National Patterns in Antidepressant Treatment by Psychiatrists and General Medical Providers: Results From the National Comorbidity Survey Replication

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Background: Primary care physicians, rather than psychiatrists, prescribe a majority of psychotropic medications in the United States. However, past research has shown significant differences in psychopharmacologic treatment practices of these 2 groups of physicians. The objective of this study was to compare patient characteristics and treatment patterns of adults in the United States treated with antidepressant medications by psychiatrists and other medical providers.

Method: Data from the National Comorbidity Survey Replication (February 2001–April 2003) were used to compare characteristics of adults (aged ≥ 18 years) prescribed antidepressants by psychiatrists (N = 255) or other medical providers (N = 673). The treatment groups were also compared with respect to presenting problem, antidepressant type and dose, and continuity of treatment.

Results: Approximately 1 in 10 adults (10.5%) were treated with an antidepressant in the past year, usually by a general medical provider (73.6%). Compared with those treated by psychiatrists, adults treated by general medical providers were significantly more likely to be at least 65 years of age and to reside in a nonurban area. By contrast, those treated by psychiatrists were significantly more likely to be male, to report significant distress, to present with serious mood or anxiety symptoms, and to meet DSM-IV criteria for mood and anxiety disorders. Individuals treated by psychiatrists typically received higher doses of medications, were less likely to stop the medication before 30 days, and were more likely to continue 90 days or longer.

Conclusions: Most adults treated with antidepressants receive the medication from general medical providers. In comparison with adults treated by psychiatrists, those treated by general medical providers are less likely to meet the criteria for mood or anxiety disorders or to continue medication beyond the first month. Quality improvement initiatives in general medical settings should focus on better targeting and continuity of antidepressant medications.

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There has been a dramatic increase in rates of outpatient treatment of depression and other common mental disorders in recent years.[1,2] Several factors likely contributed to this trend including introduction of newer medications with fewer side effects along with expanding indications for these medications, growth of direct to consumer advertising by pharmaceutical manufacturers,[3] public awareness campaigns,[4] new social policies,[5] and publicity concerning depression and antidepressant medications.[6] This development also paralleled the growing role of the general medical sector in providing outpatient care for common mental disorders.[2] Between the early 1990s and early 2000s, the percentage of individuals who sought mental health care from the general medical sector increased from 31.5% of all of those who sought mental health care to 49.6%, while the share of individuals seeking treatment from psychiatrists increased from 19.6% to 25.8%.[2] This trend is likely partly responsible for the finding that the growth in the use of antidepressant medications was much greater than in the use of psychotherapy.[1]

Primary care physicians, rather than psychiatrists, have historically prescribed a majority of psychotropic medications in the United States.[7,8] However, past research has found important differences in the quality and duration of psychopharmacologic management provided by these 2 groups of health professionals.[9–14] Specifically, mental health care provided in general medical settings was

somewhat less likely than that provided in specialty mental health care settings to be guideline consistent and to extend for an adequate time period.[9–11] Furthermore, the patients who sought care in general medical settings were different in important characteristics from those who sought care in specialized mental health care settings.[15,16] However, past research on differences in treatment patterns across the 2 groups of providers mostly predates the recent expansion in outpatient treatment of common mental disorders.

This study compared more recent patterns of antidepressant medication treatment by psychiatrists and general medical providers in a representative sample of the U.S. adult general population. More specifically, we compared individuals treated with antidepressants by general medical providers and psychiatrists with respect to sociodemographic characteristics, psychiatric diagnoses, presenting complaints, type of medications, dose ranges, continuity of treatment, adherence to medications, and perceptions of effectiveness of medication treatment.

METHOD

Sample

Data were drawn from the National Comorbidity Survey Replication (NCS-R),[2] a nationally representative cross-sectional survey of households in the 48 coterminous United States. The NCS-R was administered to 9282 individuals aged ≥ 18 years between February 2001 and April 2003 (response rate = 70.9%). The NCS-R interview included 2 parts administered in 1 interview session. Part 1 comprised the core diagnostic assessment module and the pharmacoepidemiology module administered to all participants. Part 2 included further diagnostic assessments as well as questions about current symptoms and was administered to 5692 part 1 participants who met lifetime criteria for any core disorder plus a probability subsample of other participants.

Interviews were conducted in person. Informed consent was obtained before the interview. The human subjects committees of Harvard Medical School, Boston, Mass., and the University of Michigan, Ann Arbor, Mich., approved these recruitment and consent procedures. Secondary analyses of the data presented in this article were approved by the institutional review board of the Beth Israel Medical Center, New York, N.Y.

Assessments

Antidepressant medication use was assessed by presenting the participants with a list of specific psychotropic medications and asking them which medicines on the list they had taken in the past 12 months for problems with their "emotions, nerves, mental health, substance use, energy, concentration, sleep, or ability to cope with stress." The list included 215 generic and proprietary names for commonly used psychotropic medications. For this study, the analyses were limited to antidepressant medications. The participants were asked to check the medication bottle for the exact name of the medication.

For the first 3 medication mentions, participants were asked who prescribed that medication—a psychiatrist, a general or family doctor, some other medical doctor, or some other health professional. For this report, participants were classified into 2 nonoverlapping categories: participants who took an antidepressant prescribed by a psychiatrist whether or not they also took antidepressants prescribed by a general medical provider and those who took an antidepressant prescribed by a general medical provider only (a general or family doctor, some other medical doctor, or some other health professional).

