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Factors associated with mental health service utilization among bipolar youth

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Abstract

Objectives—This study aims to characterize patterns of mental health service utilization within a sample of bipolar youth. Demographic variables, youth bipolar characteristics, youth comorbid conditions, and parental psychopathology were examined as predictors of treatment utilization across different levels of care.

Methods—A total of 293 bipolar youth (aged 7–17 years) and their parents completed a diagnostic interview, family psychiatric history measures, and an assessment of mental health service utilization. Demographic and clinical variables were measured at baseline and mental health service use was measured at the six-month follow-up.

Results—Approximately 80% of bipolar youth attended psychosocial treatment services over the span of 6 months. Of those who attended treatment, 67% attended only outpatient services, 22% received inpatient/partial hospitalization, and 12% received residential/therapeutic school-based services. Using multinomial logistic regression, older age, female gender, and bipolar characteristics, including greater symptom severity and rapid cycling, were found to predict higher levels of care. Youth suicidal and non-suicidal self-injurious behavior, comorbid conduct disorder, and parental substance use disorders also predicted use of more restrictive treatment settings.

Conclusions—Results underscore the importance of assessing for and addressing suicidality, comorbid conduct disorder, and parental substance use disorders early in the treatment of bipolar youth to potentially reduce the need for more restrictive levels of care.

Keywords

adolescence; bipolar disorder; childhood; service utilization

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Pediatric bipolar disorder (PBD) is associated with considerable impairment. Youth with PBD exhibit greater global impairment than adolescents diagnosed with major depression. Moreover, children and adolescents diagnosed with PBD are at significant risk for suicidality, externalizing disorders, and psychiatric hospitalizations (1–5). Adolescents with PBD also have significantly higher behavioral and general medical health care costs than youth with other psychiatric disorders due to higher hospital admission rates and injury/overdose-related medical visits (6).

Youth who obtain adequate services early in the course of PBD may be less likely to require more restrictive or long-term services over time. However, population-based studies of youth with psychiatric disorders reveal that a disproportionate number of youth do not receive needed specialized mental health services. In the Methodology for Epidemiology of Mental Disorders in Children and Adolescents (MECA) Study, only 25.3% of children who met criteria for a psychiatric disorder and reported significant impairment utilized mental health specialty services (7). Similarly, results from the Ontario Child Health Study suggested that fewer than one in five children diagnosed with psychiatric disorders received specialized mental health/social services over a six-month period (8). These findings highlight the need for research examining factors associated with mental health service use, particularly among youth diagnosed with PBD (6).

Although pharmacotherapy is considered to be the front-line treatment for PBD (9, 10), treatment response can be enhanced with concurrent psychosocial treatment, such as individual and/or family-focused cognitive behavioral therapy (3, 11). While prior studies have examined factors associated with use of mental health services in population-based, school-based, and general psychiatric samples of youth [see (12) for a review; (13, 14)], this question has not been examined in PBD samples. It is important to study service utilization in specific diagnostic groups as each may pose a unique set of challenges to the family (15). The purpose of the present study is to examine factors associated with mental health service utilization in a large sample of youth with PBD. Prior investigations with child and adolescent samples have shown a number of demographic variables to be associated with mental health service utilization, although results have been mixed. Some population-based and school-based studies have found higher socioeconomic status (16, 17) and older age (13) to be related to service use. Studies with school-based samples have found male gender to be associated with greater service use (13, 18). In research conducted with psychiatric samples, one study found female gender to predict greater service use among depressed youth (14), whereas another found male gender to be associated with service use, specifically recurrent psychiatric inpatient hospitalizations, among severely emotionally disturbed youth (19). Findings regarding racial differences have been more consistent, with results suggesting that Caucasian youth receive more mental health services than African-American and Hispanic youth, both in clinical (18) and school-based (20) samples. The impact of demographic characteristics on level of care has also been examined. In a sample of psychiatrically impaired children (aged 4–16 years), girls were found to receive higher rates of inpatient treatment than boys. Further, youth admitted to inpatient/day treatment programs were found to be significantly older than those who received outpatient care or consultation (21).

Parental psychopathology is another factor that has been examined in relation to youth mental health service utilization, as it may compromise parenting abilities and negatively impact child adjustment (22). In the Great Smoky Mountains Study of Youth, a longitudinal epidemiologic study of mental health service use in rural, southeastern USA, Farmer and colleagues found that having a parent with a history of psychiatric problems directly increased the probability of mental health service utilization among youth (23). Cornelius et

al. (24) found parental substance abuse in particular to be associated with higher rates of mental health service utilization in adolescent males. Similarly, children with depressed parents have been found to attend mental health services at higher rates than children of non-depressed parents (25).

Youth comorbidity may also play an important role in mental health service utilization. Among children with various psychiatric conditions, the presence of comorbid externalizing disorders increases the likelihood that a child will receive mental health treatment (26–28). Comorbid conduct disorder in particular has been associated with poor clinical outcome among youth with PBD (29). Due to the disruptive nature of externalizing disorders and associated detriment to family functioning, parents may perceive a significant need for more restrictive mental health services for youth with comorbid PBD and externalizing disorders.

