Recognizing mania in children and adolescents

- age does not matter, but decreased need for sleep does

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Abstract

Background: The diagnosis of pediatric bipolar disorders is a controversial topic. If this is mainly due to a bias against a diagnosis in younger children, just changing the information about the age of a patient should influence the likelihood of a diagnosis despite otherwise identical symptoms. Therefore, we designed a study to test if the age of a patient will influence diagnostic decisions. We further attempted to replicate an earlier result with regard to ‘decreased need for sleep’ as a salient symptom for mania. Methods: We randomly sent one out of four case vignettes describing a person with current mania to child/adolescents psychiatrists in Germany. This vignette was systematically varied with respect to age of the patient (6 vs. 16 years) and the presence/absence of decreased need for sleep but always included sufficient criteria to diagnose a mania. Results: N = 116 responded and overall 63.8% of the respondents diagnosed a bipolar disorder in the person described in the vignette. While age did not affect the likelihood of a bipolar diagnosis, the presence of ‘decreased need for sleep’ did increase its likelihood. Furthermore, the number of core symptoms identified by the clinicians was closely linked to the likelihood of assigning a bipolar diagnosis. Conclusion: Certain symptoms such as the decreased need for sleep, and also elated mood and grandiosity, seem to be salient for some clinicians and influence their diagnoses. Biological age of the patient, however, does not seem to cause a systematic bias against a diagnosis of bipolar disorder in children.

KEYWORDS: bipolar disorders, children, diagnosis, salience, prototype, assessment
Background

The recognition and diagnosis of a classical bipolar I disorder in adulthood and late adolescence is relatively uncontroversial. The picture changes greatly, however, when it comes to the diagnosis of bipolar disorders in childhood and early adolescence. Whereas some studies report relatively high rates of childhood bipolar disorders, others found low rates of bipolar disorders in children [4, 7, 15, 20, 33]. Lewinsohn, Klein, & Seeley [25] studied a representative community sample of 1709 adolescents aged 14-18 years and reported a lifetime prevalence of bipolar disorders of about 1 %, and Wittchen, et al. [36] reported similar rates for hypomania in adolescents in a German sample. In addition, the diagnosis of bipolar disorder or mania was rare in children under the age of 12 in a German sample [30]. Dubicka, et al. showed that there are differences in diagnosing mania between clinicians in the USA and Europe [5].

According to both Geller and Luby [7] and Youngstrom, et al. [38], bipolar disorders among children are often characterized by atypical symptoms, including a chronic course and mixed symptoms with rapid changes. They argue that bipolar disorders in adolescents and children might not be diagnosed and other diagnoses (e.g. ADHD) might be given instead. In line with this view Meyer, et al. [30] found that child psychiatrists reported symptoms in ADHD patients which are sometimes considered typical for mania, such as decreased need for sleep or hypersexuality [6, 27].

