Symptoms Leading to a Bipolar Diagnosis: A Phone Survey of Child and Adolescent Psychiatrists

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Abstract

Objective: We surveyed child and adolescent psychiatrists (CAPs) to characterize how they diagnose bipolar disorder (BPD) in children.

Methods: We approached by mail and then telephone 100 CAPs randomly sampled from five regions of the main professional organization of American CAPs; 53 CAPs were reached and agreed to participate. We asked about their training and practice setting, and asked them to name 10 symptoms indicative of BPD. We conducted descriptive analyses to determine how CAPs ranked symptoms, whether reports were consistent with *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition, Text Revision (DSM-IV-TR) criteria, and whether alternative symptom models might guide their decision making.

Results: CAPs considered lability, grandiosity, family history of BPD, aggression, and expansive or euphoric mood as the most important factors in diagnosing BPD. Only 21 (39.6%) CAPs reported sufficient symptoms to meet DSM criteria for BPD (DSM-Yes status). DSM-Yes status was associated with participants' region, less expertise (≤ 10 years practicing child and adolescent psychiatry), and lower levels of self-reported confidence in their ability to diagnose BPD.

Conclusions: CAPs vary in the symptoms they use to diagnose BPD, with most using a mixture of DSM and non-DSM symptoms. Expertise and confidence may lessen one's reliance on DSM criteria. Further studies are needed to understand CAPs' diagnostic decisions about BD and to develop interventions to support accurate diagnostic decision making and improve patient care.

Introduction

PREVALENCE RATES of pediatric bipolar disorder (BPD) vary in population-based (Carlson and Kashani 1988; Lewinsohn et al. 1995; Costello et al. 1996; Reich et al. 2005) and clinical samples (Wozniak et al. 1995; Youngstrom et al. 2005). Although much variation can be attributed to differences in study methodology and the conceptualization of BPD, some variation is likely due to clinicians' diagnostic decision making.

Variability in diagnosis is not only of academic concern; misdiagnosis can lead to delayed or inappropriate treatments. Research shows that patients who receive accurate diagnoses are discharged from hospitals more quickly (Miller 2001) and that when psychiatrists are given accurate diagnoses for their patients, they may change their treatment plans (Basco 2000). If clinicians miss the diagnosis of BPD, they may risk triggering manic episodes by

treating with antidepressant or stimulant medication (Strober and Carlson 1982; Briscoe et al. 1995; Strober 1998; Reichart and Nolen 2004), although, in their review of the literature, Licht and colleagues (2008) failed to find evidence of iatrogenic mood effects with selective serotonin reuptake inhibitors (SSRIs). Similarly, if clinicians diagnose BPD where instead a child has another disorder, such as attention-deficit/hyperactivity disorder (ADHD), ADHD with subthreshold manic symptoms, anxiety disorders, or depression, the child and adolescent psychiatrist (CAP) might prescribe unnecessary medication (such as a mood stabilizer or atypical antipsychotic) and fail to prescribe appropriate medication for the correct diagnosis. Reliable and accurate diagnostic reasoning is therefore a necessity.

Although part of diagnostic variability may be due to the shifting conceptualization of pediatric BPD, apart from the criteria outlined in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th

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edition, Text Revision (DSM-IV-TR) (American Psychiatric Association 2000), there is no other accepted “gold standard” for diagnosing BPD in the community (Setterberg et al. 1991; National Institute of Mental Health Research Roundtable on Prepubertal Bipolar Disorder 2001; Youngstrom et al. 2005). Given the recent rise in BPD diagnoses (Blader and Carlson 2007; Moreno et al. 2007), we were interested to determine whether CAPs apply DSM criteria consistently or instead rely on other criteria or their clinical judgment.

A growing body of research has focused on the cognitive aspects of clinicians’ decision making, particularly how they elicit and process information (for review, see Galanter and Patel 2005). Clinicians differ in how they weigh evidence and employ strategies to resolve unclear, incomplete, or inconsistent information (Way et al. 1998). One potential means to facilitate CAP decision-making and improve diagnostic accuracy is to study clinicians’ diagnostic practices, determine where additional decision support is needed, and develop tools to support decision making (Poses 1999).

