Abstract  The role of family dynamics in symptoms, course, and outcome of pediatric bipolar disorder (PBD) has been extensively studied. Individual caregiver characteristics have received less attention in the literature. Understanding how caregiver traits are related to child symptoms could have important implications for psychosocial treatment of PBD, where the parents are heavily involved. This study explored the direct and interactive associations between parent psychopathology, stress, efficacy, and coping and symptoms of PBD in 64 parents of children meeting DSM-IV criteria for bipolar I, II, or NOS. Parent psychopathology predicted increased child mania and depression severity among parents with low, but not average or above average use of coping skills. Without effective coping skills, parent psychopathology may have effects of the severity of their child’s symptoms of mania or depression. Future research should explore the extent to which interventions that teach caregivers effective tools and skills to cope with their child’s illness mitigate the effects of their own psychopathology.

Keywords  Pediatric bipolar disorder · Parenting · Family

Introduction

Pediatric bipolar disorder (PBD) is a devastating illness characterized by severe periods of episodic mood disturbance. Children with bipolar disorder experience chronic and extreme dysregulation that is associated with significant psychosocial impairment (Goldstein et al. 2009). Specifically, children with bipolar disorder demonstrate academic underperformance, disruptive behavior, poor social skills, and high levels of family stress (Geller et al. 2002). Delays to first treatment of PBD are associated with a chronic and severe course of illness (Post 1999), whereas early intervention may buffer against negative outcomes (Berk et al. 2010). Pharmacological agents are the first line of treatment for PBD, but their use alone fails to bring children to full, sustained remission (Washburn et al. 2011). As such, psychosocial interventions have been developed as an adjunct to pharmacotherapy to address the complex constellation of symptoms and associated social, cognitive, and family difficulties in PBD.

Family-based psychosocial interventions, especially, are warranted for PBD given the sensitive developmental period of its onset. Relative to their counterparts with adult onset, children with bipolar disorder are more likely to experience rapid cycling, mixed mood states, demonstrate high rates of co-morbidity, as well as experience more severe mood symptoms and less time euthymic during adulthood (Geller et al. 2004, 2008). Moreover, despite the severity of their condition, children have compromised insight and understanding of their own psychopathology, and tend to underreport their symptoms (Youngstrom et al. 2004a). The accumulation of negative prognostic indicators associated with PBD places an enormous burden on the caretakers of affected children to help intervene during this period of significant risk. Parents, therefore, bear a great responsibility to help their children identify and monitor symptoms and seek treatment. They are integral to the management of symptoms and achieving optimal functioning for the patient and whole family. Accordingly, psychosocial interventions that include the family are...
necessary for the comprehensive management of the disorder. The development of psychosocial interventions specific to PBD is a relatively new area of work, but the family-based interventions currently being developed and tested in childhood and adolescence have yielded significant reductions in mood symptoms and improvements in psychosocial functioning thus far (West and Pavuluri 2009).

Family relationships, however, are not necessarily ipso facto protective factors (Miklowitz 2007). Evidence from studies of expressed emotion suggest that the specific quality of family environment has important implications for understanding the development and maintenance of mood symptoms (Miklowitz 2004). Overall, families of patients affected by mood disorders and schizophrenia have high levels of expressed emotion, which is associated with relapse (Butzlaff and Hooley 1998; Miklowitz 2004). Consistent with these findings, families of children with PBD have low levels of cohesion, expressiveness, and activity, and high levels of conflict and expressed emotion (Belardinelli et al. 2008; Schenkel et al. 2008; Sullivan and Miklowitz 2010). These deficits in family functioning are associated with poor illness course and adverse treatment outcomes for children. One study established expressed emotion as a predictor of time to recovery in depressed children (Asarnow et al. 1993) and another as a predictor of symptom severity among adolescents with bipolar disorder (Miklowitz et al. 2006). Studies of both pharmacological and psychosocial interventions in bipolar children and adolescents demonstrate that poor family functioning moderates treatment outcome, such that patients of families with impaired functioning benefit less from treatment or require a more intensive intervention to achieve symptomatic improvement (Miklowitz et al. 2009; Sullivan et al. 2012; Townsend et al. 2007).

Viewed through this lens, child-focused treatment alone may not be sufficient to achieve improvements in mood symptoms and family functioning. For that reason, several existing interventions work intensively with the parents, under the expectation that caregiver focused aspects of intervention will help to achieve optimal functioning for the whole family and facilitate improvements in child mood symptoms. Despite their different theoretical underpinnings, family based interventions for children with PBD such as child and family focused cognitive behavioral therapy (CFF–CBT) and individual family or multi-family group psychoeducation (IFP; MFPG) do so through common strategies such as providing parents with education about PBD and the impact parent and family systems have on its course of illness, boosting parenting efficacy, helping parents cope with the illness burden of caring for a child with bipolar disorder, and managing the parents own psychological needs (Fristad 2006; West and Weinstein 2012). Similar parent-oriented strategies are also utilized in interventions designed for adolescents with bipolar disorder, such as family-focused treatment (FFT) (Miklowitz et al. 2008) and dialectical behavioral treatment (DBT) (Goldstein et al. 2007).

