A Gender-Focused Perspective on Health Service Utilization in Comorbid Bipolar I Disorder and Alcohol Use Disorders: Results From the National Epidemiologic Survey on Alcohol and Related Conditions

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Objectives: This study compares health service utilization by individuals with comorbid lifetime bipolar I disorder and lifetime alcohol use disorders (AUD) to that of individuals with either diagnosis alone, using nationally representative data.

Method: The 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions was used to identify respondents with bipolar I disorder only (BD-only; N = 636), AUD only (N = 11,068), and comorbid bipolar I disorder and AUD (BD-AUD; N = 775). Diagnoses were generated using the National Institute on Alcohol Abuse and Alcoholism Alcohol Use Disorder and Associated Disabilities Interview Schedule–DSM-IV Version. The 3 groups were compared with respect to self-reported health service utilization.

Results: For both men and women, respondents in the BD-AUD group were significantly more likely than AUD-only respondents to report any alcohol-related service utilization ($p < .001$). BD-AUD respondents were significantly more likely to report bipolar disorder–related hospital admissions as compared with BD-only respondents among males only ($p = .009$). Within the BD-AUD group, males reported significantly greater utilization of AUD treatment only ($p < .001$), and females reported significantly greater utilization of bipolar disorder treatment only ($p < .001$) and significantly greater likelihood of utilizing mental health services overall ($p < .001$). There was no gender difference in the proportion of respondents who utilized both AUD and bipolar disorder services.

Conclusions: As expected, individuals with comorbid bipolar I disorder and AUD utilize significantly more mental health services than individuals with either disorder alone. The primary original finding is that among those with comorbid bipolar I disorder and AUD, bipolar I disorder is more likely to go untreated among males and AUD is more likely to go untreated among females. Gender may be an important factor to consider in future health service planning for comorbid bipolar I disorder and AUD.

(J Clin Psychiatry 2006;67:925–932)

Received Aug. 22, 2005; accepted Nov. 14, 2005. From the Mood Disorders Program, Department of Psychiatry, Sunnybrook and Women's College Health Sciences Centre, University of Toronto, Toronto, Ontario, Canada.

The NESARC is supported by the National Institute on Alcohol Abuse and Alcoholism, Bethesda, Md., with supplemental support from the National Institute on Drug Abuse, Bethesda, Md.

Dr. Levitt has received research support from Janssen Ortho and Lundbeck and has served as a consultant for Janssen Ortho, Eli Lilly, Organon, Lundbeck, and Wyeth. Dr. Goldstein has no potential conflicts of interest to disclose.

The views and opinions expressed in this article are those of the authors and should not be construed to represent the views of the sponsoring organizations.

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The results of 3 independent epidemiologic community studies confirm that the prevalence of comorbid alcohol use disorders (AUD) among individuals with bipolar disorder is greater than that of any other drug use disorders and that alcohol is more strongly associated with bipolar disorder than with any other mood or anxiety disorder.[1–3] Data from clinical samples confirm that alcohol is the most commonly abused drug among individuals with bipolar disorder.[4] The deleterious effect of AUD on the course, treatment, and outcome of bipolar disorder has been shown repeatedly.[5–7] When AUD occur in bipolar disorder, recovery is delayed, relapse is hastened, symptoms are greater in number and persist between episodes, and disability and mortality are increased.[5]

Previous studies have shown that when substance use disorders (SUD), particularly AUD, co-occur with other psychiatric illnesses, they are associated with significantly increased health service utilization and costs.[8–12] In addition, individuals with bipolar disorder specifically are known to have high service utilization and costs.[13,14] Bryant-Comstock and colleagues[13] reported findings from a privately insured sample (N = 2883) showing that individuals with bipolar I disorder accounted for 3 to 4 times greater health service costs and utilization as compared to age- and sex-matched controls. Even when compared to patients with other psychiatric and medical disorders,

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individuals with bipolar disorder demonstrate markedly elevated health service utilization and costs. Simon and Unutzer[14] compared individuals with bipolar spectrum disorders (bipolar I disorder, bipolar II disorder, cyclothymia, and schizoaffective disorder) to patients receiving treatment for unipolar depression, patients receiving treatment for diabetes, and general medical outpatients. Costs of treatment in the bipolar disorder group exceeded those of each of the other groups. Importantly, 45% of total costs in the bipolar disorder group was accounted for by specialty mental health and substance services, as compared to 10% in the unipolar depression group.[14]

