteria for child patient participants were (a) presenting problems included a DBP (defined as: aggressive, defiant, delinquent, and/or oppositional behavior by parent report) regardless of diagnosis, (b) age between 4 and 13 years, (c) English or Spanish as primary language for child and parent and (d) child entering a new episode of psychotherapy (defined as no therapy for previous 3 months) with a participating therapist. Potential participants were recruited sequentially into the study when they began treatment with one of the 100 study therapists. Eighty-five percent (n = 218) of the 258 potential participants consented to participate. Medication use data are missing for five children due to inability to contact parents for follow-up interviews, thus the final study sample is 213.

The average age of the child participants was 9 years (SD = 2.7) and 145 (68 %) of them were male. The sample was racially/ethnically diverse with 100 (47 %) Caucasian children, 63 (30 %) Latino children, 22 (13 %) African American children, and 28 (13 %) mixed/other. The majority (87 %) of parent participants were biological mothers and 122 (57 %) of the children lived in single parent households; the average annual income was $36,052 (SD = 30,400; range: $60–250,000; note that a few high income families were receiving these publicly funded services through school-based funding that is not linked to income level). Parent participants provided informed

written consent and children provided assent; protocols were approved by affiliated human subjects committees.

Procedures and Measures

Medication Treatment

Medication treatment for the child was assessed via parent interview beginning 4 months after service entry and repeated every 4 months during the 16 month study period. Parents were asked, "In the last 4 months, has (your child) used any medications for an emotional or behavioral problem?" If yes, "please tell me the name of (a/another) medication (your child) has taken since our last interview." This question was repeated until the parent listed all medications. Parents' responses were recorded verbatim and then classified in the medication classes listed below, consistent with other studies (Leslie et al. 2007; Raghavan et al. 2005). Parental report has been used in multiple studies to assess children's service use, and has been shown to be a valid and reliable general indicator of children's medication treatment(e.g., Bussing et al. 2003). Although, studies suggest that parental report may not be as valid for more precise assessment of dose adherence and/or timing of children's medication use (Pappadopulos et al. 2009), this is not a focus of this study. Follow-up time-points were aggregated across this longitudinal study because of (a) concerns about validity of reporting precision regarding timing of medication use, and (b) observation of resulting data which revealed limited variability in start-up and discontinuation.

Psychoactive medications were grouped into classes based primarily on mechanism of action. *Stimulants (plus atomoxetine)* included amphetamine compounds, dexmethylphenidate, and methylphenidate, plus atomoxetine. *Antipsychotics* included aripiprazole, olanzapine, quetiapine, risperidone, and ziprasidone. *Antidepressants* broadly grouped together selective serotonin reuptake inhibitors, tricyclic compounds, serotonin–norepinephrine reuptake inhibitors and other categories of mechanisms (citalopram, buproprion, escitalopram, fluoxetine, imipramine, paroxetine, sertraline). *Mood Stabilizers/Anticonvulsants* included carbamazepine, lamotrigine, lithium, oxcarbazepine, topiramate, valproic acid, and zonisamide. The *Other category* included central adrenergic agonists, beta blockers and benzodiazepines (clonazepam, clonidine, diazepam, guanfacine, lorazepam, propranolol, terazosin).

Predictor Variables

Key parent variables are presented first followed by potential covariate predictors.

Caregiver Strain

Caregiver strain was assessed using the Caregiver Strain Questionnaire (CGSQ) (Brannan et al. 1997), a 21 item self-report scale that measures parents' perceptions of the impact of caring for a child with emotional and behavioral problems across six areas: economic burden, impact on family relations, disruption of family activities, impact on psychological adjustment of family members, stigma, anger and worry/guilt. The global score at service entry, representing the mean of all items, was used in the current study. Psychometric qualities of the scale are well established (Brannan et al. 1997; McCabe et al. 2003).

Parental Psychopathology

Parental emotional and behavioral symptom severity was assessed using the Brief Symptom Inventory (BSI) (Derogatis and Melisaratos 1983), a 53 item self-report assessing a wide variety of psychiatric symptoms rated on a 5-point scale of intensity. The global severity index at service entry, used in this study, is a combined measure of the number of symptoms endorsed and the intensity of perceived distress. The reliability and validity of the BSI have been well supported (Derogatis and Melisaratos 1983).

Parental Education

The parents' highest level of education was self-reported and coded into a three point scale as follows: (1) Some high school or less; (2) High school diploma, G.E.D., Some college education; (3) College degree or more.

