Screening for Bipolar Disorder in a Primary Care Practice

Amar K. Das, MD, PhD
Mark Olfson, MD, MPH
Marc J. Gameroff, PhD
Daniel J. Pilowsky, MD, MPH
Carlos Blanco, MD, PhD
Adriana Feder, MD
Raz Gross, MD, MPH
Yuval Neria, PhD
Rafael Lantigua, MD
Steven Shea, MD
Myrna M. Weissman, PhD

Context Bipolar disorder consists of episodes of manic and depressive symptoms. Efforts to screen for depression in a primary care setting without assessment of past manic symptoms can lead to incorrect diagnosis and treatment of bipolar disorder.

Objectives To screen for bipolar disorder in adult primary care patients and to examine its clinical presentation and effect on functioning.

Design, Setting, and Participants A systematic sample of 1157 patients between 18 and 70 years of age who were seeking primary care at an urban general medicine clinic serving a low-income population. The study was conducted between December 2001 and January 2003.

Main Outcome Measures Prevalence of bipolar disorder, its treatment and patient functioning. Study measures included the Mood Disorder Questionnaire, the PRIME-MD Patient Health Questionnaire, the Medical Outcomes Study 12-Item Short Form health survey, the Sheehan Disability Scale, data on past mental health treatments, and a review of medical records and *International Classification of Diseases, Ninth Revision* codes for each visit dating from 6 months prior to the screening day.

Results The prevalence of receiving positive screening results for lifetime bipolar disorder was 9.8% (n=112; 95% confidence interval, 8.0%-11.5%) and did not differ significantly by age, sex, or race/ethnicity. Eighty-one patients (72.3%) who screened positive for bipolar disorder sought professional help for their symptoms, but only 9 (8.4%) reported receiving a diagnosis of bipolar disorder. Seventy-five patients (68.2%) who screened positive for bipolar disorder had a current major depressive episode or an anxiety or substance use disorder. Of 112 patients, only 7 (6.5%) reported taking a mood-stabilizing agent in the past month. Primary care physicians recorded evidence of current depression in 47 patients (49.0%) who screened positive for bipolar disorder, but did not record a bipolar disorder diagnosis either in administrative billing or the medical record of any of these patients. Patients who screened positive for bipolar disorder reported worse health-related quality of life as well as increased social and family life impairment compared with those who screened negative.

Conclusions In an urban general medicine clinic, a positive screen for bipolar disorder appears to be common, clinically significant, and underrecognized. Because of the risks associated with treating bipolar disorder with antidepressant monotherapy, efforts are needed to educate primary care physicians about the screening, management, and pharmacotherapy of bipolar disorders.

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There have been numerous reports on the prevalence[1-15] and treatment[16,17] of major depression in primary care. Routine screening for depression is now recommended in primary care settings that have the capacity to provide effective management of these cases.[18] In spite of this progress, little attention has been given to primary care patients who have current depression and past episodes of hypomania or mania, history that may indicate bipolar disorder and a need for specialized treatment.

Bipolar disorders comprise a clinical spectrum including bipolar I disorder, bipolar II disorder, and cyclothymia.[19] One or more episodes of manic symptoms such as euphoric or irritable mood, racing thoughts, a decreased need for sleep, talkativeness, and excessive involvement in risk-taking activities are necessary to diagnose a bipolar disorder. Hypomania and mania share the same symptom criteria but differ in episode duration and impairment severity.[19] Hypomania may be more prevalent than mania, but also more difficult to detect through screening.[20]

Patients with bipolar disorders are more likely to present during an episode of depression than hypomania or mania.[21,22] In one suburban family practice, 28 of 108 consecutive adult patients (25.9%) with depressive or anxiety disorders assessed by a physician had a lifetime history of hypomania or ma-

Author Affiliations: Division of Clinical and Genetic Epidemiology, New York State Psychiatric Institute, New York (Drs Das, Olfson, Gameroff, Pilowsky, Blanco, and Feder); Department of Psychiatry, College of Physicians and Surgeons (Drs Das, Olfson, Gameroff, Pilowsky, Blanco, Feder, Gross, Neria, and Weissman); Department of Epidemiology, Mailman School of Public Health (Drs Gross, Neria, and Shea); Division of General Medicine, Department of Medicine, College of Physicians and Surgeons (Drs Lantigua and Shea) Columbia University, New York, NY.
Corresponding Author: Myrna M. Weissman, PhD, Department of Psychiatry, Columbia University, New York State Psychiatric Institute, 1051 Riverside Dr, Unit 24, New York, NY 10032 (mmw3@columbia.edu).