In addition to factors common to many child psychiatric conditions, such as parental psychopathology and youth comorbidity, clinical features specific to PBD and common co-occurring problems in this population, such as suicidality, may influence the need for more restrictive treatment settings. Research conducted with bipolar adults has shown mental health service utilization to be associated with greater severity and complexity of bipolar illness (30). It is also likely that the presence of common co-occurring problems, such as suicidal ideation, suicidal behavior, and non-suicidal self-injurious behavior (31), will be associated with the need for more restrictive treatment settings. However, to our knowledge, no research has been conducted to examine whether characteristics specific to PBD (i.e., mixed states, rapid cycling) and common co-occurring conditions (i.e., suicidality) longitudinally predict level of care.

The purpose of the present study was to build upon previous research on mental health service utilization among children and adolescents in three ways. First, we sought to examine mental health service utilization within a specific diagnostic group, youth with PBD, as children and adolescents diagnosed with PBD are particularly impaired and may substantially benefit from mental health services. To our knowledge, this is the first study to examine predictors of psychosocial service use and level of care within a sample of PBD youth. Second, we considered both parent and child characteristics that may attenuate service utilization, as these factors have been associated with treatment attendance among general psychiatric populations but have not been examined in bipolar youth. Lastly, we examined the impact of factors specific to the severity and complexity of PBD on service utilization. These factors were examined in relation to the least to most restrictive treatment setting (no treatment, outpatient, inpatient/partial hospitalization, residential/school-based) utilized within a six-month time period. We hypothesized that the presence of the following baseline characteristics would be associated with the need for a more restrictive treatment setting: (i) parental mood and substance use disorders; (ii) youth comorbid externalizing disorders; (iii) more severe bipolar symptom presentation (i.e., mixed states, rapid cycling); and (iv) self-injurious behaviors.

Methods

Participants

Participants were recruited as part of a multi-site study collaborative study funded by the National Institute of Mental Health (5R01MH59929) entitled ‘Course and Outcome of Bipolar Illness in Youth’ (COBY). Participants included youth aged 7–18 years and their parents. All youth enrolled in the study were diagnosed with bipolar I, bipolar II, or bipolar disorder not otherwise specified (BD NOS) according to the Diagnostic and Statistical Manual IV [DSM-IV (32)]. See Birmaher et al. (33) for additional participant-related details. The present study includes a subset of 293 bipolar youth and their parents who were: (i)

assessed at baseline; (ii) re-assessed at the six-month follow-up; and (iii) received a Children's Global Assessment Scale (C-GAS) score ≥ 70 (i.e., experienced levels of psychiatric severity that warranted treatment attendance). Of these participants, 46% were female and 85% were Caucasian. At baseline the mean age of the present sample was 12.7 years [standard deviation (SD) = 3.16]. A total of 44% of youth were living with both biological parents, 47% were living with at least one biological parent, and 9% were in another living arrangement. The social status (34) of participating families, from highest to lowest socioeconomic status (SES), was as follows: 19.5% V; 34.8% IV; 20.5% III; 17.1% II; and 8.2% I.

Although 72% (293/405) of all potential participants met severity criteria and participated at both assessment time-points, few selection or attrition biases were evident. No significant differences were observed between these 293 youth and the 39 youth who did not meet C-GAS severity criteria at baseline with regard to race, gender, age, or SES. Further, there were no significant differences on baseline C-GAS, age, gender, or SES between these 293 youth and the 73 youth who met C-GAS severity criteria at baseline but did not participate at the follow-up. However, non-white participants were less likely to participate at follow-up than white participants ($\chi^2 = 3.86$, $p = 0.05$). Specifically, 82% of the Caucasian participants participated at follow-up compared to 71% of the non-Caucasian participants.

Procedures

Participants were enrolled at three academic medical centers: Brown University; University of California at Los Angeles; and the University of Pittsburgh Medical Center. This study was approved by the institutional review boards (IRBs) at the participating sites. Participants were recruited through clinical referrals as well as print advertisements. Most participants were referred from outpatient treatment settings (66%), followed by inpatient settings (15%), print advertisements (15%) and other sources (5%). Informed consent was obtained prior to initiation of the assessment from the participant's parent/guardian and from participants aged 14 years and older. The study procedures were explained in age-appropriate language to younger participants and verbal assent was obtained prior to the assessment. Baseline assessments included diagnostic interviews and self-report measures completed by youth and parents. Follow-up assessments were completed every 6 months. Both parents and youth were compensated for their participation. A summary of assessment results was provided to the parent and/or youth's treatment provider upon request of the parent with a signed release-of-information form from the parent, in accordance with the Health Insurance Portability and Accountability Act (HIPAA) and IRB guidelines. Referrals to treatment providers in the community were also made as requested. See Birmaher et al. (33) for additional study details. Only demographic and clinical data collected at the baseline assessment and treatment data collected at the first six-month follow-up using the Longitudinal Interval Followup Evaluation (LIFE) are presented here.