The ultra-rapid cycling and presence of mixed symptoms, as well as the overlap in symptoms, such as irritability, distractibility, and psychomotor hyperactivity, that are discussed as typical manifestations of bipolar disorder in children, all make differential diagnoses highly complicated and raise questions about reliability. Furthermore, the controversy of bipolar disorder in childhood is about identifying mania, mixed mania, and atypical manic manifestations (e.g. ultrarapid-cycling). Additionally, professionals might not
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probe for a lifetime history of mania or hypomania if the patients present with current depression. Several studies have reported that many patients had experienced manic symptoms before they received a diagnosis of ‘unipolar depression’ [10, 17, 26]. It might be that the patients did not report these former manic symptoms, but it might be equally plausible that professionals discount hypomaniac or manic symptoms if they are reported. It has, however, to be taken into account that a misdiagnosis will be associated with a much lower likelihood of assigning the most appropriate treatment [2, 11, 28] and, more importantly, it is closely related to a negative outcome and course of the illness [13, 16, 32]. Bruchmüller and Meyer [3] found evidence that clinicians do disregard symptoms if a rational explanation seems to be provided for the symptoms. Furthermore, several studies show that some symptoms might be more salient or overshadow others and, therefore, bias diagnostic judgments [21, 31]. With regard to bipolar disorder, Meyer and Meyer [29] found that the presence of hallucinations dramatically affected the likelihood of diagnosing bipolar disorders if all other symptoms were kept equal. Similarly, patients reporting decreased need for sleep are also more likely to be diagnosed as ‘manic’ or ‘bipolar’ [3, 29]. In summary about 53 to 86% of the children reported decreased need for sleep [22]. A decreased need for sleep is one of the few symptoms which effectively differentiated between juvenile-onset bipolar disorder and ADHD and is often considered a core symptom of mania [27, 35]. Additionally, even diagnostically irrelevant factors seem to contribute to how likely it is that bipolar disorder is diagnosed, e.g. the clinician’s age or preferred treatment approach [30] Cultural aspects in the interpretation of symptoms as indicating mania or not in a child seems different, e.g. US clinicians were significantly more likely to diagnose mania than UK clinicians were [5].

Given all the aforementioned controversies and complexities with regard to the diagnosis of pediatric bipolar disorders, the present study addressed the question, do clinicians recognize mania (or bipolar disorder) in younger people if they present with typical adult-like symptoms of mania? This question is of relevance because one reason why clinicians do not
diagnose mania in children might be that the symptoms are often mixed and do not fit the adult prototype of clear-cut lasting episodes with typical symptoms. This implies that if clinicians were presented with a typical case of mania (as described in DSM-IV) with a clear episodic course, the age of the patient should not matter with regards to his or her diagnosis. Based on prior results and the controversy about pediatric bipolar disorders [15, 19, 30], however, we predicted that age would have an influence. More specifically, using an experimental design with case vignettes we expected that a young child would be less likely to be diagnosed as ‘bipolar’ than an adolescent would be even if the symptoms are the same and the only difference between the case vignettes is the reported biological age. A secondary goal was to replicate and extend to childhood bipolar disorder the finding that the presence or absence of ‘decreased need for sleep’ affects the likelihood of a clinician assigning a bipolar diagnosis. Finally, we assessed which symptoms were considered most important for the clinicians’ diagnostic decision making. This was aimed at providing exploratory data on whether some symptoms are more salient than others and are likely to influence diagnostic decisions more than others.

Methods

Participants:
We obtained a list of 368 child and adolescent psychiatrists in Southern Germany, including Bavaria and Baden-Württemberg from the medical register and health insurance companies, working in private practice. All psychiatrists were sent a case vignette and a questionnaire with the request to diagnose the described person and to make treatment recommendations. Participants were informed that the study was about decision making in clinical practice. The response rate was 34.7 % (n = 116), with 82 (22.3 %) of the participants
responding to the initial letter, and the remaining responding to a reminder letter which had been sent out after four weeks to all who had not yet replied.

The mean age of the final sample was 51 years (SD = 7.76, range: 33-67), and 48.2% of the respondents were female. The participants were licensed and formally registered within the German health care system between 1962 and 2007. The mean number of years of job experience was 21.37 (SD = 9.36, range 2–45). Asked for their main therapeutic approach, 57 (51.4%) indicated ‘pharmacological’, 7 (6.3%) indicated cognitive-behavioral, 38 (34.2%) mentioned ‘psychodynamic’, and the remaining 8 (8.1%) indicated ‘others’ (including systematic, client-centered).

Return rate was not associated with the kind of vignette that was sent out, $\chi^2(3) = 2.31$, n.s. Furthermore, the sex of the psychiatrists was independent of the vignette he or she received, $\chi^2(1) = 0.83$, n.s..

