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**Predictors of Dropout in Family-Based Psychosocial Treatment
for Pediatric Bipolar Disorder: An Exploratory Study**

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Abstract

Family-based psychosocial treatments have been developed to address the significant impairments in psychosocial functioning among youth with pediatric bipolar disorder (PBD), yet factors impacting engagement in these treatments have yet to be extensively studied. Early termination from treatment may lead to negative outcomes among youth with PBD. Thus, the primary aim of this exploratory study was to identify predictors and moderators of treatment dropout in PBD. Drawing from the child attrition literature, this study examined characteristics likely to be associated with dropout in families affected by PBD, including potential targets of treatment. Using Cox proportional hazards regressions, we explored the impact of modifiable parent, child, and family characteristics (i.e., parent stress, family coping, child symptoms) and stable demographic characteristics (i.e., family income, ethnic minority status) on dropout among 59 youth aged 7 to 13 who participated in a randomized clinical trial comparing a manualized psychotherapy for PBD (child- and family-focused cognitive behavioral therapy; CFF-CBT) versus treatment as usual (TAU). Specifically, we explored whether dropout was related to baseline levels and changes in these characteristics over the course of treatment in CFF-CBT versus TAU. Findings provide preliminary support for high parental stress as a predictor of dropout across treatments and low baseline parent coping as a predictor of retention in CFF-CBT specifically. Worsening of child depression symptoms over treatment predicted greater likelihood of dropout in CFF-CBT. Finally, improvement in children's global functioning was associated with reduced dropout across treatments. Results have important implications for tailoring interventions for PBD.

Keywords: pediatric bipolar disorder, dropout, attrition, premature termination, treatment

Introduction

Despite a growing number of efficacious evidence-based psychosocial treatments for children and adolescents, a gap remains between mental health service needs and targeted treatment among youth and families. Early intervention is critically important for ameliorating the negative impact of psychiatric disorders on youth development and functioning (Berkowitz, 2003; Kieling et al., 2011). Without adequate treatment, youth with mental health problems are at increased risk for negative outcomes such as substance use disorders, suicidal behaviors, academic failure, juvenile delinquency, and a variety of health risk behaviors (Donenberg & Pao, 2005; Goldman-Mellor et al., 2014; Kutcher & McDougall, 2009; McLeod, Uemura, & Rohrman, 2012; Patel, Flisher, Hetrick, & McGorry, 2007). Thus, understanding factors that may enhance child and adolescent treatment engagement and retention may offer a crucial step toward improving youth trajectories and reducing the overall public health burden associated with early-onset mental illness.

Attrition from treatment poses a particularly difficult challenge for engaging youth and families in outpatient psychotherapy. Prior work indicates that children and adolescents attend few treatment sessions on average, and rates of attendance differ by treatment setting. For example, average length of treatment ranges from 3 to 4 sessions in mental health clinics serving urban, low-income communities (McKay & Bannon, 2004; McKay, Harrison, Gonzales, Kim, & Quintana, 2002), but tends to improve in research settings (11 to 12 sessions; Weisz, Doss, & Hawley, 2005) and in community-based mental health clinics in areas with greater access to publicly funded behavioral health resources and that serve families with a wider range of socioeconomic status (e.g., San Diego County, 13.8 sessions; Brookman-Frazee, Haine, Gabayan, & Garland, 2008). Rates of dropout range from 40 to 60% in youth populations, with additional difficulties with retention of low-income, minority youth (Gopalan et al., 2010). Although early termination from treatment may adversely affect all youth with psychiatric conditions, early termination may exacerbate both short- and long-term consequences for youth with severe psychiatric illness, such as mood and psychotic disorders, who are already at increased risk for greater chronicity of illness, relapse, hospitalizations, and suicide (Brent et al., 1993; Costello et al., 2002; Geller et al., 2002; Krausz, Müller-Thomsen, & Haasen, 1995; Perlis et al., 2004; Wier et al., 2011).

Pediatric Bipolar Disorder (PBD) is a serious mental illness characterized by significant mood lability and psychosocial impairments across a variety of domains, including at school, at home, and with peers (Geller et al., 2000). In addition, this early-onset form of bipolar disorder is further complicated by psychiatric comorbidity, a

more chronic and severe course, and poorer outcomes (Leverich et al., 2007). Characteristics of this illness, especially difficulties inhibiting emotional responses to negative stimuli, make it difficult for these youth to develop adaptive social skills (Goldstein, Miklowitz, & Mullen, 2006). These deficits may cause or exacerbate family conflict and contribute to lower family cohesion, adaptability, and parental warmth in families affected by PBD (Keenan-Miller & Miklowitz, 2011). Though pharmacological interventions provide symptom relief, medications do not address many of the functional impairments in the daily lives of these youth and their families (West et al., 2014). In an effort to improve youths' prognosis, evidence-based psychosocial treatments have been developed and found to improve symptoms and functioning among youth with PBD when used in conjunction with pharmacological treatments (Fristad, Verducci, Walters, & Young, 2009; Miklowitz et al., 2008; West et al., 2014). Each of these treatments capitalize on the involvement of family members to address core deficits in family problem-solving, communication, and coping skills. As these family-based treatments for PBD are increasingly disseminated to community practice settings, there is a growing need to understand factors impacting engagement of youth and families.

A growing body of literature has identified factors that contribute to dropout among youth utilizing mental health services, including many modifiable factors that can be targeted in treatment (e.g., Armbruster & Kazdin, 1994; de Haan, Boon, de Jong, Hoeve, & Vermeiren, 2013; Gopalan et al., 2010; Kazdin, 1996; Staudt, 2007). A recent review of the extant literature on treatment dropout among children and adolescents identified several modifiable parent factors associated with dropout, including greater parental psychological problems and poor parenting behaviors (e.g., high expressed emotion) (de Haan et al., 2013). Greater parent and family stress have also predicted lower retention of youth in psychotherapy (Gopalan et al., 2010). In addition, characteristics of the family environment have also been associated with child and adolescent treatment engagement. Specifically, Armbruster and Fallon (1994) found a significant relationship between family cohesion and dropout among youth receiving care in an outpatient clinic specifically for families with low socioeconomic status (SES). In addition, higher family organization was a significant predictor of initial engagement in a preventative intervention for adolescent conduct problems and substance abuse, but these effects were moderated by ethnicity (Perrino, Coatsworth, Briones, Pantin, & Szapocznik, 2001). Families of youth with PBD share many of these features, which may elevate their risk of dropout from psychosocial treatment. For example, genetic studies suggest there may be a high degree of familial loading for psychiatric illness in this population, thus indicating a greater likelihood of first degree relatives with

psychological difficulties (Faraone, Glatt, & Tsuang, 2003; Pavuluri, Birmaher, & Naylor, 2005). Further, families of youth affected by PBD demonstrate high rates of stress, family dysfunction, and expressed emotion (i.e., hostile or critical communication) (Belardinelli et al., 2008; Geller et al., 2000; Miklowitz et al., 2004; Nadkarni & Fristad, 2012; Sullivan & Miklowitz, 2010). These family characteristics correlate with symptom severity (Keenan-Miller, Peris, Axelson, Kowatch, & Miklowitz, 2012) and affect illness course and treatment response (Kim, Miklowitz, Biuckians, & Mullen, 2007; Miklowitz et al., 2009; Miklowitz, Biuckians, & Richards, 2006; Sullivan, Judd, Axelson, & Miklowitz, 2012; Townsend, Demeter, Youngstrom, Drotar, & Findling, 2007), and may indeed relate to treatment dropout among families affected by PBD.