Researchers have used survey methodology to study how clinician characteristics influence diagnostic practices. For example, Epstein and colleagues (Epstein et al. 2001) found that psychiatrists were more likely to diagnose major depressive disorder if they were board certified, younger, had fewer years in practice, and had a greater percentage of patients in managed care or on psychotropic medications. Investigators in Germany (Meyer et al. 2004) surveyed CAPs and found that while 63.3% had diagnosed BPD in adolescents, only 7.8% had done so in children under 11 years old. Diagnosing BPD was positively associated with younger clinician age and with favoring (versus not favoring) a pharmacological or cognitive-behavioral approach and negatively associated with favoring a psychodynamic approach. In a study comparing the likelihood of CAPs diagnosing BPD in the United Kingdom and the United States (Dubicka et al. 2008), researchers presented clinicians with written vignettes. U.S. clinicians were more likely to interpret symptoms as indicative of BPD, whereas the British CAPs were more likely to attribute them to ADHD, behavior disorders, or pervasive developmental disorder. No surveys have examined how clinicians weighed symptoms when considering BD or how diagnostic consistency with DSM-IV relates to clinician characteristics.

To further characterize CAPs’ diagnostic practices with BD, we surveyed U.S. CAPs about practice patterns, experience with BPD, and which symptoms led them to consider BPD. Specifically, we sought to examine variability in which symptoms guided BPD diagnostic practices and understand how clinician characteristics might correlate with CAP diagnostic decision making.

Methods

Participants

Participants were chosen from the membership of the American Academy of Child and Adolescent Psychiatrists (AACAP). We randomly sampled 20 participants from each of five areas (greater Saint Louis, Massachusetts, New York, southern California, and Texas), chosen from AACAP regional organizations. These states included major research groups with expertise in BPD and were purposefully chosen to reflect diversity in BPD perspectives. We sent letters to 100 CAPs explaining the study’s purpose and offering the opportunity to opt out. Study staff then called the CAPs to request an interview. Due to the initial insufficient response rate, we recontacted doctors and offered an honorarium of \$75. A total of 23 doctors from the original sample were excluded because they: (1) were no longer members of AACAP, (2) were not child and ado-

lescent psychiatrists, or (3) were unavailable by telephone. We replaced them by resampling from their same regions. We also compared participants to selected but nonsurveyed CAPs by performing internet searches of physician profiles on the following websites: AACAP, the American Medical Association, state medical licensure boards, as well as Google searches using the doctors’ names as keywords. We were able to obtain descriptive data about all 47 nonsurveyed CAPs for gender, practice community, and region and for some on expertise ($n = 42$), medical school location (international vs. United States, $n = 41$), primary office setting ($n = 17$), and academic affiliation ($n = 18$). The nonsurveyed CAPs did not differ from the 53 participants on any of these variables. Participating CAPs gave verbal consent prior to the interview.

The study was approved by the institutional review board of the New York State Psychiatric Institute/Columbia University Department of Psychiatry.

Measures

The 30-minute phone survey, administered by the principal investigator (C.A.G.), included questions on demographics (gender, location), training site (medical school and residencies), practice settings, and experience with pediatric BPD. To study which symptoms they used to diagnose BPD, the surveyor asked, “Which symptoms (both from mental status exam and history) lead you to consider the diagnosis of bipolar disorder? Please name ten of these symptoms.” Participants ranked these symptoms in order of importance using a 1–10 scale and were also asked about diagnosticity of a symptom with the following question: “Please rate each symptom on a 1–5 scale as to how significantly it contributes to your arriving at a diagnosis of BD, where 1 is only in the presence of other symptoms and 5 is practically diagnostic.” We also asked them to rate targeted BD criteria (e.g., irritability, episodicity, and medication response) as to their applicability in diagnosing BD.

Data analysis

CAP Characteristics. We analyzed demographic, training, and practice setting data descriptively. Consistent with literature on decision making and expertise of physicians and other professionals, we categorized clinicians as experts or nonexperts, with experts having ≥ 10 years of child and adolescent psychiatry experience (including child and adolescent psychiatry residency) (Chase and Simon 1973; Hayes 1985; Patel et al. 1994; Patel et al. 2001).

Clinical characteristic categories. The symptoms reported by each CAP were recategorized into 21 clinical characteristic categories (CCCs) to decrease variability for purposes of analysis. CCCs included DSM symptoms and other clinical characteristics. We developed these categories using the constant comparative method (Glaser and Strauss 1967), a reiterative process used in qualitative research. We reviewed symptoms and clinical characteristics to create categories, and then assigned symptoms and clinical characteristics to these categories. We repeated this process of creating and revising the categories several times to best capture as many symptoms and characteristics as possible. For each CCC, we calculated ranks for frequency of citation, mean importance, and a mean diagnosticity rating. We then calculated an “overall rank” where for each CCC we calculated a mean of the above ranks (frequency, importance, and diagnosticity).

Use of DSM symptoms. We created an algorithm to determine if CAPs used *Diagnostic and Statistical Manual of Mental*

Disorders (DSM) criteria. If a CAP named euphoria and 3 “B” criteria (inflated self-esteem or grandiosity, decreased need for sleep, pressured speech, flight of ideas or racing thoughts, distractibility, increase in goal-directed activities or psychomotor agitation, and excessive involvement in pleasurable activities with high potential for painful consequences), or irritability and 4 “B” criteria, the CAP was coded as meeting the DSM criteria (DSM-Yes status). CAPs did not have to mention the DSM requirements of a distinct mood episode or impairment to be coded as meeting the DSM criteria as our question was not framed to elicit that information.