Despite the growing literature regarding health service utilization among individuals with comorbid psychiatric and substance use disorders, and regarding utilization by individuals with bipolar disorder in general, few studies have specifically examined health service utilization among individuals with comorbid bipolar disorder and AUD. Unfortunately, these few studies report conflicting results. Results from the first 500 patients recruited to the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD) study show that 54% of subjects had received some form of psychosocial intervention within 3 months prior to entry into the study and that subjects with comorbid substance use disorders were 3 times more likely to report such treatment.[15] In a study of 392 bipolar disorder patients hospitalized for manic or mixed episodes, subjects with comorbid lifetime substance abuse reported significantly more psychiatric hospitalizations.[5] In contrast, Bauer and colleagues[16] followed 103 bipolar disorder subjects from a Veterans Affairs (VA) treatment program prospectively for 1 year and found that alcohol or drug dependence was not associated with mental health service utilization, despite the fact that there is relatively easy access to treatment in the VA system.[17] Similarly, Verduin and colleagues[18] reported findings that among subjects (N = 106) with a history of a psychiatric admission, those with comorbid bipolar disorder and SUD had fewer outpatient visits and shorter hospitalizations than those with bipolar disorder alone and were less likely to be referred for treatment of their substance abuse than subjects with SUD alone.

Most individuals with bipolar disorder do not attend specialty clinics and have not had psychiatric admissions.[19] A large-scale population study of this topic is needed to mitigate the known selection biases of clinical or treatment samples and to yield results that can be generalized to individuals with bipolar disorder in the community. Disagreement regarding the relative utilization of mental health services by individuals with comorbid bipolar disorder and AUD in the extant literature is problematic as it may hinder policy planning and advocacy for appropriate service funding. Therefore, an epidemiologic study would provide information with potential for use in planning future services. The a priori hypothesis of this study was that, in a community sample, individuals with comorbid bipolar I disorder and AUD would report greater bipolar disorder–related service utilization than individuals with bipolar I disorder alone, as well as greater alcohol-related service utilization than individuals with AUD alone.

METHOD

Subjects

Subjects were identified from among the respondents of the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Respondents with a lifetime history of bipolar I disorder only (N = 636), AUD only (N = 11,068), and comorbid bipolar I disorder and AUD (N = 775) were compared on several demographic, clinical, and service utilization–related variables. The NESARC is a representative sample of the United States conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). A detailed description of the NESARC has been published elsewhere.[3] Briefly, 43,093 noninstitutionalized civilian respondents, 18 years and older, completed face-to-face computer-assisted personal interviews. The overall survey response rate was 81%.

Assessment

Approximately 1800 lay interviewers with an average of 5 years' related experience administered the NESARC using laptop computer–assisted software. Interviewers completed 10 days of centralized, standardized training sessions.

The NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule–DSM-IV Version (AUDADIS-IV)[20] was used to generate the diagnoses presented in this report. The AUDADIS-IV diagnoses of personality disorders, substance use disorders,[19] and mood and anxiety disorders[3,21] have demonstrated reliability and validity. Reliability of the bipolar I disorder diagnosis (κ = 0.59) is fair,[21] while the reliability for lifetime AUD (κ = 0.70) is good.[22]

The AUDADIS-IV explicitly addresses the temporal contiguity of manic episodes with substance use, when present. Bipolar I disorder was classified as independent of substance use in the following circumstances: (1) the respondent abstained from alcohol and drug use in the 12 months preceding the assessment, (2) the episode(s) did not occur in the context of alcohol or drug intoxication or withdrawal, (3) the episode(s) occurred before alcohol or drug intoxication or withdrawal, or (4) the episode(s) began after alcohol or drug intoxication or withdrawal, but persisted for more than 1 month after the cessation of alcohol or drug intoxication or withdrawal. Only cases in which mania occurred independently of substance use were included in the bipolar I group analyses.