In contrast to the literature on parent and family factors, few child-level factors have demonstrated robust and consistent associations with dropout. For example, baseline child symptom severity predicts dropout in some studies of youth with conduct problems and exposure to trauma (e.g., Chasson, Vincent, & Harris, 2008; Kazdin & Mazurick, 1994), but not in studies examining children with phobic and anxiety disorders (e.g., Pina, Silverman, Weems, Kurtines, & Goldman, 2003). Therefore, it is difficult to infer how these characteristics will impact likelihood of dropout among youth with PBD, who manifest severe mood disturbances (Washburn, West, & Heil, 2011).

Importantly, many parent, child, and family presenting characteristics are likely to remain stable throughout treatment, such as parent marital status, child race/ethnicity, and household income. Sociodemographic variables, such as SES and ethnic minority status, are among the most commonly investigated static variables (Armbruster & Kazdin, 1994; de Haan et al., 2013; Gopalan et al., 2010; Staudt, 2007). Across studies of child attrition, lower family SES and child ethnic minority status have been robust predictors of dropout, albeit with small effects (de Haan et al., 2013). Given the consistency of findings across a variety of diagnoses and treatments, it is possible that SES and ethnic minority status may influence dropout among youth with PBD.

Despite the available knowledge regarding parent, child, and family characteristics that contribute to dropout among youth participating in psychosocial treatment generally, little is known about the role of these factors among children with PBD, a group with documented difficulties with treatment retention (Fristad et al., 2009; Horwitz et al., 2012) and for whom family-based psychosocial treatments are indicated to treat a range of symptoms and impairments (McClellan, Kowatch, & Findling, 2007; Washburn et al., 2011). No prior study has examined modifiable and static factors that predict dropout among youth in family-based psychosocial treatment for PBD, nor

whether effects vary based on the type of treatment delivered. Therefore, the primary aim of this preliminary study was to enhance our understanding of the impact of modifiable parent, child, and family characteristics and stable demographic characteristics on dropout from psychosocial treatment for PBD and explore whether treatment assignment moderated the effects of these characteristics on dropout.

This exploratory study used data from a randomized clinical trial of Child and Family Focused Cognitive Behavioral Therapy (CFF-CBT), an efficacious psychosocial intervention for PBD (West et al., 2014) versus psychotherapy as usual (TAU). CFF-CBT is a manualized treatment that combines cognitive behavioral therapy techniques with psychoeducation, mindfulness-based approaches, and interpersonal/family therapy techniques for the treatment of youth ages 7-13 with a bipolar spectrum diagnosis. We chose to focus primarily on characteristics that may be modifiable through targeted treatment approaches: indicators of parent functioning (i.e. psychopathology, stress, coping, and self-efficacy), family functioning (i.e., coping, adaptability, and cohesion), and child functioning (i.e. mania and depression symptoms, global functioning). However, given the consistent effects of SES and child ethnic minority status on dropout in other child and adolescent samples, we chose to explore two stable characteristics, family income at baseline and child ethnicity, as potential predictors of dropout among youth in treatment for PBD. We also explored whether dropout is related to levels of parent, child, and family functioning at baseline and how dropout related to changes in these characteristics over the course of treatment in CFF-CBT versus TAU. Once identified, parent, child, and family risk factors could be addressed early in the treatment process to reduce dropout, offset the negative impact of potential static and unmodifiable barriers, and optimize treatment outcome for youth with PBD.

Based on prior work in other child and adolescent samples, we hypothesized that more impaired parent functioning at baseline (i.e., elevated parent stress and psychopathology; poor parent coping and self-efficacy) would predict greater likelihood of dropout. In addition, we anticipated a negative relationship between baseline family characteristics and dropout, such that higher baseline family cohesion, adaptability, and coping would be associated with lower rates of dropout. Since CFF-CBT was specifically designed to target the breadth of functional impairments that are characteristic of youth and families affected by PBD, we predicted that CFF-CBT would be better positioned to engage and retain families presenting to treatment with poor parent coping skills, elevated levels of parental stress and psychopathology, and lower levels of parent self-efficacy; lower family functioning (i.e., adaptability, cohesion, and coping); elevated child symptoms and lower global functioning relative to treatment as

usual (TAU). Regarding static variables, we predicted that family income and ethnic minority status would be associated with dropout among youth with PBD. Finally, given the intensive focus on improvement in children's symptomatology and functioning for youth enrolled in this trial, we also predicted that children's failure to improve over the course of treatment in terms of mania, depression, and global functioning would be associated with greater likelihood of dropout.

Method

Participants

This study is a secondary data analysis of a randomized clinical trial of family-based psychosocial treatment for PBD in a pediatric mood disorders clinic in a large, urban academic medical center. Participants were referred from providers within the clinic. Youth were eligible to participate if they met criteria for a bipolar spectrum disorder (BP-I, BP-II, and BP Not Otherwise Specified) according to DSM-IV-TR diagnostic criteria, were stable on medications, and were between the ages of 7 and 13. Youth were excluded from the study if they met any of the following criteria: IQ < 70 via the Kaufman Brief Intelligence Scale-Second Edition (KBIT-2; Kaufman & Kaufman, 2004), active, severe suicidality that necessitated immediate intervention, determined by the Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011), or current psychosis, serious medical or neurological conditions, or a current diagnosis of substance abuse or dependence as measured by the Washington University Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS; Geller et al., 2001). Youth were also excluded if, at the time of enrollment, their primary caregiver was experiencing severe symptoms of depression or mania.

Rather than use an intent to treat sample as in other CFF-CBT papers from this RCT, our specific analytic plan required that we eliminate those families that dropped out before initiating treatment ($n = 11$) due to not having sufficient data about their exact drop out date to conduct Cox proportional hazards with this subsample. In addition, one participant was excluded from analyses due to a 6-month gap between treatment sessions, resulting in a total of 59 participants included in the present study.

Procedure

Diagnosis and randomization. Youth between the ages of 7-13 were screened for a bipolar spectrum diagnosis. After meeting initial eligibility criteria and completing informed consent procedures, youth and their

parents were independently interviewed by trained professionals using the WASH-U-KSADS (Geller et al, 2001). Following confirmation of a bipolar spectrum diagnosis, youth were assessed for inclusion and exclusion criteria. After enrollment, families completed a large battery of baseline measures that assessed child and parent psychological symptoms, child global functioning, as well as child, parent, and family psychosocial functioning; measures, with the exception of parent psychological symptoms, were completed at weeks 4, 8, and 12 of treatment with a blinded rater.

Study design. Youth were randomly assigned to CFF-CBT (n =32) or to psychosocial treatment as usual (TAU; n = 27) and then proceeded with the study protocol. In the CFF-CBT treatment group, participants were assigned a clinician in the specialty mood disorders clinic who had been trained to administer the manual-based CFF-CBT treatment. Those in the TAU treatment group worked with a clinician from the general psychiatry clinic who was not trained in CFF-CBT. TAU involved non-manualized child- and family-therapy provided by a therapist in the general child psychiatry clinic; therapists received weekly supervision from licensed child-focused clinicians in the general psychiatry clinic following routine clinic practice. TAU sessions were matched with CFF-CBT for treatment dosage but otherwise not manipulated in terms of content or structure. As reported elsewhere (Weinstein, Cruz, Isaia, Peters, & West, 2017), TAU supervisors identified their clinical orientation as primarily family systems (75%, n=3), along with CBT (50%, n = 2) and behavioral/parent management (50%, n =2). All participants, regardless of treatment group, received medication management from a psychiatrist in the clinic. Any changes to a participant's medication regimen were documented throughout treatment. Both groups received a total of 12 weekly sessions of treatment (the acute phase) and 6 monthly maintenance sessions.