Measures

Schedule for Affective Disorders and Schizophrenia for School-age Children—Present and Lifetime Version (K-SADS-PL)—The K-SADS-PL (35) is a semi-structured diagnostic interview used to assess DSM-IV psychopathology in children and adolescents. The K-SADS-PL is administered first to the parent and then to the child, and both parties may be re-interviewed to resolve informant discrepancies. Mood symptoms that overlap with other psychiatric disorders (e.g., motor hyperactivity, distractibility) were not rated as present in the mood sections unless they intensified with the onset of abnormal mood. Further, comorbid diagnoses were not assigned if they occurred exclusively during a mood episode. Test-retest reliability and kappa coefficients are in the excellent range for present and/or lifetime diagnoses of major depressive, any bipolar, generalized anxiety,

conduct, and oppositional defiant disorders (0.77–1.00) and in the good range for other diagnoses (0.63–0.67) (35). The overall kappa coefficients for the psychiatric disorders assessed in this study were >0.80 . Only current mood and disruptive behavior disorder diagnoses are examined in this paper. K-SADS-PL questions that assess for current suicidal thoughts, suicidal behavior, and non-suicidal, self-injurious behavior were also examined [see Birmaher et al. (33) for K-SADS training and reliability procedures].

The Kiddie Mania Rating Scale (K-SADS-MRS)—The K-SADS-MRS (36) is a 13-item, semi-structured interview used to assess manic/hypomanic symptoms experienced during the most symptomatic week over the past month. The K-SADS MRS yields excellent reliability ($\alpha = 0.94$) and inter-rater agreement (intraclass correlation = 0.97). It is also sensitive to changes in manic symptom severity in response to treatment (36).

K-SADS Present Episode Version, Depression Section (DEP-P)—The DEP-P (35) is a 12-item, semi-structured interview that assesses depressive symptoms experienced during the most symptomatic week over the past month. The DEP-P provides a reliable measure of depression symptom severity (37, 38).

Children's Global Assessment Scale (C-GAS)—The C-GAS (39) is a clinician-rated global measure of impairment with excellent inter-rater reliability (40). Scores range from 1–100 (scores >70 indicate normal adjustment).

Family psychiatric history—The Family History Screen [FHS (41)] was used to assess the psychiatric status of first-degree relatives. Each parent who attended the interview answered questions about him/herself as well as their child's first-degree biological relatives. The FHS yields acceptable reliability and validity (41).

Service utilization—The Longitudinal Interval Follow-up Evaluation (42) was used to assess type and intensity of treatment attended by youth. The LIFE is a semi-structured interview used to elicit week-by-week changes in psychiatric symptoms, intensity of treatment exposure, and psychosocial functioning in psychiatric populations. In regard to treatment exposure, parents were asked to report the average number of individual therapy, group therapy, family therapy, and medication management sessions their child attended per week as well as the average number of days spent in inpatient hospitalization, partial hospitalization, and other treatment services (e.g., residential, school-based) per week between baseline and the six-month follow-up. Numerous longitudinal studies have used the LIFE to assess symptom status (42–45) and mental health treatment utilization over time (2, 43). The services utilization data are recorded to substantiate the psychiatric status ratings; as such, the services utilization portion of the measure has not been validated on its own. However, the LIFE as a whole yields excellent reliability and external validity (46, 47).

Results

General sample characteristics

The general sample characteristics at baseline are presented in Table 1. The bipolar sample as a whole experienced significant impairment at baseline (mean C-GAS score indicates sporadic difficulties with functioning and symptoms in several social areas). As can be seen, 38.6% of the youth had a parent with a mood disorder and 14% had a parent with a substance use disorder. Approximately 71% of youth were diagnosed with at least one comorbid externalizing disorder, with attention-deficit hyperactivity disorder (ADHD) being the most commonly observed comorbid condition. Most youth were diagnosed with youth BD I (61%) followed by BD NOS (33%) and BD II (5%). A total of 70% of participants

were in a current episode at baseline. Of these, 34.8% recovered during the six-month follow-up period. Recovery was defined as eight consecutive weeks with minimal or no symptoms as rated using the LIFE (33). However, of those who recovered, 13% experienced an episode recurrence. The most recent episode for youth and mean number of DSM-IV manic and/or depressive symptoms in each episode are as follows: 20% manic (mean = 5.8, SD = 2.0); 23% depressive (mean = 5.1, SD = 2.4); 16% mixed (manic: mean = 4.8, SD = 2.4; depressive: mean = 4.9, SD = 2.2); 8% hypomanic (mean = 4.0, SD = 2.8); 15% rapid cycling (manic: mean = 4.8, SD = 1.9; depressive: mean = 5.1, SD = 2.7); and 18% subsyndromal episode (manic: mean = 3.8, SD = 1.6; depressive: mean = 2.7, SD = 2.2).

Approximately a third of the sample reported suicidal thoughts and a quarter reported non-suicidal, self-injurious behavior within the most recent bipolar episode. A total of 10% of youth reported a suicide attempt within the most recent bipolar episode.