Characterization of CAPs who did not use DSM requirements. To characterize the decision making of CAPs not meeting DSM criteria, we calculated mean ranks for CCCs based on frequency, importance, and diagnosticity (as above) using only the subset of CAPs who did not report sufficient symptoms to meet DSM criteria.

Correlations between clinician characteristics, choice of CCC, and use of DSM criteria. We examined whether CAP personal characteristics (gender, region, expertise, primary practice setting, and confidence in ability to diagnose BD) were associated with use of individual CCCs or use of the DSM. We used chi-square tests for these analyses and the Fisher exact test when chi-square tests were invalid due to low cell counts.

All data analyses were performed using SPSS for Windows, Release 14.0.0. (2005).

Results

CAPs characteristics

We surveyed 53 CAPs. CAP characteristics are presented in Table 1. Men and women from all five regions were well represented. As shown in Table 1, less than half met our “expert” criteria, while most had an academic affiliation, and the overwhelming majority felt that they were adequately trained. Males and females were equally represented, and roughly equal proportions felt that BPD was under- and overdiagnosed.

Clinical characteristic categories leading to considering a bipolar diagnosis

Doctors named 193 symptoms. We aggregated symptoms into 21 CCCs, which accounted for 89.5% of the symptoms. These were: Aggression, cycling patterns, decreased need for sleep, depression, distractibility, episode/hospitalization, expansive or euphoric mood, family history of BPD, goal-directed activities, grandiosity, impairment, impulsivity, irritability, lability, medication response, pleasure-seeking activities, pressured speech, psychosis, racing thoughts, sleep difficulties, and suicidality. As an example,

TABLE 1. CHILD AND ADOLESCENT PSYCHIATRISTS’ DEMOGRAPHICS, TRAINING, CLINICIAN-SPECIFIC CHARACTERISTICS, AND PRACTICE PATTERNS

		n	%
Gender	Male	28	52.8
	Female	25	47.2
Practice location	New England	11	20.8
	California	13	24.5
	New York	11	20.8
	St. Louis	11	20.8
	Texas	7	13.2
Practice community	Large city	35	65.4
	Small city	8	15.4
	Suburb	8	15.4
	Rural	2	3.8
Medical school	U.S.	39	73.6
	I.M.G.	14	26.4
Medical school completed (mean $\pm$ SD)	1985.2 $\pm$ 11.1		
General psychiatry residency completed (mean $\pm$ SD)	1991.1 $\pm$ 10.1		
Child and adolescent psychiatry residency completed (mean $\pm$ SD)	1992.9 $\pm$ 9.7		
Expert (began child and adolescent psychiatry training $\geq$ 10 years prior to survey)	Yes	21	39.6
	No	32	60.4
Confidence in ability to diagnose children with bipolar disorder	Need more training	5	9.4
	Adequately trained	21	39.6
	Well trained	27	50.9
Total child/parent interview time for diagnostic evaluation	<1 hour	2	3.8
	1–2 hours	34	64.2
	>2 hours	17	32.1
Primary office setting	Private practice	18	34.0
	Outpatient public	22	41.5
	Inpatient	4	7.5
	Agency	4	7.5
	Other	5	9.4
Regional colleagues’ diagnoses of bipolar disorder	Underdiagnosed	24	45.1
	Overdiagnosed	29	54.9

Abbreviations: I.M.G. = International Medical Graduate; SD = standard deviation.

symptoms aggregated to “aggression” included aggression, aggressive outbursts without precipitation, anger outbursts, agitation, explosiveness, rage, and violence. (All symptoms’ CCC assignments are available upon request.) The six CCCs most frequently cited as leading to a bipolar diagnosis were lability (cited by 62% of CAPs), irritability (cited by 62% of CAPs), grandiosity (cited by 60% of CAPs), aggression (cited by 59% of CAPs), racing thoughts (cited by 57% of CAPs), and pressured speech (cited by 57% of CAPs) (Table 2).

CCCs that doctors considered most important on a 1–10 ranking, with 1 as most important, were expansive or euphoric mood (mean = 3.3 ± 3.0), lability (mean = 3.5 ± 3.5), and family history of BD (mean = 3.8 ± 2.8). Symptoms that were most diagnostic on a 1–5 scale, with 1 as “only in the presence of other symptoms” and 5 as “practically diagnostic,” were grandiosity (mean = 3.5 ± 1.3), lability (mean = 3.4 ± 1.0), and family history of BPD (mean = 3.4 ± 1.2). Please note that for importance, a rating of 1 was the “highest,” whereas for diagnosticity a rating of 5 was the highest. Those CCCs with the top overall rank (highest mean rank calculated from the mean ranks of frequency, importance, and diagnosticity) were lability, grandiosity, family history of BPD, aggression, and expansive or euphoric mood.