Psychiatric diagnoses were ascertained using the Composite International Diagnostic Interview,[17] a lay-administered structured interview that provides psychiatric diagnoses based on the DSM-IV[18] criteria. For this study, analyses were limited to lifetime diagnoses of common mood and anxiety disorders assessed in part 1 of the NCS-R and for which treatment with an antidepressant medication is indicated.

Psychological distress was ascertained using the K6 screening instrument.[19] The 6 items of the K6 probe how often the participant has felt nervous, restless, hopeless, worthless, extremely sad, or that "everything was an effort" during a 1-month period in the past 12 months when the participant was "the most depressed, anxious, or emotionally stressed." Each K6 item is rated on a scale ranging from "none of the time" (0) to "all of the time" (4). Thus, K6 scores can range from 0 to 24. The K6 has been shown to have a high internal consistency reliability (Cronbach's $\alpha = 0.89$) and concurrent validity against the Structured Clinical Interview for DSM-IV.[19] Consistent with past research, we used a cutoff point of < 13 vs. ≥ 13 to identify participants with serious psychological distress.[19]

Presenting problems were assessed for the first 3 medication mentions by giving the participants a list of common presenting problems and asking them to identify problems for which they had taken the medication. For this study, presenting problems were categorized into mood and anxiety symptoms, physical symptoms, cognitive symptoms, role functioning problems, and alcohol/drug problems.

Sociodemographic variables included age (18–24, 25–34, 35–44, 45–54 years), gender, race/ethnicity (non-Hispanic white, Hispanic, non-Hispanic black, other), marital status (married or living as married, divorced/separated/widowed, never married), education (0–11, 12, 13–15, ≥ 16 years), family income compared to U.S. federal poverty level for 2001 (low = < 1.5, low-average = 1.5 to < 3, high-average = 3 to < 6, and high ≥ 6), urbanicity (metropolitan counties with ≥ 1,000,000

population, other urban metropolitan counties with < 1,000,000 population, and nonurban counties, which include all nonmetropolitan counties),[2] and insurance status (any vs. no insurance, and for those with any insurance, whether preauthorization is required for specialist referral or not). Questions about income and preauthorization were included in part 2 of the NCS-R.

Medication dose was ascertained by asking participants about their frequency of use and doses of each medication. Daily dose was computed by multiplying frequency of use by milligram amount in each dose of each medication. In addition, doses were compared with dose ranges recommended in the American Psychiatric Association's Practice Guideline for the Treatment of Patients With Major Depressive Disorder.[20]

Medication continuity and adherence were assessed separately for each medication. Participants were asked how many days in the past 12 months they took the medication and if they were still taking the medication or had stopped. For those who were still taking the medication, participants were asked on how many days out of the past 30 days they took the medication. Consistent with past research,[21] continuity of antidepressant use was operationalized in 2 ways: (1) stopping antidepressants before 30 days of use and (2) using antidepressants for at least 90 days. For the first 3 medication mentions, participants were also asked, "Think of a typical month when you took (the medication's name) in the past 12 months. How many days out of 30 did you typically either forget to take it or take less of it than you were supposed to take?"

The NCS-R did not obtain information on time since start of medication. Furthermore, for participants who reported taking more than 1 antidepressant medication, the order in which these medications had been prescribed was not ascertained.

Perceived effectiveness of the antidepressant medication treatment was assessed by asking the participants, "Overall, how effective was (the medication name) in doing the things you expected it to do—very, somewhat, not very, or not at all effective?" The ratings were coded from 0 (not at all effective) to 3 (very effective).

Data Analysis

Sociodemographic characteristics, diagnoses, presenting problems, type of medications, and characteristics of medication treatment such as medication dose compared to the minimum recommended dose and continuity were compared across participants prescribed antidepressant medications by psychiatrists and general medical providers using bivariate logistic regression analyses. Dose ranges for individual medications were also computed and compared across psychiatrists and general medical providers using ordinal logistic regression models that accommodate nonnormally distributed data such as medication doses.

The relationship of type of prescribing professional with characteristics of medication treatment, including continuity of treatment, adherence, and medication dose, compared with the minimum recommended antidepressant dose for all antidepressant medications together was further assessed using multivariate logistic regression analyses that adjusted for potentially confounding variables. Medication treatment characteristics found in bivariate analyses to be different across groups at a $p < .05$ level were included in these analyses. These analyses adjusted for sociodemographic and clinical characteristics that differed in the bivariate analysis at a $p < .25$ level.[22]

The NCS-R used a complex stratified sampling design. Survey weights and design elements were included in the analyses to adjust for their effects and to make samples representative of the U.S. population. All percentages reported are weighted by the NCS-R sampling weights. STATA 9.2[23] software was used for all analyses. A $p < .05$ level was adopted as the threshold for judging the significance of statistical tests.

RESULTS

Overall, 975 (10.5%) of 9282 NCS-R participants reported having taken an antidepressant medication in the past year. For 928 (96.6%) of these participants, information was available concerning the prescribing health care professional. Of these, 237 (24.7%) reported taking antidepressants prescribed by a psychiatrist only, 18 (1.7%) by a psychiatrist as well as a general medical provider, and 673 (73.6%) by a general medical provider only. For the present analyses, the group that reported taking antidepressants prescribed both by a psychiatrist and a general medical provider was combined with the group that reported taking antidepressants prescribed by a psychiatrist only. The analytic groups thus comprised 255 participants prescribed antidepressants by psychiatrists (or psychiatrists and general medical providers) and 673 participants prescribed antidepressants by general medical providers only.

