



Predictors of Partial Hospital Readmission for Young Children with Oppositional Defiant Disorder

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Abstract

This study aimed to: (1) examine rates of readmission among young children with oppositional defiant disorder (ODD) following discharge from a psychiatric partial hospital treatment program, and (2) examine child factors (i.e., age, sex, co-occurring diagnoses, suicidality) and family factors (i.e., parental depression, stress) as prospective predictors of readmission. Participants were 261 children (ages 3–7 years) who entered the study at the time of their initial program admission and who met DSM-IV criteria for ODD. Of these 261 children, 61 (23%) were subsequently readmitted, with most readmissions occurring within 1 year. Cox regression survival analyses demonstrated that younger child age, child suicidal thoughts and behavior, and child PTSD diagnosis were associated with decreased time to readmission. Findings suggest that young children with ODD who present with co-occurring suicidality or PTSD are at risk for readmission following partial hospitalization, with implications for treatment and aftercare planning.

Keywords Early childhood · Partial hospital treatment · Readmission · Oppositional defiant disorder (ODD) · Posttraumatic stress disorder (PTSD) · Suicide

Introduction

Oppositional Defiant Disorder (ODD) is a child psychiatric disorder characterized by irritable mood, anger, argumentativeness, and defiant behavior [1]. Children who present with ODD during early childhood may be at particularly high risk for poor developmental and behavioral outcomes, with evidence to suggest that, when untreated, early emerging ODD is associated with significant impairment during elementary school and adolescence [2, 3].

Several recent studies have shown that children with ODD are also at heightened risk for inpatient psychiatric admission and readmissions [4], with severity of externalizing symptoms associated with younger age at first admission [5]. Indeed, ODD may be associated with significant

behavioral risks (e.g., aggression, threatening behavior, serious rule violations), necessitating admission to high levels of psychiatric care. For example, one recent study found that children with a disruptive behavior diagnosis were 6.2 times more likely to have one or more inpatient psychiatric admissions as compared to children receiving mental health services for most other psychiatric conditions, with only mood disorders emerging as a more robust predictor of psychiatric admission [6]. Further, for some young children with severe externalizing behavior problems, the symptoms contributing to ODD diagnosis may represent only the “tip of the iceberg” with respect to underlying psychopathology and associated clinical risks. For example, children who present with early-onset ODD and psychiatric comorbidity, including depression and anxiety, high-risk behaviors, or heightened family stress, may be vulnerable to a more chronic clinical course, including increased risk for multiple courses of intensive psychiatric treatment, compared to those without these associated problems.

Although repeated contact with intensive clinical care has been observed for a substantial portion of this population, this is not the case for the majority of young children with ODD [7]. Our currently limited ability to prospectively identify those at risk for repeated clinical contact in this

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population poses significant challenges for optimizing discharge planning and strategies for prevention efforts. Understanding risk for early and repeated intensive psychiatric treatment admissions is important because of the costliness of this treatment, as well the potential for psychiatric hospitalization to be disruptive and distressing to both young children and their families. A better understanding of the factors associated with readmission to psychiatric care among young children with ODD may yield specific targets for preventative interventions.

We are aware of no previous research to date that has examined prospective predictors of early psychiatric care and readmission among children with very early-onset ODD. Therefore, the objective of the current study is to characterize risk for readmission in this clinically severe population. Regarding candidate risk factors for readmission in this population, research with older children and adolescents has identified depression [8], disruptive behavior problems [9], and self-injurious behaviors [10] as associated with increased risk of readmission to intensive psychiatric care. In addition, several studies have suggested that family factors (e.g., parental stress, harsh discipline, history of maltreatment) may be associated with increased risk of readmission [9, 11]. It is not clear whether these same variables might also be helpful in predicting treatment readmissions among very young children with ODD. As such, the purpose of this study was to: (1) describe rates of readmission among young children with ODD (ages 3–7 years) who received psychiatric partial hospital treatment, and (2) to examine child and family factors as prospective predictors of partial hospital readmission in this population. Based on the extant literature on psychiatric readmission among school-aged children and adolescents, we particularly focused on co-occurring child psychiatric disorders (including depression, attention deficit hyperactivity disorder, and posttraumatic stress disorder), self-injurious thoughts and behaviors, and parental distress (including depressive symptoms and parenting stress) as hypothesized predictors of intensive treatment readmission.

