Validation of the Mood Disorder Questionnaire for Bipolar Disorders in Adolescents

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Objective: The study was designed to determine the validity of the Mood Disorder Questionnaire-Adolescent Version (MDQ-A) as a screening instrument for bipolar disorders (I, II, not otherwise specified, and cyclothymia) in an adolescent outpatient psychiatric population.

Method: 104 adolescents and their parents completed the MDQ-A. Three versions of the MDQ-A were compared: (1) self report of symptoms by adolescent, (2) attributional report—how the adolescent believed teachers or friends would report his/her symptoms, and (3) parent report of adolescent's symptoms. DSM-IV diagnosis was made based upon the clinician-administered Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL), a semistructured diagnostic interview. MDQ-A items were summed, yielding a score for each adolescent ranging from 0 to 13 on each of the 3 MDQ-A versions. Each possible scoring threshold, in combination with co-occurrence of symptoms and behaviors and with moderate to serious problems caused by symptoms, was crossed with the results of the K-SADS-PL diagnostic interview to assess sensitivity and specificity. The study was conducted from April 2002 to September 2003.

Results: A score of 5 or more items on the parent version yielded a sensitivity of 0.72 and specificity of 0.81, which were superior to self and attributional versions.

Conclusions: The MDQ-A completed by parents about their adolescents' symptoms may be a useful screening instrument for bipolar disorders in an adolescent psychiatric outpatient population.

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Bipolar disorders have an early age at onset and are associated with serious course of illness. Lifetime prevalence rates of bipolar disorder and subsyndromal bipolar disorder in adolescents have been reported to be 1% and 5%, respectively.[1] These disorders in adolescents have been associated with psychosocial impairment, poor global functioning, and increased utilization of mental health services in adulthood.[1] Screening for this illness would allow for early identification and intervention.

The Mood Disorder Questionnaire (MDQ), a 13-item self-report scale, has been shown to be a valid instrument for the screening of bipolar disorders in adults across a wide array of settings, including psychiatric outpatient clinics,[2–4] psychiatric inpatient units,[3] the general population,[5,6] and primary care practices.[7]

The present study was designed to determine the validity of the Mood Disorder Questionnaire-Adolescent Version (MDQ-A) as a screening instrument for bipolar disorders (I, II, not otherwise specified, and cyclothymia) in an adolescent outpatient psychiatric population.

METHOD

This study was conducted at 4 outpatient psychiatric clinics that treat children and adolescents. The protocol was approved by the institutional review board at each site. Written informed consent was obtained from the parents and assent obtained from the adolescents. The study was conducted from April 2002 to September 2003.

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Adolescents being seen for evaluation and treatment were asked to complete the MDQ-A. Three versions of the MDQ-A were administered: (1) self report of symptoms by adolescent, (2) attributional report—how the adolescent believed teachers or friends would describe his/her symptoms, and (3) parent report of adolescent's symptoms. The purpose of administering the 3 versions was to determine whether self report, attributional report, or parent report yielded the highest sensitivity and specificity in screening for bipolar disorders. In addition to responding yes or no to the 13 MDQ-A items, the adolescent and parent were asked whether any reported symptoms occurred at the same time and the extent to which these symptoms had caused problems for the adolescent.

The Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL),[8] a semistructured diagnostic interview, was used to determine a diagnosis based upon DSM-IV criteria. The clinician who administered the K-SADS-PL diagnostic interview was blind to the results of the MDQ-A.

MDQ-A items were summed, yielding a score for each adolescent ranging from 0 to 13 on each of the 3 versions of the MDQ-A. Each possible scoring threshold, in combination with co-occurrence of symptoms and behaviors and with moderate to serious problems caused by symptoms, was crossed with the results of the K-SADS-PL diagnostic interview to assess sensitivity and specificity. Internal reliability was assessed by Cronbach α.