There were minor sociodemographic differences between these 2 groups (Table 1). As compared with participants treated by general medical providers, participants treated by psychiatrists were more likely to be male, to be from the "other" racial/ethnic group, and to have never married. In relation to participants treated with antidepressants by psychiatrists, those treated by general medical providers were more likely to be at least 65 years of age and to reside in a nonurban area (Table 1).

Differences with regard to psychiatric diagnoses and psychological distress were more marked (Table 2). Compared with participants treated with antidepressants by general medical providers, those who were treated by psychiatrists were more likely to meet criteria for DSM-IV diagnoses of major depressive disorder, bipolar disorder, panic disorder, social phobia, and posttraumatic stress

Table 1. Sociodemographic Characteristics of National Comorbidity Survey Replication Participants Treated With Antidepressants Prescribed by Psychiatrists and by General Medical Providers[a]

	Prescribed by Psychiatrists (N = 255)		Prescribed by General Medical Providers (N = 673)		Bivariate Binary Logistic Regression for Comparison of Groups		
Characteristic	N	%	N	%	Odds Ratio	95% CI	p Value
Age, y[b]							
18–24	20	9.0	50	8.8	1.00	Reference	…
25–34	46	16.1	111	13.2	1.19	0.57 to 2.47	.630
35–44	64	26.3	149	21.9	1.17	0.60 to 2.31	.634
45–54	73	29.0	161	26.3	1.08	0.54 to 2.14	.832
55–64	37	12.9	98	13.8	0.91	0.40 to 2.08	.823
≥ 65	15	6.6	103	16.1	0.40	0.20 to 0.80	.011
Gender[c]							
Female	176	63.6	507	73.5	1.00	Reference	…
Male	79	36.4	166	26.5	1.59	1.15 to 2.19	.006
Race/ethnicity[c]							
Non-Hispanic white	207	83.2	572	85.8	1.00	Reference	…
Hispanic	15	6.0	44	8.0	0.78	0.34 to 1.81	.554
Non-Hispanic black	19	6.3	40	4.3	1.53	0.82 to 2.86	.176
Other	14	4.5	17	2.0	2.36	1.06 to 5.26	.037
Marital status[d]							
Married/living as married	117	44.6	373	54.3	1.00	Reference	…
Divorced/separated/widowed	85	30.8	190	28.1	1.34	0.82 to 2.17	.232
Never married	53	24.6	110	17.6	1.70	1.04 to 2.78	.034
Education, y[e]							
0–11	33	12.7	105	16.8	1.00	Reference	…
12	75	31.7	195	32.3	1.30	0.72 to 2.34	.383
13–15	81	30.5	225	30.2	1.33	0.69 to 2.58	.387
≥ 16	66	25.1	148	20.8	1.60	0.79 to 3.23	.189
Family income (part 2 sample)[f]							
Low	68	28.8	117	25.3	1.00	Reference	…
Low average	48	18.8	135	21.9	0.75	0.37 to 1.53	.425
High average	68	29.7	199	33.3	0.78	0.45 to 1.35	.366
High	54	22.6	118	19.5	1.01	0.53 to 1.93	.963
Urbanicity[g,h]							
Metropolitan	110	41.6	245	31.8	1.00	Reference	…
Other urban	96	32.8	253	31.0	0.81	0.56 to 1.16	.242
Nonurban	49	25.6	175	37.2	0.52	0.35 to 0.77	.002
Chronic physical conditions (part 2 sample)[i]							
Present	154	63.5	362	64.0	1.00	Reference	…
Absent	93	36.5	231	36.0	0.98	0.71 to 1.36	.898
Health insurance status (part 2 sample)							
Any insurance	218	88.4	551	91.8	1.00	Reference	…
No insurance	28	11.6	42	8.2	1.47	0.76 to 2.84	.248
Preauthorization for referral[j]							
Not required	77	38.9	216	41.8	1.00	Reference	…
Required	135	61.1	315	58.2	1.13	0.74 to 1.72	.571

[a]All percentages are weighted by the National Comorbidity Survey Replication sampling weights.
[b]Overall test: F = 2.77; df = 5,38; p = .031.
[c]Overall test: F = 2.30; df = 3,40; p = .092.
[d]Overall test: F = 2.35; df = 2,41; p = .108.
[e]Overall test: F = 0.72; df = 3,40; p = .547.
[f]Overall test: F = 0.27; df = 3,40; p = .848.
[g]"Metropolitan" consists of large, core metropolitan counties with a population ≥ 1,000,000; "other urban" consists of medium and lesser metropolitan counties with a population < 1,000,000; and "nonurban" consists of all nonmetropolitan counties.
[h]Overall test: F = 6.94; df = 2,41; p = .003.
[i]Chronic medical conditions included arthritis, hypertension, diabetes, heart disease, asthma, and other lung disease.
[j]This question was asked to people who reported having any type of health insurance.
Symbol: … = no data.

disorder. There was no significant difference between the groups in the prevalence of dysthymia or generalized anxiety disorder. Participants who took antidepressants prescribed by psychiatrists experienced more psychological distress as measured by the K6 (Table 2).

Consistent with differences in diagnoses, there were also significant group differences with regard to presenting problems across the 2 groups of participants (Table 2). Compared with participants who were treated by general medical providers, those who were treated by psychiatrists were more likely to present with complaints of mood and anxiety symptoms, including sadness, manic mood, anger/irritability, panic, suicidal thoughts, and poor concentration.