Additional Potential Predictors

Child Socio-Demographics Data on child age, gender, and race/ethnicity was obtained in a baseline in-person interview with the parent. Given the relatively small numbers in some categories of race/ethnicity, the analyses were conducted by classifying children into White (47 %, n = 100) and Non-White (53 %, n = 113).

Child Clinical Variables As noted above, study inclusion required disruptive behavior as a primary referral or presenting problem, but clinician-assigned diagnoses were varied including, ADHD (49 %, n = 104), Oppositional defiant/conduct disorder (31 %, n = 66), Mood disorders (29 %, n = 61) and Anxiety disorders (18 %, n = 38), and Autism Spectrum disorders (9 %, n = 19). Given that many children received more than one diagnosis, dichotomous variables for each diagnosis were entered into analyses. Child symptom severity was assessed using the Eyberg Child Behavior Problems Inventory (ECBI)

(Eyberg et al. 2008). The ECBI is a 36 item, well established parent report measure of behavior and emotional problems for children ages 2 through 16. The intensity scale at baseline was used here to capture the most variability in intensity of problems. Psychometric characteristics are well established (Boggs et al. 1990).

Service Entry Variables Data on funding source (Medi-Cal vs. School-based) was obtained from billing records and referral source (self, school, or other) was obtained from baseline parent interview.

Data Analyses

Data analyses were conducted in stages. First, descriptive data on frequency of medication use and number of medication classes were calculated for the full sample of 213 children, collapsing across interview time points so that use reflects any reported use in the 16 month study period. Next, bivariate analyses (chi-square and t tests depending on type of variable) were used to screen for significant associations between the potential predictors and medication use. Predictors that were significantly related to use ($p < .05$) were then entered into the final multivariate logistic regression model. Given that the main aim of the study was to test whether parent characteristics contributed significantly to likelihood of use beyond the effects of child and service entry characteristics, the variables were entered in two steps (i.e., step one included significant child or service entry characteristics with a significant bivariate relationship to medication treatment use and step two included significant parent characteristics). The Nagelkerke R^2 statistic reflects the amount of additional variation explained by the addition of parent characteristics to the model. The predictors that retained a significant relationship with use in the multivariate model are reported with the odds ratio and confidence interval. To examine specificity of predictors for individual classes of medication use, the same staged approach was used with each medication class outcome, but only the subsample of children with any medication use was included (n = 134).

Results

Use of Any Medication

The number of children who used at least one psychoactive medication during the 16 month study period was 134 out of 213 (62.9 %); 67 children (31.5 %) used medications from more than one class. The mean number of medication classes used for all children was 1.10 ($SD = 1.11$; range 0–4).

Predictors of Medication Treatment

Of all variables tested (as listed in the "Methods" section), the following eight were significantly ($p < .05$) associated with use of any medication in bivariate analyses (the sign represents the direction of the relationship): child male gender (+), child "non-white" race/ethnicity (−), child ADHD diagnosis (+), child DBD diagnosis (−), child comorbid diagnoses (+), school-based funding source (+) caregiver education level (+), and caregiver strain (+). These variables were entered into a hierarchical multivariate regression and five of the variables retained significance ($p < .05$). Specifically, the significant child characteristic predictors were ADHD diagnosis ($OR = 4.41$; 95 % CI 1.93, 10.07); DBD diagnosis ($OR = 0.39$; 95 % CI 0.16, 0.97) and non-white race/ethnicity ($OR = 0.26$; 95 % CI 0.12, 0.57). Significant parent characteristic predictors were education level ($OR = 2.26$; 95 % CI 1.16, 4.38) and caregiver strain ($OR = 2.07$; 95 % CI 1.27, 3.36). Inclusion of parent characteristics increased the variance accounted for in the model (Nagelkerke R-squared statistic increased from 0.350 to 0.427).

Treatment with Specific Medication Classes and Multiple Medication Classes

Of the 134 children who used any medication, 96 (71.6 %) used a stimulant, 45 (33.6 %) used an atypical antipsychotic, 41 (30.6 %) used an antidepressant, 27 (20.1 %) used a mood stabilizer, and 26 (19.4 %) used other medications (antihypertensives and benzodiazepines). 67 (50.0 %) used medications from more than one medication class. Of the 67 children who used more than one medication class, the most frequent combinations included, stimulants and antipsychotics (34.3 %), mood and antipsychotics (29.9 %), stimulants and antidepressants (28.4 %), stimulants and other medications (28.4 %).