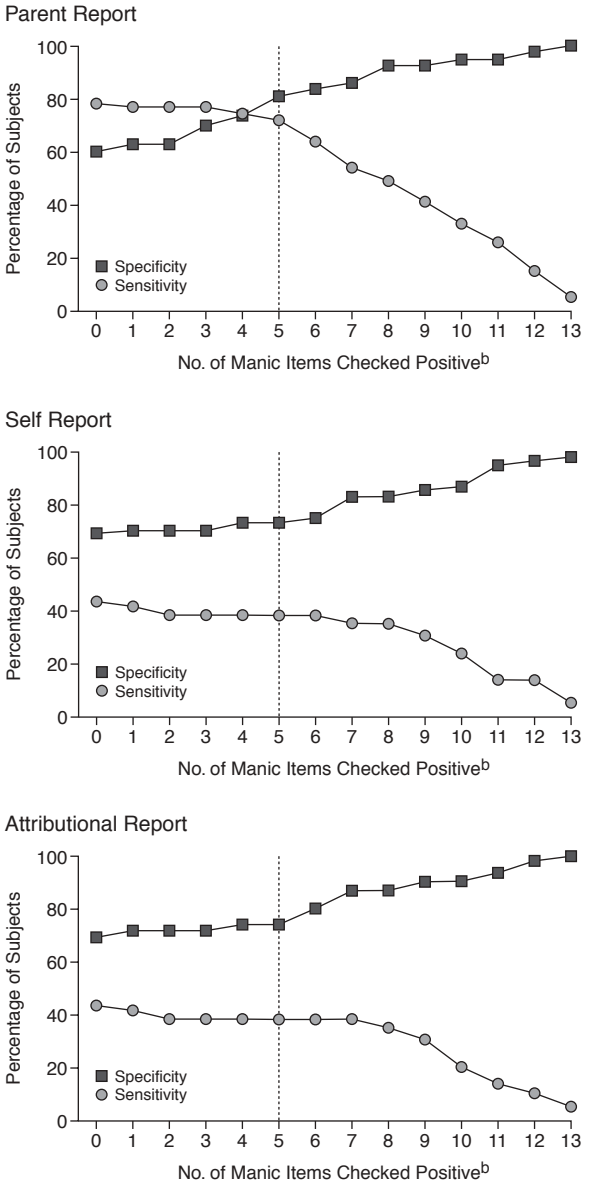
RESULTS

One hundred four adolescents (48 males and 56 females) and their parents participated in the study. The numbers of adolescents from each of the 4 sites were 44, 23, 25, and 12. The mean age of the adolescents was 14.5 years (SD = 1.6; range, 12–17 years). Seventy-two percent of the sample was white, 11% were African American, 9% were Hispanic, and 9% were other.

A K-SADS-PL primary diagnosis of bipolar disorder (bipolar I: N = 33, bipolar II: N = 1, bipolar not otherwise specified: N = 6, cyclothymia: N = 1) was given to 41 of the adolescents. The remaining adolescents were given the following primary diagnoses: major depressive disorder (N = 38), attention-deficit/hyperactivity disorder (N = 11), dysthymia (N = 4), schizophrenia (N = 3), adjustment disorder (N = 2), conduct disorder (N = 2), posttraumatic stress disorder (N = 1), separation anxiety disorder (N = 1), and alcohol abuse (N = 1).

Comorbid disorders (N [%]) in the bipolar group were as follows: attention-deficit/hyperactivity disorder (17 [41.5%]), oppositional defiant disorder (3 [7.3%]), panic disorder (3 [7.3%]), and posttraumatic stress disorder (1 [2.4%]).

Figure 1. Operating Characteristics of 3 Versions of the Mood Disorder Questionnaire-Adolescent Version for Various Threshold Scores[a]



[a]A score of 5 or higher was chosen as optimal cutoff.
[b]In addition to threshold number of symptoms, adolescent or parent must have also indicated that symptoms occurred in same time period and caused moderate or serious problems.

Adolescents and parents were similar in terms of the frequency of endorsement of individual manic behaviors. However, parents were more likely to report that the behaviors were either a moderate or a serious problem (66% compared with 47%, $\chi^2 = 7.01$, p = .008).

Cronbach α values of .84, .84, and .83 were obtained for the self, attributional, and parent reported behaviors, respectively, suggesting good overall internal reliability.

Figure 2. Sensitivity and Specificity of 3 Versions of the Mood Disorder Questionnaire-Adolescent Version in Receiver Operating Characteristic Plot