Although these interventions are designed to accommodate caregiver needs, there is actually a limited evidence base to fundamentally explain which and how these specific parent level factors relate to child mood symptoms. How parent traits influence child symptoms and behavior is an important advancement in the field, given it is well established that psychiatric disorders, and mood disorders in particular, are highly heritable. Convergent findings from twin and offspring studies regarding genetic risk for mood disorders suggest that heritability ranges from 60 to 90 % (Smoller and Finn 2003). In contrast to offspring of parents with no psychiatric history, offspring of parents with bipolar disorder are almost three times more likely to develop a psychiatric disorder, and four times as likely to develop a mood disorder (Lapalme et al. 1997).

Given that it is widely known that rates of intergenerational transmission of mood disorders are high, a better understanding of the ways in which parent behaviors exacerbate psychiatric symptoms among children could help dictate intervention approaches. However, only a few existing studies have examined how specific parent characteristics relate to child symptoms in mood disorders. Geller and colleagues found that parents of children with bipolar disorder treated their children with less warmth, and greater tension and hostility relative to parents of healthy controls and children with ADHD (Geller et al. 2000). Longitudinally, lower maternal warmth in the PBD group significantly predicted shorter time to relapse after recovery from mania at both the 2 and 4 year follow up (Geller et al. 2002, 2004). Additionally, in a separate study of adolescents with unipolar depression and bipolar disorder, Robertson et al. (2001) found that adolescents with bipolar disorder reported more problems with parents compared to adolescents with unipolar depression and healthy controls (Robertson et al. 2001). Furthermore, in an ancillary study to the Sequenced Treatment Alternatives to Relieve Depression (STAR*D), maternal depressive episodes were associated with increased risk for psychiatric disorders and poor long-term functioning among offspring (Pilowsky et al. 2006; Wickramaratne et al. 2011).

Indeed, these findings regarding parental warmth, conflict, and mental health status have important treatment implications. However, to achieve optimal implementation of the parent-focused aspects of psychosocial interventions for PBD, a more complete understanding of exactly how caregiver characteristics are implicated in the maintenance of PBD symptoms is needed. Ultimately, a comprehensive understanding of these relationships could help guide
flexible implementation and adaptation of the parent-focused aspects of psychosocial interventions to better serve specific needs of the child and family. This study builds on previous work regarding the family context in PBD by examining how caregiver characteristics are involved in the symptomatic status of children with bipolar disorder. The aim of the present study is to gain a better understanding of the relation between parent traits and mood symptoms in children, and to describe the impact of parent behaviors on child mood state. Specifically, we are interested in how parent psychopathology, coping skills, stress and burden of caring for a child with bipolar disorder, and parent knowledge and efficacy about parenting a child with bipolar disorder are related to child symptoms of mania and depression. We seek to assess both the direct influence of parent psychopathology, parenting stress, coping and parenting efficacy on symptoms of depression and mania in children, as well as whether skills that can be taught to parents through psychosocial intervention (i.e., coping skills and parenting efficacy) may buffer against the severity of child mood symptoms for caregivers higher in psychopathology and stress.

Method

Participants

Participants (n = 64) for the study were referred from providers in the Pediatric Mood Disorders Clinic at the University of Illinois at Chicago Medical Center. All participants were part of a randomized clinical trial of a family-based psychosocial treatment for PBD. A trained research assistant assessed potential participants for eligibility. All eligible participants fulfilled the following criteria: a DSM-IV diagnosis of bipolar I, II, or not otherwise specified (NOS) based on the Washington University in St. Louis Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS) (Geller et al. 2001) interview with the child and at least one parent; stable on current medication regimen; age between 7 and 13 years. Participants were not eligible for the study if the parent(s) met criteria for an acute episode of mania or depression, or if the child scored <70 on the Kaufman Brief Intelligence Test, Second Addition (Kaufman and Kaufman 2004), was actively psychotic, acutely suicidal, reported active substance use, or suffered from any neurological or other medical condition that would potentially cause or complicate presenting psychiatric symptoms.

The average age of the sample was 9.21 years (SD = 1.56). Forty-six percent were female; 56 % European Caucasian, 30 % African American, 5 % Hispanic, 5 % American Indian or Alaskan, 2 % Native American or Pacific Islander, and 2 % identified as “Other.” Thirty-six percent of the sample was diagnosed with bipolar I, 3 % bipolar II, and 61 % with bipolar disorder NOS. Thirty percent had a co-morbid anxiety disorder, 78 % had co-morbid ADHD, 37 % had co-morbid oppositional defiant disorder, and 10 % had co-morbid conduct disorder. Nearly half of the sample (42 %) reported their current or most recent episode as mixed, 27 % reported manic or hypomanic, 10 % depressed, and 28 % did not specify.