Measures

Measures of parent functioning. The Parental Stress Scale (PSS; Berry & Jones, 1995) is a well-validated and reliable measure of parent stress that captures positive and negative aspects of parenting, including the parent's feelings about the parent-child relationship. Parents rate 18 items on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree), and responses are summed across the items to create a total score. Higher scores reflect greater levels of parental stress. The internal consistency of the PSS was good ($\alpha = .89$).

The Coping Health Inventory for Parents (CHIP; McCubbin et al., 1983) is a self-report measure that assesses parents' perceptions of their ability to manage family life in the context of caring for a child who is severely

and/or chronically ill. All scores are summed to create a total coping score. There are also 3 subscales of coping skills: (1) maintaining family integration, cooperation, and an optimistic definition of the situation; (2) maintaining social support, self-esteem and psychological stability; and (3) understanding the medical situation through communication with other parents and consultation with medical staff. All responses are rated on a 4-point Likert scale from 0 (not helpful) to 3 (extremely helpful). Higher scores indicate better coping. The internal consistency for the total coping score was excellent ($\alpha = .93$), and good for the 3 coping subscales: Coping 1 ($\alpha = .84$); Coping 2 ($\alpha = .86$); and Coping 3 ($\alpha = .80$).

The Therapy Outcome Parents Scale (TOPS; West et al., 2009) measures parents' knowledge of their child's illness and ability to cope with caring for a child with bipolar disorder. Parents rate 20 items on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Responses are summed to create a total score, with higher scores indicating greater perceptions of knowledge and self-efficacy. Sample items include: "I feel confident in my ability to spot the early warning signs of 'out of control' behavior in my child" and "I encourage the use of positive self-statements in my child and try to discourage negative thoughts." This measure demonstrated good internal consistency ($\alpha = .83$).

The Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 1996) is a reliable and valid instrument for the assessment of a broad range of psychological problems and symptoms of psychopathology in adults. Parents rated 90 items on a 5-point Likert scale from 0 (not at all) to 4 (extremely). The SCL-90-R yields multiple symptom dimensions. The present study focused on the Global Severity Index (GSI) as an overall indicator of parent psychological distress. Higher scores on the GSI indicate greater psychological distress. Internal consistency for the GSI was excellent ($\alpha = .98$).

Measures of family functioning. The Family Adaptability and Cohesion Evaluation Scale (FACES-IV; Olson, 2011) is a measure completed by the parent to assess aspects of family interactions. The FACES is comprised of subscales that reflect dimensions of cohesion and flexibility within the family unit. Greater family cohesion and flexibility are indicated by higher scores on each subscale. The FACES has 62 items rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Internal consistency was good for the cohesion subscale ($\alpha = .84$), and acceptable for the flexibility subscale ($\alpha = .77$).

The Family Crisis Oriented Personal Evaluation Scales (F-COPES; McCubbin, Olson, & Larsen, 1991) is a reliable and valid assessment of family problem-solving attitudes and behavioral strategies implemented in response

to difficult situations. Parents rate 30 items on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Scores are summed across to create a total family coping score and higher scores reflect better family coping. The total score demonstrated good internal consistency ($\alpha = .84$).

Measures of child functioning. The Child Mania Rating Scale, parent version (CMRS; West, Celio, Henry, & Pavuluri, 2011) measures the severity of child mania symptoms according to DSM-IV-TR diagnostic criteria. Parents rate their child on 21 items on a 4-point Likert scale from 0 (never) to 3 (very often). Item content reflect symptoms of mania, including elevated, expansive, or irritable mood, decreased need for sleep, and risky or hypersexual behavior. Responses are summed across all items to create a total score. Total scores greater than 20 indicate clinically significant symptoms of mania. In our sample, the internal consistency of the CMRS was good ($\alpha = .88$).

The Child Bipolar Depression Rating Scale, parent version (CBDRS; West et al., 2014) is a parent-report measure of child depression symptoms based on DSM-IV-TR criteria. Parents rate their child on 22 items on a 4-point Likert scale from 0 (never) to 3 (very often). Higher scores reflect greater levels of depression symptomatology. This measure has strong reliability in our sample ($\alpha = .87$).

The Children's Global Assessment Scale (CGAS; Shaffer et al., 1983) is a measure of children's general functioning across home, school, and peer domains as determined by the clinician. Children are rated on a scale of 1-100, with scores of 1 indicating extremely impaired functioning, and scores of 100 reflecting superior functioning. Inter-rater reliability was moderate in our sample (ICC = 0.76).

Demographics. Demographic variables, including child age, gender, ethnicity, and annual family income were assessed at baseline using the Conners-March Developmental Questionnaire (CMDQ; Conners & March, 1996). For the present study, parent responses to the family income item were consolidated into two categories: greater or less than \$50,000. Child ethnicity was collapsed into two categories: White or ethnic minority.

Outcome measures. For survival analyses, the dependent variable was the duration of treatment, measured as the number of weeks elapsed between the start and end of treatment. Dropout from treatment was the event of interest, with dropouts coded as 1. Dropout could occur at any point prior to the 12th session of treatment. Treatment completion is defined as attending all 12 sessions of the acute phase of treatment. Censored cases were youth who had not dropped out of the acute phase of treatment (i.e., completers) by the end of the study period.

Data Analysis

Analyses were performed using SPSS 23.0. Comparison of survival curves using Kaplan-Meier survival analysis was used to estimate patterns of dropout among youth in CFF-CBT and TAU during the acute phase of treatment. Separate hierarchical Cox proportional hazard regressions analyses were performed to model the effects of each baseline child, parent, family, and sociodemographic characteristic, and their interactions with treatment assignment, on dropout among families who initiated treatment. Additional Cox regression analyses were conducted to explore how changes in parent, child, and family characteristics over the course of treatment relate to dropout. Change scores were calculated by subtracting baseline scores for each predictor from scores obtained at the 12-week assessment (final session). To maximize power, when scores for the 12th week were not available, scores from the last completed assessment were carried forward; the pattern of results did not differ with the inclusion of these additional cases. Predictors included four parent characteristics (stress; coping skills; psychological symptoms; self-efficacy), three family functioning measures (coping; adaptability; cohesion), three child functioning measures (mania and depression symptoms; global functioning), and two sociodemographic variables (family income; child ethnic minority status). In each model, predictors were entered in step 1, treatment assignment was entered in step 2, and the predictor by treatment assignment interaction was entered in step 3. Across all Cox regression models, we report the change in -2 log likelihood for each step of the model. All predictors were centered at their means. Treatment assignment, family income, and child ethnicity were dummy coded such that TAU, families with greater than \$50,000 annual household income, and Whites were designated as the reference groups for each respective variable.

All variables were normally distributed or transformed when appropriate. Sample sizes differed across analyses due to the presence of missing data for some predictors (see Table 2). Chi-square and t-tests were conducted to examine relationships between demographic variables (child age, gender, and ethnicity; family income) and treatment assignment. Child age, gender, and ethnicity were not related to treatment assignment (all p 's > .24). Univariate Cox proportional hazard regression models examined the effects of demographic controls such as child age, gender, ethnicity, and family income on dropout. None of the demographic controls were significantly related to dropout (all p 's > .28). Further, the assumptions of proportional hazards were met for each predictor.