Method

Participants

Study participants were 261 young children (age 3-years-0-months to 7-years-11-months, M age = 4.67 years, $SD = 1.17$) who met DSM-IV criteria for ODD and were admitted to an early childhood psychiatric partial hospitalization program. In addition to ODD, participating children presented with a wide variety of co-morbid clinical concerns, including mood problems, anxiety, trauma, ADHD, self- and other-directed aggression, and serious family relationship difficulties. Children who were diagnosed with

an intellectual disability or autism spectrum disorder were excluded from the study, as were children who had been previously admitted to the treatment program. Almost three-quarters ($n = 192$; 73.6%) of the participating children were male. Parent-derived reports of race/ethnicity indicated that 15 children (5.7%) were Black/African-American, 163 (62.5%) were Non-Hispanic/White, 26 (10.0%) were Hispanic/Latino, and 57 (21.8%) were classified as “other” or unreported. Ninety-one participating parents (34.9%) reported they were single/never married, 103 (39.5%) reported they were married or part of an unmarried couple, 51 (19.5%) reported they were divorced, separated, or widowed, and 16 (6.1%) did not specify their marital status. Many participating families declined to provide information about family income; for the families who provided this information ($n = 151$), median yearly household income was reported to be \$35,000.

A parent or guardian provided written, informed consent for child and family participation in the study. Index admission data were collected over a period of 4 years, from March 2010–December 2014, with readmission data collected for an additional 12 months (until December 2015). The hospital’s Institutional Review Board approved all study procedures and measures.

Procedures

A parent or primary caregiver completed all study measures and interviews shortly after program admission, usually within 1–2 weeks. A diagnostic interview was administered to caregivers by trained Master’s level or Ph.D. interviewers. Most often, the parent who participated in this interview was the biological mother ($n = 179$, 68.6%) or both biological parents ($n = 33$, 12.6%), although non-maternal caregivers (e.g., biological father only, adoptive parents, other legal guardians) served as primary interview informants for 49 (18.8%) of the participating children.

Measures

Child Psychiatric Diagnoses

The Diagnostic Infant and Preschool Assessment [12] is a semi-structured parent-report interview used to assess for DSM-IV disorders. Interviews were administered to caregivers by Master’s level or Ph.D. clinicians with extensive experience in diagnostic interviewing. Interviewers were trained by the developer of the DIPA, with continued supervision provided by an experienced clinician and lead study author (J.R.B.). The DIPA has been shown to have acceptable test–retest reliability and criterion validity for commonly occurring DSM-IV diagnoses [12].

The DIPA was used to identify children who met DSM-IV criteria for ODD and to assess for the following additional DSM-IV diagnoses: Major Depressive Disorder (MDD), Posttraumatic Stress Disorder (PTSD), and Attention-Deficit/Hyperactivity Disorder (ADHD). Suicidal thoughts and behavior items were excluded when determining MDD diagnosis so as to ensure that any effect observed for MDD was not simply due to the presence of suicide risk; as described below, suicidal thoughts and behaviors were treated as a separate variable in all prospective analyses.

Child Suicidal Thoughts and Behaviors

The DIPA was used to assess for children's suicidal thoughts and behaviors, as these items are queried as part of the MDD module. We defined suicidal thoughts and behaviors as parental endorsement of any of the following three questions: *Does s/he ever think about ending it all? Has s/he made a plan to kill him/herself?, Has s/he ever actually tried to kill him/herself?*

Parental Distress

Parental distress was assessed using the Center for Epidemiological Studies Depression scale [13] and the Parenting Stress Index/Short Form [14]. These measures were completed by 244 (93.5%) and 247 (94.6%) parents, respectively, most often the biological mother (87 and 88%, respectively), at program admission. The CES-D includes 20 items (rated on a four-point scale from “rarely or none of the time” to “most or all of the time”) assessing depressive symptoms (e.g., sad mood, irritability, sleep disruption) experienced over the past week. Items are summed to compute a total score, with scores over 16 considered to be clinically elevated. The PSI/SF includes 36 items (rated on a five-point scale from “strongly agree” to “strongly disagree”) and assesses parents' experience of potentially stressful aspects of parenting. For the purposes of this study, we used the Total Stress scale (computed as the sum of all PSI/SF items) as an index of parents' overall stress within their parenting role, with raw scores above 86 considered to be clinically elevated. Both the CES-D and the PSI/SF have demonstrated sound psychometric properties, with good reliability and validity in clinical and community samples [15, 16].