Procedures

After the informed consent procedures, children with suspected or diagnosed bipolar spectrum disorder and their caregiver(s) were screened for eligibility for the study. The parent(s) were interviewed by a trained interviewer using the Washington University Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS) (Geller et al. 2001). The child was interviewed separately by a different trained interviewer; content from the parent assessment was used to corroborate child report. Two licensed clinical psychologists, the study principal investigator and co-investigator, reviewed the diagnostic interviews at weekly team meetings to confirm the diagnosis.

After confirmation of a bipolar spectrum disorder diagnosis and the administration of inclusion/exclusion measures, children and caregivers completed a battery of baseline assessments and questionnaires, including measures of symptoms, global functioning, and child, caregiver, and family psychosocial functioning. Parent completed measures on their own, whereas children completed measures with the help of a study staff member. The current study uses baseline clinician and parent-rated measures of child depression and mania symptoms, and parent self-report of coping strategies, psychopathology, stress, and parenting efficacy.

Measures

Washington University Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS)

The WASH-U-KSADS is a semi-structured clinician administered interview designed to yield current and lifetime DSM-IV diagnosis. Current mood state was defined as the past 2 weeks, inclusive of the interview date. Lifetime diagnoses assessed the worst period of symptoms prior to the last 2 weeks. This diagnostic instrument has demonstrated good test–retest reliability and inter-rater reliability (Geller et al. 2001).
Clinician-Rated, Child Report Measures

Kiddie Young Mania Rating Scale (K-YMRS)

The K-YMRS is an eleven-item, rating scale used to assess the severity of manic symptoms in children. The scale was originally developed for the evaluation of adult patients suffering from bipolar disorder (Young et al. 1978). It has since been modified for use in pediatric patients and is established as a reliable and valid measure of manic symptoms in children ages 5–17 (Fristad et al. 1992, 1995; Youngstrom et al. 2002). Scores are calculated by summing across the 11 items. In this study, the K-YMRS was used to assess current mood state, operationally defined as the past 2 weeks, inclusive of the assessment date. The internal consistency of the K-YMRS in this sample was .60.

Children’s Depression Rating Scale—Revised (CDRS-R)

The CDRS-R (Poznanski 1984) is a reliable and valid clinician-rated instrument for measuring the severity of depression in children. The CDRS-R resembles the Hamilton Depression Rating Scale in its use of categories and subcategories (Hamilton 1967), but with developmental modifications that are more appropriate for a pediatric population. The scale has demonstrated strong inter-rater reliability and validity (Poznanski et al. 1979). Scores are calculated by summing scores across the 17 items that assess depressive symptoms, each of which are rated on a 5 point Likert-type scale. In this study, the CDRS was used to assess current mood state, operationally defined as the past 2 weeks, inclusive of the assessment date. The CDRS demonstrated good internal consistency in this sample ($\alpha = .83$).

Parent Report Measures

Child Mania Rating Scale (CMRS)

The CMRS parent report (Pavuluri et al. 2006) measures symptoms of mania, such as elevated mood, increased motor activity, hypersexual interest, lack of sleep, irritability, tangential language and pressured speech, and aggressive behavior, with high inter-rater reliability and concurrent validity with other mania rating scales. Scores are calculated by summing the 21 items assessing mania, each of which are rated on a Likert scale ranging from 0 (never) to 3 (very often). Parents in this study reported broadly on lifetime symptoms of child’s mania severity. The CMRS demonstrated good internal consistency in this sample ($\alpha = .89$).

Child Bipolar Depression Rating Scale (CBDRS)

The CBDRS (Pavuluri, unpublished) parent report consists of content valid questions concerning childhood depression symptoms. Scores are calculated by summing 22 items assessing depression, each of which are rated on a Likert scale ranging from 0 (never) to 3 (very often). Parents in this study reported broadly on lifetime symptoms of their child’s depression. The CBDRS demonstrated good internal consistency in this sample ($\alpha = .87$).

Coping Health Inventory for Parents (CHIP)

The CHIP (McCubbin and Thompson 1991) is specifically designed to measure parents’ responses to management of family life when they have a child who is seriously or chronically ill. It includes subscales measuring (1) family integration and cooperation (2) social support, self-esteem, and psychological stability, and (3) understanding of the illness through communication with other parents and professionals. Scores are calculated by summing scores for the total number of items, and the item in each of the subscales, which are each rated on a Likert scale from 0 (not helpful) to 3 (extremely helpful). All subscales and overall scale have demonstrated high internal consistency. Parents in this study reported broadly on their lifetime coping patterns. The CHIP demonstrated excellent internal consistency in this sample ($\alpha = .94$). Subscales demonstrated good internal consistency in this sample: family integration and cooperation ($\alpha = .87$); social support, self-esteem, and psychological stability ($\alpha = .88$); understanding of illness through communication with other parents and professionals ($\alpha = .81$).