**Material:**

**Case vignettes:**

We designed a basic case vignette and three additional versions of it varying only in specific additional information (see below). The basic case vignette described a child of age 6 years presenting with symptoms of a current episode of mania (vignettes available from the authors on request). We modeled this basic vignette according to the one used by Meyer and Meyer [29]. The relevant symptoms were described without using any labels such as ‘bipolar’ or ‘mania’. It was ensured that the description of these episodes included all of the necessary criteria to clearly diagnose a manic episode or bipolar (affective) disorder according to DSM-IV and ICD-10, respectively, and represented a clear episodic course. We systematically varied two bits of information in the vignettes resulting in a 2 x 2 design: 1) Need for sleep: In 50% of the case vignettes the information was: ‘The parents report that he needs hardly any sleep compared to normal times, so that he sleeps a maximum of 4 hours at night’ (along with other symptoms of mania such grandiose ideas, euphoria, high energy levels, distractibility).
The remaining 50% of the vignettes included matched information: ‘The parents report that he sleeps quietly at night, on average 6 to 8 hours’. 2) Age of the patient: For testing our main hypothesis that given the same symptom pattern the likelihood of a bipolar diagnosis changes depending on the age of the patient, 50% of the case vignettes described the patient as ‘being 6 years old and being in 1st grade’, while in the remaining 50% he was described as ‘being 16 years old and being in 10th grade’.

**Questionnaire:**

On the questionnaire, the psychiatrists were asked to make a diagnosis using the ICD-10 codes [37] for the case described and to answer further questions about the case. We chose the ICD-10 code because German psychiatrists and psychologists are used to refer to the ICD-10 when dealing with health insurance companies. We also asked the therapists to rate on a scale from 0% to 100%: (1) how certain they were about the diagnosis; (2) how certain they were that other colleagues would make the same diagnosis; and (3) how likely the diagnosis would have to be changed again. The first and the second question were aimed to assess subjective certainty directly and indirectly.

Furthermore, we asked the psychiatrists to make recommendations regarding a treatment for the client. To make it more convenient and valid for the practitioners we used a similar format to the one used by them when they provide information to health insurance companies in Germany. Given that the information assessed in this part might be fairly specific to the German health system and also given our space restrictions, these results will not be presented here (available on request from the authors). In addition, socio-demographic data such as sex, age, job experience, and number of cases treated per year were collected.

**Procedure:**

Based on a priori power analysis using results from Meyer and Meyer [29] we needed a total sample size of 122 participants to detect a medium to large effect with 80% power. Even when taking into account a response rate of 40-50%, our original sample of over 350
psychiatrists left us with a sufficiently powered data set. Each participant received a letter including informed consent, a vignette, and the questionnaire. The vignettes were randomly assigned to the participants. If the questionnaire was not returned within a month, a reminder letter was sent out.

With regard to the four vignettes, we ensured that all vignettes were similar except for the information about the patient’s age and his need for sleep, which we varied systematically. This ensured that mania or bipolar disorder would always be unambiguously diagnosed if one strictly followed ICD-10 and DSM-IV. The unambiguousness of the vignettes was examined in a pretest among four experts who were all experienced clinicians. The pretest confirmed our expectations that in all cases bipolar disorder/mania is the appropriate diagnosis, if formal criteria are applied.

Statistical Analysis

Having categorical and mostly nominal data, most hypotheses were tested using the $\chi^2$-test, first testing for an overall effect for all conditions and then testing separately for the factors ‘need for sleep’ and ‘age’. Analysis of variance (ANOVA) was used with the two independent factors ‘age 6 versus age 16’ and ‘presence versus absence of decreased need for sleep’ only for the evaluation of possible group differences with regard to clinicians’ confidence in their diagnoses. If there was a high correlation between variables, multivariate ANOVA was applied. The sample sizes sometimes vary due to single missing answers.