Individual multivariate models that included variables pre-screened for a significant bivariate relationship for each medication class indicate that *stimulant* use is predicted by younger child age ($OR = 0.80$; 0.67, 0.96 with older youth as reference) and ADHD diagnosis ($OR = 9.74$; 3.95, 24.93). *Antipsychotic* use was predicted by caregiver strain only ($OR = 1.55$; 1.02, 2.35). There were no significant predictors of use an *antidepressant*. *Mood stabilizer* use was predicted by a child mood disorder diagnosis ($OR = 3.31$; 1.30, 8.41) and higher caregiver strain ($OR = 1.94$; 1.14, 3.30). The Nagelkerke R-squared statistic increased from 0.083 to 0.152 when parent characteristics were entered into the mood stabilizer model. Use of *more than one medication class* was associated with higher caregiver strain only ($OR = 1.67$; 1.01, 2.79).

Discussion

Almost two-thirds (134/213) of child study participants who entered outpatient care for disruptive behavior problems in community-based mental health clinics were treated with psychoactive medications during the 16 month study period and half of those used medications from two or more medication classes during the study period. Among those who used medication, the most frequently used medication class was stimulants (used by over 70 % of the children who used medication); atypical antipsychotics and antidepressants were used by approximately one-third of these children and approximately 20 % used mood stabilizers and other medications. When multiple medications were used within the study period, the most frequently reported combination was antipsychotics and stimulant medications.

The fact that almost two-thirds of these children received some psychoactive medication supports reports of high rates of medication treatment for children with behavioral problems (Olfson et al. 2002). Direct comparisons to existing studies are challenging given different sampling criteria, but one of the closest comparisons is a sample of children ages 8–13 years receiving routine care community-based treatment for disruptive behavior disorders in the Netherlands where 58 % (15 of 26) children used any medication and 93 % (14/15) of those used stimulants only (van de Wiel et al. 2007). Thus the rate of any psychoactive medication treatment was relatively comparable, but the use of medications other than, and in addition to stimulants, was significantly higher in our sample.

The relatively high rate of atypical antipsychotics treatment in our sample of children ages 4–13 is consistent with recent observations of increased rates of use of this class of medications alone and in combination with other drugs (Comer et al. 2010; Olfson et al. 2002). National data indicate that the rate of co-prescription of stimulants and atypical antipsychotics has been rising quickly in recent years (Comer et al. 2010). This was the most common combination for children in our sample, although we cannot conclude that they were taking these medications concurrently, just that they took both medications during the 16 month study period. There is a need for more research on the effectiveness of atypical antipsychotics for children with DBPs given documented metabolic risks (Comer et al. 2010; Crystal et al. 2009; Varley and McClellan 2009) and current research indicating that most children receiving these medications do not receive recommended metabolic screening (Essock et al. 2009; Marrato et al. 2010).

Beyond simply describing utilization rates for children in community-based clinics, the unique aim of this study was to test how parent characteristics may influence medication treatment, while accounting for other predictors. Results indicate that parent factors have a significant role in the likelihood of child medication treatment after accounting for the influence of child and service system factors such as child diagnosis, race/ethnicity, and funding source. Specifically, higher levels of parental education and greater reported caregiver strain were significant and robust predictors of any psychoactive medication treatment. More detailed analyses of specific medication classes indicated that higher caregiver strain was a robust predictor of children's use of antipsychotics, mood stabilizers, and use of medications from multiple classes.

The two significant parent predictors, education level and reported strain, may be somewhat inter-related (although statistically they contributed uniquely to likelihood of medication use). The caregiver strain measure assesses for objective strain, such as fiscal impact and job absences, as well as emotional and social impact such as perceived stigma and worry. Caregiver strain has been found to be an important factor associated with initial access to children's mental health service use across several studies (e.g., Angold et al. 2002; Bussing et al. 2003). This is the first study we are aware of to find that caregiver strain is associated with psychoactive medication treatment for children. Caregiver strain likely motivates parents to seek help for their children. Parents who communicate higher caregiver strain may also motivate physicians to prescribe medications for children to potentially reduce family stress and disruption.