Symptom Checklist 90-R (SCL-90-R)

The SCL-90-R (Derogatis 1996) is a brief instrument with extensive data on its reliability and validity that helps evaluate a broad range of psychological problems and symptoms of psychopathology in adults. It contains 90 items rated on a 5-point scale. The measure yields nine primary symptom dimensions (Somatization, Obsessive–Compulsive, Interpersonal Sensitivity, Anxiety, Depression, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism) and three global indices (Global Severity, Positive Symptom Index, Positive Symptom Total). This study utilizes the Global Severity index, which reflects both the frequency and severity of parent symptoms reported. Parents in this study reported broadly on their lifetime symptoms of psychopathology. The SCL-90-R demonstrated excellent internal consistency in this sample ($\alpha = .98$).
**Parental Stress Scale (PSS)**

The PSS (Berry and Jones 1995) assesses caregivers feelings regarding the parent–child relationship, such as feeling overwhelmed, satisfied, close, and worried. Scores on the PSS are calculated by summing scores across 18 items, each of which are rated on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale has good test–retest reliability and has been standardized in several populations. Validity was established through the scale’s correlation with other well-established measures of parenting stress, such as the Parenting Stress Index (PSI) (Abidin 1986). Parents in this study reported broadly on their lifetime experience of parental stress. The PSS demonstrated good internal consistency in this sample ($\alpha = .84$).

**Therapy Outcomes Parents Scale (TOPS)**

The TOPS was developed to assess parent feelings and perceptions regarding their child’s bipolar disorder, including their knowledge about the disorder and sense of efficacy in coping with it. Parents’ rate 20 items on a 5-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree.’ Higher scores indicate greater knowledge and perceived self-efficacy in managing the child’s disorder. This face-valid measure has shown good internal reliability (The CDRS demonstrated good internal consistency in this sample ($\alpha = .88$) in previous studies (West et al. 2009). Parents in this study reported broadly on their lifetime sense of parenting efficacy. The TOPS demonstrated acceptable internal consistency in this sample ($\alpha = .76$).

**Data Analytic Approach**

The present study utilized multiple linear regression models in SPSS 20.0 to model the effects of caregiver characteristics on child mood symptoms. Models were conducted separately to examine the effects of each parent baseline characteristic on child mood symptoms, including effects for the focal predictor (parent psychopathology, parenting stress), moderator variable (parent coping, parenting efficacy), and predictor by moderator. Models were conducted using both parent-reported and clinician-rated/child reported outcome measures of mood symptoms, as previous literature has indicated inconsistencies in symptom report can exist according to informant (De Los Reyes et al. 2011a, b; Youngstrom et al. 2004a, 2011).

Effects for demographic controls (age, gender) were included in models when demographic characteristics demonstrated significant associations with dependent variables in preliminary analyses. Regression analyses involved the hierarchical entry of demographic controls, focal predictor, moderator variable, and interactions between the focal predictor and proposed moderator. In addition, for measures comprised of several subscales (i.e. CHIP), if a significant interaction was found using the total scale, a series of analyses were conducted that tested the interaction between focal predictor and subscale (including the same set of covariates and main effects included in previous models). All continuous independent variables were mean-centered. The only categorical predictor, sex, was dummy coded with females as the comparison level. Interaction terms were mean centered and tested continuously. To probe the form of significant interaction terms, simple slopes of the focal predictor on child mood symptoms were subsequently tested at the mean, and one standard deviation (SD) above and below the mean of the

| Table 1 Demographic and clinical characteristics of 64 children and families with pediatric bipolar disorder |
|-----------------------------------------------|
| Mean | SD |
| Age | 9.21 | 1.56 |
| Sex (female) | 29 | 46 |
| Family income (<50,000) | 22 | 38 |
| Ethnicity | | |
| European Caucasian | 36 | 56 |
| African American | 19 | 30 |
| Hispanic | 3 | 5 |
| Native American or Pacific Islander | 1 | 2 |
| American Indian or Alaskan | 3 | 5 |
| Other | 1 | 2 |
| Diagnosis | | |
| Bipolar I | 23 | 36 |
| Bipolar II | 2 | 3 |
| Bipolar NOS | 39 | 61 |
| Co-morbidities | | |
| Anxiety disorder | 19 | 30 |
| Attention deficit hyperactivity disorder | 50 | 78 |
| Oppositional defiant disorder | 23 | 37 |
| Conduct disorder | 6 | 10 |
| Current episode | | |
| Manic/hypomanic | 16 | 27 |
| Depressed | 6 | 10 |
| Mixed | 25 | 42 |
| Unspecified | 17 | 28 |

Percentages are represented as n (%) and calculated based on the number of available cases