Table 2. Diagnoses, Psychological Distress, and Presenting Complaints of National Comorbidity Survey Replication Participants Treated With Antidepressants Prescribed by Psychiatrists and by General Medical Providers[a]

	Prescribed by Psychiatrists (N = 255)		Prescribed by General Medical Providers (N = 673)		Bivariate Binary Logistic Regression for Comparison of Groups		
Characteristic	N	%	N	%	Odds Ratio	95% CI	p Value
Lifetime psychiatric diagnoses							
Mood disorders							
Major depressive disorder	120	46.4	243	35.3	1.73	1.27 to 2.34	.001
Dysthymia	28	10.9	46	7.4	1.62	0.90 to 2.90	.105
Bipolar disorder	42	16.9	36	5.4	3.54	2.09 to 5.98	< .001
Any mood disorder	166	64.8	283	41.7	2.58	1.81 to 3.67	< .001
Anxiety disorders							
Panic disorder	64	23.8	96	14.7	1.84	1.16 to 2.92	.011
Generalized anxiety disorder	39	14.6	95	14.1	1.06	0.68 to 1.66	.785
Social phobia	105	40.2	165	22.8	2.35	1.70 to 3.26	< .001
Posttraumatic stress disorder	71	26.0	102	16.3	1.94	1.34 to 2.80	.001
Any anxiety disorder	121	43.7	226	34.8	1.46	1.02 to 2.07	.036
Any mood or anxiety disorder	202	76.8	385	57.6	2.43	1.61 to 3.69	< .001
Psychological distress (K6 score)[b]							
0–12	161	63.5	507	82.1	1.00	Reference	…
13–24	86	36.5	105	17.9	2.64	1.62 to 4.30	< .001
Presenting problems							
Mood and anxiety symptoms							
Sadness/depression/crying	196	78.2	392	58.0	2.60	1.86 to 3.62	< .001
Manic mood	22	9.3	20	2.6	3.91	2.60 to 5.88	< .001
Anger or irritability	38	16.9	54	7.8	2.42	1.50 to 3.90	.001
Nerves/anxiety	89	36.0	237	36.1	1.00	0.71 to 1.40	.979
Panic	37	14.9	63	8.4	1.90	1.29 to 2.80	.002
Suicidal thoughts	14	5.4	11	1.7	3.42	1.52 to 7.70	.004
Physical symptoms							
Low energy	27	10.4	56	7.9	1.36	0.77 to 2.39	.280
Poor appetite	10	4.5	18	2.9	1.58	0.55 to 4.52	.383
Poor sleep	57	22.3	136	19.0	1.22	0.79 to 1.88	.356
Little or no sexual functioning	8	3.7	9	1.3	2.84	0.75 to 10.72	.120
Physical pain	5	3.5	49	7.4	0.45	0.15 to 1.34	.148
Cognitive symptom							
Poor concentration	34	14.4	41	5.8	2.76	1.38 to 5.49	.005
Poor memory	14	5.2	21	2.7	1.98	0.93 to 4.22	.076
Role functioning problems							
Marital problems	7	2.8	12	1.8	1.59	0.51 to 4.92	.412
Not getting along with others	6	1.9	9	1.7	1.09	0.33 to 3.57	.881
Poor work performance	3	0.9	10	1.4	0.66	0.15 to 2.96	.576
Alcohol/drug problems	2	1.9	6	0.8	2.45	0.40 to 14.91	.321

[a]All percentages are weighted by the National Comorbidity Survey Replication sampling weights.
[b]Part 2 sample.
Symbol: … = no data.

There were few differences between the groups with regard to type of antidepressant medication prescribed (Table 3). Participants treated with antidepressants by psychiatrists were significantly more likely than those who were treated by general medical providers to be prescribed fluoxetine and significantly less likely to be prescribed amitriptyline. Otherwise, there were no significant differences with regard to type of medication among groups.

Selective serotonin reuptake inhibitors (SSRIs) were the most commonly prescribed class of antidepressants overall, prescribed to an equal percentage of participants treated by psychiatrists and general medical providers (Table 3). The percentage of participants treated with tricyclic antidepressants was also very similar across groups (Table 3). Of note, only 1 participant reported having taken a monoamine oxidase inhibitor.

However, there were more differences across groups with regard to doses of individual medications. Participants treated by psychiatrists with sertraline, paroxetine, citalopram, and trazodone received higher doses of these medications than those treated by general medical providers (Table 3). The doses of these medications compared with dose ranges recommended in the American Psychiatric Association's Practice Guideline for the Treatment of Patients With Major Depressive Disorder[20] are also depicted in Figure 1, which reveals that a higher percentage of individuals treated by psychiatrists compared with general medical providers received at least the minimum antidepressant dose of these medications or reached the maximum dose.

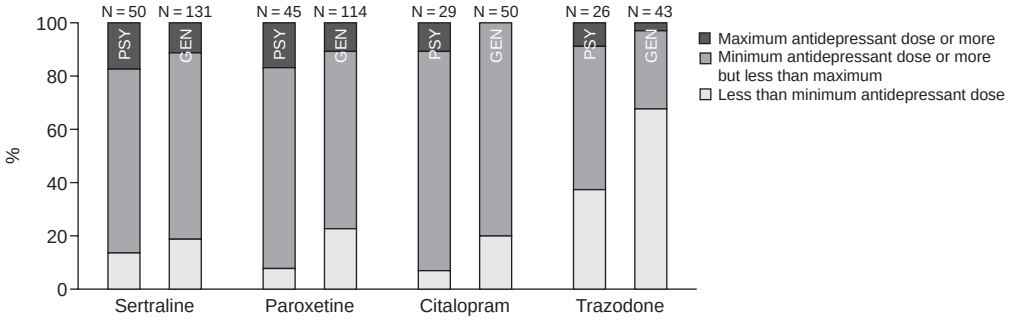
The differences across groups with regard to current status, the number of days that the participant forgot to