There is limited research on the role of parental education level in children's treatment, but it is likely that education may be associated with treatment preferences, and more specifically, awareness of, and advocacy for psychoactive medications for their child. Education level may be associated with race/ethnicity and research has indicated that parents' from different cultural backgrounds have different attitudes and beliefs about mental health problems, and these attitudes are associated with treatment preferences (Yeh et al. 2005). Specifically, parents from ethnic minority backgrounds are less likely than Caucasian parents to endorse biopsychosocial beliefs about the causes of mental health problems and more likely to endorse alternative beliefs which are associated with a lower likelihood of use of traditional mental health care (Yeh et al. 2005). In addition to cultural difference, our findings suggest that parental education level may contribute uniquely to treatment preferences. Caucasian race/ethnicity and higher parental education level were two robust predictors of psychoactive medication treatment for children during the study period.

Other studies have reported that Caucasian children are more likely to receive psychoactive medications compared

to children from other race/ethnic groups (Goodwin et al. 2001; Leslie et al. 2003; Olfson et al. 2002). This finding was robust in our study in that the race/ethnic effect retained significance while accounting for the potential confounding effects of parental education and funding source.

Other findings regarding predictors of any medication use were not entirely consistent with existing studies. For example, several studies have reported that males are more likely to receive psychoactive medications (Goodwin et al. 2001; Luby et al. 2007; Olfson et al. 2002; Zito et al. 2003). We found a significant bivariate association in this direction, but the effect was not significant in the multivariate model, accounting for the effects of other types of predictors.

Significant child clinical predictors of use of specific classes of medication included logical associations, such as the finding that an ADHD diagnosis predicted use of stimulant medication but inhibited the likelihood of use of antidepressants. In addition, a mood disorder diagnosis significantly predicted use of mood stabilizers. A disruptive behavior disorder diagnosis actually reduced the likelihood of any medication use. These findings provide reassurance regarding the specificity of medication treatment for children with different clinical profiles.

Strengths and Limitations of Study

This is one of the few studies to provide relatively detailed data on the types of care received by children in routine community-based mental health clinics. Children in this study are generally representative of other clinical samples of children receiving community based care, in terms of gender and race/ethnic distribution, as well as common diagnoses (Bickman et al. 1995; Foster et al. 2001; Eyberg et al. 2008; Zima et al. 2005). However, generalizability to other practice contexts is unknown.

Study limitations include the lack of data on the characteristics of the physicians prescribing the medications, but this was not intended as a detailed study of prescribing practices, rather a study of broad indicators of medication treatment patterns and predictors. We do know that the rate of medication use (any medication) reported did not differ significantly by clinic which suggests that there are no major confounding prescriber effects. Study limitations also include the fact that medication use data were based on parent report only, however the validity of parent report of children's medication use is supported in previous research (Bussing et al. 2003). An additional limitation is the lack of data on dosage or duration of use and lack of specificity regarding potential concurrent use versus serial use across the study period.

Future Directions and Clinical Significance

Critical next steps in practice-based research include examination of how medication treatment is associated with outcome trajectories as a main effect and interaction with other services, including psychotherapy. Research on mental health services seems often to be divided into psychosocial services versus medication services. Given that the majority of children in this study were receiving both types of care, more research on the interaction is needed. In addition, more research is needed on provider effects on prescription patterns, including attention to training background, geographic and temporal trends, etc.

This study highlights the significant role that parent characteristics have in determining likelihood of children's psychoactive medication treatment. Parents with more education and/or those experiencing more caregiver strain may be stronger advocates for a variety of treatment interventions for their children, including medication treatment. Alternatively, children without such strong advocates may be less likely to receive treatments. Physicians' clinical decision-making may be influenced by these parent characteristics either explicitly or implicitly. More knowledge about how parents advocate for, or inhibit medication prescriptions and the extent to which advocacy may be driven by clinical need and other factors is needed. In addition, more research is needed on providers' clinical decision-making regarding prescription of psychoactive medications and how they are influenced by parents. Given the public attention to increasing use of psychoactive medications for children, more empirically-derived knowledge about factors associated with prescription practices and patient utilization in usual care contexts is needed.

References

Andersen, R. M., McCutcheon, A., Aday, L. A., Chiu, G. Y., & Bell, R. (1983). Exploring dimensions of access to medical care. *Health Services Research, 18*, 49–74.

Angold, A., Erkanli, E., Farmer, E. M., Fairbank, J. A., Burns, B. J., Keeler, G., et al. (2002). Psychiatric disorder, impairment, and service use in rural African American and white youth. *Archives of General Psychiatry, 59*, 893–901.

Bickman, L., Guthrie, P. R., Foster, E. M., Lambert, E. W., Summerfelt, W. T., Breda, C. S., et al. (1995). *Evaluating managed mental health services: The Fort Bragg experiment*. New York: Plenum Press.