* Unspecified refers to children reporting symptoms that did not meet full criteria for a current manic, depressed, or mixed episode, but met lifetime criteria for a bipolar spectrum disorder and reported residual mood symptoms during the diagnostic interview
Table 2 Descriptive statistics for variables of interest; n = 64

| Independent variables | Mean  | SD   |
|-----------------------|-------|------|
| SCL                   | -1.28 | 1.19 |
| PSS                   | 44.39 | 11.48|
| CHIP                  | 81.75 | 24.25|
| TOPS                  | 71.16 | 10.94|

| Dependent variables   | Mean  | SD   |
|-----------------------|-------|------|
| CMRS                  | 23.66 | 10.45|
| YMRS                  | 12.14 | 5.48 |
| CBDRS                 | 19.01 | 9.71 |
| CDRS                  | 41.25 | 10.92|

Results

Preliminary Analyses

All variables were first checked for normal distribution. This inspection revealed that the SCL-90-R was a skewed variable. We took the natural logarithm of the SCL-90-R to normalize the distribution, and used this logarithmic transformation in all further analyses.

Demographic and clinical characteristics of the total sample are reported in Table 1. Descriptive statistics for all study measures are reported in Table 2. Bivariate correlations and between group student’s t-tests were used to examine associations between demographic factors (e.g., child age, child sex, child race, family income) and outcome measures of child symptoms of mania and depression (YMRS, CMRS, CDRS, CBDRS). Child age was positively associated with parent-rated child CBDRS severity ($r = .26$, $p = .047$), and parents of girls reported higher CBDRS scores relative ($M = 21.56$, $SD = 8.95$) to boys ($M = 16.73$, $SD = 10.03$), $t(1, 59) = -1.97$, $p = .05$. Therefore, in models predicting parent-rated child CBDRS scores, child age and sex were included as control variables. Race and income were unrelated to parent-rated CBDRS scores (all $p$’s $>.602$). Age, sex, race, and income were not associated with CMRS, YMRS, or CDRS scores (all $p$’s $>.161$).

Bivariate correlations were also used to examine associations between predictor variables (e.g., parent psychopathology, parenting stress, parent coping, and parenting efficacy). Parenting efficacy and parenting stress were correlated, $r = -.45$, $p < .001$. No other associations between predictor variables were significant (all $p$’s $>.069$).

Main Analyses: Effects of Parent Characteristics on Child Mood Symptoms

Results of the models, including parameter estimates, standard error, and $t$-values are presented in Table 3.

A model predicting child CBDRS scores indicated a significant interaction between parent SCL-90-R and CHIP scores, as is illustrated in Fig. 1. Increases in the log of the parent SCL-90-R scores predicted increases in child CBDRS scores for parents low on the CHIP, $b = 3.08$, $SE = 1.45$, $t(2.13)$, $p = .038$. SCL-90-R scores were unrelated to child CBDRS scores among parents with moderate, $b = .45$, $SE = .98$, $t(46)$, $p = .65$, or high, $b = -2.18$, $SE = 1.44$, $t(-1.52)$, $p = .130$ use of coping skills as measured by the CHIP. An analysis of the coping subscales indicated a significant interaction between parent SCL-90-R scores and the social support/self-esteem/psychological stability subscale ($b = -.26$, $SE = .09$, $t(-2.80)$, $p = .007$), accounting for 11% of unique variance in CBDRS scores. Increases in the log of parent SCL-90-R scores predicted increases in child CBDRS scores among parents low in social support, self-esteem, and overall psychological stability ($b = 3.15$, $SE = 1.41$, $t(2.24)$, $p = .029$). Parent SCL-90-R scores were unrelated to child CBDRS scores among parents with moderate ($b = .42$, $SE = .97$, $t(43)$, $p = .668$) or high ($b = -2.31$, $SE = 1.35$, $t(-1.72)$, $p = .092$) levels of social support, self-esteem, and psychological stability. The coping subscales of family integration/cooperation and communicating with other parents/professionals were unrelated to child CBDRS scores. These models returned no main effects of age, sex, parent psychopathology, or coping.

A similar pattern of results was observed for parent-rated child CMRS scores. There was again a significant interaction between parent SCL-90-R and CHIP scores, as is illustrated in Fig. 2. Increases in the log of parent SCL-90-R scores most strongly predicted increases in child CMRS scores for parents low in coping as measured by the CHIP, $b = 3.25$, $SE = 1.62$, $t(2.01)$, $p = .049$. There was no association between parent SCL-90-R scores and child CMRS scores for parents with moderate, $b = .45$, $SE = 1.09$, $t(.42)$, $p = .679$, or high scores on the CHIP, $b = -2.34$, $SE = 1.60$, $t(-1.46)$, $p = .149$. An analysis of the CHIP subscales indicated that parent SCL-90-R scores interacted with the communicating with other parents/professionals subscale ($b = -.50$, $SE = .19$, $t(-2.73)$, $p = .008$), accounting for 4% of variance in CMRS scores. Increases in the log of parent SCL-90-R scores predicted increases in child CMRS scores among parents.
who rarely communicate with or seek care from other parents or professionals \((b = 2.60, SE = 1.30, t(1.90), p = .050)\). Parent SCL-90-R scores were unrelated to child CMRS scores among parents with moderate \((b = -2.10, SE = 1.09, t(-1.09), p = .924)\) or high \((b = -2.79, SE = 1.57, t(-1.77), p = .081)\) use of communication with other parents or professionals. The coping subscales of family integration/cooperation and social support/self-esteem/psychological stability were unrelated to child CMRS scores. This model returned no main effects of age, sex, parent psychopathology, or coping.