Table 3. Type and Doses of Medications Taken by National Comorbidity Survey Replication Participants Treated With Antidepressants Prescribed by Psychiatrists and by General Medical Providers[a]

	Medication Types							Doses of Medications (mg/day)						
	Prescribed by Psychiatrists (N = 255)		Prescribed by General Medical Providers (N = 673)		Bivariate Binary Logistic Regression for Comparison of Groups			Prescribed by Psychiatrists (N = 255)		Prescribed by General Medical Providers (N = 673)		Bivariate Ordinal Logistic Regression for Comparison of Groups		
Characteristic	N	%	N	%	Odds Ratio	95% CI	p Value	Median	25th–75th Percentile	Median	25th–75th Percentile	Odds Ratio	95% CI	p Value
Medication type														
SSRIs														
Sertraline	57	20.5	157	23.3	0.85	0.56 to 1.29	.429	100	50–150	50	50–100	2.61	1.32 to 5.13	.007
Paroxetine	45	16.5	133	21.2	0.73	0.51 to 1.05	.085	30	20–40	20	10–30	3.09	1.69 to 5.65	.001
Fluoxetine	50	21.2	98	14.9	1.54	1.01 to 2.56	.047	20	20–40	20	20–40	1.72	0.67 to 4.41	.251
Citalopram	32	14.7	61	9.8	1.58	0.91 to 2.71	.099	40	20–40	20	20–30	2.77	1.04 to 7.35	.042
Fluvoxamine	1	0.1	4	0.8	1.51	0.01 to 3.11	.214	300	…	100	50–100	…	…	…
Any SSRI	168	66.6	433	66.6	1.00	0.74 to 1.34	1.000	…	…	…	…	…	…	…
Tricyclics														
Amitriptyline	11	4.5	66	9.5	0.45	0.21 to 0.96	.039	40	25–50	50	25–75	1.14	0.41 to 3.15	.793
Doxepin	8	3.0	13	1.4	2.16	0.89 to 5.24	.086	50	25–150	20	20–50	2.15	0.20 to 23.77	.503
Nortriptyline	7	2.5	7	0.9	3.04	0.74 to 12.39	.119	50	25–100	37.5	10–50	3.76	0.23 to 60.08	.312
Imipramine	0	0.0	5	0.7	…[b]	…	…	…	…	50	25–100	…	…	…
Clomipramine	2	0.9	0	0.0	…[b]	…	…	62.5	25–100	…	…	…	…	…
Desipramine	0	0.0	1	0.1	…[b]	…	…	…	…	…	…	…	…	…
Protriptyline	0	0.0	1	0.3	…[b]	…	…	…	…	…	…	…	…	…
Any tricyclic	27	10.5	92	12.8	0.80	0.46 to 1.38	.412	…	…	…	…	…	…	…
SNRI/NDRI														
Bupropion	39	16.0	74	10.7	1.59	0.96 to 2.64	.073	300	250–400	300	150–300	2.03	0.78 to 5.31	.143
Venlafaxine	23	8.8	51	7.3	1.23	0.65 to 2.30	.513	150	75–300	150	75–150	2.12	0.59 to 7.55	.238
Any SNRI/NDRI	60	23.8	125	17.9	1.43	0.97 to 2.10	.067	…	…	…	…	…	…	…
Other														
Trazodone	27	10.4	47	6.6	1.64	0.93 to 2.92	.088	100	50–300	50	50–100	2.78	1.03 to 7.50	.044
Mirtazapine	7	3.2	7	1.0	3.29	0.91 to 12.24	.069	30	15–30	30	15–30	0.59	0.03 to 10.98	.689
Phenelzine	0	0.0	1	0.1	…[b]	…	…	…	…	30	…	…	…	…

[a]All percentages are weighted by the National Comorbidity Survey Replication sampling weights.
[b]Regression analysis could not be conducted, as 1 group did not have any variability in outcome.
Abbreviations: NDRI = norepinephrine dopamine reuptake inhibitor, SNRI = serotonin-norepinephrine reuptake inhibitor, SSRI = selective serotonin reuptake inhibitor.
Symbol: … = no data.

Figure 1. Percentage of Participants in Each Dose Range for Sertraline, Paroxetine, Citalopram, and Trazodone Prescribed by Psychiatrists (PSY) and General Medical Providers (GEN)[a]



[a]Doses were compared with dose ranges recommended in the American Psychiatric Association's Practice Guideline for the Treatment of Patients With Major Depressive Disorder.[20]

Table 4. Bivariate Analyses of Medication Use Characteristics of National Comorbidity Survey Replication Participants Treated With Antidepressants Prescribed by Psychiatrists and by General Medical Providers[a]