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nia.[23] Seventy-seven (71.4%) had not previously been diagnosed or treated for bipolar disorders.[23] Because of the 2-stage design of this study, it was not possible to estimate the prevalence of bipolar disorder among participants. A history of hypomania or mania can easily be missed in this setting since primary care physicians may not routinely ask patients about past mood elevation.[24]

Determining whether depression is part of a depressive or bipolar disorder is essential for appropriate pharmacological management. Treatment of patients with bipolar disorder with unopposed antidepressants, such as serotonin reuptake inhibitors, risks precipitating mania, hypomania, mixed affective states, and rapid cycling between depression and mania.[25,26] This risk is reduced with a mood-stabilizing agent such as lithium or divalproex or an antipsychotic medication. The American Psychiatric Association practice guideline cautions against antidepressant monotherapy in the management of bipolar disorder.[27]

The specific aims of this study were to (1) estimate the lifetime prevalence of patients who receive positive screen results for bipolar disorder in an urban general medicine clinic; (2) compare demographic, clinical, and treatment characteristics of patients who screen positive for bipolar disorder with those who do not; (3) report on health functioning and impairment of screen-positive patients; and (4) determine whether the primary care physician was aware of a history of manic symptoms at the time of screening.

METHODS

The study was conducted at the faculty and resident group practice of the Division of General Medicine, Columbia University Medical Center in New York City between December 2001 and January 2003. The practice serves approximately 18 000 adult patients from the surrounding community each year.

The institutional review boards of the Columbia University Medical Center and the New York State Psychiatric Institute approved the study protocol. All participants provided written informed consent.

Participant Recruitment

A systematic sample of consecutive adult patients seeking primary care at the practice was invited to participate. Patients were systematically approached to determine their eligibility on the basis of the position of the seat they freely selected in the waiting room. Every consecutive patient from the chairs in the back of the room to the front were screened for eligibility to obtain our final goal of about 1000 patients. Eligible patients were between 18 and 70 years of age, had made at least 1 prior visit, could speak and understand English or Spanish, and were waiting for a scheduled face-to-face contact with their primary care physician. Patients were excluded if their current general health status prohibited completion of the survey form.

Because one aim of the study was to examine primary care detection and management of patients who screened positive for bipolar disorder, we limited the sample to returning patients, as these patients are likely to be better known to the primary care physicians than patients making their first clinic visit. We also excluded a substantial number of waiting room patients who were scheduled to see other health care professionals, were picking up medications but not seeing a physician, or who were persons accompanying patients.

A total of 3807 patients were approached, of whom 169 (4.4%) refused to participate. Of the 3638 who were prescreened, 2291 (63.0%) were ineligible to participate. Common criteria for exclusion were: (1) not being scheduled for face-to-face contact with a primary care physician (56.5%); (2) not being between 18 and 70 years of age (33.5%); and (3) not having made a previous visit to the practice (16.7%). Less commonly, patients were excluded because of poor physical health (3.3%) or cognitive impairment (1.6%). Of the 1347 who met eligibility criteria, 1157 (85.9%) consented to participate. A total of 1146 patients (99.0%) completed the screen.

Sociodemographic and Clinical Assessment

All data forms were translated from English to Spanish and back-translated by a bilingual team of mental health professionals. All participants completed a sociodemographic history form to assess sex, age, annual household income, race/ethnicity, marital status, educational achievement, and occupational status.

Participants also completed the Mood Disorder Questionnaire (MDQ), a 15-item self-report assessment of lifetime bipolar disorder based on *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* criteria.[28] Standard MDQ scoring for bipolar disorder requires endorsement of at least 7 lifetime manic symptoms, several co-occurring symptoms, and moderate or serious associated functional impairment. With these criteria, the MDQ has a sensitivity of 0.28 and a specificity of 0.97 in a community sample[29]; a sensitivity of 0.73 and a specificity of 0.90 in an outpatient psychiatric sample[28] in relation to Structured Clinical Interview for *DSM-IV* bipolar I and bipolar II disorders. In the current analysis, participants who met or exceeded the standard MDQ scoring algorithm were considered to have screened positive for a lifetime history of bipolar disorder. Patients were also asked the age at which symptoms began to be a problem and whether they had consulted a health professional about these symptoms.

