Racial Differences in Symptoms, Comorbidity, and Treatment for Major Depressive Disorder Among Black and White Adults

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Objective: Racial differences in the clinical nature of major depressive disorder (MDD) could contribute to treatment disparities, but national data with large samples are limited. Our objective was to examine black-white differences in clinical characteristics and treatment for MDD from one of the largest, national community samples of US adults.

Methods: Non-Hispanic black and white adults (n = 32752) from the 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions produced data on 1866 respondents who met criteria for MDD based on the *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Edition) in the preceding 12 months. Outcome measures were depressive symptoms, comorbid psychiatric and medical disorders, disability, and treatment.

Results: Blacks with MDD had significantly higher odds of initial insomnia, early-morning awakening, and restlessness than whites. Odds of hypertension (odds ratio [OR], 2.16; 95% confidence interval [CI], 1.48-3.14), obesity (OR, 1.98; 95% CI, 1.45-2.69), and liver disease (OR, 3.68; 95% CI, 1.20-11.30) were higher among blacks than whites. In unadjusted models, blacks had greater impairment than whites in social and physical functioning. However, adjusting for sociodemographic characteristics eliminated these differences. Blacks were less likely than whites to receive outpatient services (OR, 0.51; 95% CI, 0.36-0.72) and be prescribed medications for MDD, but were more likely to receive emergency room and inpatient treatment.

Conclusions: We found few racial differences in depressive symptoms, psychiatric comorbidity, and disability after adjusting for sociodemographic factors. Blacks' lower utilization of ambulatory treatment for MDD and greater medical comorbidity, emergency department use, and hospitalization suggests that management of MDD among blacks should be emphasized in primary care or other settings where treatment is more accessible.

Keywords: African Americans ■ depression ■ comorbidity ■ treatment

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INTRODUCTION

Major depressive disorder (MDD) is predicted to rank as the second largest contributor to the worldwide burden of disease by 2020, exceeded only by ischemic heart disease.[1] MDD is associated with significant comorbidity,[2,3] poor physical health and functioning,[4] and increased medical service utilization.[4,5] Despite important initiatives over the last decade to address racial disparities in depression management in the United States,[6-8] blacks with MDD are less likely to receive treatment compared to their white counterparts.[9-13] Racial variations in depressive symptomatology and comorbid disorders may contribute to lower rates of depression treatment among black adults.[14] However, information at the national level on racial differences in

the clinical characteristics, impairment, and treatment for MDD among black and white Americans is limited.[10]

Prior studies suggest that black and white adults differ in the presenting symptoms of MDD.[14-19] For example, there is evidence that blacks with MDD have more somatic symptoms, such as sleep disturbance, compared to whites with MDD.[14,20] A study of age- and gender-matched outpatients found that depressed black patients were more likely to have diurnal variation in comparison to depressed white patients.[21] Regardless of how subtle, these and other differences in symptom expression could affect clinicians' decisions to initiate depression treatment among blacks, subsequently contributing to racial treatment disparities.[17,22]

Racial differences in the number and type of comorbid disorders associated with MDD could also contribute to undertreatment among black adults.[23] Indeed, there is evidence that co-occurring psychiatric disorders vary across cultures.[24] Clinical studies suggest that blacks with depression have more comorbid psychiatric disorders than whites with depression.[16,19] Similarly, MDD is associated with an increased prevalence of comorbid medical diseases, such as arthritis and cardiovascular disease,[25] and many chronic medical conditions disproportionately affect black adults.[26] Comorbidity can negatively affect treatment compliance and outcome,[27] but there is evidence that comorbid illnesses are commonly underdiagnosed.[28,29] Therefore, identifying differences in the prevalence of comorbid disorders among black and white adults with MDD may provide information for clinician education to generate more focused interventions for MDD.

Clinical and population-based studies have examined functional impairment among blacks and whites with MDD. These studies suggested that blacks were more disabled in social[10,16] and physical functioning[16,19] compared to whites. However, none of the studies controlled for level of education, personal income, or other indicators of socioeconomic status. Given the association of lower socioeconomic status with many health-related impairments, and the generally lower socioeconomic status of black Americans,[30,31] adjustment of such analyses by socioeconomic status is crucial to accurately determine whether blacks are more disabled than whites with MDD.