Table 1. Demographic and Clinical Characteristics of Males With Bipolar I Disorder (BD-only), Alcohol Use Disorders (AUD-only), and Comorbid Bipolar I Disorder and AUD (BD-AUD)

Characteristic	BD-Only (N = 166)	AUD-Only (N = 7066)	BD-AUD (N = 413)	Statistics		
				Test Result	df	p
Demographic						
Age, mean (SD), y	38.3 (16.7)	44.8 (15.6)[a]	38.2 (14.8)[b]	F = 48.1	2	< .001
Annual income, mean (SD)[c]	23.5 (27.3)	41.2 (65.1)[a]	25.5 (25.2)[b]	F = 17.9	2	< .001
Married/cohabiting, N (%)	67 (40)	3988 (56)[a]	175 (42)[b]	χ^2 = 46.6	2	< .001
Caucasian, N (%)	127 (77)	5895 (56)[a]	342 (83)	χ^2 = 5.6	2	< .06
Clinical, mean (SD), y						
Age at onset of mania	24.4 (12.6)	…	24.2 (11.5)	T = 0.2		.84
Age first sought mania treatment	28.6 (12.7)	…	29.2 (12.6)	T = 0.3		.77
Latency of mania treatment	3.9 (7.4)	…	4.7 (8.0)	T = 0.6		.57
Age at onset of AUD	…	22.6 (8.0)	21.0 (6.9)	T = 4.1		< .001
Age first sought AUD treatment	…	32.2 (11.3)	27.9 (11.1)	T = 4.1		< .001
Latency of AUD treatment	…	7.8 (9.4)	6.6 (9.1)	T = 1.3		.20

[a]p < .05 vs. BD-only.
[b]p < .05 vs. AUD-only.
[c]Expressed in thousands of U.S. dollars.

Age at onset of bipolar I disorder and AUD, age at first treatment of bipolar I disorder and AUD, types of treatment, and demographic variables were all determined by self-report data from the AUDADIS-IV. The AUDADIS-IV does not address the duration, intensity, or referral source of services that respondents endorse having accessed.

Statistical Analysis

One-way analysis of variance or Student t test was used to compare differences between groups on dimensional measures, while cross-tabulations and odds ratios were calculated to detect differences on categorical measures. Groups were first compared with respect to any utilization of bipolar disorder or AUD services. If differences were significant, groups were then compared with respect to specific subtypes of utilization. If differences were nonsignificant, the significance of any further comparisons of specific subtypes of utilization was Bonferroni-corrected for multiple comparisons.

Analyses were conducted separately for males and females, as determined a priori, owing to the known contribution of gender to variability in the association between alcohol and bipolar disorder.[23–25] Gender comparisons of mental health service utilization were conducted only for the respondents with comorbid bipolar I disorder and AUD, as this was the group of primary interest in the present study. Due to the large differences in group sizes among males, 2-sided Fisher exact statistic was utilized for comparisons of categorical measures, and Levene's test for equality of variances was used for continuous measures.

Weighting procedures were not utilized because the present study addresses a very specific subgroup of the complete NESARC sample and is not intended to provide population estimates of any of the diagnoses described herein, as these have been previously reported.[3,21,26]

RESULTS

Descriptive Findings

Demographic and clinical characteristics. Demographic and clinical characteristics of male and female subjects are presented in Tables 1 and 2, respectively. There were significant between-group differences in age and marital status among both males and females and between-group differences in race among females. For both males and females, subjects with bipolar I disorder only (BD-only) reported similar latency of treatment for mania as compared to subjects with comorbid bipolar I disorder and AUD (BD-AUD). Similarly, AUD-only subjects reported similar latency of treatment for AUD as compared to BD-AUD subjects. Comparison of males versus females was only conducted for BD-AUD subjects, as reported later in this section.

Health service utilization. Results regarding health service utilization of males and females in each of the 3 groups are reported in Tables 3 and 4, respectively. Utilization of any mental health service for bipolar disorder was not significantly different between BD-AUD males and BD-only males ($\chi^2 = 1.0$, df = 1, p = .35); however, BD-AUD males were significantly more likely than BD-only males to report being admitted to hospital ($\chi^2 = 6.8$, df = 1, p = .009), and there was a statistical trend for bipolar disorder–related emergency department visits ($\chi^2 = 3.9$, df = 1, p = .059). After correction for multiple comparisons, the difference between BD-AUD and BD-only males in emergency department visits did not approach significance ($0.059 \times 4 = 0.236$), and this was not further explored in multivariate analyses. The proportion of males in each group who reported visiting an individual professional or being prescribed a medication for bipolar I disorder was not significantly different.