The survey forms included the *DSM-IV* Primary Care Evaluation of Mental Disorders (PRIME-MD) Patient Health Questionnaire[30] to assess current symptoms of major depression, panic disorder, general anxiety disorder, and past-year probable alcohol abuse/dependence. In addition, past year probable drug abuse/dependence was assessed with a module patterned after the Patient Health Questionnaire alcohol use disorder module. Suicidal ideation was assessed by asking whether patients experienced thoughts of being better off dead or of hurting themselves in some way during the last 2 weeks.

Physical and mental health functioning were based, respectively, on the

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Physical and Mental Component Summary scores of the Medical Outcomes Study 12-Item Short Form Health Survey (SF-12).[31] Impairment was evaluated with the 10-point self-rated social life and family life/home responsibilities subscales of the Sheehan Disability Scale (0, none; 1-3, mild; 4-6, moderate; 7-9, marked; 10, extreme).[32] Significant impairment for each subscale was defined by a rating of 7 or higher. Because only 229 (20.0%) of the patients were gainfully employed, the work subscale of the Sheehan Disability Scale was not used in the following analyses. Independent of the record review (described in the next section), self-report information was collected from the patient on mental health diagnoses given by a health professional and on mental health treatment history, including psychotropic medication.

The institutional review board required that study participants provide specific written authorization to notify their physician about screening results; 8.7% of patients gave permission. If patients reported current suicidal ideation or appeared acutely distressed, they were referred to the clinic psychiatrist (A.F.).

Medical Record Review

A medical record review of primary care visits was conducted by 2 board-certified psychiatrists (A.F. and M.O.). *International Classification of Diseases, Ninth Revision* diagnoses claimed for the index visit and the preceding 6 months were used to assess whether the primary care physicians were currently aware of the patient's history of bipolar disorder symptoms. All available medical records were reviewed for evidence that a primary care physician recognized bipolar disorder or symptoms, depressive disorders or symptoms, or other mental disorders or psychiatric symptoms during the index visit and a 6-month period preceding that visit. Due to the potential confound with somatic illness, sleep and appetite disturbance were not considered depressive symptoms.

Analytic Strategy

Descriptive methods were used to examine background characteristics of the entire sample. A positive screen for lifetime bipolar disorder was determined to estimate the prevalence of bipolar disorder by scoring positive responses to MDQ items, and the 95% confidence interval (CI) was determined. Rates of major depression, panic disorder, general anxiety disorder, and alcohol and drug use disorders were based on diagnostic algorithms for the PRIME-MD Patient Health Questionnaire.[30]

The prevalence of a positive screen for bipolar disorder was stratified by age (18-44, 45-54, 55-64, and 65-70 years), sex, and race/ethnicity. Race/ethnicity was assessed in order to evaluate possible health disparities. Patients were categorized as Hispanic if they identified their national origin/ancestry as Latin American, were born in a Spanish-speaking country, or if they chose to complete the study forms in Spanish. Non-Hispanic patients classified themselves as black, white, or other.

Comparisons between patients who did and did not screen positive for bipolar disorder on categorical variables (past mental health diagnoses, current mental conditions, mental health care, social and family life impairment, and work loss) were made with the χ^2 test, except when any cell had an expected count of less than 5, in which case the Fisher exact test was used. Student's *t* test was used for comparisons involving continuous variables (SF-12 mental and physical component summary scores). The percentage of missing data in each group was less than 5% except where noted.

Logistic regression was used to measure the relative risk (RR) of the various diagnostic, health-related, and treatment characteristics as a function of a positive screen for bipolar disorder. Because many of these characteristics were relatively common (>10%), and odds ratios (ORs) are known to overestimate RRs in such circumstances,[33] ORs from the logistic regression output were converted to RRs.[34] Linear regression was used to determine the expected change in SF-12 mental and physical component summary scores due to a positive screen for a history of bipolar disorder. For those who screened positive for bipolar disorder, we examined past-month use of psychotropic prescriptions.