Finally, regarding treatment, primary care settings currently provide the majority of depression care in the United States,[13,32,33] especially among black Americans[14,32,34] and adults with low income.[4] However, depressed blacks in primary care are less likely to be prescribed antidepressants or receive any treatment compared to depressed whites in primary care.[34,35] In general, previous studies show that treatment rates for MDD among blacks are between 33% and 50% of those among whites. [12,13,36,37] Examination of treatment patterns by race (both inpatient and outpatient) in a nationally representative sample is important to inform outreach strategies and avoid biases that may arise when the issues are examined within clinical samples.

Thus, the purpose of this study is to compare black and white adults with 12-month MDD on the following: (1) *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Revision) (*DSM-IV*) depressive symptoms,[38] (2) comorbid psychiatric disorders, (3) comorbid medical disorders, (4) disability, and (5) MDD treatment received. We used data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), one of the largest, nationally representative surveys conducted in the United States.[2,27] Given its large sample of black and white adults (N = 32 752) and use of a reliable, valid structured diagnostic interview, the NESARC allowed us to examine clinically relevant characteristics of MDD by race in greater detail than has been done previously.

METHODS

Sample

The sample was drawn from the 2001-2002 NESARC, a nationally representative face-to-face survey of US (including Hawaii and Alaska) civilian, nonnstitutionalized participants aged 18 years and older. Details of the sampling framework, informed consent, training, and quality control are described elsewhere.[39] The National Institute on Alcohol Abuse and Alcoholism (NIAAA) sponsored the study and supervised the fieldwork, which was conducted by the US Census Bureau. Full ethical review and approval for the research protocol was received from the US Census Bureau and US Office of Management and Budget.[40] Young adults aged 18 to 24 years and black populations were oversampled. The overall response rate[39] was 81%.

The NESARC sample included 24 507 non-Hispanic white and 8245 non-Hispanic black respondents. Sociodemographic characteristics of the black and white respondents in the NESARC have been described in detail previously.[40] The subsample for the present analysis consisted of the black (n = 387) and white (n = 1479) NESARC participants who met full diagnostic criteria for *DSM-IV* major depressive disorder in the 12 months prior to the interview.

Psychiatric Assessment: Alcohol Use Disorder and Associated Disabilities Interview Schedule—*Diagnostic and Statistical Manual of Mental Disorders* (Fourth Revision) Version

The Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS-IV) is a fully structured diagnostic interview specifically designed by the NIAAA to be administered by lay interviewers.[39] In the NESARC, the AUDADIS-IV took an average of 1 hour to administer. All psychiatric diagnoses are were made according to *DSM-IV* criteria.[38]

Major Depressive Disorder

A major depressive episode was diagnosed when at least 2 weeks of persistently depressed mood or anhedonia were present, with at least 5 of the 9 *DSM-IV* symptoms of major depression during the episode.[2,38] Social and/or occupational dysfunction must have also been present. Those respondents without a history of manic, mixed, or hypomanic episodes who had at least 1 major depressive episode in the year preceding the interview were classified with 12-month MDD. Diagnoses of MDD ruled out bereavement and were not due to a substance or general medical condition. AUDADIS-IV 12-month MDD diagnoses have good test-retest reliability ($\kappa = 0.59$-0.68) and have been validated by psychiatric diagnosis in Puerto Rico, demonstrating support for the instrument across racial groups.[2,40-42]

Comorbid Anxiety Disorders

The *DSM-IV* anxiety disorders assessed by the AUDADIS-IV were generalized anxiety disorder, panic disorder with and without agoraphobia, social phobia, and specific phobia. The test-retest reliability of 12-month anxiety disorders were fair to good, with $\kappa = 0.40$ for specific phobia to $\kappa = 0.52$ for panic disorder.[41] The anxiety disorders in this report exclude substance-induced disorders or those due to a general medical condition.[2] Due to low prevalence estimates of panic disorders, an aggregate category was created to include panic disorder with and without agoraphobia.

Comorbid Substance Use Disorders

The AUDADIS-IV assessed *DSM-IV* substance abuse and dependence for alcohol and 10 different classes of drugs, including sedatives, tranquilizers, opiates (other than heroin or methadone), stimulants, hallucinogens, cannabis, cocaine, inhalants/solvents, heroin, and other drugs. A diagnosis of alcohol dependence required respondents to meet at least 3 of the *DSM-IV* criteria for dependence during the last year, while a diagnosis of alcohol abuse required respondents to satisfy at least 1 of the 4 *DSM-IV* criteria for abuse in the 12-month period preceding the interview and not meet the criteria for dependence.[39] The same diagnostic criteria were applied for drug use disorders, except that drug dependence and abuse diagnoses were not mutually exclusive.