Use of DSM symptoms

Only 21 (39.6%) CAPs reported sufficient symptoms to meet DSM bipolar diagnostic criteria (DSM-Yes CAPs). CAPs who did not report sufficient symptoms to meet DSM bipolar diagnostic criteria (DSM-No CAPs) volunteered 3.06 ± 1.3 DSM BPD symptoms. Only 15 of 32 reported a DSM BPD mood symptom (elevated expansive or irritable mood) and those who did were

1.87 ± 1.1 criteria short of meeting DSM criteria. Comparing DSM-Yes CAPs to DSM-No CAPs, we found that DSM-Yes CAPs were more likely to name a number of DSM symptoms and less likely to report non-DSM symptoms (depression, sleep difficulties, aggression, and lability) (see Fig. 1).

To better understand DSM-No CAPs’ diagnostic decision-making, we examined which symptoms/CCCs received their highest rankings. Interestingly, lability, family history of BPD, aggression, grandiosity, and psychosis had the top five overall rankings among DSM-No CAPs.

We also asked CAPs to rate the appropriateness of the DSM episode requirement. We asked, “Please rate on a scale from 1 to 9 the appropriateness of the following statement: A child must have a distinct period of abnormally and persistently elevated, expansive or irritable mood for at least a week (or any duration if hospitalization is necessary) in order for me to diagnose the child with bipolar disorder” and asked them to rate the appropriateness of the statement using a 1–9 scale where 1 was extremely inappropriate and 9 was extremely appropriate. Slightly more than half of the participants (28/53, 52.8%) rated this statement in the appropriate (7–9) range although a significant minority (25/53, 47.2%) rated the statement in the inappropriate (1–3) (13/53, 24.5%) or equivocal (4–6) (12/53, 22.6%) range.

Correlations between clinician characteristics, choice of CCC, and use of DSM

Use of DSM. Of note, experts (>10 years), versus non-experts, were less likely to generate DSM criteria (21.9% versus 61.9%, chi-square = 8.65, degrees of freedom [df] = 1, $p < 0.01$).

TABLE 2. BIPOLAR DISORDER CLINICAL CHARACTERISTIC CATEGORIES CHARACTERISTICS: OVERALL RANK,^a FREQUENCY OF CITATION, RANK OF IMPORTANCE, AND RATE OF DIAGNOSTICITY

Overall ranking	Clinical characteristic categories (CCCs)	Frequency		Importance ^b		Diagnosticity ^c		Mean of Rank ^d (SD)
		# Cited	Rank	Mean (SD)	Rank	Mean (SD)	Rank	
1	Lability	33	1	3.48 (3.45)	2	3.42 (1.02)	2	1.7 (0.58)
2	Grandiosity	32	3	3.88 (1.98)	4	3.47 (1.25)	1	2.7 (1.53)
3	Family history of BPD	26	8	3.77 (2.76)	3	3.38 (1.16)	3	4.7 (2.89)
4	Aggression	31	4	4.10 (2.24)	5	2.97 (1.19)	12	7.0 (4.36)
4	Expansive or euphoric mood	12	15	3.33 (3.02)	1	3.25 (1.42)	5	7.0 (7.21)
6	Irritability	33	1	4.61 (3.09)	7	2.67 (1.27)	17	8.3 (8.08)
7	Racing thoughts	30	5	5.77 (1.99)	13	3.10 (1.21)	8	8.7 (4.04)
7	Sleep (decreased need)	24	9	5.04 (2.16)	8	3.08 (1.17)	9	8.7 (0.58)
9	Pressured speech	30	5	6.70 (2.20)	18	3.27 (0.78)	4	9.0 (7.81)
10	Pleasure-seeking activities	28	7	5.88 (2.51)	14	3.11 (1.11)	7	9.3 (4.04)
11	Psychosis	23	11	5.48 (3.12)	10	3.00 (1.26)	10	10.3 (0.58)
12	Episode/hospitalization	11	16	4.27 (2.33)	6	3.00 (1.02)	10	10.7 (5.03)
13	Cycling patterns	8	20	5.25 (2.89)	9	3.13 (1.62)	6	11.7 (7.37)
14	Sleep (difficulties)	21	13	5.52 (2.66)	11	2.76 (1.18)	14	12.7 (1.53)
15	Depression	22	12	6.35 (2.87)	15	2.68 (0.95)	16	14.3 (2.08)
16	Goal-directed activities	24	9	6.54 (2.50)	16	2.33 (0.87)	19	14.7 (5.13)
17	Medication response	6	21	5.67 (1.79)	12	2.83 (0.89)	13	15.3 (4.98)
18	Impulsivity	19	14	6.68 (2.38)	17	2.37 (0.83)	18	16.3 (2.08)
19	Suicidality	10	17	6.90 (1.91)	20	2.70 (1.06)	15	17.3 (2.52)
20	Impairment	9	18	6.78 (3.77)	19	2.00 (0.87)	21	19.3 (1.53)
21	Distractibility	9	18	7.00 (2.36)	21	2.22 (0.76)	20	19.7 (1.53)