Biederman, J., Spencer, T. J., Newcorn, J. H., Gao, H., Milton, D. R., Feldman, P. D., et al. (2007). Effect of comorbid symptoms of oppositional defiant disorder on responses to atomoxetine in

children with ADHD: A meta-analysis of controlled clinical trial data. *Psychopharmacology (Berl), 190*(1), 31–41.

Boggs, S. R., Eyberg, S., & Reynolds, L. A. (1990). Concurrent validity of the Eyberg child behavior inventory. *Journal of Clinical Child Psychology, 19*, 75–78.

Brannan, A. M., Heflinger, C. A., & Bickman, L. (1997). The caregiver strain questionnaire: Measuring the impact on the family of living with a child with serious emotional disturbance. *Journal of Emotional and Behavioral Disorders, 5*(4), 212–222.

Burke, J., Loeber, R., & Birmaher, B. (2002). 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, 41*(11), 1275–1293.

Bussing, R., Mason, D. M., Leon, C. E., & Sinha, K. (2003). Agreement between CASA parent reports and provider records of children's ADHD services. *The Journal of Behavioral Health Services & Research, 30*(4), 462–469.

Comer, J. S., Olfson, M., & Mojtabai, R. (2010). National trends in child and adolescent psychotropic polypharmacy in office-based practice, 1996–2007. *Journal of the American Academy of Child and Adolescent Psychiatry, 49*(10), 1001–1010.

Crystal, S., Olfson, M., Huang, C., Pincus, H., & Gerhard, T. (2009). Broadened use of atypical antipsychotics: Safety, effectiveness, and policy challenges. *Health Affairs, 28*(5), 770–781.

Derogatis, L. R., & Melisaratos, N. (1983). The brief symptom inventory: An introductory report. *Psychological Medicine, 13*(3), 595–605.

dos Reis, S., Zito, J., Safer, D., Gardner, J., Puccia, K., & Owens, P. J. (2005). Multiple psychotropic medication use for youths: A two-state comparison. *Journal of Child and Adolescent Psychopharmacology, 15*(1), 68–77.

Essock, S. M., Covell, N. H., Leckman-Westin, E., Lieberman, J. A., Sederer, L. I., Kealey, E., et al. (2009). Identifying clinically questionable psychotropic prescribing practices for medicaid recipients in New York State. *Psychiatric Services, 60*(12), 1595–1602.

Eyberg, S. M., Nelson, M. M., & Boggs, S. R. (2008). Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. *Journal of Clinical Child & Adolescent Psychology, 37*(1), 215–237.

Foster, E. M., Kelsch, C. C., Kamradt, B., Sosna, T., & Yang, Z. (2001). Expenditures and sustainability in systems of care. *Journal of Emotional and Behavioral Disorders, 9*, 53–70.

Garland, A. F., Brookman-Frazee, L., Hurlburt, M. S., Accurso, E. C., Zoffness, R. J., Haine-Schlagel, R., et al. (2010). Mental health care for children with disruptive behavior problems: A view inside the therapists' offices. *Psychiatric Services, 61*(8), 788–795.

Garland, A. F., Hough, R. L., McCabe, K. M., Yeh, M., Wood, P. A., & Aarons, G. A. (2001). Prevalence of psychiatric disorders in youths across five sectors of care. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*(4), 409–418.

Goodwin, R., Gould, M., Blanco, C., & Olfson, M. (2001). Prescription of psychotropic medications to youths in office-based practice. *Psychiatric Services, 52*(8), 1081–1087.

Ipser, J., & Stein, D. (2007). Systemic review of pharmacotherapy of disruptive behavior disorders in children and adolescents. *Psychopharmacology (Berl), 19*, 127–140.

Jensen, P. S., Arnold, L. E., Swanson, J. M., Vitiello, B., Abikoff, H. B., Greenhill, L. L., et al. (2007). 3 Year follow-up of the NIMH MTA study. *Journal of the American Academy of Child and Adolescent Psychiatry, 46*(8), 989–1002.

Jensen, P., Bhatara, V., Vitiello, B., Hoagwood, K., Feil, M., & Burke, L. (1999). Psychoactive medication prescribing practices for US children: Gaps between research and clinical practice. *Journal of the American Academy of Child and Adolescent Psychiatry, 38*(5), 557–565.

Kaplan, S., Heiligenstein, J., West, S., Busner, J., Harder, D., Dittman, R., et al. (2004). Efficacy and safety of atomoxetine in childhood attention-deficit/hyperactivity disorder with comorbid oppositional defiant disorder. *Journal of Attention Disorders, 8*(2), 45–52.