Results

Evaluating potential confounds and frequency of diagnoses

Before testing our main hypotheses we evaluated if any potential confounds could have affected our results by being unequally distributed across the four case vignettes conditions. Our evaluation showed that the age of the clinicians did not differ between the four case vignettes, $F(3, 112) = 1.16$, n.s. Gender of the clinicians was equally distributed across
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Almost half of all psychiatrists diagnosed a ‘manic episode’ (n = 56, 48.3%) and a further 13.8% (n = 16) diagnosed ‘bipolar affective disorder’. Two clinicians diagnosed ‘chronic mood disorder’ (1.7%). Therefore, overall an appropriate diagnosis was made by 63.8% of the clinicians. A diagnosis of F2, i.e. schizophrenia, schizotypal disorder or delusional disorder was made by 16.4% (n = 19). Conduct disorder was diagnosed in seven cases (6.0%) and substance-related disorders in six cases (5.2%). The remaining 10 clinicians (8.6%) diagnosed other disorders, e.g. personality disorders.

Effects of the systematically varied information: age and sleep

The information provided in the case vignettes had an overall significant effect, \( \chi^2(3, n=114) = 7.70, p \leq .05 \). This significant effect seemed mainly due to the fact that 82.1% of the clinicians diagnosed bipolar disorder when decreased need for sleep was present in the adolescent case whereas this diagnosis varied between 50% and 65.7% in the other three conditions.

Looking at each factor individually, the following picture emerged: If one ignores the age of the patient, the presence of the symptom ‘decreased need for sleep’ significantly influenced the likelihood of a bipolar diagnosis with 71.9% \([n = 46]\) versus 52% \([n = 26]\) when sleep was reported to be normal, \( \chi^2(1, n = 114) = 4.77, p<.05 \). If one ignores the absence or presence of the symptom ‘decreased need for sleep’, contrary to our hypothesis the age of the patient did not significantly affect the likelihood of the diagnosis, \( \chi^2(1, n = 114) = 0.40, \text{n.s.} \).

How certain were the clinicians with their diagnosis with respect to the different case vignettes? Overall they rated their certainty on average as 64.3% on a scale from 0 to 100 (SD = 23.5) but this varied significantly between conditions (F(3, 114) = 5.24, p<.01). Post hoc Scheffé tests revealed that this was primarily due to a significantly higher subjective
confidence rating in the case of the adolescent reporting decreased need for sleep compared to both cases of the 6 year old boy (Table 1). When asked how certain they were that colleagues would make the same diagnosis, the average rating was slightly lower (55.3%, SD = 24.4). Here again, the information presented in the case vignettes had a significant effect (F(3, 114) = 3.97, p<.01). Post hoc Scheffé tests revealed that this was primarily due to clinicians’ expressing significantly higher confidence in their diagnoses in the case of the adolescent who reported decreased need for sleep compared to the 6 year old boy who presented with normal sleep (Table 1).

**Most influential symptoms for a diagnosis of bipolar disorder**

The clinicians were also asked in an open-ended question to write down up to three symptoms which they considered most important for their diagnostic decision. One-hundred-and-nine clinicians provided us with this subjective information. ‘Decreased need for sleep’ as well as an ‘episodic course’ were each mentioned by 19 clinicians (17.4%) as most important. ‘Increased energy or drive’ was pointed out by 18.3% (n = 20). ‘Elevated mood’ was mentioned by 11.9% (n = 13) and 11.0% said ‘grandiose ideas’ (n = 12) was the most important symptom. ‘Flight of ideas’ was listed by 6.4% of the clinicians as the most important symptom (n = 7), and the same was true for ‘perceptual aberrations’, which refers to a change in perceiving colors which was listed as a symptom (6.4%, n = 7). All other symptoms (for example: age, agitation, attention, impulsivity) were each reported by 2.8% or less of the clinicians.