RESULTS

Background Characteristics

Of 1146 participants who completed the screen, 796 (69.5%) were female and the mean (SD) age was 51.0 (12.2) years. Eight hundred fifty (75.2%) reported that their annual family income was below $12 000. Nine hundred forty-one (82.1%) were of Hispanic origin and of non-Hispanic participants, 149 (72.7%) were black. Most participants (782; 68.4%) had never married or were currently separated, divorced, or widowed. Four hundred nine (36.1%) had completed 8 or fewer years of education. Eleven hundred thirty-three (98.9%) had health insurance. Participants reported whether they were paid workers (229; 20.0%), unemployed (222; 19.4%), or described their occupational status as disabled (523; 45.6%).

Prevalence, Frequency, and Onset of Probable Bipolar Disorder

A total of 9.8% (95% CI, 8.1%-11.6%) of the participants had a positive screen for a lifetime history of bipolar disorder. Among the 112 participants who screened positive for bipolar disorder, the most commonly reported manic symptoms were being very irritable (100; 89.3%) or "hyper" (99; 88.4%). Other frequently endorsed symptoms included being easily distractible (98; 87.5%), having racing thoughts (97; 87.4%), and being more talkative (96; 85.7%). Among those with a positive screen for bipolar disorder, the least endorsed items were being more social or outgoing (59; 53.2%), being more interested in sex (54; 48.2%), and having a decreased need for sleep (51; 45.5%).

Participants with a positive screen for bipolar disorder first recognized these symptoms as a problem at a mean (SD) age of 35.0 (13.1) years. Twelve participants (11.3%) reported an onset at age 18 or younger, whereas 44 (41.5%) had an onset at age 40 or older. Eighty-

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one participants (72.3%) who screened positive for bipolar disorder had sought professional help specifically for these symptoms.

Sociodemographic Correlates

The prevalence of screening positive for bipolar disorder did not vary significantly by sex, age, race/ethnicity, marital status, or level of educational achievement (TABLE 1). Screening positive for a history of bipolar disorder was significantly related to level of annual household income, with the highest rates among the poorest respondents.

Past Diagnoses

Nearly nine out of ten (88.4%) participants who screened positive for bipolar disorder reported being previously diagnosed with a mental disorder by a health professional, but only 9 (8.4%) reported having received a diagnosis of bipolar disorder or manic depression (TABLE 2). Most commonly, these participants had been told that they had depression (79.5%), or either anxiety/bad nerves or nervous breakdown (76.8%). Twenty-two (19.6%) were diagnosed with an alcohol or drug use problem. The patient's report of any past mental diagnosis by a health professional was strongly associated (ie, odds ratio >3.0) with having a positive screen for bipolar disorder.

Current Mental Disorders

Nearly half (47.3%) of the participants who screened positive for bipolar disorder met criteria for a current major depression episode (Table 2). Of all participants presenting with major depression, nearly one quarter (23.5%) endorsed bipolar screen criteria. After adjustment for demographic covariates, there was a strong association between screening positive for bipolar disorder and current major depression.

Approximately half (48.1%) of the participants who screened positive for bipolar disorder also met PRIME-MD *DSM-IV* criteria for one or more anxiety or substance use disorders (Table 2). The most frequent comorbid disorder was generalized anxiety disorder (25.2%), followed by alcohol use disorder (21.5%), panic disorder (11.9%), and drug use disorder (9.1%). Among those who had current anxiety or substance use disorder, the prevalence of screening positive for lifetime bipolar disorder ranged from 23.3% (general anxiety disorder) to 32.3% (drug use disorder). After adjustment for demographic covariates, screening positive for a history of bipolar disorder was strongly associated with each of the anxiety and substance use disorders.

Suicidal Ideation

Nearly one fifth (18.8%) of those who screened positive for bipolar disorder as compared with 3.9% of those who screened negative reported suicidal ideation at least some days during the previous 2 weeks. After controlling for the presence of any current mental condition (major depression, panic disorder, generalized anxiety disorder, alcohol use disorder, or drug use disorder) and demographic covariates, screening positive for bipolar disorder remained significantly associated with current suicidal ideation (RR=4.80; 95% CI, 2.92-7.49).