^aOverall rank reflects the mean frequency, importance, and diagnosticity.

^bImportance based on ranking of the 10 symptoms participants named on a 1–10 scale with 1 being most important.

^cDiagnosticity based on rating symptoms on a 1–5 scale with 5 being “practically diagnostic” of BPD and 1 being diagnostic of BPD “only in the presence of other symptoms.”

^dMean of ranks reflects a mean of frequency, importance, and diagnosticity ranks.

Abbreviations: SD = standard deviation; BPD = Bipolar disorder; DSM = *Diagnostic and Statistical Manual of Mental Disorders*.

FIG. 1. How frequently DSM-Yes versus DSM-No CAPs named bipolar disorder clinical characteristic categories. Differences between DSM-Yes and DSM-No psychiatrists: (***) ≤ 0.001 , (**) ≤ 0.01 , and (*) ≤ 0.05 , chi-squared tests. DSM = *Diagnostic and Statistical Manual of Mental Disorders*; CAP = child and adolescent psychiatrist; DSM-Yes CAP = psychiatrist who named sufficient symptoms for making a DSM-based diagnosis for a manic episode when asked to name 10 symptoms that lead them to a diagnosis of bipolar disorder.

Additionally, the proportion of CAPs who were DSM-Yes varied by region but this variation was not statistically significant (proportion of DSM-Yes CAPs: Massachusetts, 36.4%; Southern California, 53.8%; New York, 9.1%; Greater St. Louis, 45.5%; Texas, 42.9%; chi-square = 5.64, $df = 4$; $p < 0.23$). When we compared New York CAPs to CAPs from other regions combined on whether they were DSM-Yes, there was a statistically significant difference (9.1% versus 45.2%, Fisher exact test, $p < 0.05$). This difference may be explained by the fact that the majority of the New York CAPs who responded to the survey were experts (New York, 81.8% versus Massachusetts, 54.5%; southern California, 38.5%; greater St. Louis, 54.5%; Texas, 85.7%). Thus, we conducted a logistic regression including expertise and New York location as independent variables and DSM-Yes status as an outcome variable. New York location was no longer significant (odds ratio [OR] = 0.1, 95% confidence interval [CI] = 0.0–1.3, $p = 0.08$) although expertise continued to be significant (OR = 0.2, 95% CI = 0.1–0.8, $p < 0.05$). It may be that we did not have enough power to disentangle the independent effects of expertise and geographic location.

Confidence in ability to diagnose BD was also related to reporting DSM criteria. Specifically, all CAPs who considered themselves “in need of more training” were DSM-Yes CAPs (5 of 5), those who considered themselves “adequately trained” were unlikely to be DSM-Yes CAPs (3 of 21), and those who felt “well-trained” were equally likely to be DSM-Yes CAPs (13 of 27) (chi-square = 14.08, $df = 1$, $p = 0.001$). Other clinician-specific variables were not associated with DSM-Yes status.

Discussion

CAPs relied on symptoms and clinical characteristics other than those from the DSM to diagnose BPD in children. Lability, family history of BPD, and aggression were more commonly cited, ranked more important, and rated more pathognomonic than many DSM criteria. Less than half of the CAPs reported diagnostic criteria

sufficient to meet DSM bipolar diagnoses. Those CAPs who did not cite BPD symptoms sufficient to meet DSM BPD criteria (60.4% of those surveyed) often used non-DSM symptoms in making the diagnosis. In fact only one in five of their top ranked symptoms was a DSM BPD criterion. CAPs with less expertise and confidence were more likely to report symptoms meeting DSM BD criteria. We did not detect other significant correlations between clinician characteristics and diagnostic practices, although our study was not adequately powered to do so.