	Prescribed by Psychiatrists (N = 255)		Prescribed by General Medical Providers (N = 673)		Bivariate Binary Logistic and Linear Regression Analyses for Comparison of Groups		
Characteristic	N	%	N	%	Odds Ratio	95% CI	p Value
Dose in relation to usual range							
At or above lower bound	210	83.9	501	74.9	1.00	Reference	…
Below lower bound	45	16.1	172	25.1	0.68	0.43 to 1.06	.085
Stopped medication before 30 days							
No	237	93.8	578	87.4	1.00	Reference	…
Yes	17	6.2	88	12.6	0.46	0.28 to 0.74	.002
Continued medication at least 90 days							
No	40	17.6	179	25.8	1.00	Reference	…
Yes	214	82.4	487	74.2	1.63	1.06 to 2.50	.027
Current status							
Still taking medication	177	68.6	450	68.0	1.00	Reference	…
Stopped medication	78	31.4	223	32.1	1.03	0.66 to 1.60	.895
	Mean	SE	Mean	SE	β[b]	SE	p Value
No. of days forgot to take medication in a typical month or took less	2.09	0.36	2.83	0.30	–0.74	0.47	.122
No. of days taking medication in the past 30 days among those who still take medication	28.06	0.42	25.88	0.49	2.18	0.59	.001
Perceived effectiveness of medication[c]	2.41	0.06	2.36	0.03	0.05	0.06	.459

[a]All percentages are weighted by the National Comorbidity Replication sampling weights.
[b]Unstandardized regression coefficient obtained in linear regression.
[c]Scores range from 0 (not at all effective) to 3 (very effective).
Symbol: … = no data.

take the medication or took a smaller dose in a typical month, and perceived effectiveness of antidepressants were not statistically significant (Table 4). Participants treated by psychiatrists were more likely to receive medications at or above minimum recommended antidepressant doses (aggregated across all medication types), although this difference was only at a trend level ($p = .085$) and did not reach a statistically significant level. However, differences across groups with regard to continuity of treatment and adherence did reach a statistically significant level. Participants treated with antidepressants by psychiatrists were less likely to stop the medication before 30 days and more likely to continue taking the antidepressant for 90 days or longer. Among participants who continued taking the medication, those treated by psychiatrists reported skipping fewer doses in the past 30 days (Table 4).

The significant group differences in continuity of antidepressant treatment persisted in multivariate analyses adjusting for all sociodemographic and clinical variables found to be different across groups at a $p < .25$ level (Table 5). Participants treated by psychiatrists were significantly less likely to discontinue antidepressant treatment before 30 days and more likely to continue

Table 5. Multivariate Analyses of Medication Use Characteristics of National Comorbidity Survey Replication Participants Treated With Antidepressants Prescribed by Psychiatrists and by General Medical Providers[a]

	Stopped Medication Before 30 Days			Continued Medication at Least 90 Days		
Characteristic	Adjusted Odds Ratio	95% CI	p Value	Adjusted Odds Ratio	95% CI	p Value
Prescribed by						
General medical provider	Reference	…	…	Reference	…	…
Psychiatrist	0.36	0.18 to 0.69	.003	1.91	1.10 to 3.31	.022
Age, y						
18–24	Reference	…	…	Reference	…	…
25–34	1.31	0.41 to 4.16	.640	1.51	0.71 to 3.20	.279
35–44	0.63	0.19 to 2.12	.443	2.51	1.27 to 4.98	.010
45–54	0.54	0.18 to 1.59	.256	1.99	0.91 to 4.34	.082
55–64	0.36	0.10 to 1.27	.109	3.37	1.77 to 6.41	< .001
≥ 65	0.46	0.11 to 1.94	.285	4.23	1.80 to 9.98	.001
Gender						
Female	Reference	…	…	Reference	…	…
Male	1.46	0.88 to 2.40	.139	0.62	0.43 to 0.92	.017
Race/ethnicity						
Non-Hispanic white	Reference	…	…	Reference	…	…
Hispanic	1.87	0.77 to 4.54	.163	0.56	0.26 to 1.19	.130
Non-Hispanic black	2.28	0.86 to 6.00	.094	0.32	0.15 to 0.66	.003
Other	2.40	0.79 to 7.28	.121	0.60	0.21 to 1.74	.335
Marital status						
Married/living as married	Reference	…	…	Reference	…	…
Divorced/separated/widowed	1.00	0.51 to 1.95	.998	0.98	0.58 to 1.67	.949
Never married	1.30	0.62 to 2.73	.477	0.80	0.45 to 1.40	.418
Urbanicity						
Metropolitan	Reference	…	…	Reference	…	…
Other urban	0.40	0.20 to 0.80	.011	1.29	0.78 to 2.15	.314
Nonurban	0.52	0.31 to 0.88	.016	1.49	0.91 to 2.42	.110
Psychiatric diagnoses						
Major depression	1.17	0.61 to 2.24	.635	1.01	0.62 to 1.65	.967
Dysthymia	0.53	0.17 to 1.69	.278	1.42	0.73 to 2.77	.299
Bipolar disorder	0.77	0.25 to 2.38	.639	1.57	0.63 to 3.92	.330
Panic disorder	1.24	0.61 to 2.52	.545	1.00	0.63 to 1.59	.999
Social phobia	0.66	0.32 to 1.37	.257	0.99	0.63 to 1.57	.973
Posttraumatic stress disorder	1.62	0.88 to 2.97	.118	0.82	0.52 to 1.31	.407
Psychological distress (K6 score)						
0–12	Reference	…	…	Reference	…	…
13–24	1.81	0.99 to 3.32	.055	0.73	0.45 to 1.18	.194
Presenting problems						
Sadness/depression/crying	0.65	0.40 to 1.06	.085	1.60	1.05 to 2.44	.031
Manic mood	0.28	0.06 to 1.28	.098	3.48	1.02 to 11.94	.047
Anger or irritability	2.01	0.72 to 5.64	.177	0.50	0.23 to 1.07	.073
Panic	0.58	0.21 to 1.56	.268	1.84	0.95 to 3.57	.069
Suicidal thoughts	1.77	0.37 to 8.61	.469	1.64	0.34 to 7.95	.531
Little or no sexual functioning	…[b]	…	…	0.81	0.18 to 3.68	.775
Physical pain	2.36	0.95 to 5.85	.063	0.51	0.21 to 1.22	.125
Poor concentration	0.84	0.21 to 3.34	.798	0.73	0.31 to 1.73	.466
Poor memory	0.41	0.07 to 2.55	.329	1.06	0.31 to 3.66	.921
Medication type						
Paroxetine	0.77	0.33 to 1.81	.540	1.44	0.76 to 2.73	.257
Fluoxetine	0.52	0.20 to 1.35	.177	0.76	0.43 to 1.33	.326
Citalopram	0.99	0.49 to 2.02	.985	0.48	0.21 to 1.10	.080
Fluvoxamine	…[b]	…	…	…[b]	…	…
Amitriptyline	0.57	0.17 to 1.86	.342	1.08	0.58 to 1.99	.812
Doxepin	2.44	0.77 to 7.79	.127	0.88	0.33 to 2.39	.799
Nortriptyline	…[b]	…	…	1.67	0.17 to 16.76	.657
Bupropion	0.78	0.37 to 1.66	.510	0.71	0.39 to 1.28	.248
Trazodone	1.29	0.49 to 3.41	.605	0.81	0.39 to 1.71	.579
Mirtazapine	…[b]	…	…	1.65	0.13 to 20.61	.692