The difference in overall bipolar disorder–related utilization between BD-AUD females and BD-only females

Table 2. Demographic and Clinical Characteristics of Females With Bipolar I Disorder (BD-only), Alcohol Use Disorders (AUD-only), and Comorbid Bipolar I Disorder and AUD (BD-AUD)

Characteristic	BD-Only (N = 470)	AUD-Only (N = 4002)	BD-AUD (N = 362)	Statistics		
				Test Result	df	p
Demographic						
Age, mean (SD), y	41.1 (15.7)	40.9 (13.9)	37.3 (12.7)[a,b]	F = 11.1	2	< .001
Annual income, mean (SD)[c]	14.8 (17.1)	27.1 (43.0)[a]	16.6 (17.0)[b]	F = 29.0	2	< .001
Married/cohabiting, N (%)	209 (45)	1896 (47)[a]	140 (39)[b]	χ^2 = 10.9	2	.004
Caucasian, N (%)	325 (69)	3379 (84)[a]	286 (79)[a,b]	χ^2 = 71.6	2	< .001
Clinical, mean (SD), y						
Age at onset of mania	28.4 (13.8)	…	25.2 (11.6)	T = 3.5		< .001
Age first sought mania treatment	33.1 (13.8)	…	30.0 (11.4)	T = 2.3		.02
Latency of mania treatment	3.2 (8.1)	…	3.7 (7.2)	T = 0.6		.56
Age at onset of AUD	…	22.7 (7.9)	21.7 (7.7)	T = 4.0		< .001
Age first sought AUD treatment	…	30.0 (11.3)	28.0 (10.5)	T = 4.5		< .001
Latency of AUD treatment	…	6.0 (7.6)	5.6 (7.9)	T = 0.5		.61

[a]p < .05 vs. BD-only.
[b]p < .05 vs. AUD-only.
[c]Expressed in thousands of U.S. dollars.

Table 3. Health Service Utilization of Males With Bipolar I Disorder (BD-only), Alcohol Use Disorders (AUD-only), and Comorbid Bipolar I Disorder and AUD (BD-AUD)

Type of Service Utilization	BD-Only (N = 166)	AUD-Only (N = 7066)	BD-AUD (N = 413)	Statistics			
				Test Result	df	p	OR (95% CI)
Bipolar service utilization, N (%)							
Any utilization[a]	62 (37)	…	173 (42)	χ^2 = 1.0	1	.35	
Visited individual professional	58 (35)	…	166 (40)	χ^2 = 1.4	1	.26	
Overnight stay in hospital	17 (10)	…	79 (19)	χ^2 = 6.8	1	.009	2.13 (1.22 to 3.74)
Visited emergency department	15 (9)	…	63 (15)	χ^2 = 3.9	1	.059	1.87 (1.02 to 3.38)
Doctor prescribed medication	48 (29)	…	134 (32)	χ^2 = 0.7	1	.43	
Alcohol service utilization, N (%)							
Any utilization[b]	…	1153 (16)	138 (33)	χ^2 = 79.9	1	< .001	2.57 (2.08 to 3.19)
Thought of treatment but did not seek	…	571 (8)	110 (27)	χ^2 = 159.8	1	< .001	4.16 (3.29 to 5.26)
Attended 12-step program	…	876 (12)	106 (26)	χ^2 = 60.0	1	< .001	2.46 (1.95 to 3.10)
Family or social services	…	239 (3)	34 (8)	χ^2 = 26.1	1	< .001	2.58 (1.77 to 3.74)
Detoxification program	…	374 (5)	63 (15)	χ^2 = 70.4	1	< .001	3.24 (2.43 to 4.32)
Psychiatric admission	…	239 (3)	60 (15)	χ^2 = 126.3	1	< .001	4.88 (3.61 to 6.61)
Outpatient/day hospital program	…	310 (4)	59 (14)	χ^2 = 81.5	1	< .001	3.65 (2.71 to 4.92)
Alcohol rehabilitation	…	528 (8)	77 (19)	χ^2 = 65.5	1	< .001	2.85 (2.19 to 3.71)
Visited emergency department	…	282 (4)	54 (13)	χ^2 = 75.0	1	< .001	3.64 (2.67 to 4.96)
Visited individual professional	…	362 (5)	81 (20)	χ^2 = 147.0	1	< .001	4.55 (3.49 to 5.93)
All-cause hospital utilization, mean (SD)[c]							
12-month hospital days	1.0 (4.0)	0.6 (4.0)	1.5 (5.9)[d]	F = 12.0	2,7429	< .001	
12-month emergency department visits	0.5 (1.5)	0.4 (1.6)	0.7 (1.4)[d]	F = 7.7	2,7434	< .001	