Analyses: level of care utilized

To ensure adequate cell sizes and increase power for analyses, services were grouped into one of four mutually exclusive categories. Residential and long-term therapeutic school-based services (i.e., most restrictive level of care) were designated as ‘long-term’ services. Psychiatric inpatient and partial hospitalization were designated as ‘short-term’ services (i.e., moderately restrictive level of care). Outpatient-based psychotherapies (individual, family, and/or group) were designated as ‘outpatient-only’ services (i.e., least restrictive level of care). The fourth group included youth who did not attend any long-term, short-term, or outpatient-only services. Youth were grouped into one of these four categories based on the most restrictive level of care received during the six-month period following baseline assessment. Specifically, 9% (n = 27) of youth received long-term services, 17% (n = 50) received short-term services, 53% (n = 155) received outpatient-only services, and 21% (n = 61) received no psychosocial treatment. Table 2 shows the number of youth participating in each treatment modality within level of care and frequency of service utilization. Of note, 86% of participants were receiving medication and concurrently attending medication management sessions. Specifically, 61% were prescribed antipsychotics, 32% antidepressants, 34% stimulants, 37% lithium, 33% valproate, and/or 25% other anticonvulsants. As this study focused on psychosocial treatment attendance, medication management sessions were not examined.

Our first set of analyses examined whether baseline demographics, global impairment (i.e., baseline C-GAS), parental psychopathology, child comorbid externalizing disorders, PBD-specific characteristics, and co-occurring suicidality were associated with the presence or absence of any psychosocial services or dose of treatment (e.g., number of outpatient psychosocial sessions, number of days in inpatient/partial hospital setting, or number of days in residential/school-based treatment) received between the baseline and six-month follow-up time-points. These analyses indicate that participants receiving psychosocial treatment were significantly: (i) older [$t(293) = 2.40, p < 0.05$]; and (ii) evidenced higher baseline DEP-P scores [$t(293) = 2.49, p < 0.05$]. Further, participants received more days of inpatient/partial hospitalization if they were Caucasian [$t(50) = 2.85, p < 0.01$], and had a parent with a substance use disorder [$t(49) = 2.24, p < 0.05$]. These findings remained significant after controlling for age, gender, and C-GAS score, with one exception: Caucasian ethnicity no longer predicted dose of treatment in short-term settings. No other differences were evident.

A second set of analyses were conducted, using multinomial logistic regression, to examine whether baseline characteristics were associated with level of care received between baseline and the six-month follow-up. The ‘no treatment’ group served as the comparison group for these analyses. Table 3 presents the mean values or frequencies for each of the

predictor variables separately for each of the four treatment categories. Results are summarized in Table 4 and described below.

These analyses indicate that participants were more likely to receive long-term services compared to no psychosocial treatment when they: (i) were older [with every one-year increase in age, 95% confidence interval (CI) = 1.02–1.38]; (ii) were diagnosed with comorbid conduct disorder (95% CI = 1.12–13.77); this effect remained significant when comorbid ADHD and oppositional defiant disorder (ODD) were controlled [odds ratio (OR) = 3.60, 95% CI = 1.00–12.90]; (iii) evidenced higher baseline DEP-P scores (95% CI = 1.04–1.14); (iv) experienced rapid cycling (i.e., four or more distinct mood episodes in a one-year period) (95% CI = 1.33–11.46); and (v) reported co-occurring suicidal ideation (95% CI = 1.35–9.37), non-suicidal, self-injurious behavior (95% CI = 1.09–7.68), and suicidal behavior (95% CI = 1.58–21.91).

With regard to short-term services, results indicate that participants were more likely to receive than to not receive psychosocial services when they: (i) were older (95% CI = 1.07–1.37); (ii) were female (95% CI = 1.05–4.95); (iii) evidenced higher baseline DEP-P scores (95% CI = 1.01–1.09); and (iv) evidenced higher baseline MRS scores (95% CI = 1.02–1.09). In addition, with regard to outpatient-only services, higher baseline C-GAS scores were associated with an increased likelihood of receiving services (95% CI = 1.01–1.07) than no psychosocial treatment.

To ensure that the observed effects were not due to the influence of age, gender, or global impairment, analyses were rerun while simultaneously controlling for these factors. Results remained significant with one exception: higher DEP-P scores were no longer associated with an increased likelihood of receiving short-term services.

A third set of analyses were conducted to examine whether baseline characteristics were differentially related to specific levels of care among the participants who received treatment between baseline and the six-month follow-up. Specifically, the multinomial logistic regressions discussed previously were rerun, excluding the 61 participants who did not attend any treatment during the follow-up (i.e., the outpatient-only services category served as the comparison group). These results are presented in Table 5 and are discussed below.

Participants were more likely to receive long-term services compared to outpatient-only services when they: (i) evidenced lower baseline C-GAS scores (95% CI = 0.89–0.97); (ii) were diagnosed with comorbid conduct disorder (95% CI = 1.05–7.70; this effect remained significant when comorbid ADHD and ODD were controlled (OR = 2.81, 95% CI = 1.01–7.83)); (iii) evidenced higher DEP-P scores at baseline (95% CI = 1.02–1.10); (iv) experienced rapid cycling (95% CI = 1.67–10.46); and (v) reported co-occurring suicidal ideation (95% CI = 1.35–7.21), non-suicidal, self-injurious behavior (95% CI = 1.22–6.70), and suicidal behavior (95% CI = 1.98–5.27).