The reliability of AUDADIS-IV substance use disorder measures has been assessed in general population and clinical samples in the United States and internationally.[41,43-45] The test-retest reliability of diagnosing past-year substance use disorders in these samples was good to excellent, with $\kappa = 0.73$-0.75 for alcohol dependence or abuse diagnoses[41] and $\kappa = 0.79$ for drug use diagnoses.[2]

Comorbid Medical Disorders

The AUDADIS-IV assessed medical disorders by asking patients if they had specific medical conditions in the 12 months preceding the interview. Medical conditions assessed included high blood pressure/hypertension, arteriosclerosis, heart attack/myocardial infarction, angina pectoris/chest pain, tachycardia/rapid heart beat, other heart disease, gastritis, stomach ulcer, cirrhosis, other liver disease, obesity, and arthritis. For those respondents who answered affirmatively, they were then asked if a doctor or health professional confirmed that they had the condition. Only medical conditions reportedly confirmed by a doctor or other health professional were considered positive in this analysis. Due to low prevalence estimates of some disorders, aggregate categories were created for liver disease (cirrhosis and any other liver disease) and other heart disease (arteriosclerosis, heart attack, angina pectoris, tachycardia, and other heart disease).

To calculate the obesity indicator, respondents were asked their height in feet and inches and their weight in pounds. Body mass index (BMI) was calculated and a dichotomous variable was created whereby those respondents who had a BMI of at least 30 were categorized as obese, in accordance with accepted BMI standards.[46,47]

Disability

The Short Form 12, version 2 (SF-12v2) was used to assess disability. The SF-12v2 is an abbreviated version of the original 36-Item Short Form Health Survey long form that has been validated internationally.[48,49] We analyzed 5 SF-12v2 scales: general health, mental health, role emotional functioning, physical functioning, and social functioning. Each SF-12v2 norm-based disability score is a continuous variable with a range of 0 to 100, mean of 50, and standard deviation of ±10 in the general US population. Lower scores indicate greater impairment.[27,48]

Treatment for 12-Month Major Depressive Disorder

Respondents with 12-month MDD were asked if, during the previous year, they had ever: (1) visited a counselor, therapist, physician, psychologist, or other person to improve their mood; (2) were prescribed medications by a doctor to improve their mood; (3) visited an emergency department to get help for depression; or (4) were hospitalized at least 1 night for depression.[39,50] We analyzed each of these categories separately and then as an aggregate category to assess prevalence of any MDD treatment received.

Statistical Analysis

Cross-tabulations were used to calculate weighted prevalence estimates and standard errors for depressive symptoms, comorbid disorders, and treatment. Odds ratios (ORs) and 95% confidence intervals (CIs) comparing blacks to whites on all predictor variables were derived from weighted logistic regression models adjusting for sociodemographic factors, including age, gender,

marital status, education, and personal income. The model assessing MDD treatment was adjusted by the aforementioned sociodemographic factors and current health insurance status (present or absent).[40] White adults served as the reference group for all reported ORs.

To assess disability, mean scores on the SF-12v2 were calculated by race, and differences in means between blacks and whites were assessed with weighted linear regression. *P* values comparing blacks to whites were calculated in both crude analyses and analyses adjusted for sociodemographic factors ($p < .05$, 2 tailed, indicates statistical significance). All analyses were conducted with Software for Data Survey Analysis (SUDAAN) statistical programming software version 10.0 (Research Triangle Institute, Research Triangle Park, NC) to account for the complex sample design of the NESARC through Taylor series linearization.[51]

RESULTS

Symptoms of 12-Month Major Depressive Disorder

There were significant racial differences in each sleep disturbance item assessed (Table 1). Blacks were more likely than whites to report insomnia (OR, 1.58) and early morning awakening (OR, 1.41), but less likely than whites to report excess sleep (OR, 0.63). Blacks were more likely to report feeling restless (OR, 1.97) compared to whites. Blacks were less likely to report fatigue or loss of energy (OR, 0.58) and cognitive symptoms, including indecisiveness (OR, 0.70) and worthlessness (OR, 0.71). Odds of suicide attempts, suicidal ideation, or thinking about one's own death did not vary by race.