[a]Respondent endorsed utilizing 1 or more BD-related services during a mood episode.
[b]Respondent endorsed utilizing 1 or more alcohol-related services.
[c]Including all medical, psychiatric, and substance-related causes.
[d]p < .05 vs. AUD-only.

did not reach statistical significance (χ^2 = 3.3, df = 1, p = .07). Compared to BD-only females, BD-AUD females were significantly more likely to report having visited an individual professional (χ^2 = 3.9, df = 1, p = .047); however, this difference was no longer significant after correction for multiple comparisons (0.047 × 4 = 0.188), and this was not further explored in multivariate analyses.

BD-AUD respondents, both males and females, were significantly more likely than AUD-only respondents to report any overall alcohol-related service utilization (χ^2 = 79.9, df = 1, p < .001 for males; χ^2 = 54.4, df = 1, p < .001 for females). Both males and females in the BD-AUD group also reported significantly more utilization of each specific type of alcohol-related service as compared to respondents in the AUD-only group and were significantly more likely to report having thought of seeking treatment but not doing so.

There was a between-group difference among males in both 12-month hospital days (F = 12.0, df = 2,7429; p < .001) and 12-month emergency department visits (F = 7.7, df = 2,7434; p < .001). Post hoc tests showed that BD-AUD males reported significantly (p < .05) greater mean 12-month hospital days and 12-month emergency department visits as compared to AUD-only males. All-cause hospital utilization by males in the BD-only and AUD-only groups was not significantly different. There

Table 4. Health Service Utilization of Females With Bipolar I Disorder (BD-only), Alcohol Use Disorders (AUD-only), and Comorbid Bipolar I Disorder and AUD (BD-AUD)

Type of Service Utilization	BD-Only (N = 470)	AUD-Only (N = 4002)	BD-AUD (N = 362)	Statistics			
				Test Result	df	p	OR (95% CI)
Bipolar service utilization, N (%)							
Any utilization[a]	284 (60)	…	241 (67)	$\chi^2 = 3.3$	1	.07	
Visited individual professional	264 (56)	…	228 (63)	$\chi^2 = 3.9$	1	.047	1.33 (1.00 to 1.76)
Overnight stay in hospital	107 (23)	…	92 (25)	$\chi^2 = 0.8$	1	.38	
Visited emergency department	113 (24)	…	78 (22)	$\chi^2 = 0.7$	1	.40	
Doctor prescribed medication	238 (51)	…	197 (54)	$\chi^2 = 1.2$	1	.28	
Alcohol service utilization, N (%)							
Any utilization[b]	…	458 (11)	90 (25)	$\chi^2 = 54.4$	1	< .001	2.56 (1.98 to 3.31)
Thought of treatment but did not seek	…	298 (8)	74 (20)	$\chi^2 = 70.9$	1	< .001	3.40 (2.56 to 4.50)
Attended 12-step program	…	340 (9)	77 (21)	$\chi^2 = 62.7$	1	< .001	2.91 (2.21 to 3.83)
Family or social services	…	106 (3)	31 (9)	$\chi^2 = 38.2$	1	< .001	3.44 (2.27 to 5.22)
Detoxification program	…	149 (4)	45 (12)	$\chi^2 = 59.3$	1	< .001	3.67 (2.58 to 5.22)
Psychiatric admission	…	115 (3)	43 (12)	$\chi^2 = 77.1$	1	< .001	4.16 (3.15 to 6.59)
Outpatient/day hospital program	…	132 (3)	36 (10)	$\chi^2 = 19.3$	1	< .001	3.34 (2.27 to 4.91)
Alcohol rehabilitation	…	181 (5)	46 (13)	$\chi^2 = 45.1$	1	< .001	3.25 (2.31 to 4.59)
Visited emergency department	…	112 (3)	32 (9)	$\chi^2 = 38.0$	1	< .001	3.56 (2.37 to 5.36)
Visited individual professional	…	185 (5)	58 (16)	$\chi^2 = 82.0$	1	< .001	4.17 (3.04 to 5.74)
All-cause hospital utilization, mean (SD)[c]							
12-month hospital days	1.2 (4.3)	0.6 (3.7)[d]	1.3 (4.2)[e]	F = 8.1	2,7432	< .001	
12-month emergency department visits	1.0 (3.1)	0.4 (1.2)[d]	1.1 (5.4)[e]	F = 32.1	2,4733	< .001	