[a]All analyses are weighted by the part 2 sample weights.
[b]Variable was excluded from the regression model because it predicted outcome perfectly.
Symbol: … = no data.

antidepressant treatment for 90 days or longer (Table 5). The analysis for the number of days taking the medication in the past 30 days among participants who continued treatment showed a trend level difference in the multivariate model (unstandardized regression coefficient = 1.65, SE = 0.87, t = 1.90, df = 42, p = .064).

DISCUSSION

The findings of this study should be interpreted in the context of several limitations. First, information on medication use was based on self-report supplemented with information from medication bottle labels. Physician or pharmacy records were not available. However, past research indicates that depressed patients provide accurate reports of their history of antidepressant medication trials and duration of such trials, especially more recent trials.[24] Second, the NCS-R data do not distinguish new episodes of medication treatment from episodes that started more than 1 year ago. This limitation may explain the discrepancy in results between this report and an earlier report that found that 42.4% of patients who initiate antidepressants discontinue the medications within 30 days and only 27.6% continue beyond 90 days.[21] Furthermore, it is conceivable that short-time users of antidepressants who are overrepresented in the group of participants treated by general medical providers may have different reasons for stopping antidepressants from the long-term users. Thus, combining the short-term and long-term users might have blurred significant differences between these groups with regard to correlates of stopping medications. Third, the survey asked about the health care professional who prescribed the antidepressant medication in the past year. Some participants might have been started on a medication by a psychiatrist and then continued receiving their prescriptions from a primary care provider or vice versa. Fourth, the cross-sectional nature of the data limits causal inferences. For example, participants' knowledge about insurance plan requirements for preauthorization to access a psychiatrist may be the result of having sought such care rather than a determinant of choice between provider types. Individuals who prefer to receive mental health care from psychiatrists may choose plans with freer access to specialists. Fifth, we examined the prevalence of lifetime DSM-IV diagnoses, as some of the patients who have been receiving medications for a year or longer for maintenance treatment of these disorders might not have experienced significant symptoms meeting diagnostic criteria in the past year. However, the results for 12-month diagnoses were consistent with the results for lifetime diagnoses. Overall, 60.6% of participants treated by psychiatrists compared with 42.5% of those treated by general medical providers met the 12-month diagnoses of mood and anxiety disorders included in this study (OR = 2.08, 95% CI = 1.54 to 2.80, p < .001). Finally, the study was naturalistic in design, and although multivariate analyses adjusted for several measured differences across the study groups, unmeasured group differences may explain the differences in choice of providers and continuation of medication treatment. In particular, potentially important predictors of choice of provider and continuity of medication treatment such as participants' motivation to seek mental health treatment and their attitudes toward psychiatric medications[16] were not assessed in the NCS-R.

Nevertheless, NCS-R data are unique in that they provide relatively recent and detailed information about the use of prescription medications from a representative population sample along with DSM-IV diagnoses based on structured interviews. These strengths make the NCS-R data especially suitable for analyses of recent patterns of antidepressant medication treatment in the U.S. general population.

Three important findings emerge from the current analyses. First, antidepressants are commonly prescribed to adults in the United States. During the course of 1 year, 1 in 10 adults report receiving treatment with an antidepressant medication. Second, adults treated with antidepressants by psychiatrists are significantly more likely than those treated by general medical providers to suffer from common DSM-IV mood and anxiety disorders, to present with significant mood and anxiety symptoms, and to report psychological distress. Third, adults treated by psychiatrists are more likely than those treated by general medical providers to continue antidepressant treatment for at least 1 month and less likely to discontinue within 3 months, even after adjusting for differences in diagnoses, presenting problems, and distress.