Partial Hospital Readmission

The number of days from discharge following first partial hospital admission to program readmission or study age out were calculated for all participants. For each patient, follow-up data were collected for the time period between their index hospitalization and the first of three possible outcomes: (i) end date of study readmission data collection (i.e.,

December 2015), (ii) date of first readmission, and (iii) date the patient became too old (i.e., 8 years of age) for readmission to the program.

Data Analyses

Cox regression survival analyses were conducted to assess child sex, suicidal thoughts and behaviors, MDD, PTSD, ADHD, and parental depressive symptoms and parenting stress, in relation to time (in days) to patients' prospective partial hospital readmission, with age at time of index admission co-varied in all analyses. This analytic technique allows for variation in the length of follow-up in longitudinal studies, thus minimizing biases due to attrition and allows for “right censoring” of cases that do not experience the outcome of interest within the prospective phase of the study [17, 18]. Survival analysis utilizes all available data at each time point and is able to account for missing data. First, a series of survival analyses was conducted with each predictor of interest considered in relation to prospective readmission, with age at index admission co-varied. Predictors found to be significant were then entered into a final multivariate model, again with age at index admission co-varied in this analysis.

Results

Descriptive Analyses

Clinical characteristics of the study sample are presented in Table 1. As shown, many participating children presented with comorbid psychiatric diagnoses. Suicidal thoughts and behaviors were endorsed as concerns for approximately 16% of the sample. Parental distress was high, with 59.8

Table 1 Clinical characteristics of the study sample

Variable	N (%) / M (SD)
Co-occurring child psychiatric disorders (DIPA)	
Major depressive disorder (MDD) ^a	94 (36.0%)
Posttraumatic stress disorder (PTSD)	48 (18.4%)
Attention-deficit/hyperactivity disorder (ADHD)	163 (62.5%)
Child suicidal thoughts and behaviors (DIPA)	42 (16.1%)
Parental distress	
Parental depressive symptoms (CESD)	20.36 (12.46)
Parental parenting stress (PSI)	103.02 (20.86)

Note DIPA = Diagnostic Infant and Preschool Assessment, CESD = Center for Epidemiological Studies Depression Scale, PSI = Parenting Stress Index

^aSuicidal thoughts and behaviors were excluded so as to ensure that any effect observed for major depressive disorder is not simply due to the presence of the former

and 79.4% of parents endorsing clinically elevated levels of depressive symptoms and parenting stress, respectively.

Of 261 children admitted for psychiatric partial hospital treatment, 61 (23%) were subsequently readmitted. Children who were readmitted were predominantly male ($n=45$, 73.8%) and were, on average, 4 years old ($M=4.09$, $SD=0.98$) at the time of their index admission. The average time from initial discharge to readmission was 323 days ($SD=293$ days), ranging from 6 days to over 3 years (1234 days). Most readmissions ($n=40$, 66%) occurred within 1 year of the index admission, with fewer than 10% of readmissions ($n=6$) occurring after more than 2 years.