[a]Respondent endorsed utilizing 1 or more BD-related services during a mood episode.
[b]Respondent endorsed utilizing 1 or more alcohol-related services.
[c]Including all medical, psychiatric, and substance-related causes.
[d]$p < .05$ vs. BD-only.
[e]$p < .05$ vs. AUD-only.

Table 5. Gender Differences in Health Service Utilization Among Individuals With Comorbid Bipolar I Disorder and Alcohol Use Disorders

Type of Service Utilization	Males (N = 413), N (%)	Females (N = 362), N (%)	Statistics			
			χ^2	df	p	OR (95% CI)
Any alcohol or bipolar service utilization[a]	232 (56)	260 (72)	20.4	1	< .001	0.22 (0.17 to 0.29)
Any bipolar service utilization[b]	173 (42)	241 (67)	47.2	1	< .001	0.36 (0.27 to 0.49)
Any alcohol service utilization[c]	138 (33)	90 (25)	6.8	1	.009	1.52 (1.11 to 2.08)
Both alcohol and bipolar service utilization	79 (19)	71 (20)	0.0	1	.87	
Bipolar service utilization only[d]	94 (23)	170 (47)	50.3	1	< .001	0.33 (0.24 to 0.45)
Alcohol service utilization only[e]	59 (14)	19 (5)	17.4	1	< .001	3.00 (1.76 to 5.15)
Overnight stay in hospital for depression	56 (14)	74 (20)	6.5	1	.01	0.64 (0.46 to 0.89)
Visited emergency department for depression	82 (20)	101 (28)	6.9	1	.009	0.61 (0.42 to 0.89)
Overnight stay in hospital for mania	51 (12)	50 (14)	0.4	1	.55	
Visited emergency department for mania	41 (10)	36 (10)	0.0	1	.99	

[a]Respondent endorsed use of alcohol (AUD)- or bipolar (BD)-related service or both.
[b]Respondent endorsed use of BD-related service, with or without AUD-related service utilization.
[c]Respondent endorsed use of AUD-related service, with or without BD-related service utilization.
[d]Respondent endorsed use of BD-related service, but not AUD-related service.
[e]Respondent endorsed use of AUD-related service, but not BD-related service.

was a between-group difference among females in both 12-month hospital days ($F = 8.1$, $df = 2,4732$; $p < .001$) and 12-month emergency department visits ($F = 32.1$, $df = 2,4733$; $p < .001$). Post hoc tests showed that AUD-only females reported significantly ($p < .05$) fewer hospital days and emergency department visits than BD-only and BD-AUD females. All-cause hospital utilization by females in the BD-AUD and BD-only groups was not significantly different.

Gender comparison among BD-AUD respondents. Several differences emerged when BD-AUD males and BD-AUD females were compared (Table 5). Males were significantly less likely than females to access any alcohol- or bipolar disorder–related services ($\chi^2 = 20.4$, $df = 1$, $p < .001$). BD-AUD males were more likely than BD-AUD females to utilize AUD-related services only ($\chi^2 = 17.4$, $df = 1$, $p < .001$), while females were more likely to utilize bipolar disorder–related services only ($\chi^2 = 50.3$, $df = 1$, $p < .001$). There was no gender difference in the proportion of BD-AUD subjects who utilized both AUD- and bipolar disorder–related services ($\chi^2 = 0.0$, $df = 1$, $p < .87$). Exploratory analyses of gender differences in hospital-based service utilization were conducted separately for depression and mania in order to further examine the gender difference in overall hospital-based mental health service utilization.