It was striking that only a minority of CAPs reported symptoms sufficient to fulfill DSM criteria for BPD. One possible reason for this is that CAPs are correct to ignore the DSM for BPD in children because criteria do not accurately describe pediatric BPD. Over the past decade, well-known investigators have described unique features of the presentation of BPD such as severe impairment associated with “affective storms,” aggressive temper outbursts (Davis 1979; Wozniak et al. 1995; Carlson et al. 2003), and ultrarapid or ultradian cycling (Geller et al. 1995; Geller et al. 2000; Geller et al. 2002). This literature is consistent with our findings that, among DSM-No CAPs, lability, and aggression had some of the highest overall rankings of the CCCs. These findings suggest that shifts in how CAPs conceptualize BPD and outstanding questions around the phenomenology of BPD, are affecting CAP decision making and contribute to the low proportion of CAPs using DSM criteria. As one dramatic example, many CAPs did not endorse the DSM language of a “distinct mood period,” suggesting that many CAPs do not require an “episode” to diagnose BPD.

CAPs often stated that family history of BPD was likely to lead them to a bipolar diagnosis. Although family history and genetics are important factors in differentiating diagnoses (Robins and Guze 1970), doctors may be overweighing their importance. Recent reviews of studies examining children of bipolar parents have indicated that children with bipolar parents are at increased risk for developing BPD over other children in the populations (for review, see Lapalme et al. 1997; DelBello and Geller 2001; Chang et al.

2003) but are also at risk for developing other disorders. In their metaanalysis, Lapalme and colleagues, (Lapalme et al. 1997) found that 5.4% of the child offspring of individuals with BPD developed BPD. However, they also found that 8.5% developed unipolar depression and that 20.6% developed nonaffective disorders. Thus, while children of bipolar parents are at increased risk for BPD over the general population, they are more likely to develop other disorders including unipolar depression or ADHD, than BPD.

Other factors may have affected CAPs' reports of symptoms and decision making. Possibly, CAPs use DSM criteria in clinical practice, but did not report them in this interview format. CAPs may also use decision-making styles that are not symptom based. Other investigators have shown that physicians rely on pattern recognition for diagnostic decision making (for review, see Elstein and Schwarz 2002). That is, CAPs may diagnose a patient based on similarity to specific or abstracted memories of past patients. Our study was not designed to examine alternative decision-making styles such as pattern recognition, however.

We were not surprised to find that experts were less likely to report DSM symptoms than subexperts. Other studies comparing expert and subexpert physicians have demonstrated that junior clinicians organize their knowledge at a detail-oriented level in contrast to more experienced clinicians, who organize at a "higher level." Experts combine information into chunks, which allows them to manage greater amounts of information (Bordage and Zacks 1984; Joseph and Patel 1990; Patel et al. 1994; Patel et al. 2001). Brailey and colleagues (Brailey et al. 2001) found that years of experience were positively associated with more flexible, accurate, and selective memory of diagnostic information. However, it is also possible that some experts are less accurate in diagnosing BPD because they are further out from training or more susceptible to biases developed over years of practice. We also found a negative relationship between confidence and reporting DSM symptoms. It may be that the less confident doctors were more likely to rely on rules to support their decision making.

Limitations

Our study was limited by our response rate of 53%. Consequently, it is possible that our participants were not representative of CAPs in the sampled regions. Comparisons between participants and nonparticipants indicated that those with a primary setting of private practice may have been underrepresented in our sample.

We purposely chose to sample CAPs from regions where there were major research groups with expertise in pediatric BPD, and thus it is possible that these results would not be generalizable to other regions of the country. Another limitation was that our survey did not assess problem-solving modes other than those based on symptoms. Also, it is possible that if our questions were worded differently we might have had higher rates of CAPs using DSM criteria. Additionally, it is possible that face-to-face interviews would have yielded different results, although studies comparing face-to-face and phone diagnostic interviews show that results are comparable (Rhode et al. 1997; Lyneham and Rapee 2005). Because CAPs may or may not have been in their regular practice setting at the time of interview, they may not have had access to the tools they would generally use in practice, such as rating scales or their DSM-IV-TR (2000), to support their decision making. During our study, if CAPs asked about using tools during the interview, they were encouraged to use what they used in their typical practice.

Finally, our study was not adequately powered to detect the impact of clinician characteristics on their diagnostic practices.

Clinical Implications

Our study demonstrates that child and adolescent psychiatrists vary in how they diagnose BPD and use symptoms other than those in the DSM to make this diagnosis. It is likely that this variation leads to delayed and inappropriate diagnosis of psychopathology in at least some children. In addition to developing greater consensus among experts about the BPD diagnostic criteria, it is important that we better understand CAPs' clinical decision making so that we can develop interventions that will support appropriate diagnostic decision making and improve patient care.