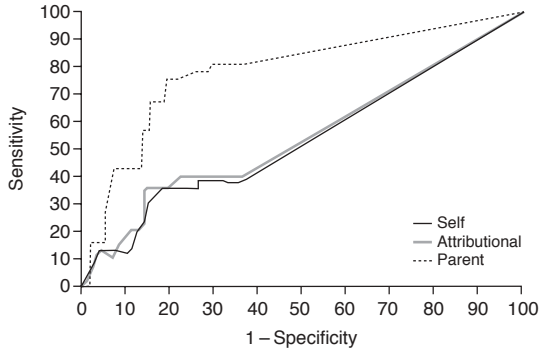


Table 1. Summary Statistics for the ROC and Logistic Regression Analysis

	AUC Analysis		Logistic Regression		
Measure	AUC	SE	χ^2	df	p
MDQ-A					
Parent version	0.803	0.048	22.94	1	< .0001
Self version	0.567	0.054	2.13	1	.145
Attributional version	0.578	0.054	2.95	1	.086
Comparison of ROC curves					
Overall (3 correlated curves)			14.60	2	.0007
Self vs parent version			14.44	1	.00015
Attributional vs parent version			14.12	1	.00017
Self vs attributional version			0.05	1	.82

Abbreviations: AUC = area under the curve, MDQ-A = Mood Disorder Questionnaire-Adolescent Version, ROC = receiver operating characteristic, SE = standard error.

The means and standard deviations for the 3 versions of the MDQ-A for the entire sample were as follows: parent report, 6.0 ± 3.5; self report, 6.3 ± 3.6; and attributional report, 6.0 ± 3.5. The average item correlations between the MDQ-A versions were as follows: parent and self report, 0.21; parent and attributional report, 0.27; and self report and attributional report, 0.70.

Sensitivity and specificity analyses were conducted for self, attributional, and parent reported data using K-SADS-PL bipolar diagnosis as the standard. For parent reported behaviors, sensitivity reached acceptable levels and gradually declined (as would be expected) with the addition of scale items. Using a cut score of endorsement of 5 items, the parent reported data yielded a sensitivity of 72% and specificity of 81% (Figure 1). For self and attributional reporting, sensitivity was never higher than 43%. Using a cut score of 5 items, sensitivity and specificity for the self report were 38% and 73%, respectively, and for the attributional report were 38% and 74%, respectively.

The sensitivity and specificity were combined into a receiver operating characteristic (ROC) plot, with the 3 versions of the MDQ-A depicted in Figure 2. Statistical superiority of the parent version of the MDQ-A ($p < .0001$) was demonstrated based on a logistic regression analysis for the ROC area under the curve (Table 1). The parent version of the MDQ-A is shown in Appendix 1.

DISCUSSION

The operating characteristics of the MDQ-A as a screen for bipolar disorders in adolescents were good (sensitivity of 72% and specificity of 81%) when responses were obtained from parents about their adolescents' symptoms. Adolescent self report and adolescent report of how others viewed their behaviors were less useful in screening for bipolar disorders. The parent report on the MDQ-A showed similar sensitivity and specificity to the MDQ given to adults in a psychiatric outpatient clinic.[2]

The MDQ-A adds to the armamentarium of screening instruments for bipolar disorder in youth including the Conners' Abbreviated Parent Questionnaire,[9] the Child Behavior Checklist,[10] the Parent Young Mania Rating Scale,[11] and the General Behavior Inventory.[12]

Administration of the MDQ-A to the parents of adolescents in a psychiatric outpatient clinic may facilitate recognition of bipolar disorders in these youths. Further research is needed to determine whether the MDQ-A would be useful in screening for bipolar disorders in adolescents within primary care settings and the community.

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Editor's Note: We encourage authors to submit papers for consideration as a part of our Focus on Childhood and Adolescent Mental Health section. Please contact Melissa P. DelBello, M.D., at delbelmp@email.uc.edu.

Appendix 1. Mood Disorder Questionnaire-Adolescent Version

Has there ever been a time for a week or more when your adolescent was not his/her usual self and…	Yes	No
…felt too good or excited?	❑	❑
…was so irritable that he/she started fights or arguments with people?	❑	❑
…felt he/she could do anything?	❑	❑
…needed much less sleep?	❑	❑
…couldn't slow his/her mind down or thoughts raced through his/her head?	❑	❑
…was so easily distracted by things?	❑	❑
…had much more energy than usual?	❑	❑
…was much more active or did more things than usual?	❑	❑
…had many boyfriends or girlfriends at the same time?	❑	❑
…was more interested in sex than usual?	❑	❑
…did many things that were foolish or risky?	❑	❑
…spent too much money?	❑	❑
…used more alcohol or drugs?	❑	❑
If you checked YES to more than one of the above, have several of these ever happened to your adolescent during the same period of time?	❑	❑

How much of problems did any of these cause your adolescent—like school problems, failing grades, problems with family and friends, legal troubles? Please circle one response only.

No problem Minor problem Moderate problem Serious problem