Multivariate Analyses

Health service utilization. Analyses were conducted separately for men and women. Because of the between-group differences in demographic characteristics, the following continuous and dichotomous variables were included as covariates in multivariate analyses (MANCOVA): age, marital status (married/cohabiting vs. single/separated/widowed), race (white vs. nonwhite), and annual income. Due to the previous reports of increased prevalence among individuals with comorbid bipolar disorder and AUD, lifetime anxiety disorder[27,28] and personality disorder[29,30] were also included as covariates. Finally, because individuals with bipolar disorder have a propensity toward alcohol dependence as compared to alcohol abuse,[3] the type of alcohol use disorder (i.e., abuse vs. dependence) was included as a dichotomous covariate.

The association of comorbid AUD with bipolar disorder–related psychiatric admission among males with bipolar I disorder was not significant ($F = 2.1$, $df = 1,578$; $p = .14$). Comorbidity of bipolar I disorder and AUD was associated with significantly greater overall alcohol-related health service utilization as compared to AUD only among both males ($F = 19.1$, $df = 1,7418$; $p < .001$) and females ($F = 14.3$, $df = 1,4330$; $p < .001$). The mean number of all-cause 12-month hospital days was significantly greater in the BD-AUD group as compared to the AUD-only group among males ($F = 20.9$, $df = 2,7274$; $p < .001$) but not among females ($F = 1.5$, $df = 2,4275$; $p = .07$). The mean number of all-cause emergency department visits was significantly greater in the BD-AUD group as compared to the AUD-only group among both males ($F = 3.9$, $df = 2,7279$; $p = .048$) and females ($F = 19.6$, $df = 2,4275$; $p < .001$).

Gender comparison among BD-AUD respondents. Again, using MANCOVA, the results regarding gender differences in the BD-AUD group showed that gender (entered as a dichotomous variable) was significantly associated with differences in utilization of any mental health service ($F = 18.2$, $df = 1,767$; $p < .001$), any AUD-related services ($F = 8.5$, $df = 1,767$; $p = .004$), any bipolar disorder–related services ($F = 45.6$, $df = 1,767$; $p < .001$), AUD-related services only ($F = 16.5$, $df = 1,767$; $p < .001$), and bipolar disorder–related services only ($F = 50.8$, $df = 1,767$; $p < .001$). In contrast, MANCOVA demonstrated no significant gender difference in either emergency department visits for depression ($F = 0.6$, $df = 1,575$; $p = .45$) or hospitalizations for depression ($F = 0.0$, $df = 1,575$; $p = .85$).

DISCUSSION

The results of this study indicate that among men and women with AUD, those with bipolar I disorder are more likely to seek and access AUD-related health services as compared to those without bipolar I disorder. In contrast, among men and women with bipolar I disorder, AUD are not associated with significantly greater bipolar disorder–related health service utilization. Few previous studies have examined health service utilization in this population explicitly, and these studies have drawn upon clinical populations and reported conflicting results.[5,15,16,18] Most compelling, however, are the gender differences in health service utilization among individuals with comorbid bipolar I disorder and AUD. A significantly greater proportion of comorbid females utilized some form of bipolar disorder– or AUD-related service as compared to comorbid males. In addition, comorbid females were significantly more likely to utilize bipolar disorder services only (i.e., did not utilize any AUD-related services) as compared to males. Comorbid males, in contrast, were significantly more likely to utilize AUD services only (i.e., did not utilize any bipolar disorder–related services) as compared to females.

Previous studies suggest that alcohol consumption in bipolar disorder is associated with mania among males and depression among females.[23–25] Exploratory analyses confirmed that, among the comorbid group, females were significantly more likely to report depression-related admissions and emergency department visits. However, there were no significant gender differences in hospital-based service utilization for mania.