Leslie, L. K., Aarons, G. A., Haine, R. A., & Hough, R. L. (2007). Caregiver depression and medication use by youths with ADHD who receive services in the public sector. *Psychiatric Services, 58*(1), 131–134.

Leslie, L. K., Weckerly, J., Landsverk, J., Hough, R. L., Hurlburt, M. S., & Wood, P. A. (2003). Racial/ethnic differences in the use of psychotropic medication in high-risk children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 42*(12), 1433–1442.

Luby, J., Stalets, M., & Belden, A. (2007). Psychotropic prescriptions in a sample including both healthy and mood and disruptive disordered preschoolers: Relationships to diagnosis, impairment, prescriber type, and assessment methods. *Journal of Child and Adolescent Psychopharmacology, 17*(2), 205–215.

Marrato, E. H., Nicol, G. E., Maahs, D., Druss, B. G., Hartung, D. M., Valuck, R. J., et al. (2010). Metabolic screening in children receiving antipsychotic drug treatment. *Pediatrics & Adolescent Medicine, 164*(4), 344–351.

McCabe, K. M., Yeh, M., Lau, A., Garland, A., & Hough, R. (2003). Racial/ethnic differences in caregiver strain and perceived social support among parents of youth with emotional and behavioral problems. *Mental Health Services Research, 5*(3), 137–147.

McLennan, J., Wathen, N., MacMillan, H., & Lavis, J. (2006). Research-practice gaps in child mental health. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*(6), 658–665.

MTA group. (1999). A 14 month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. The MTA Cooperative Group. Multimodal treatment study of children with ADHD. *Archives of General Psychiatry, 56*(12), 1073–1086.

Olfson, M., Marcus, S., Weissman, M., & Jensen, P. (2002). National trends in the use of psychotropic medications by children. *Journal of the American Academy of Child and Adolescent Psychiatry, 14*(5), 514–521.

Pappadopulos, E., et al. (2009). Medication adherence in MTA: Saliva methylphenidate samples versus parent report and mediating effect of concomitent behavioral therapy. *Journal of the American Academy of Child and Adolescent Psychiatry, 48*(5), 501–510.

Raghavan, R., Zima, B. T., Andersen, R. M., Leibowitz, A. A., Schuster, M. A., & Landsverk, J. (2005). Psychotropic medication use in a national probability sample of children in the child welfare system. *Journal of Child and Adolescent Psychopharmacology, 15*(1), 97–106.

Riddle, M., Kastelic, E. A., & Frosch, E. (2005). Pediatric psychopharmacology. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 42*(1), 73–90.

Shin, S., & Brown, T. (2005). Racial and ethnic disparities in caregiver strain and the use of child mental health services: A structural equation model. *Psychiatric Services, 60*(8), 1039–1045.

van de Wiel, N. M., Matthys, W., Cohen-Kettenis, P. T., Maassen, G. H., Lochman, J. E., & van Engeland, H. (2007). The effectiveness of an experimental treatment when compared to care as usual depends on the type of care as usual. *Behavior Modification, 31*(3), 298–312.

Varley, C., & McClellan, J. (2009). Implications of marked weight gain associated with atypical antipsychotic medications in children and adolescents. *Journal of American Medical Association, 302*(16), 1811–1812.

Yeh, M., McCabe, K., Hough, R. L., Lau, A., Fakhry, F., & Garland, A. (2005). Why bother with beliefs? Examining relationships between race/ethnicity, parental beliefs about causes of child problems and mental health service use. *Journal of Consulting and Clinical Psychololgy, 73*(5), 800–807.

Zima, B., Hurlburt, M., Knapp, P., Ladd, H., Tang, L., Duan, N., et al. (2005). Quality of publicly-funded outpatient specialty mental health care for common childhood psychiatric disorders in California. *Journal of the American Academy of Child and Adolescent Psychiatry, 44*(2), 130–144.

Zito, J., Safer, D., dos dosReis S, S., Gardner, J. F., Gardner, J. F., Magder, L., et al. (2003). Psychotropic practice patterns for youth: a 10 year perspective. *Archives of Pediatrics and Adolescent Medicine, 157*, 17–25.

Zito, J., Safer, D., Sai, D., Gardner, J. F., Thomas, D., Coombes, P., et al. (2008). Psychotropic medication patterns among youth in foster care. *Pediatrics, 121*, 157–163.