The rate of antidepressant treatment in the United States[1] and in other industrialized countries[11,25–27] has grown markedly over the past 2 decades. This trend paralleled introduction of newer antidepressant medications with fewer side effects as well as expansion of the indications for antidepressant treatment. In the United States, this trend also coincided with increased demand for and use of mental health services overall,[28] changes in the structure and financing of mental health care,[5] and increased visibility of antidepressant medications in popular media,[6] as well as the growth of direct to consumer advertising of pharmaceuticals.[3] These trends have given rise to concerns about the possible overuse of antidepressants, especially in the general medical sector.[29,30]

Compared with participants treated by general medical providers, those who were treated with antidepressants by psychiatrists were more likely to meet the criteria for common DSM-IV mood and anxiety disorders except for dysthymia and generalized anxiety disorder. They were also more likely to score in the significantly distressed range on the K6. These epidemiologic results are consistent with past clinical research documenting greater severity

of mental health conditions among individuals who seek treatment in the mental health specialty sector compared with the general medical sector[15,31] and are consistent with the greater specialized training of psychiatrists. A tendency for general medical providers to refer more severely ill adults to psychiatrists and self-selection of individuals with more severe symptoms into the mental health specialty sector may further contribute to this pattern of illness severity.

The differences across groups with regard to presenting problems corroborate differences in diagnoses, as participants treated by psychiatrists reported complaints that were more consistent with severe mood and anxiety disorders. However, in contrast to past research in clinical samples,[32,33] in this community sample, individuals treated with antidepressants by general medical providers were not more likely than those treated by psychiatrists to present with physical complaints such as low energy, poor appetite, or pain.

In line with previous studies,[31,34–36] adults treated by psychiatrists tended to continue treatment for a longer time period. This difference in antidepressant treatment continuity may be attributable to greater skill of psychiatrists in engaging patients in antidepressant treatment[37] or to differences between individuals treated by psychiatrists and general medical providers. Although persistence of depressive symptoms and distress appear to motivate patients to continue treatment,[21,38] the associations between distress and antidepressant treatment continuity may be quite complex. In our analyses, elevation of a nonspecific psychological distress screen (K6) was weakly associated with early antidepressant discontinuation. However, as the time frame for the K6 rating was not ascertained in relation to antidepressant use, it is not possible to distinguish patients who experienced an increase in distress soon after stopping antidepressant medications from those who had elevated distress before initiating the medication. Furthermore, the K6 was developed to correlate with a wide range of mental disorders,[19] some of which, such as nonaffective psychosis and bipolar disorder, may not respond favorably to antidepressant medication treatment.

Some past reports have noted that psychiatrists tend to use antidepressants at higher doses than general medical providers.[10,11] This practice has been attributed to a reluctance of general medical providers to use the full recommended doses of the older tricyclic antidepressants borne of a concern over their side effects.[39] In an era dominated by newer antidepressants, we found that psychiatrists continue to be more likely than general medical providers to prescribe antidepressants and, more specifically, SSRIs at a higher dose and to reach the maximum recommended dose. There was little evidence that the 2 groups differed with respect to selection of specific antidepressants, although general medical providers were significantly more likely to prescribe amitriptyline, which is more commonly used than other antidepressants for the treatment of chronic pain.[40]

The high percentage of participants receiving lower than the recommended antidepressant dose of trazodone and the differences across psychiatrists and general medical providers may be due to prescribing this medication at lower doses as a sleep aid.[41] Doses as low as 5 to 20 mg of trazodone have been shown to effectively improve sleep.[41]

In line with our findings, past research[15,31,42] has shown that older adults and women are less likely to receive antidepressants from psychiatrists and more likely to receive them from general medical providers. This might be due to greater access of women and older adults to a regular primary care provider or to these providers' greater willingness to prescribe antidepressants to these groups rather than to refer them to psychiatrists.

In our analysis, health insurance, income, and education—factors traditionally associated with access to specialty mental health care—did not influence the choice between psychiatrists and general medical providers. Furthermore, among participants with insurance, the requirement for preauthorization to seek specialist care was not associated with greater reliance on general medical providers for antidepressant medication treatment.

A puzzling finding in the multivariate analyses reported in Table 5 was the association of nonmetropolitan residence with lower likelihood of stopping medication before 30 days. The basis of the association remains unclear. However, nonmetropolitan areas are characterized by relatively few per capita mental health service providers[43] and lower rates of mental health treatment for depression.[44] It is possible that the greater ease of access to mental health services in metropolitan as compared with nonmetropolitan areas contributes to antidepressant initiation among adults with less motivation to continue treatment. Further research on this important topic is clearly needed with stronger measures of geographic access and motivation for antidepressant treatment.

CONCLUSION

By the early 2000s, 1 of 10 American adults was treated with an antidepressant during the course of a year, and most of the antidepressant treatment was provided within the general medical sector.[2,42] As compared with antidepressant treatment provided by psychiatrists, the treatment provided by general medical professionals was less targeted, with a smaller proportion of the treated individuals meeting criteria for common antidepressant indications. Furthermore, the adults treated by general medical providers were typically treated with lower doses of antidepressants and more prone than their counterparts treated by psychiatrists to report early antidepressant

discontinuation. Amid public concern regarding overuse of antidepressants, these differences support calls for vigorous renewed efforts to improve patient selection and enhance antidepressant treatment continuity in general medical care.

Drug names: bupropion (Wellbutrin and others), citalopram (Celexa and others), clomipramine (Anafranil and others), desipramine (Norpramin and others), doxepin (Sinequan, Zonalon, and others), fluoxetine (Prozac and others), fluvoxamine (Luvox), imipramine (Tofranil and others), mirtazapine (Remeron and others), nortriptyline (Pamelor, Aventyl, and others), paroxetine (Paxil, Pexeva, and others), phenelzine (Nardil), protriptyline (Vivactil), sertraline (Zoloft and others), venlafaxine (Effexor and others).

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