Another finding with potential clinical relevance relates to respondents who reported having contemplated seeking AUD-related treatment without doing so. Although financial constraints or lack of health insurance may prevent some of these individuals from seeking professional or hospital-based services, the ubiquity of free 12-step groups such as Alcoholics Anonymous suggests that money may not be the only barrier to AUD-related services. Fully 28% of BD-AUD males and 20% of BD-AUD females, as compared to 8% of AUD-only males and females, reported having contemplated seeking AUD treatment without doing so and can arguably be described as being in Prochaska's contemplative stage of change[30] with respect to their alcohol use. This may well be an area where clinicians can facilitate an individual's decision to take action in seeking treatment.

The overwhelming majority of individuals with AUD, regardless of bipolar I comorbidity, reported not utilizing any AUD-related health services. Similarly, regardless of AUD comorbidity, the majority of males with bipolar I disorder and a significant minority of females with bipolar I disorder reported not utilizing any bipolar disorder–related health services. Only one fifth of respondents with comorbid bipolar I disorder and AUD, both males and females, reported utilizing services for both conditions. Even among the high-needs comorbid BD-AUD group, almost half of males and one quarter of females did not utilize any bipolar disorder– or AUD-related services at all.

The data suggest that approximately 1 in 7 males with comorbid bipolar I disorder and AUD access the mental health care system through AUD-related services, and this may be a target area for screening and identifying unrecognized, and therefore untreated, bipolar I disorder among males. Similarly, almost 1 in 2 females with comorbid bipolar I disorder and AUD had received treatment for bipolar I disorder only. Therefore, even when females with the comorbid disorders succeed in accessing services for bipolar I disorder, AUD goes untreated. This is particularly unfortunate in light of recent evidence that women show relatively greater remission rates than men following substance abuse treatment programs.[31] These findings further verify the urgency of meeting the unmet needs of this population as identified in a recent call to action by the Depression and Bipolar Support Alliance.[32]

The question arises as to the reason for these gender differences in utilization. One possible explanation is referral bias. There is evidence that females who utilize psychiatric emergency services are more often referred by the emergency physician or another health care professional, whereas men are more often referred by police or self-refer.[33] Relying on self-referral by males is problematic, given the observations that self-perceived gender roles may in fact serve as a barrier to help seeking among men[34] and that men report lower perceived need for mental health care than women.[35]

There are several inherent limitations in the present study. The primary limitation of this study, as with any large-scale epidemiologic study, is its reliance on lay interviewer–administered structured interviews to determine diagnoses. In addition, the NESARC does not address potentially important aspects of health service utilization such as duration, frequency, and intensity, and this limits the precision with which between-group differences in utilization can be examined. It was not possible to corroborate self-reported health service utilization with clinical or administrative records. Therefore, it is possible that reporting bias, whether gender-related or diagnosis-related, may confound some of the present findings. Another potential limitation is that the presence or absence of AUD symptoms was not verified with collateral informants. However, this is not likely to assert a sizable effect given that collateral information has been shown to correlate highly with self-report among individuals with bipolar disorder and substance use disorders.[36] Finally, previous studies of health service utilization in comorbid bipolar disorder and AUD describe clinically ascertained samples[5,15–18]; therefore, the findings of the present study cannot be directly compared to those of previous studies.

Despite these limitations, the present study yields potentially important novel findings that are based on a representative sample of the United States. These findings have several implications. First, enhanced screening, identification, and treatment of AUD among individuals with bipolar disorder in the community are indicated. These efforts may then lead to a reduction in acute hospital-based health service utilization, which accounts for the majority of the increased treatment costs of individuals with bipolar disorder.[13] Second, individuals with comorbid bipolar I disorder and AUD are more likely to have considered seeking treatment without doing so than AUD-only individuals. This underscores the potential value of offering, suggesting, or referring these individuals for AUD treatment. Finally, this study demonstrates gender-specific opportunities for screening and identification of bipolar disorder–AUD comorbidity. In particular, clinicians should be aware of potential gender-related referral biases, as present findings suggest that females with comorbid bipolar I disorder and AUD underutilize AUD-related services and males with this comorbidity underutilize bipolar disorder–related services. Future studies are needed to further clarify the specific needs of men and women with bipolar disorder and AUD, to evaluate needs-matched interventions for these individuals, and to identify gender-specific barriers to mental health service access.

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