Several of the predictor variables were also related to use of short-term services. Specifically, participants were more likely to receive short-term services compared to outpatient-only services when they: (i) were older (95% CI = 1.01–1.25); (ii) were female (95% CI = 1.31–4.96); (iii) evidenced lower baseline C-GAS scores (95% CI = 0.90–0.96); (iv) had a parent with a substance use disorder (95% CI = 1.05–5.70); this effect remained significant when parental mood disorders were controlled (OR = 3.10, 95% CI = 1.20–7.97); and (v) evidenced higher MRS scores at baseline (95% CI = 1.01–1.07).

As with the previously discussed regressions comparing long-term, short-term, and outpatient-only services to no treatment, these analyses were rerun controlling for age, gender, and global impairment; results remained significant.

Discussion

The primary aim of this paper was to examine factors associated with mental health service utilization within a large sample of bipolar youth. As most of the sample was obtained through clinical referrals, the majority (80%) of bipolar children and adolescents in the present study reported receipt of mental health therapy-based services. Approximately 12% attended residential or therapeutic school-based programs, 21% inpatient or partial hospitalization, and 67% received only outpatient therapy. Interestingly, the majority of bipolar youth who received outpatient therapy attended individual outpatient treatment (91%), with much lower rates of attendance at family therapy (5.8%). This finding is surprising as preliminary research suggests that caregivers of youth with PBD experience high levels of parenting stress (48). Further, in comparison to other clinical control groups, families of youth with PBD report lower levels of maternal-child warmth and higher maternal-child and paternal-child tension (49). Relatedly, the few psychosocial treatments developed to date for this very challenging treatment population center on the family unit and offer promising results (3, 11, 50). It is unclear whether the low rate of family therapy attendance in the present sample reflects referral practices, insurance guidelines, lack of training in and/or availability of family-based treatments for PBD, lack of education regarding the beneficial effects of family-based treatment as an adjunct to medication, and/or the early developmental stage of empirically based treatments for PBD at this time.

With regard to demographic characteristics, older youth were more likely to attend any psychosocial treatment compared to younger youth. In particular, older age increased the likelihood of receiving residential/school-based and inpatient/partial hospital services. These findings suggest that older youth may have PBD symptoms that are more difficult for parents to manage and thus require services that take them out of the home for extended periods of time. Females were also more likely to receive inpatient/partial hospitalization than males. This finding is consistent with prior research (21) and may reflect familial biases regarding the acceptability of mental health treatment for girls versus boys (51).

As expected, participants were more likely to receive long-term residential/school-based services and short-term inpatient/partial hospitalization services compared to outpatient-only services when they evidenced greater global impairment at baseline. However, when comparing treatment-seeking youth to those who did not attend psychosocial services, results suggested that participants were more likely to receive outpatient-only services when they evidenced lower global impairment at baseline. These findings may reflect the heterogeneity of the no-treatment group and/or a greater relative effect of treatment barriers in the subsample of youth who did not receive services. It may also reflect the fact that youth who attend treatment can be evaluated and triaged to more restrictive levels of care when needed. As this evaluation process does not occur for youth who fail to attend treatment, greater global impairment may not necessarily be associated with level of care in a linear fashion.

Consistent with prior research (24), parental substance use disorders were associated with more restrictive levels of care. Specifically, having a parent with a substance use disorder more than doubled the odds of receiving inpatient/partial hospitalization compared to only outpatient-based therapy services. Further, youth who had a parent with a substance use disorder also spent more days in inpatient/partial hospitalization settings. Families with a parent who abuses substances have been characterized by poor parental monitoring, poor communication, high levels of family conflict, and low family cohesion (52, 53). Under such conditions, not only is relapse more likely (54, 55), but early symptoms of a bipolar episode in the child may go unrecognized. By the time the bipolar symptoms are attended to, they may be so severe that outpatient treatment alone is insufficient.

With regard to child comorbidity, the presence of comorbid conduct disorder was associated with a four-fold increase in the likelihood of attending residential/school-based services. Surprisingly, ODD and ADHD did not influence the level of care received. Pediatric BD is, however, a condition associated with a high degree of impairment in terms of behavior, cognition, and emotion. Comorbid ODD and ADHD, in comparison to the more severe symptoms of conduct disorder, may not add significantly to the impairment experienced by youth with PBD.

When examining bipolar characteristics, although mixed states did not influence service utilization in our sample, greater manic and depression symptom severity distinguished youth who received inpatient/partial hospitalization from those who did not receive therapy services. Manic symptom severity also differentiated youth who received inpatient/partial hospitalization from those who only received outpatient therapy. Further, rapid cycling and depression symptom severity differentiated youth who received residential/school-based services from those who received outpatient-only and no therapy services. Also of interest is the finding that BD NOS youth received comparable levels of care to youth diagnosed with BD I. These results suggest that the clinical presentation of youth diagnosed with BD NOS is indeed severe enough to warrant more restrictive levels of care and thus, youth with this diagnosis are important to include in studies of PBD. Considered together and consistent with research conducted with bipolar adults (30), these results suggest that youth presenting with more severe depressive and manic symptoms, as well as rapid cycling, may require more use of more restrictive treatment services over time regardless of bipolar category.