While we were unable to conduct Cox proportional hazards analyses with the 11 youth who dropped out before initiating treatment, we conducted a series of logistic regression analyses to examine the effects of baseline

indicators of parent, child, and family functioning on pre-treatment dropout (0 = started treatment; 1 = dropped out pre-treatment). There was a trend for parent psychopathology to positively predict termination before beginning treatment across the sample ($OR = 4.56$, $95\% CI = 0.83, 25.13$, $p = .08$); no other predictors were significant.

Results

Descriptive Statistics

Table 1 includes baseline demographic and clinical characteristics of the study sample by treatment assignment. Table 2 presents descriptive statistics for all predictor and outcome measures. Among the 59 youth who initiated treatment, results indicated that treatment conditions were equivalent at baseline with 3 exceptions: (1) a greater proportion of youth in TAU had comorbid ADHD relative to CFF-CBT, $\chi^2(1) = 5.44$, $p = .02$; (2) baseline levels of parent stress were higher in CFF-CBT relative to TAU, $t(57) = 2.38$, $p = .02$; and (3) youth in TAU had significantly higher manic symptoms at baseline than those in CFF-CBT, $t(57) = -3.46$, $p = .001$.

Premature Terminations from Treatment

Among the 59 youth who began treatment, 15 youth (25%) dropped out of treatment prematurely ($N_{TAU} = 10$; $N_{CFF-CBT} = 5$). Among the 15 youth who dropped out prematurely, youth in CFF-CBT completed an average of 5.60 treatment sessions before they terminated ($SD = 3.28$, range 1-10), which was similar to youth in TAU ($M = 4.80$, $SD = 3.46$, range 1-10; $t(13) = -.43$, $p = .68$). As depicted in Figure 1, once treatment was initiated, youth in CFF-CBT had similar rates of dropout as youth in TAU (Log-Rank [$1 df$] = 2.56, $p = .11$). Because the survival probability did not drop below 0.5 in either treatment, the median week of dropout could not be reliably estimated among youth in CFF-CBT or TAU.

Effects of Baseline Characteristics on Dropout

Separate hierarchical Cox regression models explored the effects of baseline parent, family, child, and sociodemographic characteristics, and their interactions with treatment assignment, on dropout. Results of these models are presented in Tables 3 and 4.

Regarding baseline parent characteristics, there was a significant main effect for parental stress (PSS), indicating that there was a greater likelihood of dropout among parents with higher levels of perceived stress ($HR =$

1.07; 95% CIs [1.00, 1.14], $p = .045$). This effect emerged after controlling for baseline group differences and with the inclusion of the interaction term for treatment assignment and parental stress. The interaction of parent stress with treatment assignment was not significant. In addition, the main effect for parent coping skills (CHIP) was not significant. However, there was a significant interaction of parent coping skills and treatment assignment (HR = 1.08; 95% CIs [1.01, 1.15], $p = .02$), indicating that among parents in CFF-CBT, the probability of dropout was lower for families with lower baseline parent coping skills. There was no effect of parent coping skills on likelihood of dropout among parents in TAU. We also explored whether any particular subscale of the CHIP was driving the significant interaction by examining each of the subscales separately. Results indicated that all of the treatment by subscale interactions were significant or trends, suggesting that no one specific subscale of parent coping accounted for the results. No main effects emerged for parent knowledge and self-efficacy (TOPS) nor for parent psychological distress (SCL-90-R GSI). Further, interactions with treatment assignment were not significant for any of these variables.

In addition, family flexibility and cohesion (FACES) and family coping (F-COPES) were not significantly related to dropout; moreover, interactions with treatment assignment were not significant. Similarly, child mania symptoms (CMRS), depression symptoms (CBDRS), and global functioning (CGAS) were all not significantly related to dropout. Dropout was also not predicted from the interaction of treatment assignment and baseline scores for any of these variables. Regarding sociodemographic characteristics, the main effects of annual family income and child ethnic minority status on dropout were not significant, nor was the interaction of treatment assignment with either of these variables.

Post Hoc Analyses

Given the baseline group differences on child mania symptoms, parental stress, and the presence of comorbid ADHD, analyses were also run with these variables included as covariates in step 1 of each model. With fewer degrees of freedom following the inclusion of these variables, the general pattern remained, but the main effect of parental stress and the interaction of treatment assignment with the CHIP total scale both became trends.

Effects of Change in Functioning Over Treatment on Dropout

Separate hierarchical Cox regression models explored the effects of changes in parent, family, and child functioning over treatment, including interactions with treatment assignment, on dropout. Results for hierarchical Cox regression models involving changes in parent, family, and child functioning are presented in Tables 5 and 6.

Analyses exploring changes in parent stress (PSS), parent coping (CHIP), and parent knowledge and self-efficacy (TOPS) revealed no significant associations with dropout. Dropout was also not predicted from the interaction of treatment assignment and changes in any of these variables.

Further, changes in family flexibility and cohesion (FACES) and family coping (F-COPES) were not significantly related to dropout. Dropout was also not predicted from the interaction of treatment assignment and changes in family flexibility, cohesion, or coping.

Finally, dropout was not predicted by changes in child mania symptoms (CMRS), nor by the interaction of CMRS scores with treatment assignment. Similarly, the main effect for change in child depression symptoms (CBDRS) was not significant. However, there was a significant interaction of change in child depression symptoms and treatment assignment ($HR = 1.20$, 95% CIs [1.02, 1.41], $p = .03$), indicating that the probability of dropout increased as child depression symptoms worsened over treatment in CFF-CBT relative to TAU. Results from the CGAS indicate a significant main effect of changes in child global functioning on dropout ($HR = 0.94$; 95% CIs [0.90, 0.98], $p = .01$) such that with greater improvements in child global functioning across treatment, the probability of dropout declined. Dropout was not significantly predicted by the interaction of changes in child global functioning and treatment assignment.

Discussion

This is the first study to examine predictors and moderators of dropout among youth in family-based psychosocial treatment for PBD. Our goal was to emphasize characteristics of the parent, child, and family that are likely to be impaired in families affected by PBD, but may be modifiable via targeted intervention approaches. With regard to baseline characteristics, results emphasize the influence of parent characteristics (i.e., parent stress and parent coping skills) on treatment retention. Specifically, our results suggest that parents with higher levels of perceived stress at baseline may be at a greater risk of dropping out of treatment. Greater levels of parent and family stress have been associated with poor retention in other samples (Gopalan et al., 2010; Kazdin & Mazurick, 1994; Pellerin, Costa, Weems, & Dalton, 2010), as the burden of caring for a chronically ill child may interfere with the

parent's ability to remain actively engaged in treatment. Prior research suggests that engagement interventions that directly attend to parent and family stress levels throughout treatment are met with increased retention (Ingoldsby, 2010). Surprisingly, and contrary to hypotheses, CFF-CBT was not more effective at engaging parents with greater perceived stress. We offer one potential explanation for these results. Early sessions of CFF-CBT are dedicated to introducing the rationale and ingredients of the treatment, psychoeducation about PBD, and developing affect regulation skills for parent and the child, whereas later sessions provide parents with coping skills and stress management tools, such as mindfulness techniques and promoting a more balanced lifestyle for parents (West et al., 2014). Thus, it may be that parents with higher perceived stress dropped out of CFF-CBT before they were able to benefit from the additional coping and stress management tools provided to parents in later sessions. Consequently, it may be important to screen for parents who present to treatment with high levels of perceived stress and to introduce stress management techniques earlier in treatment.