Often ‘decreased need for sleep’, ‘elevated mood’ and ‘grandiosity’ are listed among the most prototypical and discriminating symptoms of mania [6, 9, 27]. Therefore, we additionally tested if it made a difference for their diagnoses if the clinicians cited them among the three most important symptoms for their decision making. We classified the responses as either endorsing none, one, or at least two of these core symptoms as ‘important’ [Only four clinicians actually had listed all three of them]. The results clearly showed that the
likelihood of making a bipolar diagnosis was related in an almost linear way with the number of core bipolar symptoms the clinicians considered most important for the diagnosis, $\chi^2(3, n = 107) = 13.01, p<.001$. If none of the core symptoms was mentioned, a non-bipolar diagnosis was more likely (60%) than a bipolar one (40%). If one of three core symptoms was listed, this was reversed with 61% of the clinicians diagnosing bipolar disorder and 39% diagnosing a non-bipolar disorder. If at least two core symptoms were listed, 86.1% of the clinicians diagnosed bipolar disorder and 13.9% did not. One could argue that this analysis could be confounded by the experimental variation given that half of the vignettes reported ‘decreased need for sleep’ whereas the others reported ‘normal sleep’. We, therefore, re-ran the analysis excluding ‘sleep’ as a core symptom, thereby focusing on ‘elevated mood’ and ‘grandiosity’ which were present in all vignettes. The results remained unchanged: having listed at least one of the two symptoms as a core symptom was significantly associated with a higher likelihood of diagnosing bipolar disorder (72.9% compared to 52.8%), $\chi^2(1, n = 107) = 3.83, p\leq.05$.

Potential other diagnostically irrelevant factors influencing the likelihood of a diagnosis

Clinicians’ gender was not associated with the likelihood of diagnosing bipolar disorder ($\chi^2(1, n = 114) = 0.01$, n.s.). The same was true for age when using median split ($\chi^2(1, n = 111) = 0.91$, n.s.). Using a median split for number of years of job experience (i.e., fewer or more than 15) revealed that the number of years of job experience also did not matter ($\chi^2(1, n = 112) = 0.06$, n.s.), and the same held true with regard to high or low patient load ($\chi^2(1, n = 107) = 1.62$, n.s.).

Discussion

Pediatric bipolar disorder is often described as being characterized by an atypical symptom pattern with ultra-rapid cycling, irritability, and without clearly defined episodes [1, 4, 7, 38].
There is even a controversy over whether this condition can be sufficiently differentiated from other conditions and whether it is justified to call it ‘bipolar’ in children [15, 19, 20]. Regardless of the issue whether pediatric bipolar disorder is an under- or over-estimated clinical problem, we wanted to know if bipolar disorder is being diagnosed when an adult-like symptom pattern (i.e. sufficient number of symptoms, clearly defined episode, elated mood, and grandiosity) is present. Depending on whether one classifies ‘chronic mood disorder’ (i.e. cyclothymia) as bipolar disorder, overall 63.8% (or 62.1%) of the clinicians in our sample diagnosed a bipolar spectrum disorder. Contrary to our expectation, age did not show a main effect on its own. However, the results revealed that the likelihood of a bipolar diagnosis was highest when an adolescent reported ‘decreased need for sleep’ (82.1%). The likelihood of a bipolar diagnosis sank to 65.7% if the vignette was about a child instead of an adolescent, and it was further reduced if the vignette reported that the child’s or adolescent’s sleep was normal. The presence or absence of a ‘decreased need for sleep’ had a major impact on the likelihood of making a bipolar diagnosis. This finding replicates former studies [3, 29]. It was also obvious that clinicians felt much more confident in making a bipolar diagnosis when the case referred to a 16 year old presenting with decreased need for sleep than when the case referred to a 6 year old presenting with the same symptoms.