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References

- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition, Text Revision (DSM-IV-TR). Washington (DC): American Psychiatric Association, 2000.
- Basco MR, Bostic JQ, Davies D, Rush AJ, Witte B, Hendrickse W, Barnett V: Methods to improve diagnostic accuracy in a community mental health setting. *Am J Psychiatry* 157:1599–1605, 2000.
- Blader JC, Carlson GA: Increased rates of bipolar disorder diagnoses among U.S. child, adolescent and adult inpatients, 1996–2004. *Biol Psychiatry* 62:107–114, 2007.
- Bordage G, Zacks R: The structure of medical knowledge in the memories of medical students and general practitioners: Categories and prototypes. *Med Educ* 18:406–416, 1984.
- Brailey K, Vasterling JJ, Franks JJ: Memory of psychodiagnostic information: Biases and effects of expertise. *Am J Psychol* 114:55–92, 2001.
- Briscoe J, Harrington R, Prendergast M: Development of mania in close association with tricyclic antidepressant administration in children. *Eur Child Adolesc Psychiatry* 4:280–283, 1995.
- Carlson GA, Kashani JH: Manic symptoms in a non-referred adolescent population. *J Affect Disord* 15:219–226, 1988.
- Carlson GA, Jensen PS, Findling RL, Meyer RE, Calabrese J, Del-Bello MP, Emslie G, Flynn L, Goodwin F, Hellander M, Kowatch R, Kusumakar V, Laughren T, Leibenluft E, McCracken J, Nottelmann E, Pine D, Sachs G, Shaffer D, Simar R, Strober M, Weller EB, Wozniak J, Youngstrom EA: Methodological issues and controversies in clinical trials with child and adolescent patients with bipolar disorder: A report of a consensus conference. *J Child Adolesc Psychopharmacol* 13:1–15, 2003.
- Chang KD, Blasey CM, Ketter TA, Steiner H: Temperament characteristics of child and adolescent bipolar offspring. *J Affect Disord* 77:11–19, 2003.