Our results indicate that the influence of baseline parent coping skills on retention may differ according to the type of intervention that the family receives. Consistent with our hypothesis, parents with low levels of coping skills were more likely to be retained in CFF-CBT compared to TAU. Although analyses cannot tell us specifically why these families were retained in treatment, one possible explanation for findings is that CFF-CBT was more effective at engaging parents with low levels of coping skills to remain in treatment. Given that CFF-CBT repeatedly emphasizes the development of healthy coping skills, including building child affect regulation skills and implementing behavioral management strategies for parents (West & Weinstein, 2011), parents in CFF-CBT with poor coping skills at baseline may have been particularly receptive to CFF-CBT's focus on increasing parents' ability to cope with the severe mood dysregulation characteristic of this illness. On the other end of the spectrum, CFF-CBT demonstrated difficulties (compared to TAU) retaining parents with better baseline coping skills. It is possible that families with better coping skills may have found the structured treatment content that so heavily focused on increased coping skills redundant, while TAU may have been able to more flexibly adjust to address content more relevant to a family's particular struggles. Thus, results from the present study suggest that it is important to assess parent coping skills prior to treatment, and that even structured evidence-based treatments may need to include flexible administration to individually target the primary symptoms and deficits experienced by each family while capitalizing on their baseline strengths. For example, if families possess higher skills at baseline but

struggle with implementation, treatment may maximize success by focusing on barriers to successful implementation.

In line with expectations, changes in child depression symptoms influenced dropout. Somewhat surprisingly, as children's depression symptoms worsened over the course of treatment, families in CFF-CBT were more likely to drop out of treatment. We cautiously speculate that poor retention in CFF-CBT following a worsening of child depression symptoms may be due to parent's general feelings of hopelessness (e.g., "nothing works") and helplessness (e.g., "there's nothing I can do") about their child's ability to get better, especially given lack of improvement in a highly-targeted, evidence-based treatment specifically designed to ameliorate symptoms of PBD; similarly, hopelessness or helplessness on the child's part may have led to their refusal to attend treatment sessions. Negative parent cognitions have been shown to have a powerful influence on engagement in treatment, contributing to reduced retention (Morrissey-Kane & Prinz, 1999). Alternatively, parents may have felt that their child needed a higher level of care than provided by the treatment. It is also possible that parents felt the treatment may be contributing to a worsening of their child's symptoms.

The present study is one of few that have explored the effects of children's global functioning on attrition. Consistent with results from Armbruster and Fallon (1994), we found no relationship between children's baseline global functioning and likelihood of dropout in our sample. However, consistent with predictions, we found that youth demonstrating greater improvements in global functioning over the course of treatment were less likely to dropout. Thus, it is likely that improvements in child functioning reinforce attendance and engagement in treatment. Notably, child global functioning was rated by a clinician; thus, it was encouraging that we found significant effects for multiple child characteristics (i.e., changes in depression symptoms and global functioning) on dropout regardless of the rater (i.e., clinician versus parent), suggesting that child-level factors may indeed be important predictors of dropout in PBD.

In this preliminary study, several factors were not associated with dropout among youth with PBD, including other indicators of functioning in the parent (self-knowledge and efficacy, psychopathology), family (coping, flexibility, cohesion), and child (mania symptoms), and sociodemographic variables (family income, child ethnic minority status). Contrary to predictions, we failed to find associations for parent psychopathology on dropout. One potential explanation for this may be a restriction in range of parent psychopathology levels due to strict exclusion criteria that prevented parents with elevated manic or depressive symptoms from enrolling in the

larger study (West et al., 2014); as such, it may be that subclinical levels of parental symptomatology do not influence dropout, whereas parents with more severe symptoms may have difficulty retaining in treatment. Given the large body of literature emphasizing significant impairments in family functioning in PBD, it was intriguing that none of the family characteristics significantly predicted attrition from treatment in the present study. However, it is possible that we failed to detect significant relationships for family coping specifically due to shared variance among parent and family coping skills. Future work assessing predictors of dropout in PBD may also benefit from the incorporation of measures of parent/family expressed emotion (EE), which has been found to negatively relate to family flexibility and cohesion (Miklowitz et al., 2009) and to influence mood symptom severity and response to treatment (Miklowitz et al., 2009; Miklowitz et al., 2006). Finally, results from the present study suggest that changes in child depression symptoms and global functioning seem to be more important for engagement compared to changes in mania symptoms. Global functioning (as measured via the CGAS) captures overall child impairment and taps into quality of life. Thus, while changes in specific mania symptoms (e.g., elated mood, irritability, etc.) may not directly influence a family's engagement in treatment, improved quality of life may have a greater influence on the family's perception of progress, which in turn may have reinforced engagement in treatment.

Regarding sociodemographic characteristics, our preliminary results fail to support previous findings demonstrating significant associations between dropout and sociodemographic variables such as SES and ethnic minority in other child and adolescent samples. One potential reason for the lack of significant associations may be related to characteristics of the setting in which this research was conducted—a large, urban academic medical center whose mission is to serve low-income, minority youth and families. Thus, it may be that these clinicians and supervisors are well-informed of the barriers impacting engagement in this population, and further that standard procedures provided within this medical center (e.g., reminder calls, language translation services, coordinated care, and case management services) serve to enhance engagement of these families. It could be that other types of treatment settings may have less experience with or fewer resources to meet the needs of this traditionally difficult-to-engage population, contributing to lower rates of retention. Supporting this hypothesis, high and low-income families both responded equally to CFF-CBT (Weinstein, Henry, Katz, Peters, & West, 2015).

Results from the present study indicate only 25% of this sample terminated treatment before all 12 sessions were completed. These rates are lower than those found in other studies of attrition from child psychotherapy (de Haan et al., 2013; Kazdin, 1996). Given the severity of symptoms and impairments among youth with PBD, it is

encouraging that the majority of families completed the psychosocial treatment, as this increases the likelihood of positive child outcomes among these youth (Fristad et al., 2009). Participation in a research trial may have served to enhance retention rates in the present study as well.

Surprisingly, we did not find a significant overall group difference in dropout rates between families in CFF-CBT and those in TAU in the present study. However, when we examined rates of attrition within the full sample of 71 participants and not just those who initiated treatment services, families in CFF-CBT demonstrated lower rates of dropout than families in TAU (West et al., 2014). Thus, rates of dropout, and the factors that influence dropout, may differ across various phases of the treatment process (i.e., dropout before the initial session vs after initiating treatment), consistent with findings from studies that have explored dropout at different phases of the clinical process (Kazdin & Mazurick, 1994; Sirles, 1990). Further, results from our larger study point to the importance of treatment tailored specifically to address the unique needs of youth and families with PBD in reducing premature terminations. Similarly, families of children with antisocial behaviors demonstrated lower rates of attrition in an enhanced family treatment that targeted specific parent concerns and stressors compared to a standard family treatment (Prinz & Miller, 1994).