Mental Health Care

Participants who screened positive for bipolar disorder were more likely than those who screened negative to have had past mental health treatment (Table 2). In logistic regression models that adjusted for demographic covariates, screening positive for bipolar disorder remained strongly associated with past

Table 1. Rates of Positive Screen for Lifetime Bipolar Disorder Stratified By Demographic Characteristics

Characteristics	Patients With Positive Screen for Bipolar Disorder, No./Total (%)*	Test	*P* Value
All participants (n = 1146)	112 (9.8)		
Sex			
Female	73/796 (9.2)	$\chi^2_1 = 1.07$	.30
Male	39/350 (11.1)		
Age, y			
18-44	31/321 (9.7)	$\chi^2_3 = 7.40$	.06
45-54	44/338 (13.0)		
55-64	27/320 (8.4)		
65-70	10/167 (6.0)		
Annual household income			
<$6000	59/458 (12.9)	$\chi^2_3 = 8.81$	.03
$6000-$11 999	29/392 (7.4)		
$12 000-$17 999	13/156 (8.3)		
≥$18 000	9/124 (7.3)		
Race/ethnicity			
Hispanic	92/941 (9.8)	$\chi^2_2 = 0.08$	.96
Non-Hispanic black	14/149 (9.4)		
Non-Hispanic white or other†	6/56 (10.7)		
Marital status			
Married/cohabiting	33/361 (9.1)	$\chi^2_1 = 0.26$	.61
Other‡	79/782 (10.1)		
Educational status			
≤8th grade	42/409 (10.3)	$\chi^2_4 = 3.14$	.53
9th to 11th grade	20/202 (9.9)		
High school graduate	28/270 (10.4)		
Some college or technical school	16/162 (9.9)		
At least 4 years of college	4/90 (4.4)		

*History of bipolar disorder assessed with the Mood Disorder Questionnaire (MDQ). Participants screen positive for lifetime bipolar disorder if they meet all of the following: (a) At least 7 of 13 hypomanic/manic symptoms are endorsed, (b) 2 or more of these symptoms happened during the same period, and (c) these symptoms caused the subject a "moderate problem" or "serious problem" (vs a "minor problem" or "no problem"), such as being unable to work; having family, money, or legal troubles; or getting into arguments or fights.

†The rate of screening positive for bipolar disorder was 8.0% (95% CI, 2.4%-25.1%) for white non-Hispanics, and 12.9% (95% CI, 5.3%-29.0%) for Asian/Pacific Islanders and other non-Hispanics who were not white or black.

‡Other marital status includes patients who never married or who were currently separated, divorced, or widowed.

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use of prescribed psychotropic medications and previous mental health hospitalization. Among patients who screened positive for bipolar disorder, 43.9% (47/107) reported that they took a prescribed psychotropic medication within the past month, but only 6.5% (7/107) reported taking a mood-stabilizing medication such as lithium, valproate, or carbamazepine in the past month.

Health Functioning, Impairment and Work Loss

Mental and physical health-related quality of life based on the SF-12 mental and physical component summaries was lower (worse) for those who screened positive than negative for bipolar disorder (TABLE 3). These measures remained lower after controlling for relevant covariates. Significant social and family life impairment were more common among participants who screened positive than negative for bipolar disorder (Table 3). Impairment in both areas remained associated with screening positive for bipolar disorder in the multivariate models. Work loss of 1 week or more in the past month was more commonly reported by patients who screened positive than negative for bipolar disorder, but was not significantly associated with a positive bipolar disorder screen after controlling for the covariates.

Recognition by the Primary Care Physician

Of 112 participants who screened positive for lifetime bipolar disorder, 100 had identifiable medical record numbers, and among these, 96 included notes for 1 or more primary care visits during the 6-month review period.

A mental disorder or psychiatric symptom was recorded in the records of 67.7% of the patients who screened positive for bipolar disorder. Depressive disorders or symptoms were noted in 55 (49.0%) of these medical records, but none included an indication of a bipolar disorder diagnosis. Mood stabilizers were prescribed by the primary care physicians in 7.3% (7/96) of the cases. No *International Classification of Diseases, Ninth Revision* codes for bipolar disorder were found for any patients, at any visits, during the 6-month review period. During the period of this study, primary care physicians at this practice did not have access to past psychiatric treatment records, unless they specifically requested them from the facility providing care.