- Chase WG, Simon HA: The mind's eye in chess. In: *Visual Information Processing*. Edited by WG Chase. New York: Academic Press, 1973, pp 215–272.
- Costello EJ, Angold A, Burns BJ, Stangl DK, Tweed DL, Erkanli A, Worthman CM: The Great Smoky Mountains Study of Youth: Goals, design, methods, and the prevalence of DSM-III-R disorders. *Arch Gen Psychiatry* 51:405–410, 1996.
- Davis RE: Manic-depressive variant syndrome of childhood: A preliminary report. *Am J Psychiatry* 136:702–706, 1979.
- DelBello MP, Geller B: Review of studies of child and adolescent offspring of bipolar patients. *Bipolar Disord* 3:325–334, 2001.
- Dubicka B, Carlson GA, Vail A, Harrington R: Prepubertal mania: Diagnostic differences between US and UK clinicians. *Eur Child Adolesc Psychiatry* 17:153–161, 2008.
- Elstein AS, Schwartz A: Clinical problem solving and diagnostic decision making: Selective review of the cognitive literature. *Br Med J (Clin Res Ed)* 324:729–732, 2002.
- Epstein SA, Gonzales JJ, Weinfurt K, Boekeloo B, Yuan N, Chase G: Are psychiatrists' characteristics related to how they care for depression in the medically ill? Results from a national case-vignette survey. *Psychosomatics* 42:482–489, 2001.
- Galanter CA, Patel VL: Medical decision making: A selective review for child psychiatrists and psychologists. *J Child Psychol Psychiatry* 46:675–689, 2005.
- Geller B, Sun K, Zimmerman B, Luby J, Frazier J, Williams M: Complex and rapid-cycling in bipolar children and adolescents: A preliminary study. *J Affect Disord* 34:259–268, 1995.
- Geller B, Zimmerman B, Williams M, Bolhofner K, Craney JL, DelBello MP, Soutullo CA: Diagnostic characteristics of 93 cases of a prepubertal and early adolescent bipolar disorder phenotype by gender, puberty and comorbid attention deficit hyperactivity disorder. *J Child Adolesc Psychopharmacol* 10:157–164, 2000.
- Geller B, Zimmerman B, Williams M, DelBello MP, Bolhofner K, Craney JL, Frazier J, Beringer L, Nicklesburg MJ: DSM-IV mania symptoms in a prepubertal and early adolescent bipolar disorder phenotype compared to attention deficit hyperactive and normal controls. *J Child Adolesc Psychopharmacol* 12:11–25, 2002.
- Glaser BG, Straus AL: *Discovery of Grounded Theory: Strategies for Qualitative Research*. New York: Aldine de Gruyter, 1967.
- Hayes JR: Teaching thinking skills. In: *Thinking and Learning Skills*, vol. 2. Edited by Chipman SF, Segal JW, Glaser R. Hillsdale (New Jersey): Lawrence Erlbaum Associates, 1985.
- Joseph G-M, Patel VL: Domain knowledge and hypothesis generation in diagnostic reasoning. *Med Decis Making* 10:31–46, 1990.
- Lapalme M, Hodgins S, LaRoche C: Children of parents with bipolar disorder: A meta-analysis of risk for mental disorders. *Can J Psychiatry* 42:623–631, 1997.
- Lewinsohn P, Klein D, Seeley J: Bipolar disorders in a community sample of older adolescents: Prevalence, phenomenology, comorbidity, and course. *J Am Acad Child Adolesc Psychiatry* 34:454–463, 1995.
- Licht RW, Gijsman H, Nolen WA, Angst J: Are antidepressants safe in the treatment of bipolar depression? A critical evaluation of their potential risk to induce switch into mania or cycle acceleration. *Acta Psychiatr Scand* 118:337–346, 2008.
- Lyneham HJ, Rapee RM: Agreement between telephone and in-person delivery of a structured interview for anxiety disorders in children. *J Am Acad Child Adolesc Psychiatry* 44:274–282, 2005.
- Meyer TD, Kossmann-Bohm S, Schlottke PF: Do child psychiatrists in Germany diagnose bipolar disorders in children and adolescents? Results from a survey. *Bipolar Disord* 6:426–431, 2004.
- Miller PR: Inpatient diagnostic assessments: 2. Interrater reliability and outcomes of structured vs. unstructured interviews. *Psychiatry Res* 105:265–271, 2001.
- Moreno C, Laje G, Blanco C, Jiang H, Schmidt AB, Olfson M: National trends in the outpatient diagnosis and treatment of bipolar disorder in youth. *Arch Gen Psychiatry* 64:1032–1039, 2007.
- National Institute of Mental Health Research Roundtable on Prepubertal Bipolar Disorder: *J Am Acad Child Adolesc Psychiatry* 40:871–878, 2001.
- Patel VL, Arocha JF, Diermeier M, How J, Mottur-Pilson C: Cognitive psychological studies of representation and use of clinical practice guidelines. *Int J Med Informatics* 63:147–167, 2001.
- Patel VL, Arocha JF, Kaufman DR: Diagnostic reasoning and medical expertise. *The Psychology of Learning and Motivation* 31:187–252, 1994.
- Poses RM: One size does not fit all: Questions to answer before intervening to change physician behavior. *Jt Comm J Qual Improv* 25:486–495, 1999.
- Reich W, Neuman RJ, Volk HE, Joyner CA, Todd RD: Comorbidity between ADHD and symptoms of bipolar disorder in a community sample of children and adolescents. *Twin Res Hum Genet* 8:459–466, 2005.
- Reichart CG, Nolen WA: Earlier onset of bipolar disorder in children by antidepressants or stimulants? An hypothesis. *J Affect Disord* 78:81–84, 2004.
- Rhode P, Lewisohn PM, Seeley JR: Comparability of telephone and face-to-face interviews in assessing Axis I and Axis II disorders. *Am J Psychiatry* 154:1593–1598, 1997.
- Robins E, Guze SB: Establishment of diagnostic validity in psychiatric illness: Its applicability to schizophrenia. *Am J Psychiatry* 126:983–987, 1970.
- Setterberg SR, Ernst M, Rao U, Campbell M, Carlson GA, Shaffer D, Staghezza BM: Child psychiatrists' views of DSM-III-R: A survey of usage and opinions. *J Am Acad Child Adolesc Psychiatry* 30:652–658, 1991.
- SPSS for Windows, Release 14.0.0, Chicago (Illinois): SPSS Inc., 2005.
- Strober M: Mixed mania associated with tricyclic antidepressant therapy in prepubertal delusional depression: Three cases. *J Child Adolesc Psychopharmacol* 8:181–185, 1998.
- Strober M, Carlson G: Bipolar illness in adolescents with major depression: Clinical, genetic, and psychopharmacologic predictors in a three-to-four-year prospective follow-up investigation. *Arch Gen Psychiatry* 39:549–555, 1982.
- Way BB, Allen MH, Mumpower JL, Stewart TR, Banks SM: Interrater agreement among psychiatrist in psychiatric emergency assessments. *Am J Psychiatry* 155:1423–1428, 1998.
- Wozniak J, Biederman J, Kiely K, Ablon S, Faraone SV, Mundy E, Mennin D: Mania-like symptoms suggestive of childhood-onset bipolar disorder in clinically referred children. *J Am Acad Child Adolesc Psychiatry* 34:867–876, 1995.
- Youngstrom EA, Findling RL, Youngstrom JK, Calabrese JR: Towards an evidence-based assessment of pediatric bipolar disorder. *J Clin Child Adolesc Psychol* 34:433–448, 2005.

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