When these models were conducted using clinician-rated/child-reported measures of depressive (CDRS) and manic (YMRS) symptoms, the effect of parent SCL-90-R scores did not depend on the level of parent CHIP scores (See Table 3). Rather, these models revealed a direct association between parent CHIP scores and the YMRS, such that greater parent use of coping skills was associated with more severe child manic symptoms. That is, increases in parent coping were associated with increases in mania severity. This association was true in particular for the coping subscales of family integration and cooperation \((b = .15, SE = .07, t(2.03, p = .048)\) and social support, self-esteem, and psychological stability \((b = .14, SE = .07, t(1.96), p = .050)\), but not for communicating with professionals \((b = .24, SE = .13, t(1.83), p = .072)\).

In contrast to the findings found above for the effects of parent SCL-90-R and CHIP scores on symptoms of bipolar disorder, the effect of parent SCL-90-R and CHIP scores on symptoms of pediatric bipolar disorder; \(n = 64\)

| Parent characteristics | Effect on CBDRS | Effect on CMRS | Effect on CDRS-R | Effect on K-YMRS |
|-------------------------|----------------|---------------|----------------|-----------------|
|                         | \(b\) | \(SE\) | \(t\) | \(b\) | \(SE\) | \(t\) | \(b\) | \(SE\) | \(t\) | \(b\) | \(SE\) | \(t\) |
| **Psychopathology (SCL-90-R)** | | | | | | | | | | | | |
| Age                     | 1.32 | .80 | 1.66 | - | - | - | - | - | - | - | - | - |
| Sex                     | 3.40 | 2.49 | 1.37 | - | - | - | - | - | - | - | - | - |
| Psychopathology         | .45  | .98 | .46  | .45 | 1.09 | .42 | -20 | 1.19 | -.17 | -15 | .59  | -.25 |
| Coping                  | -.05 | .06 | -.84 | <01 | .06 | .06 | .06 | .07 | .86 | .07 | .03  | 1.96 |
| Psychopathology × coping | -.12*| .05 | -2.50 | -.13*| .05 | -2.37 | -01 | .06 | -.06 | .01 | .03  | .29 |
| Psychopathology × coping 1* | -.20 | .15 | -1.39 | -.31 | .16 | -1.99 | - | - | - | - | - | - |
| Psychopathology × coping 2* | -.26**| .09 | -2.80 | -.20 | .11 | -1.89 | - | - | - | - | - | - |
| Psychopathology × coping 3* | -.32 | .17 | -1.85 | -.51**| .19 | -2.73 | - | - | - | - | - | - |
| **Age**                 | 1.38 | .76 | 1.83 | - | - | - | - | - | - | - | - | - |
| **Sex**                 | 3.71 | 2.52 | 1.47 | - | - | - | - | - | - | - | - | - |
| Psychopathology         | -.17 | 1.03 | -.16 | -.23 | 1.19 | -.20 | .23 | 1.25 | -.19 | -.21 | .64  | -.34 |
| Parenting efficacy      | -.05 | .11 | -.41 | -.09 | .13 | -.65 | .20 | .14 | 1.43 | -.03 | .07  | -.48 |
| Psychopathology × parenting efficacy | .13 | .09 | 1.37 | .09 | .10 | .93 | .07 | .11 | .66 | -.03 | .05  | -.56 |

| **Parenting stress (PSS)** | | | | | | | | | | | | |
| Age                     | 1.13 | .82 | 1.37 | - | - | - | - | - | - | - | - | - |
| Sex                     | 4.80 | 2.55 | 1.88 | - | - | - | - | - | - | - | - | - |
| Parenting stress        | -.15 | .11 | -1.42 | -.03 | .12 | -.21 | -.16 | .12 | -1.31 | .04 | .06  | .59 |
| Coping                  | .01  | .06 | .11 | .04 | .06 | .68 | .09 | .07 | 1.31 | .07* | .03  | 2.24 |
| Parenting stress × coping | .01 | .01 | 1.38 | -.01 | .01 | -.20 | .01 | .01 | 1.37 | <01 | <01  | 1.04 |
| Age                     | 1.36 | .74 | 1.83 | - | - | - | - | - | - | - | - | - |
| Sex                     | 4.47 | 2.41 | 1.86 | - | - | - | - | - | - | - | - | - |
| Parenting stress        | -.14 | .11 | -1.28 | -.07 | .13 | -.53 | -.03 | .14 | .83 | .07  | .08  | .83 |
| Parenting efficacy      | -.10 | .12 | -.86 | -.08 | .14 | -.61 | .17 | .14 | .24 | .04  | .07  | .57 |
| Parenting stress × parenting efficacy | .01 | .01 | 1.57 | .01 | .12 | .01 | .01 | .25 | .01  | .09 | .15  |

\* \(p < .05\)

\** \(p < .01\)

a Coping 1 = family integration and cooperation

b Coping 2 = social support/self-esteem/psychological stability
c Coping 3 = communication with other parents and professionals
Fig. 1 Association between caregiver psychopathology and child depression as a function of parent social support, self-esteem, and psychological stability.