Preliminary findings from the present study highlight the relevance of modifiable parent, child, and family factors in the prediction of dropout from family-based psychosocial treatment for PBD. The present study took advantage of both parent and clinician-rated measures of functioning to increase confidence in our findings. In line with the present findings, results from prior work indicate that the effectiveness of CFF-CBT in improving child mood symptoms and global psychosocial functioning is partially mediated by increases in parent coping skills and behaviors, family flexibility, and positive reframing (MacPherson, Weinstein, Henry, & West, 2016). Consistent with these findings, we also found that CFF-CBT may enhance treatment engagement among parents with initial deficits in parent coping skills. However, results from the present study also imply that retention of youth and families may be further augmented through careful tailoring and adaptation of evidence-based psychosocial treatment for PBD. Advancements in the development of modular approaches to youth psychosocial treatment (Weisz et al., 2012), which emphasize the flexible implementation of evidence-based treatment strategies, suggest that youth outcomes may be enhanced through personalized treatment approaches. Consistent with recent initiatives from the National Institute of Mental Health calling for these types of person-centered approaches to treatment (U. S. Department of Health and Human Services, 2015), youth with PBD may benefit from modifications to existing

treatments whereby individual/family characteristics play a larger role in guiding selection of activities or skill building exercises. It is possible this approach may facilitate engagement and retention of youth and families at risk of dropout due to closer alignment of strategies and tools with the child's and parents' skills and goals, but further research is needed.

Limitations

There are several study limitations worth mentioning. First, given the exploratory nature of this study, we conducted multiple analyses without correcting for the total number of models tested. Thus, these results are preliminary and require replication in a larger sample. Second, while we included a broad range of parent, child, and family variables in the present study, we did not assess several other potentially important variables, such as treatment or therapist factors, that may have influenced dropout. A recent meta-analysis of dropout from child treatment concluded that aspects of the treatment and the therapist were stronger predictors of dropout than parent, child, and family characteristics (de Haan et al., 2013). Accordingly, future studies would benefit from incorporating treatment and therapist measures to form a more comprehensive understanding of dropout from family-based psychosocial treatment for PBD. Third, we took a conservative approach to defining completion of treatment in the present study, as those who completed treatment attended all sessions during the acute phase. As noted in many studies of attrition (e.g., Armbruster & Kazdin, 1994; de Haan et al., 2013), dropout and completions are defined in different ways across studies. Therefore, these results warrant replication in other studies of family-based psychosocial treatment for PBD using different criteria for completion. Fourth, the parent completed most of the measures in this study; as such, informant bias may have influenced the results. Additional objective measures of parent and child functioning, and of the quality of family relationships, may lend greater support to these findings. Fifth, these results may not be generalizable to other samples of youth in psychosocial treatment beyond youth with PBD. Further, this research was conducted at a specialty outpatient clinic for children with mood disorders in an urban, academic medical center, and therefore characteristics of the families served and the treatment setting may not generalize to other settings. Additionally, families participating in this research were part of a research trial in which data collection is vital; therefore, rates of retention reported for this study may differ from community clinics where there may be fewer dedicated resources for engaging and retaining families. However, it is also important to note that enrollment in the RCT may have negatively impacted retention as well in that families were disappointed at the outset of

treatment when they did not get the “preferred” treatment. Thus, presenting a treatment as evidenced-based and empirically supported may be useful for engaging families.

These limitations notwithstanding, the present study contributes to the growing body of literature addressing risk factors for dropout in child and adolescent psychosocial treatment, and provides initial support for the role of baseline parent stress and parent coping as well as changes in child depression symptoms and child global functioning as potential predictors of dropout among youth in family-based psychosocial treatment for PBD. Our results also suggest that an intensive family-based treatment specifically developed to meet the needs of families affected by PBD may be particularly beneficial for engaging parents with poor baseline coping behaviors. This line of research may have important clinical implications. Premature terminations from treatment among youth with PBD represent a significant public health concern as these youth are characterized by a severe, chronic, and refractory illness with high rates of suicidal ideation, attempts, and completions (Brent et al., 1993; Goldstein et al., 2005; Hauser, Galling, & Correll, 2013; Lewinsohn, Seeley, & Klein, 2003b; Weinstein et al., 2017; Weinstein, Van Meter, Katz, Peters, & West, 2015), psychiatric hospitalization (Lewinsohn, Seeley, & Klein, 2003a), school dropout (Breslau, Lane, Sampson, & Kessler, 2008), and disability (Gore et al., 2011). Future work may be needed to optimize treatments to enhance engagement among families affected by PBD who are at greatest risk of dropping out of treatment prematurely.

Compliance with Ethical Standards

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Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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Table 1. Baseline Demographics and Clinical Characteristics of Youth with Pediatric Bipolar Disorder, n = 59

	CFF-CBT n = 32		TAU n = 27	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Child Age	9.38	1.91	9.07	1.24
	N	%	N	%
Child Sex (female)	15	47	11	41
Child Ethnicity				
White	18	56	11	41
Black	9	28	10	37
Hispanic	4	13	3	11
American Indian or Alaskan Native	0	0	3	11
Other	1	3	0	0
Family Income (< \$50,000)	11	42	11	48
Diagnosis				
Bipolar I	7	22	13	48
Bipolar II	1	3	0	0
Bipolar NOS	24	75	14	52
Comorbid Diagnoses				
Anxiety Disorder	11	38	9	35
ADHD*	20	67	24	92
ODD	10	35	11	42
CD	3	11	3	12

Note. Where data points were missing, percentages are calculated based on total number of available cases.

ADHD = attention-deficit/hyperactivity disorder, ODD = oppositional defiant disorder, CD = conduct disorder

*Denotes group differences, † $p < .10$, * $p < .05$, ** $p < .01$ on t-test or chi-square analyses.

Table 2. Descriptive Statistics for Predictor and Outcome Measures, n = 59

Baseline							Change Over Treatment							
CFF-CBT n = 32							TAU n = 27		CFF-CBT n = 32				TAU n = 27	
Predictors														
	N	Range	M	SD	M	SD	N	Range	M	SD	M	SD		
Parent Functioning														
PSS*	59	23.00 - 76.00	47.03	11.99	40.15	9.90	59	-31.00 - 13.00	-1.54	9.47	-0.27	5.70		
CHIP	59	0.00 - 128.00	84.00	25.91	85.96	18.37	59	-60.00 - 62.00	3.63	24.65	-2.41	19.75		
Coping 1	59	0.00 - 57.00	37.53	10.60	39.52	8.68	59	-27.00 - 32.00	0.91	10.26	-2.00	7.85		
Coping 2	59	0.00 - 50.00	30.75	11.47	30.70	9.02	59	-23.00 - 32.00	1.78	12.04	0.11	9.44		
Coping 3	59	0.00 - 24.00	15.72	6.09	15.74	4.58	59	-11.00 - 17.00	0.72	5.41	-0.52	4.17		
TOPS	59	35.00 - 96.84	70.42	10.00	72.57	11.43	59	-8.16 - 57.00	8.13	12.14	4.24	6.41		
SCL-90-R GSI	58	0.00 - 2.08	0.63	0.37	0.55	0.27	--	--	--	--	--	--		
Family Functioning														
FACES Cohesion	57	16.00 - 35.00	27.58	4.62	28.65	5.14	57	-9.00 - 13.00	0.52	3.58	1.54	3.55		
FACES Flexibility	57	8.00 - 35.00	25.48	4.11	25.96	6.01	57	-11.00 - 13.00	0.19	3.86	1.04	3.93		
F-COPES	59	65.00 - 132.00	98.39	13.12	102.45	14.49	59	-21.54 - 26.00	-0.11	13.05	1.25	9.58		
Child Functioning														
CMRS**	59	1.00 - 48.00	19.18	8.53	27.70	10.39	59	-23.00 - 19.00	-3.67	8.17	-1.63	7.04		
CBDRS	59	1.00 - 45.00	17.70	9.74	19.87	9.77	59	-18.00 - 20.00	-3.58	6.47	-0.94	6.85		
CGAS	58	40.00 - 69.00	50.72	6.26	48.85	4.60	58	-22.00 - 44.00	8.34	14.80	7.12	10.99		
Outcome Measures														
			N	%	N	%								
Dropouts During Treatment			5	16	10	37								
			M	SD	M	SD								
Length of Treatment (Weeks)			14.81	6.47	15.63	9.66								