Consistent with our hypothesis was the finding that suicidal thoughts, suicidal behavior, and non-suicidal, self-injurious behavior were greater among those who received the most restrictive level of care (residential/school-based) compared to those not attending therapy-based services and those receiving only outpatient services. In fact, suicidality conferred a 6–10-fold increase in the likelihood of receiving residential/therapeutic school-based services between baseline and the 6-month follow-up. Suicidality appeared to be a strong marker of PBD severity as well as a predictor of a more chronic course of the disorder in the present sample. It is also possible that results reflect, in part, therapist discomfort in treating bipolar youth exhibiting suicidal behavior on an outpatient basis and associated liability concerns.

Limitations

The present study has several limitations. First, the sample included predominantly Caucasian children and adolescents. As a result, findings may not generalize to youth of other races and cultures. Second, data were not obtained on therapeutic orientation of treatment providers or type of therapy delivered (e.g., cognitive behavioral, inter-personal, psychodynamic), which could potentially be related to mental health service utilization. Third, because so few families attended family or group therapy, we were unable to examine differences in service utilization across outpatient treatment modalities. As the few psychosocial treatments developed to date for youth with PBD center on the family unit, future examination of factors associated with attendance at family treatment will be especially important. Fourth, most youth were referred to the study by treating psychiatrists, physicians, and therapists. Therefore, results may not readily generalize to epidemiological samples of youth diagnosed with PBD. Last, although we were able to compare rates of attendance to those of other child psychiatric samples reported in the literature, results would have been enhanced by the addition of clinical comparison groups.

Clinical implications

Youth initially presenting with more severe bipolar symptoms may require close monitoring and perhaps a greater dose of outpatient therapy services at the onset of treatment to prevent the need for more restrictive therapy-based services. Cognitive behavioral, family-based therapy services may serve as a promising adjunct to medication management for these youth (11, 50). Relatedly, education and training in evidence-based family therapies for PBD will be needed as these treatment programs are more fully developed and disseminated. Assessing for and addressing parental substance use disorders, youth comorbid conduct disorder, as well as suicidal and non-suicidal self-injurious thoughts and behavior will also be needed. Assessment and early intervention in these areas may alter the service trajectory and could potentially offset the likelihood of requiring acute hospitalization and long-term services for many bipolar youth. The potential benefits of incorporating such practices may better serve the needs of bipolar youth and their families as well as decrease the burden and costs to the mental health care system as a whole. However, it should also be noted that, for a subset of bipolar youth, disease severity may require a more restrictive level of care from the outset.

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Table 1

Mean values or frequencies of predictor variables for the general sample (n = 293)

	n (%)	Mean (SD)
Demographics		
Age (years)	293	12.74 (3.16)
Gender (% female)	135 (46.1)	
Socio-economic status (% category I)	24 (8.2)	
Race (% White)	249 (85.0)	
Global impairment (C-GAS)	293	52.43 (10.35)
Parental psychopathology		
Parental mood disorder	113 (38.6)	
Parental substance use disorder	41 (14.0)	
Child comorbid externalizing disorder		
Attention-deficit hyperactivity disorder	179 (61.1)	
Conduct disorder	36 (12.3)	
Oppositional defiant disorder	101 (34.5)	
Pediatric bipolar-specific characteristics		
Bipolar I diagnosis	179 (61.1)	
Bipolar II diagnosis	16 (5.5)	
Bipolar NOS diagnosis	98 (33.4)	
DEP-P score	287	16.07 (10.44)
MRS score	290	24.37 (11.94)
Mixed episode	47 (16.1)	
Rapid cycling	44 (15.0)	
Co-occurring suicidality		
Suicidal ideation	82 (28.0)	
Non-suicidal self-damaging acts	74 (25.3)	
Suicidal acts	29 (9.9)	

SD = standard deviation; C-GAS = Children's Global Assessment Scale; Bipolar NOS = bipolar disorder not otherwise specified; MRS = K-SADS Mania Rating Scale; DEP-P = K-SADS Present Depression Section.

Table 2

Treatment modality utilization during the six-month follow-up period by highest level of care category

Treatment modality	n (%) ^a	Number of sessions ^b Mean (SD)
Long-term services (n = 27)		
Residential placement	13 (48.1)	50.41 (70.67)
Therapeutic school	15 (55.6)	40.70 (51.87)
Short-term services (n = 50)		
Inpatient hospitalization	41 (82.0)	16.84 (17.65)
Partial hospitalization	18 (36.0)	15.80 (34.50)
Outpatient-only services (n = 155)		
Individual therapy	141 (91.0)	11.17 (9.95)
Family therapy	9 (5.8)	0.39 (2.16)
Group therapy	5 (3.2)	0.59 (3.66)

^aPercentage refers to the percentage of participants *within* the specific level of care who engaged in the treatment modality during the follow-up period.

^bFor *long-term* and *short-term services*, the mean number of sessions refers to the number of days (rather than the number of sessions) engaged in the treatment modality.

Sixty-one participants did not attend any treatment during the follow-up period. Within each level of care (i.e., *long-term*, *short-term*, *outpatient-only*), the sum of the numbers of youth engaging in the specific treatment modalities is greater than the number of participants within the specific level of care because some participants attended more than one modality (e.g., during the follow-up period, one youth was involved in both residential placement and therapeutic school modalities).