Fig. 2 Association between parent psychopathology and child mania as a function of parent communication with other parents and professionals.
disorder in children, we did not find any evidence for a relationship between the Parental Stress Scale or Therapy Outcomes Parents Scale and child mood symptoms. Models assessing how the Parental Stress Scale or Therapy Outcomes Parents Scale relate to child mood symptoms returned no main or interactive effects for the parent-reported measures of child symptoms (CBDRS, CMRS), nor for depression and mania symptom ratings gathered from the child by a clinician (CDRS, YMRS). See Table 3.

Discussion

The present study investigated how parent characteristics relate to the symptomatic profile of children with bipolar disorder. Family dynamics—as related to the symptoms, course, and outcome in PBD—have been extensively studied. However, individual caregiver characteristics have not received as much attention in the literature. This study provides evidence that individual traits of caregivers may be associated with the experience of symptoms of depression and mania among children with PBD. We found that parent psychopathology predicted increased child mania and depression severity among parents with low, but not average or above average use of coping skills when rated by parents. Specifically, high levels of social support, self-esteem, and psychological stability buffered against the effects of parent symptoms on child depression. Communicating with other parents and professionals buffered against the effects of parent symptoms on child mania. In addition we found a direct association between higher levels of parent coping and increased child mania severity when children were evaluated by clinicians. In contrast, we did not find any evidence that parenting stress or parenting efficacy were related to mood symptoms among children with bipolar disorder.

These findings suggest that, although parent psychopathology does not directly predict symptoms of depression or mania among children, it is strongly related to symptom severity in parents who report rare or insufficient use of skills to cope with their child’s affective illness. Previous research has suggested that the role of parent psychopathology in a child’s mental illness may operate through two different pathways (Neiderhiser et al. 1999). First, children of parents with psychological disturbance may have a genetic predisposition to develop symptoms of their own. Second, children, especially young children of a pre-pubertal age, may be viewed as a “sponge,” modeling behaviors they observe in their parents. When parents are emotionally distressed, the traits and behaviors their children learn may be maladaptive and contribute to the development of psychopathology. Findings from this study suggest the possibility that parents who employ skills to cope with their child’s illness may have the power to mitigate these negative trajectories, as our results indicate that the effects of parent psychopathology on child mood symptoms are lessened when parents use skills at a moderate to high level to cope with their child’s illness.

In particular, establishing a social support system and boosting self-esteem seems most helpful for parents in coping with their child’s symptoms of depression, whereas communicating with other parents and professionals was beneficial for coping with their child’s symptoms of mania. Consequently, it may be of value in intervention work to encourage the use of different parent coping strategies depending on the child’s mood; increasing self-restorative features in the parents’ environment in response to depressive symptoms, and in response to mania, trying to build a better understanding of the nature of bipolar disorder and its consequences by talking with others. Increasing parental social support and self-esteem may be a technique met with the most success, as these behaviors accounted for more variance in child depressive symptoms than communicating with other parents and professionals accounted for variance in child manic symptoms.

It is important to consider the context of these findings, in particular, how child behavior may have affected parent reporting regarding their own symptoms, stress, and coping. Because parents were asked to report on these characteristics at the baseline interview of a treatment study for children seeking help for acute mood symptoms, it is difficult to disentangle to what degree parent report of their own behaviors represented trait or possibly state functioning. Parent functioning in the current state may have been influenced by the stress and challenges associated with their child’s symptoms and could be subject to change during periods when their child is less symptomatic. Furthermore, parent-rated symptoms may have been subject to bias from their own psychopathology, stress, or other traits. However, given that PBD is a chronic and recurrent disorder, it is of value to understand how parents behave in the face of their child’s active illness.

It was interesting that although the association between parent psychopathology and child symptoms of depression and mania depended on the level of coping when models were conducted using parent-rated outcomes, we observed a direct association between coping and manic severity using clinician-rated outcomes of child-report. The direction of this association indicated that increases in parent coping were actually associated with increases in manic symptom severity. Given the cross sectional design of the study, and the potential bi-directional nature of parent and child variables, it is possible that children with a severely manic presentation are more difficult to manage, and in turn, cause their parents to utilize more coping strategies. However, it is not clear why this association would not
extend to parent perceptions of the association between coping and their child’s symptoms. In general, previous literature has indicated that, especially among this pre-pubertal age group, parent report of child symptoms are more reliable and credible relative to other informants (Youngstrom et al. 2004a, b, 2011). Parents are perceived as more credible even when the primary caregiver experiences mood symptoms (Youngstrom et al. 2011). In our study, parents reported on their child’s behavior independently. Although child report was ultimately corroborated by parent report and clinical judgment of the evaluator, it is possible that the child report data was subject to inaccuracies. Furthermore, the child-report measures of mood state assessed current functioning, whereas parents reported broadly on symptomatic periods. Behaviors reported by parents over the course of a lifetime may not be good at predicting the current assessment. Therefore, we are inclined to more heavily weigh our findings from parent-rated outcomes, given their superior reliability and consistency of evaluation period between independent and dependent variables. More carefully examining the associations between parent coping and child symptoms using additional informants (other family members, teachers, etc.) may help to clarify the directional nature of these associations.