Table 2 Survival analysis of time to readmission

Predictor	OR	95% CI	<i>P</i>
Sex (female)	1.23	.69–2.16	.499
Suicidal thoughts and behaviors	2.09	1.08–4.05	.029
Major depressive disorder (MDD) ^a	1.56	.94–2.59	.088
Post-traumatic stress disorder (PTSD)	1.98	1.09–3.58	.024
Attention-deficit/hyperactivity disorder (ADHD)	0.88	.52–1.47	.616
Parental depressive symptoms (CESD)	1.01	.99–1.03	.365
Parental parenting stress (PSI)	1.00	.99–1.01	.935

Note Each row represents a separate survival analysis with age at time of index admission covaried

^aSuicidal thoughts and behaviors were excluded so as to ensure that any effect observed for major depressive disorder is not simply due to the presence of the former

Prospective Analyses

When evaluated individually, suicidal thoughts and behaviors and PTSD were associated with shorter time to readmission, whereas sex, MDD, ADHD, parental depressive symptoms, and parenting stress were not associated with time to readmission, after age at index admission was covaried (see Table 2). Figures 1 and 2 depict the survival curves for readmission as a function of the presence versus absence of suicidal thoughts and behaviors and PTSD, respectively. Suicidal thoughts and behaviors and PTSD were then entered into a multivariate model, with time to readmission as the criterion variable and age as a covariate. Both variables entered into this model, presented in Table 3, remained associated with shorter time to readmission.

Discussion

The purpose of this study was to describe rates of readmission among young children with ODD (ages 3–7 years) who received psychiatric partial hospital treatment, and to evaluate child and family factors as prospective predictors of partial hospital readmission. About one-quarter of the sample was readmitted, with most readmissions occurring within 1 year of index admission. To our knowledge, this is the first study to examine readmission rates for such a young age group, although comparable rates have been reported in samples of older children and adolescents [11, 19].

Fig. 1 Time to subsequent readmission as a function of suicidal thoughts/behaviors. Although figures for suicidal thoughts/behaviors and PTSD appear identical, they do accurately reflect respective analyses

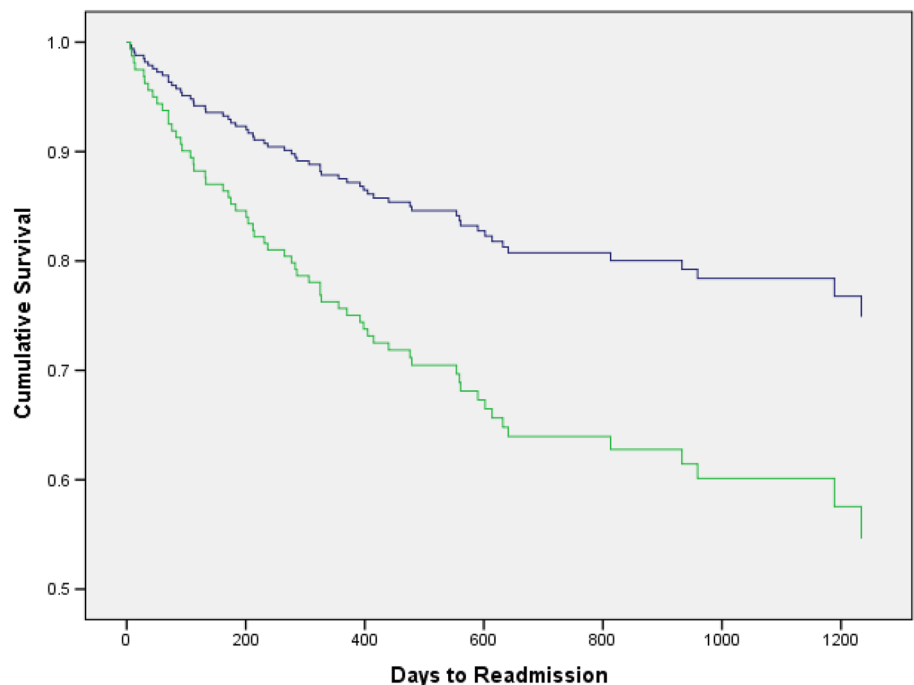


Fig. 2 Time to subsequent readmission as a function of PTSD diagnosis. Although figures for suicidal thoughts/behaviors and PTSD appear identical, they do accurately reflect respective analyses