Table 3

Mean values or frequencies of predictor variables as a function of highest level of care utilized during the follow-up

	Long-term services (n = 27)	Short-term services (n = 50)	Outpatient-only services (n = 155)	No psychosocial treatment (n = 61)
Demographics				
Age (years)	13.52 (2.25)	13.70 (3.14)	12.64 (3.16)	11.89 (3.30)
Gender (% female)	7 (25.9%)	33 (66.0%)	67 (43.2%)	28 (45.9%)
Socio-economic status (% category I)	4 (14.8%)	4 (6.6%)	13 (8.4%)	4 (6.6%)
Race (% White)	23 (85.2%)	52 (85.2%)	131 (84.5%)	52 (85.2%)
Global impairment (C-GAS)	47.74 (10.82)	47.86 (11.52)	55.13 (8.68)	51.38 (11.02)
Parental psychopathology				
Parental mood disorder	12 (44.4%)	15 (30.0%)	63 (40.6%)	23 (37.7%)
Parental substance use disorder	6 (22.2%)	11 (22.0%)	16 (10.3%)	8 (13.1%)
Child comorbid externalizing disorder				
Attention-deficit hyperactivity disorder	16 (59.3%)	27 (54.0%)	97 (62.6%)	39 (63.9%)
Conduct disorder	7 (25.9%)	7 (14.0%)	17 (11.0%)	5 (8.2%)
Oppositional defiant disorder	7 (25.9%)	16 (32.0%)	52 (33.5%)	26 (42.6%)
Pediatric bipolar-specific characteristics				
Bipolar I diagnosis	20 (74.1%)	35 (70.0%)	87 (56.1%)	37 (60.7%)
Bipolar II diagnosis	1 (3.7%)	3 (6.0%)	11 (7.1%)	1 (1.6%)
Bipolar NOS diagnosis	6 (22.2%)	12 (24.0%)	57 (36.8%)	23 (37.7%)
DEP-P score	22.11 (12.34)	17.41 (12.43)	15.74 (9.24)	13.12 (9.52)
MRS score	25.81 (10.15)	28.24 (11.68)	23.88 (11.38)	21.75 (13.58)
Mixed episode	4 (14.8%)	8 (16.0%)	25 (16.2%)	10 (16.4%)
Rapid cycling	10 (37.0%)	7 (14.0%)	19 (12.3%)	8 (13.1%)
Co-occurring suicidality				
Suicidal ideation	14 (51.9%)	15 (30.0%)	39 (25.2%)	14 (23.0%)
Non-suicidal self-damaging acts	12 (44.4%)	16 (32.0%)	33 (21.3%)	13 (21.3%)
Suicidal acts	8 (29.6%)	6 (12.0%)	11 (7.1%)	4 (6.6%)

Values are expressed as mean (SD) or n (%).

SD = standard deviation; C-GAS = Children's Global Assessment Scale; Bipolar NOS = bipolar disorder not otherwise specified; MRS = K-SADS Mania Rating Scale; DEP-P = K-SADS Present Depression Section.

Table 4
Multinomial logistic regressions predicting highest level of care utilized during the follow-up

	Long-term services (n = 27)				Short-term services (n = 50)				Outpatient only services (n = 155)			
	B	SE	OR	Wald	B	SE	OR	Wald	B	SE	OR	Wald
Demographics												
Age	0.17	0.08	1.19	4.91 ^a	0.19	0.06	1.21	8.78 ^b	0.08	0.05	1.08	2.48
Gender	-0.89	0.51	0.41	3.03	0.83	0.39	2.29	4.42 ^a	-0.11	0.30	0.90	0.13
Socio-economic status (I versus II-V)	0.91	0.75	2.48	1.47	-0.10	0.79	0.91	0.01	0.27	0.59	1.31	0.20
Race (non-Caucasian versus Caucasian)	0.01	0.65	1.01	0.00	-0.06	0.54	0.94	0.01	0.06	0.42	1.06	0.02
Global impairment (C-GAS)	-0.04	0.02	0.97	2.35	-0.03	0.02	0.97	3.21	0.04	0.02	1.04	6.21 ^a
Parental psychopathology												
Parental mood disorder	0.42	0.48	1.53	0.77	-0.32	0.41	0.73	0.60	0.15	0.31	1.16	0.22
Parental substance use disorder	0.72	0.60	2.05	1.42	0.63	0.51	1.88	1.53	-0.26	0.46	0.77	0.32
Child comorbid externalizing disorder												
Attention-deficit hyperactivity disorder	-0.20	0.47	0.82	0.17	-0.41	0.39	0.66	1.12	-0.06	0.31	0.94	0.03
Conduct disorder	1.37	0.64	3.92	4.54 ^a	0.60	0.62	1.82	0.94	0.32	0.53	1.38	0.37
Oppositional defiant disorder	-0.75	0.51	0.47	2.18	-0.46	0.40	0.63	1.31	-0.39	0.31	0.68	1.55
Pediatric bipolar-specific characteristics												
Bipolar I diagnosis	0.62	0.51	1.85	1.46	0.41	0.41	1.51	1.05	-0.19	0.31	0.83	0.37
Bipolar II diagnosis	0.84	1.43	2.31	0.34	1.34	1.17	3.83	1.32	1.52	1.06	4.58	2.08
Bipolar NOS	-0.75	0.53	0.47	1.98	-0.65	0.42	0.52	2.36	-0.04	0.31	0.96	0.02
DEP-P score	0.08	0.02	1.09	13.06 ^c	0.04	0.02	1.04	4.84 ^a	0.03	0.02	1.03	2.91
MRS score	0.03	0.02	1.03	2.08	0.05	0.02	1.05	7.93 ^b	0.02	0.01	1.02	1.35
Mixed episode	-0.12	0.64	0.89	0.04	-0.03	0.52	0.97	0.00	-0.01	0.41	0.99	0.00
Rapid cycling	1.36	0.55	3.90	6.11 ^a	0.08	0.56	0.89	0.02	-0.07	0.45	0.88	0.02
Co-occurring suicidality												
Suicidal ideation	1.26	0.49	3.54	6.61 ^b	0.37	0.44	1.45	0.73	0.13	0.36	1.13	0.12
Non-suicidal self-damaging acts	1.06	0.50	2.89	4.55 ^a	0.56	0.44	1.75	1.65	0.01	0.37	1.01	0.00
Suicidal acts	1.77	0.67	5.89	7.00 ^b	0.66	0.68	1.94	0.95	0.06	0.61	1.06	0.01