It was surprising that we did not find any evidence to support an association between parenting stress or parenting efficacy and symptoms of PBD. A potential explanation is that although parenting stress and parenting efficacy are not involved in the maintenance of symptoms, they may be involved in other aspects surrounding the child’s illness, such as problem behaviors or family functioning. Therefore, it would be worthwhile to assess the impact parenting stress and parenting efficacy have on areas of functioning that are often impaired in children with bipolar disorder, such as school performance, social skills, family functioning, etc. It is also possible that we had a limited statistical ability in our sample to detect an association between parent stress or efficacy and symptoms. For instance, our measure of parenting efficacy has traditionally been used as an outcome measure, assessing change after treatment (West et al. 2009). At baseline, this measure showed moderately less variability in scores. Therefore, it is possible that this scale is better suited for detecting change than capturing dynamic associations with other variables at first measurement.

Collectively, our findings indicate that several parent factors are indeed related to child mood symptoms. Although these findings are preliminary, one potential application is with respect to family-based interventions. In previous studies among mothers with unipolar depression, remission of symptoms after treatment was associated with improvements in symptoms and functioning among offspring (Pilowsky et al. 2008; Weissman et al. 2006). Understanding that it is likely not only child, but also parent traits that are involved in the maintenance of mood symptoms in children, interventions that address child, but not parent dysfunction may be considered incomplete or insufficient. Within the context of family-based treatment, it could be important not only to devote time in sessions to the child and to the child and parent together, but also to set aside time for parent only sessions. Incorporating parent only sessions allows the time and resources for parents to develop strategies and strengths to recognize and defend against the negative impact their individual behaviors may have on their child’s illness. For instance, findings from this study suggest that improving coping through social support, self-esteem, and overall psychological stability as well as boosting parent communication with parents and other professionals may benefit children whose parents report a high level of their own symptoms. Investigating whether improvements in parent coping is associated with improvements in child symptoms is warranted in longitudinal, treatment-based studies.

Several study limitations are worth noting. First, the cross-sectional design limits conclusions about the direction of the reported associations. It is not only possible, but likely, that the severity of child mood symptoms may contribute to more distressed parent–child relationships, which in turn may exacerbate symptoms of parent psychopathology or cause parents to utilize more coping strategies to manage their child’s severe illness. One prospective study does support that parent characteristics predict symptomatic course and outcome in pre-pubertal children with bipolar disorder. This 8-year follow up found that lower maternal warmth predicted a faster relapse following recovery from a manic episode (Geller et al. 2004). However, more longitudinal studies examining the temporal relationships between changes in parent functioning and long-term outcomes in children with bipolar disorder are needed to disentangle whether disturbances in parent functioning are a cause or result of pediatric mania and depression. Equally possible is that child symptoms are a product of a dynamic interaction between parent and child traits—reciprocally affecting one another.

In addition, all of the families enrolled in this study were seeking an intensive family-based psychosocial treatment. It is possible that participants were seeking family-based treatment because of parent–child discord or because of the caregivers’ difficulties with managing their child with bipolar disorder or their own symptoms and distress, and therefore the sample may be biased according to the degree of impairment and distress endorsed by parents. This study also lacks external measures of parent characteristics. For instance, assessments from independent evaluators and child-report of parent characteristics are needed to validate.
the findings in this study regarding the effects of parent psychopathology and coping. Similarly, although the present study utilized a general domain of parent psychopathology, we did not collect parental psychiatric diagnoses using a structured interview, making it difficult to assess how specific kinds of parent symptoms relate to child mood state. It is possible that certain parental diagnoses contribute to child mood symptoms more or less than others. Finally, this study was conducted in a relatively small sample and warrants replication in larger samples.

These limitations notwithstanding, the findings begin to carve out an understanding that, not only family characteristics, but also specific parent traits and behaviors may be involved in the maintenance of mood symptoms in children with bipolar disorder. Managing a child’s chronic psychiatric ill health requires a great deal of coping on behalf of the parent. In the absence of effective coping skills, a parent’s own psychopathology may have effects of the severity of their child’s symptoms of mania or depression. Future research should explore how interventions that give parents effective tools and skills to cope with their child’s illness are associated with treatment outcomes for the child.

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