COMMENT

Nearly 10% of participants at an urban general medicine clinic screened positive for lifetime bipolar disorder. This is one of the highest reported lifetime estimates of the rates of bipolar disorders in primary care. Past primary care studies have estimated the rate of bipolar disorders between 0.7% and 1.2%.[6,11,14] These studies used diagnos-

Table 2. Past Mental Health Diagnoses, Mental Health Care, and Current Mental Disorders Among Participants Who Did and Did Not Screen Positive for Lifetime Bipolar Disorder

Characteristics	Screen for Bipolar Disorder, No. (%)		Positive (vs Negative) Screen for Bipolar Disorder		
			Unadjusted		
	Positive (n = 112)	Negative (n = 1034)	χ^2_1	*P* Value	Adjusted RR (95% CI)*
Past mental health diagnoses†					
Bipolar disorder or manic depression	9 (8.4)	32 (3.2)	7.64	.01‡	2.42 (1.14-4.91)
Depression	89 (79.5)	378 (36.9)	75.66	<.001	2.21 (1.97-2.38)
Anxiety/bad nerves or "nervous breakdown"	86 (76.8)	301 (29.4)	100.95	<.001	2.69 (2.38-2.92)
Alcohol or drug use problems	22 (19.6)	49 (4.8)	37.86	<.001	4.29 (2.59-6.69)
Any of the above	99 (88.4)	465 (45.5)	74.13	<.001	1.96 (1.80-2.06)
Past mental health care					
Mental health prescription	64 (58.7)	288 (28.0)	43.56	<.001	2.13 (1.76-2.48)
Mental health hospitalization	29 (26.6)	90 (8.8)	33.51	<.001	2.95 (2.01-4.13)
Any mental health care§	73 (67.0)	355 (34.6)	43.96	<.001	1.98 (1.68-2.23)
Current mental disorders‖					
Major depressive episode	53 (47.3)	173 (16.9)	58.97	<.001	2.90 (2.28-3.52)
Panic disorder	13 (11.9)	38 (3.7)	15.52	<.001‡	3.16 (1.70-5.59)
Generalized anxiety disorder	28 (25.2)	92 (8.9)	28.32	<.001	2.82 (1.90-3.99)
Alcohol use disorder	23 (21.5)	59 (5.9)	34.45	<.001	3.68 (2.29-5.59)
Drug use disorder	10 (9.1)	21 (2.1)	18.35	<.001‡	4.26 (1.99-8.64)
Any of the above	75 (68.2)	266 (26.8)	79.15	<.001	2.53 (2.16-2.85)
Suicidal ideation	21 (18.8)	40 (3.9)	43.97	<.001	4.80 (2.92-7.49)

Abbreviation: CI, confidence interval.
*Relative risk (RR) of having the specified diagnosis or type of mental health care as a function of positive screen for bipolar disorder, adjusting for patient age, sex, race/ethnicity, and marital status. Relative risk calculated from odds ratios (ORs) using the following equation: $OR/[(1 - P_o) + (P_o \times OR)]$, where P_o is the probability of the outcome in the group screening negative for bipolar disorder.
†Based on patient self-report of being diagnosed by a health professional.
‡*P* value from Fisher exact test, reported when any cell had an expected count <5.
§Includes any mental health prescription or hospitalization, or a positive response to "Have you ever been treated for an emotional or mental problem?"
‖Based on positive screen from the PRIME-MD Patient Health Questionnaire.

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Table 3. Health Functioning, Impairment, and Work Loss Among Participants Who Did and Did Not Screen Positive for Lifetime Bipolar Disorder

Characteristics	Screen for Bipolar Disorder: Positive (n = 112)	Screen for Bipolar Disorder: Negative (n = 1034)	Positive (vs Negative) Screen for Bipolar Disorder, Unadjusted: Test	Unadjusted: *P* Value	Adjusted Data (95% CI)
Health functioning†					Expected Change in Score, β*
Mental health–related quality of life, mean (SD)	38.19 (11.18)	47.28 (12.00)	$t_{1089} = 7.52$	<.001	−3.54 (−5.63 to −1.46)
Physical health–related quality of life, mean (SD)	36.59 (10.82)	40.40 (11.47)	$t_{1089} = 3.29$	.001	−2.94 (−5.19 to −0.68)
Impairment§					Relative Risk‡
Social, No./total (%)	34/96 (35.4)	135 (13.5)	$\chi^2_1 = 32.37$	<.001	1.72 (1.12 to 2.51)
Family life, No./total (%)	31/104 (29.8)	112 (11.1)	$\chi^2_1 = 29.35$	<.001	1.68 (1.08 to 2.51)
Work loss of ≥7 d in past month, No./total (%)	42/81 (51.9)	181/664 (27.3)	$\chi^2_1 = 20.82$	<.001	1.35 (0.94 to 1.81)