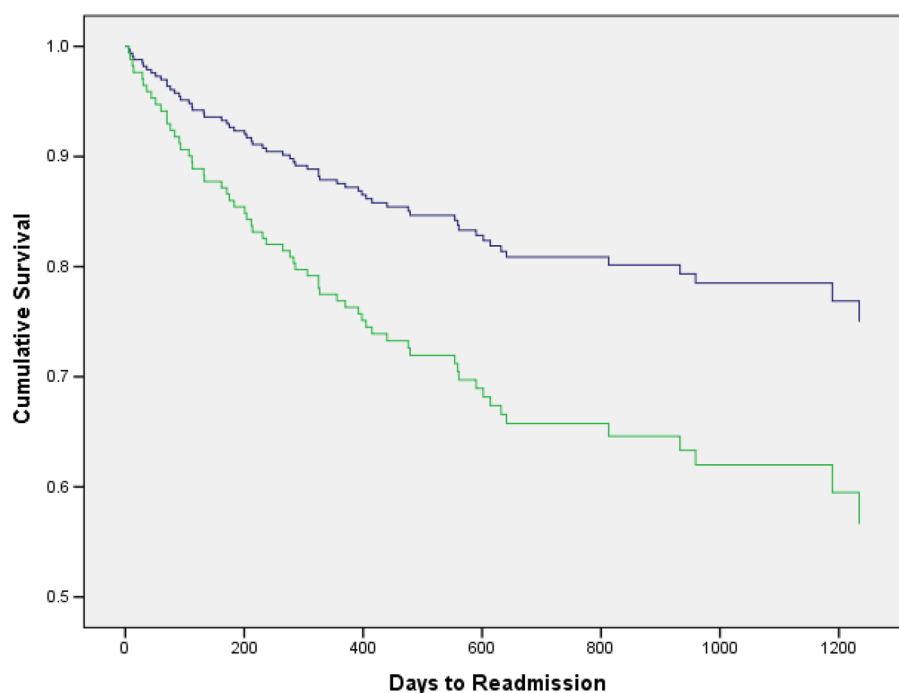


Table 3 Multivariate survival analysis of time to readmission

Predictor	OR	95% CI	<i>P</i>
Age	.64	.49–.83	.001
Suicidal thoughts and behaviors	1.99	1.02–3.87	.044
Post-traumatic stress disorder (PTSD)	1.89	1.04–3.43	.037

With respect to predictors of readmission, both child and parent variables were examined. Neither of the parent variables assessed at index admission—parental depression and parenting stress—were found to be predictors of readmission. This was somewhat surprising since previous research has found family factors to predict psychiatric readmission among school-aged children and adolescents [9, 11]. Moreover, given the importance of parenting and family functioning with respect to early childhood mental health and behavioral outcomes, we expected these variables to be associated with a more chronic clinical course and increased likelihood of repeated psychiatric admissions. However, it is also important to note that the majority of parents in this acute clinical sample endorsed high levels of distress and psychiatric symptoms, with mean scores at or above clinical cut off thresholds on our measures, and this limited variability may have affected the results. It is also possible that, although parental depression and stress undoubtedly influence child behavioral and mental health, these factors may be only indirectly associated with psychiatric readmission,

with factors such as parent–child interaction, quality of family relationships, and discipline style more proximally linked to readmission risk. Examination of these additional family factors is an important area for future research.

With respect to child variables, age was inversely related to readmission with younger children more likely to be readmitted. One possible explanation for this finding is that younger children simply had more time to be readmitted prior to their aging out of program and study eligibility (i.e., at 8 years of age). On the other hand, it is also possible that children whose psychopathology was so severe as to require partial hospital level of care at younger ages are more likely to follow a more chronic symptom course, involving multiple contacts with intensive psychiatric care. This latter possibility would be consistent with the finding that earlier age of onset of ODD is associated with a worsened trajectory [20].