Keeping in mind the caveat that our analyses were only exploratory in nature, we think it is interesting to note that the likelihood of a bipolar diagnosis significantly increased if the clinicians themselves picked the following symptoms as most important in their diagnostic decision making: elated mood, grandiosity, and decreased need for sleep. Even after disregarding ‘decreased need for sleep’, listing elated mood or grandiosity as core symptoms of bipolar disorder was still associated with a higher likelihood of diagnosing bipolar disorder. If clinicians focused on other symptoms (e.g. attention problems, decreased interest in doing school-related home work), however, this was more likely to be associated with a less appropriate diagnosis. These results suggest that some symptoms are either more salient or
more prototypical than others and, therefore, are likely to affect diagnostic decisions. Interestingly, an episodic course was specifically mentioned by 17% of the clinicians as a salient feature for making a bipolar diagnosis. Although such effects on decision making are long known [21, 23, 34] they often seem to be widely ignored in clinical assessment.

One important question is why - contrary to our expectations - the age of a patient did not influence the likelihood of a bipolar diagnosis and what the implications of this result are. Our conclusion is that most clinicians are sufficiently familiar with the typical symptom pattern of mania and bipolar disorder but this familiarity might be limited to ‘classical mania’ with an episodic course, clearly defined episodes, and prototypical symptoms such as elated mood, grandiosity and/or decreased need for sleep. Our data do not allow drawing any conclusions about cases in which pediatric bipolar disorders present in a way that is often described in the literature, i.e. with mixed symptoms, irritability as the prominent mood, and ultra-rapid cycling [1, 7, 24, 38]. In line with Dubicka, et al. [5], however, the clinicians’ interpretation of symptoms seems to be important for making a bipolar diagnosis.

Some limitations of this study should be noted. Firstly, one could argue that the vignettes that included ‘decreased need for sleep’ provided more diagnostic information pointing towards a bipolar disorder than those which included ‘normal sleep’. The design of our study, therefore, does not allow us to draw definite conclusions about whether the increased likelihood of diagnosing bipolar disorder is just due to the total number of criteria mentioned, or whether the criterion of reduced sleep specifically plays a crucial role for the diagnosis of bipolar disorder. Therefore it is possible that eliminating any one individual symptom (not necessarily decreased need for sleep) could have led to similar results. Indirect evidence that the total number of symptoms might not be the key factor is that the rate of bipolar diagnoses was mainly increased when decreased need of sleep was reported in adolescence whereas it was not increased when the same symptoms were reported in childhood. Our result is in line with Meyer and Meyer [29] who found that not the number of criteria mentioned but rather
the kind of criteria mentioned influenced the likelihood of a bipolar diagnosis. Secondly, compared to real clinical settings one might question the validity of diagnostic and treatment decisions based on written case vignettes. Additionally, a case vignette also does not allow clinicians to gather further information to confirm or disconfirm their decisions. Nevertheless, clinicians should always base their diagnostic decisions on ICD-10 or DSM-IV criteria. Therefore, given that we made sure that our case vignettes entailed all the necessary criteria to clearly diagnose bipolar disorder, the diagnosis based on our case vignettes should be comparably or even less difficult than a diagnosis in a clinical practice. Future studies should, however, try to increase ecological validity, for example, by using video tapes which will provide more information, and/or by gathering information about what additional questions clinicians would ask.

Conclusion

We think that there is sufficient evidence from our study to conclude that there are certain symptoms which influence diagnostic decisions more than others. The age of the patient, however, does not seem to matter with regard to a diagnosis of bipolar disorder. The latter statement might be restricted to those cases in which typical manic episodes are reported. Despite our original assumption, the data provide some evidence that age itself is not creating a major bias which would explain the different rates of diagnosed pediatric bipolar disorders in different countries. Our data, however, do not rule out the possibility that different cultures have different attitudes about ‘labeling’ certain symptom patterns in prepubertal children as ‘bipolar’.
References


### Table 1

**Influence of the information about age and decreased sleep**

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<th>Age: 6 years</th>
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<td>b) Others would agree with this diagnosis</td>
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*Notes. N=number; %=per cent, M=mean, SD= standard deviation
*Not all participants provided valid answers to these questions