The 'No treatment' category (n = 61) served as the reference group for these analyses.

SE = standard error; OR = odds ratio; Wald = Wald statistic; C-GAS = Children's Global Assessment Scale; Bipolar NOS = bipolar disorder not otherwise specified; MRS = K-SADS Mania Rating Scale; DEP-P = K-SADS Present Depression Section.

- ^a p < 0.05;
- ^b p < 0.01;
- ^c p < 0.001.

Table 5

Multinomial logistic regressions comparing participants utilizing long-term services (n = 27) or short-term services (n = 50) to participants utilizing outpatient-only services (n = 155) during the follow-up

	Long-term services (n = 27)				Short-term services (n = 50)			
	B	SE	OR	Wald	B	SE	OR	Wald
Demographics								
Age	0.96	0.07	1.10	1.86	0.12	0.06	1.12	4.34 ^a
Gender	-0.78	0.47	0.46	2.76	0.94	0.34	2.55	7.59 ^b
Socio-economic status (I versus II-V)	0.64	0.61	1.90	1.09	-0.36	0.66	0.70	0.30
Race (non-Caucasian versus Caucasian)	-0.05	0.59	0.95	0.01	-0.12	0.46	0.89	0.07
Global impairment (C-GAS)	-0.08	0.02	0.93	12.19 ^c	-0.08	0.02	0.93	18.36 ^c
Parental psychopathology								
Parental mood disorder	0.28	0.43	1.32	0.41	-0.46	0.35	0.63	1.73
Parental substance use disorder	0.98	0.54	2.66	3.32	0.89	0.43	2.44	4.26 ^a
Child comorbid externalizing disorder								
Attention-deficit hyperactivity disorder	-0.14	0.43	0.87	0.11	-0.35	0.33	0.70	1.16
Conduct disorder	1.04	0.51	2.84	4.21 ^a	0.28	0.48	1.32	0.34
Oppositional defiant disorder	-0.37	0.47	0.69	0.61	-0.07	0.35	0.93	0.04
Pediatric bipolar-specific characteristics								
Bipolar I diagnosis	0.80	0.47	2.23	2.95	0.60	0.35	1.82	2.97
Bipolar II diagnosis	-0.67	1.07	0.50	0.41	-0.18	0.67	0.84	0.07
Bipolar NOS	-0.71	0.49	0.49	2.09	-0.61	0.37	0.54	2.72
DEP-P score	0.06	0.02	1.06	7.99 ^b	0.02	0.02	1.02	0.99
MRS score	0.02	0.02	1.02	0.65	0.04	0.02	1.04	5.35 ^a
Mixed episode	-0.11	0.58	0.90	0.03	-0.02	0.44	0.98	0.00
Rapid cycling	1.43	0.47	4.18	9.35 ^b	0.15	0.48	1.16	0.09
Co-occurring suicidality								
Suicidal ideation	1.14	0.43	3.12	7.08 ^b	0.25	0.36	1.28	0.46
Non-suicidal self-damaging acts	1.05	0.43	2.86	5.85 ^a	0.55	0.36	1.73	2.30
Suicidal acts	1.72	0.53	5.58	10.60 ^c	0.61	0.54	1.84	1.28

The 'Outpatient-only services' category ($n = 155$) served as the reference group for these analyses.

SE = standard error; OR = odds ratio; Wald = Wald statistic; C-GAS = Children's Global Assessment Scale; Bipolar NOS = bipolar disorder not otherwise specified; MRS = K-SADS Mania Rating Scale; DEP-P = K-SADS Present Depression Section.

^a $p < 0.05$;

^b $p < 0.01$;

^c $p < 0.001$.