Clinical factors predicting readmission included both child suicidal thoughts and behaviors and PTSD diagnosis. With respect to suicidal thoughts and behaviors, our findings are consistent with recent research to suggest that suicidal thinking and actions in very young children with serious psychopathology is related to concurrent psychopathology as well as suicidal ideation at school-age [21]. Findings from the present study further suggest that, in young children with disruptive behavior problems, early suicidal thoughts and behaviors are also predictive of the need for multiple admissions to intensive psychiatric care prior to age 8 years of age. Although research has identified suicidality as a primary cause for hospital readmission among older children and adolescents [10], no previous studies have focused on

suicidal thoughts and behaviors as associated clinical treatment outcomes among very young children. This finding of an association between suicidality and risk for readmission in young children with ODD is particularly important for several reasons. First, expressions of suicidality are at higher risk of being discounted in this age group in part because of its rarity in early childhood [22], and in some measure because of the long held view by clinicians that children below the age of 10 generally do not possess the cognitive capacity to fully comprehend the nature of death and are consequently unable to experience suicidality [23]. However, recent research suggests that suicidal thoughts and behaviors may occur in children as young as 3 years of age [21]. It may also be possible that expressions of suicidality are being misinterpreted as a manifestation of the angry and provocative behaviors characteristic of young children with ODD. Yet, the current findings suggest that indications of suicidality should not be discounted in this age group, as it is associated with a significantly worse clinical course and increased need for clinical care. Indeed, it may be that suicidality warrants particular clinical attention at this age specifically *because* of its rarity, less than 1 in 5 children in this study.

The other child variable that predicted readmission was a PTSD diagnosis. Trauma has been strongly associated with significant psychiatric impairment in children and adolescents [24, 25], as well as psychiatric readmission in adolescents [26]. Findings of the present study suggest that among very young children presenting with disruptive behavior problems, traumatic stress similarly increases the risk for multiple psychiatric admissions. Indeed, the co-occurrence of PTSD in young children with ODD may be associated with a particularly impairing and intractable set of clinical problems for young children, including arousal, reactivity, irritability, and highly aggressive behavior, with associated risk for chronic psychiatric difficulties and less optimal clinical outcomes.

There are several limitations that should be kept in mind when evaluating the findings presented here. Most importantly, we did not have follow up clinical data on all of the children who were admitted for an initial course of partial hospital treatment, only those who subsequently returned for an additional course of treatment. Similarly, although participating children had not been previously admitted to the partial hospital program at which the study was conducted, it is possible that some children had received previous treatment services elsewhere. However it is important to note that the treatment program at which this study was conducted is the only hospital-based early childhood partial program available in the region, such that it is highly probable that children requiring more than one course of partial hospitalization treatment would be readmitted to this same program. Nevertheless, we cannot definitively

rule out the possibility that some children received additional intensive psychiatric care elsewhere. In addition, our sample was comprised of predominantly male children presenting with severe externalizing psychopathology which limits generalization to young girls and children with other diagnostic presentations. Finally, we focused on a relatively narrow range of clinical and family factors as predictors of readmission. Future research should consider such clinical problems as impulsivity, chronic irritability, and cognitive inflexibility as additional risk factors for relapse and increased need for clinical care, particularly insofar as such problems are quite common among young children with ODD. Evidence for specific skills deficits associated with readmission would also provide important insight into targets for additional treatments to prevent the need for repeated hospital admissions.

Despite these limitations, the study findings have important clinical implications. Children with suicidal ideation/behavior and/or a PTSD diagnosis at admission to partial hospital programs can be identified as high risk for readmission at discharge. Parents and outpatient treatment providers can be counseled about the child's risk status, including the importance of monitoring for suicidality and trauma symptoms that may be indications of a worsening course and the need for more intensive outpatient intervention to avoid rehospitalization.

Summary

Early emerging ODD is associated with a host of poor developmental and clinical outcomes, including heightened risk for repeated admissions to high levels of psychiatric care. In this study, we examined prospective predictors of readmission among young children with ODD following discharge from a psychiatric partial hospital treatment program. We found that approximately one-quarter of our sample (23%) was readmitted, with most readmissions occurring within 1 year. Younger child age, suicidal thoughts and behaviors, and PTSD diagnosis were associated with decreased time to readmission. These results suggest that among young children with severe disruptive behavior problems, children with co-occurring suicidality and PTSD are at particularly high risk for a more chronic clinical course and repeated contacts with intensive psychiatric care. Practitioners working with young children with ODD in intensive clinical settings should be aware of this risk, such that interventions and aftercare treatments can directly target suicidality and trauma symptoms, in addition to disruptive behaviors, with the goal of improving clinical outcomes and preventing the need for rehospitalization.

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