† p < .10, * p < .05, **p < .01

Table 3. Results of Hierarchical Cox Regressions Predicting Dropout as a Function of Baseline Parent Characteristics and Treatment Assignment, n = 59

Variable	Step 1			Step 2			Step 3		
	B	HR	95% CI	B	HR	95% CI	B	HR	95% CI
<i>Parent Stress (PSS)</i>									
PSS Total	.02	1.02	[0.98, 1.07]	.04 [†]	1.04	[0.99, 1.09]	.07*	1.07	[1.001, 1.14]
Treatment Assignment				-1.21*	.30	[0.09, 0.98]	-1.01 [†]	.36	[0.12, 1.12]
PSS Total x Tx Assignment							-.06	.95	[0.86, 1.04]
-2 Log Likelihood		111.60			107.28*			105.87	
<i>Parent Coping Skills (CHIP)</i>									
CHIP Total	.02	1.02	[0.99, 1.04]	.02	1.02	[0.99, 1.04]	-.01	.99	[0.96, 1.03]
Treatment Assignment				-.80	.45	[0.15, 1.33]	-1.49 [†]	.23	[0.05, 1.07]
CHIP Total x Tx Assignment							.07*	1.08	[1.01, 1.15]
-2 Log Likelihood		110.85			108.64			102.84*	
Coping 1	.03	1.03	[0.97, 1.09]	.02	1.02	[0.96, 1.08]	-.03	.90	[0.96, 1.04]
Treatment Assignment				-.80	.45	[0.15, 1.35]	-1.32 [†]	.27	[0.06, 1.15]
Coping 1 x Tx Assignment							.18*	1.20	[1.02, 1.40]
-2 Log Likelihood		111.82			109.68			103.66*	
Coping 2	.04	1.04	[0.98, 1.10]	.04	1.04	[0.98, 1.10]	-.003	1.00	[0.93, 1.07]
Treatment Assignment				-.84	.43	[0.15, 1.28]	-1.44 [†]	.24	[0.05, 1.11]
Coping 2 x Tx Assignment							.14 [†]	1.15	[0.99, 1.32]
-2 Log Likelihood		110.84			108.41			104.40*	
Coping 3	.07	1.07	[0.96, 1.19]	.07	1.07	[0.96, 1.20]	-.01	.99	[0.87, 1.13]
Treatment Assignment				-.85	.43	[0.14, 1.27]	-1.42 [†]	.24	[0.05, 1.17]
Coping 3 x Tx Assignment							.25 [†]	1.28	[0.97, 1.70]
-2 Log Likelihood		110.92			108.44			104.76 [†]	
<i>Parent Knowledge & Self-Efficacy (TOPS)</i>									
TOPS Total	.00	1.00	[0.96, 1.05]	-.004	1.00	[0.95, 1.04]	-.01	.99	[0.94, 1.04]
Treatment Assignment				-.86	.42	[0.14, 1.25]	-.87	.42	[0.14, 1.25]
TOPS Total x Tx Assignment							.04	1.04	[0.92, 1.17]
-2 Log Likelihood		112.65			110.08			109.68	
<i>Parent Psychopathology (SCL-90-R)</i>									
SCL-90-R GSI	-.57	.57	[0.11, 3.00]	-.45	.64	[0.11, 3.69]	-1.82	.16	[0.01, 2.75]
Treatment Assignment				-.87	.42	[0.14, 1.25]	-.84	.43	[0.13, 1.42]
SCL-90-R GSI x Tx Assignment							2.49	12.11	[0.33, 445.3]
-2 Log Likelihood		111.68			109.09			107.18	

Note. HR = hazards ratio; CI = confidence interval; [†] $p < .10$, * $p < .05$, ** $p < .01$

Table 4. Results of Hierarchical Cox Regressions Predicting Dropout as a Function of Baseline Family and Child Characteristics and Treatment, n = 59

Variable	Step 1			Step 2			Step 3		
	B	HR	95% CI	B	HR	95% CI	B	HR	95% CI
<i>Family Adaptability & Cohesion (FACES)</i>									
Cohesion	.02	1.02	[0.91, 1.13]	.01	1.01	[0.91, 1.12]	.04	1.04	[0.91, 1.18]
Treatment Assignment				-.86	.42	[0.14, 1.26]	-.89	.41	[0.13, 1.28]
Cohesion x Tx Assignment							-.09	.92	[0.74, 1.14]
-2 Log Likelihood		111.54			109.01			108.38	
Flexibility	-.01	.99	[0.91, 1.09]	-.01	.99	[0.91, 1.08]	.02	1.02	[0.92, 1.12]
Treatment Assignment				-.86	.42	[0.14, 1.25]	-.96	.39	[0.12, 1.22]
Flexibility x Tx Assignment							-.13	.88	[0.70, 1.11]
-2 Log Likelihood		111.61			109.01			107.86	
<i>Family Coping (F-COPES)</i>									
F-COPES Total	.01	1.01	[0.98, 1.05]	.01	1.01	[0.97, 1.05]	.01	1.01	[0.97, 1.06]
Treatment Assignment				-.82	.44	[0.15, 1.31]	-.83	.44	[0.14, 1.34]
F-COPES Total x Tx Assignment							-.02	.98	[0.91, 1.06]
-2 Log Likelihood		112.24			109.93			109.65	
<i>Child Mania Symptoms (CMRS)</i>									
CMRS	.03	1.03	[0.98, 1.08]	.01	1.01	[0.96, 1.07]	.01	1.01	[0.96, 1.07]
Treatment Assignment				-.75	.47	[0.15, 1.50]	-.75	.47	[0.15, 1.51]
CMRS x Tx Assignment							-.004	.100	[0.89, 1.12]
-2 Log Likelihood		111.54			109.86			109.86	
<i>Child Depression Symptoms (CBDRS)</i>									
CBDRS	.02	1.02	[0.97, 1.07]	.02	1.02	[0.97, 1.07]	.02	1.02	[0.96, 1.08]
Treatment Assignment				-.84	.43	[0.15, 1.28]	-.82	.44	[0.15, 1.32]
CBDRS x Tx Assignment							-.02	.99	[0.89, 1.10]
-2 Log Likelihood		112.20			109.77			109.69	
<i>Child Global Functioning (CGAS)</i>									
CGAS	-.03	.97	[0.88, 1.08]	-.01	.99	[0.89, 1.10]	-.03	.97	[0.83, 1.12]
Treatment Assignment				-.89	.41	[0.14, 1.23]	-.88	.42	[0.14, 1.27]
CGAS x Tx Assignment							.04	1.04	[0.84, 1.29]
-2 Log Likelihood		111.51			108.82			108.68	
<i>Sociodemographic Characteristics</i>									
Family Income	-.57	.57	[0.17, 1.90]	-.71	.49	[0.15, 1.65]	-.93	.39	[0.10, 1.53]
Treatment Assignment				-1.87*	.15	[0.03, 0.71]	-2.34*	.10	[0.01, 0.79]
Family Income x Tx Assignment							1.27	3.57	[0.16, 78.10]
-2 Log Likelihood		86.52			78.57**			77.94	