Abbreviation: CI, confidence interval.
*Expected change in health functioning score as a function of positive screen for bipolar disorder, adjusting for patient age, sex, race/ethnicity, marital status, and presence of any current mental condition (major depression, generalized anxiety disorder, panic disorder, alcohol use disorder, or drug use disorder).
†Based on SF-12 mental and physical component summary scores, respectively (lower scores indicate worse functioning).
‡Relative risk (RR) of having the specified impairment or work loss as a function of positive screen for bipolar disorder, adjusting for patient age, sex, race/ethnicity, marital status, and presence of any current mental condition (major depression, general anxiety disorder, panic disorder, alcohol use disorder, or drug use disorder). Relative risk calculated from odds ratios (ORs) using the following equation: $OR/[(1-P_o) + (P_o \times OR)]$, where P_o is the probability of the outcome in the group screening negative for bipolar disorder.
§Impairment defined by a subscale score of ≥7 (marked or extreme impairment) on the social and family life subscales of the Sheehan Disability Scale.

tic instruments that may have poor sensitivity for detecting hypomanic episodes and thus may underestimate bipolar II disorder.[35] Bipolar II disorder, characterized by recurrent depressive episodes and brief periods of hypomania, may be the most prevalent form of bipolar disorder.[20,36]

Several national and community studies[37-41] have estimated the prevalence of a broader spectrum of bipolar disorders. These studies have found a lifetime prevalence between 2.6% and 6.5%. A recent study of a large nationally representative community sample reported a lifetime prevalence of 3.7% with the MDQ.[42]

The high estimated prevalence in this clinical setting (9.8%) may be related to the low socioeconomic status of the population. In a national study,[42] lifetime prevalence of bipolar disorder was highest (5.7%) among participants with the lowest annual household income (<$20 000/y). In our clinical sample, nearly nine in ten participants reported a household income below $18 000 per year, and the rate of screening positive for lifetime bipolar disorder was inversely associated with household income. These findings are consistent with community-based studies[43,44] that have shown that economically disadvantaged individuals have higher rates of mental disorders than their more affluent counterparts. Previous research[45,46] at our clinic site has also found high rates of major depression, psychotic symptoms, and suicidal ideation. The reported mean age of onset of bipolar disorder (35 years) is approximately a decade older than reported in community samples. The later onset in this sample may be due to the problem of recall in an older primary care sample or may reflect a true later age of onset in this sample.

Remarkably few participants who screened positive for bipolar disorder reported that they had been told by a health professional that they had a bipolar disorder, though a majority had sought professional help for these symptoms and had been previously diagnosed with a mental health condition. Several factors may explain the apparent low rate of professional diagnosis of bipolar disorders. First, participants may not recall receiving the diagnosis or may not have understood the diagnosis. Second, assessment and treatment by mental health specialists may not reduce misdiagnosis of bipolar disorder.[47] Third, two fifths of participants who screened positive for bipolar disorder reported a late onset (age 40 or older). Late-onset bipolar disorder has been associated with a less severe symptom course than early onset bipolar disorder[48] and, as a result, may be more likely to pass undiagnosed. Last, the racial and ethnic composition of our sample may place them at a particularly high risk of being misdiagnosed.[49]

A majority of participants with a history of manic symptoms in our study had current symptoms of major depression, anxiety, or substance use disorders. Nearly half screened positive for major depression, a finding similar to those of 2 studies that found that 31.9% of participants with bipolar I disorder[50] and 50.3% of participants with bipolar II disorder[51] experienced depressive symptoms during weekly mood ratings. The high rates of anxiety and substance use disorders among participants with lifetime manic symptoms are consistent with community and clinical studies.[6,52]

Screening low-income primary care patients with current mental conditions can improve the detection of bipolar disorders. Poor people are less likely to receive mental health treatment[53] and, if they do, are comparatively less likely to receive treatment from a mental health specialist.[54,55] Because the poor tend to rely disproportionately on primary care physicians for mental health treatment,[56] these health professionals can play an important role in the assessment and management of bipolar disorders.

Current guidelines for bipolar disorders[27] caution against monotherapy with antidepressants since these agents may induce a hypomanic, manic, or

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mixed depressive/manic episode.[25,26] In our study, almost two thirds of participants with lifetime manic symptoms who received medication in the past month reported taking antidepressant monotherapy. In comparison, one third of participants with bipolar disorders who are seen by outpatient psychiatrists have been found to take pharmacotherapy without a mood stabilizer.[57] Given the recent increase in the prescribing of antidepressants,[58] there is a growing risk that misdiagnosed cases of bipolar disorder in primary care may receive inappropriate treatment.

Bipolar disorders are associated with significant disability.[59] Many patients with these disorders do not fully recover ability to function in work and social activities[60] and they remain impaired despite maintenance treatment.[61-65] Our study demonstrates that primary care patients who screen positive for bipolar disorder also experience significant disability in health, social, family, and occupational functioning. Even after adjusting for the presence of any current mental condition, impairment in health-related quality of life, social activities, and in family life remained significantly associated with a positive screen for bipolar disorder.

Participants with bipolar disorders are at high risk for suicide attempts and completion.[66-70] Our study indicates that primary care participants who screen positive for bipolar disorder are at increased risk of current suicidal ideation, even after controlling for several other current mental conditions. Screening primary care patients for bipolar disorder should also include ongoing assessment and management of suicide risk. Given the high rates of morbidity and mortality associated with bipolar disorders, detected primary care patients may be better referred to mental health specialists who can provide regular visits and who are trained to use complex pharmacologic regimens and manage acute crises.

The current study has several limitations. First, we used a self-report instrument, the MDQ, to screen for bipolar disorder. The MDQ may be less accurate than a structured diagnostic interview undertaken by a health professional and may overestimate the lifetime prevalence of bipolar disorder. Second, the specificity and sensitivity of the MDQ have not yet been established in a primary care setting. The instrument's specificity has been shown to be high (0.97) in a large national sample,[42] but may be lower in our study setting because manic symptoms may be caused by medical illnesses, such as hyperthyroidism, and medications, such as corticosteroids. Its sensitivity may have been modest in our sample, given that only about one out of five participants who were given a past diagnosis of bipolar disorder or manic depression screened positive. Third, though we asked patients whether they had ever been diagnosed with bipolar disorder or manic depression, we did not ask specifically about other related conditions, such as manic episode, hypomanic episode or mania that might have uncovered additional information. Last, because the study was undertaken in an urban general medical practice serving a largely low-income population, the findings may not generalize to primary care settings with different populations.[71,72]

In an urban general medicine practice, screening positive for bipolar disorder is relatively common but frequently underrecognized and is associated with poor health-related quality of life, impairment in social activities and family life, and current suicidal ideation. A significant proportion of primary care participants who screened positive for bipolar disorder present with major depression or an anxiety or substance use disorder. These participants are at risk for adverse events if prescribed antidepressant monotherapy. However, addition of a selective serotonin reuptake inhibitor does not appear to increase the risk of switching from depression to mania in patients concurrently treated with a mood stabilizer or antipsychotic medication.[73] To improve the recognition and reduce the morbidity of bipolar disorders in primary care, further efforts are needed by primary care physicians to screen selectively for past hypomania or mania among participants with known depression, anxiety, or substance use conditions.

Author Contributions: Dr Weissman had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.
Study concept and design: Das, Olfson, Pilowsky, Feder, Gross, Shea, Weissman.
Acquisition of data: Das, Lantigua, Shea, Weissman.
Analysis and interpretation of data: Das, Olfson, Gameroff, Blanco, Gross, Neria, Shea, Weissman.
Drafting of the manuscript: Das, Olfson, Gameroff, Pilowsky, Gross, Weissman.
Critical revision of the manuscript for important intellectual content: Das, Olfson, Pilowsky, Blanco, Feder, Neria, Lantigua, Shea, Weissman.
Statistical analysis: Das, Gameroff, Shea.
Obtained funding: Olfson, Weissman.
Administrative, technical, or material support: Das, Feder, Lantigua, Weissman.
Study supervision: Olfson, Pilowsky, Shea, Weissman.
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