Child Ethnicity	-.32	.73	[0.26, 2.04]	-.52	.60	[0.21, 1.71]	-1.10 [†]	.33	[0.09, 1.20]
Treatment Assignment				-.96 [†]	.38	[0.13, 1.15]	-1.77*	.17	[0.03, 0.85]
Child Ethnicity x Tx Assignment							1.76	5.80	[0.65, 52.16]
-2 Log Likelihood		112.82			109.18 [†]			106.67	

Note. HR = hazards ratio; CI = confidence interval; [†] $p < .10$, * $p < .05$, ** $p < .01$

Table 5. Results of Hierarchical Cox Regressions Predicting Dropout as a Function of Changes in Parent Characteristics and Treatment Assignment, n = 59

Variable	Step 1			Step 2			Step 3		
	B	HR	95% CI	B	HR	95% CI	B	HR	95% CI
<i>Parent Stress (PSS)</i>									
Δ PSS Total	-.16	.85	[0.52, 1.39]	-.15	.86	[0.50, 1.46]	-.04	.97	[0.44, 2.12]
Treatment Assignment				-.84	.43	[0.15, 1.28]	-.87	.42	[0.14, 1.26]
Δ PSS Total x Tx Assignment							-.22	.80	[0.28, 2.33]
-2 Log Likelihood		112.23			109.80			109.64	
<i>Parent Coping Skills (CHIP)</i>									
Δ CHIP Total	-.003	1.00	[0.98, 1.02]	.00	1.00	[0.98, 1.02]	.01	1.01	[0.99, 1.04]
Treatment Assignment				-.85	.43	[0.14, 1.28]	-.91	.40	[0.13, 1.25]
Δ CHIP Total x Tx Assignment							-.03	.97	[0.93, 1.01]
-2 Log Likelihood		112.57			110.11			108.03	
Δ Coping 1	-.01	.99	[0.94, 1.04]	-.01	1.00	[0.94, 1.05]	.03	1.03	[0.96, 1.11]
Treatment Assignment				-.83	.43	[0.14, 1.31]	-.94	.39	[0.13, 1.22]
Δ Coping 1 x Tx Assignment							-.09 [†]	.92	[0.82, 1.02]
-2 Log Likelihood		112.42			110.07			107.48	
Δ Coping 2	-.003	1.00	[0.95, 1.04]	.00	1.00	[0.96, 1.05]	.02	1.02	[0.97, 1.08]
Treatment Assignment				-.85	.43	[0.14, 1.26]	-.91	.40	[0.13, 1.26]
Δ Coping 2 x Tx Assignment							-.06	.94	[0.86, 1.03]
-2 Log Likelihood		112.63			110.11			108.43	
Δ Coping 3	-.01	.99	[0.90, 1.10]	.01	1.01	[0.91, 1.11]	.05	1.05	[0.91, 1.20]
Treatment Assignment				-.86	.42	[0.14, 1.26]	-.87	.42	[0.14, 1.25]
Δ Coping 3 x Tx Assignment							-.10	.91	[0.72, 1.14]
-2 Log Likelihood		112.64			110.10			109.33	
<i>Parent Knowledge & Self-Efficacy (TOPS)</i>									
Δ TOPS Total	-.06	.95	[0.88, 1.01]	-.05	.95	[0.89, 1.02]	.003	1.00	[0.91, 1.10]
Treatment Assignment				-.71	.49	[0.16, 1.46]	-1.23 [†]	.29	[0.07, 1.19]
Δ TOPS Total x Tx Assignment							-.13	.88	[0.75, 1.04]
-2 Log Likelihood		109.85 [†]			108.12			105.55	

Note. HR = hazards ratio; CI = confidence interval; [†] $p < .10$, * $p < .05$, ** $p < .01$

Table 6. Results of Hierarchical Cox Regressions Predicting Dropout as a Function of Changes in Family and Child Characteristics and Treatment, n = 59

Variable	Step 1			Step 2			Step 3		
	B	HR	95% CI	B	HR	95% CI	B	HR	95% CI
<i>Family Adaptability & Cohesion (FACES)</i>									
Δ Cohesion	-.12	.89	[0.77, 1.03]	-.15 [†]	.86	[0.74, 1.01]	-.01	.99	[0.82, 1.19]
Treatment Assignment				-1.03 [†]	.36	[0.12, 1.09]	-1.55*	.21	[0.05, 0.92]
Δ Cohesion x Tx Assignment							-.27 [†]	.76	[0.58, 1.00]
-2 Log Likelihood		109.21			105.66 [†]			102.23 [†]	
Δ Flexibility	-.11 [†]	.90	[0.80, 1.02]	-.13 [†]	.88	[0.76, 1.00]	-.09	.92	[0.77, 1.09]
Treatment Assignment				-1.04 [†]	.35	[0.12, 1.07]	-1.25 [†]	.29	[0.08, 1.07]
Δ Flexibility x Tx Assignment							-.09	.91	[0.71, 1.17]
-2 Log Likelihood		108.72 [†]			105.09 [†]			104.58	
<i>Family Coping (F-COPES)</i>									
Δ F-COPES Total	.001	1.00	[0.96, 1.05]	.001	1.00	[0.96, 1.05]	.03	1.03	[0.97, 1.09]
Treatment Assignment				-.85	.43	[0.14, 1.26]	-.88	.42	[0.13, 1.32]
Δ F-COPES Total x Tx Assignment							-.06	.95	[0.86, 1.04]
-2 Log Likelihood		112.65			110.11			108.74	
<i>Child Mania Symptoms (CMRS)</i>									
Δ CMRS	.03	1.03	[0.97, 1.10]	.02	1.02	[0.96, 1.10]	.00	1.00	[0.92, 1.09]
Treatment Assignment				-.79	.45	[0.15, 1.36]	-.86	.43	[0.14, 1.30]
Δ CMRS x Tx Assignment							.06	1.06	[0.93, 1.20]
-2 Log Likelihood		111.74			109.62			108.88	
<i>Child Depression Symptoms (CBDRS)</i>									
Δ CBDRS	.03	1.03	[0.97, 1.10]	.02	1.02	[0.96, 1.09]	-.03	.97	[0.88, 1.06]
Treatment Assignment				-.77	.46	[0.15, 1.40]	-1.15 [†]	.32	[0.09, 1.14]
Δ CBDRS x Tx Assignment							.18*	1.20	[1.02, 1.41]
-2 Log Likelihood		111.64			109.68			104.54*	
<i>Child Global Functioning (CGAS)</i>									
Δ CGAS	-.06**	.94	[0.90, 0.98]	-.07**	.93	[0.88, 0.98]	-.06	.95	[0.88, 1.02]
Treatment Assignment				-1.12 [†]	.33	[0.10, 1.01]	-1.45 [†]	.24	[0.05, 1.15]
Δ CGAS x Tx Assignment							-.03	.97	[0.87, 1.07]
-2 Log Likelihood		103.88**			99.78*			99.37	

Note. HR = hazards ratio; CI = confidence interval; [†] $p < .10$, * $p < .05$, ** $p < .01$

Figure 1. Cumulative survival of youth in CFF-CBT and TAU