Table 1. *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Revision) Symptoms of 12-Month Major Depressive Disorder Among Black and White Adults Meeting Criteria for Major Depressive Disorder (N = 1866)[a]

	Blacks (n = 387)		Whites (n = 1479)		Blacks Compared to Whites[b]	
	%	(SE)	%	(SE)	OR[c]	(95% CI)
Mood symptoms						
Depressed mood (1781)	95.3	(1.3)	95.5	(0.6)	1.09	(0.54-2.21)
Anhedonia (1661)	85.3	(2.7)	88.9	(1.0)	0.73	(0.45-1.19)
Appetite/weight disturbance						
Appetite decreased (981)	55.3	(3.3)	50.2	(1.5)	1.18	(0.87-1.61)
Weight loss (755)	44.0	(3.7)	37.1	(1.4)	1.30	(0.94-1.81)
Appetite increased (607)	30.6	(3.3)	33.1	(1.3)	0.88	(0.62-1.24)
Weight gain (533)	24.3	(2.7)	28.3	(1.3)	0.81	(0.59-1.11)
Sleep disturbance						
Insomnia (1300)	75.9	(3.2)	66.8	(1.6)	**1.58**	**(1.07-2.33)**
Early-morning awakening (1034)	57.9	(3.3)	51.6	(1.6)	**1.41**	**(1.06-1.86)**
Hypersomnia (877)	39.8	(3.1)	48.9	(1.6)	**0.63**	**(0.47-0.84)**
Psychomotor disturbance						
Agitation (684)	40.7	(3.0)	34.9	(1.6)	1.19	(0.89-1.59)
Restlessness (925)	61.8	(3.2)	46.2	(1.5)	**1.97**	**(1.47-2.64)**
Retardation (748)	38.9	(3.0)	39.8	(1.5)	0.91	(0.68-1.20)
Energy deficit						
Fatigue/loss of energy (1624)	77.9	(3.2)	87.0	(1.1)	**0.58**	**(0.38-0.89)**
Cognitive symptoms						
Impaired concentration (1588)	83.1	(2.5)	85.6	(1.2)	0.82	(0.55-1.21)
Indecisiveness (1406)	67.0	(3.2)	75.3	(1.4)	**0.70**	**(0.50-0.98)**
Guilt (1076)	53.3	(3.1)	58.0	(1.5)	0.84	(0.63-1.12)
Worthlessness (1178)	59.4	(3.5)	64.7	(1.4)	**0.71**	**(0.51-0.97)**
Suicide symptoms						
Suicide attempt (174)	10.5	(2.0)	9.4	(0.9)	1.00	(0.61-1.62)
Thought about committing suicide (669)	33.6	(3.2)	37.7	(1.6)	0.79	(0.56-1.11)
Felt like wanted to die (884)	43.6	(3.5)	48.5	(1.5)	0.75	(0.55-1.02)
Thought a lot about own death (663)	41.1	(3.2)	34.9	(1.5)	1.24	(0.91-1.70)

Abbreviations: CI, confidence interval; OR, odds ratio; SE, standard error.

[a] Bold type indicates a significant difference ($p < .05$ for blacks compared to whites).

[b] Whites serve as reference group.

[c] Odds ratios adjusted for sex, age, marital status, education, and income.

Comorbid Psychiatric and Medical Disorders

Blacks had lower odds of comorbid alcohol abuse (OR, 0.48) compared to whites (Table 2). There were no significant racial differences in the prevalence estimates for any of the comorbid anxiety disorders, alcohol dependence, or drug use disorders.

Regarding medical disorders comorbid with MDD, blacks with MDD had significantly higher odds of any medical disease (OR, 1.71), hypertension (OR, 2.16), obesity (OR, 1.98), and liver disease (OR, 3.68) compared to whites with MDD.

Disability

Mean scores on 5 domains of the SF-12v2 compare black and white adults with 12-month MDD on disability (Table 3). In crude models, blacks were more disabled than whites in social functioning (p = .03) and physical functioning (p = .04). However, importantly, after adjusting analyses for sociodemographic factors, there were no significant racial differences in disability across any of the domains assessed.

Treatment for 12-Month Major Depressive Disorder

Blacks had significantly lower odds of receiving any treatment for 12-month MDD (Table 4). Adjusting for sociodemographic factors and current health insurance, blacks were less likely to see a counselor, therapist, doctor, or other person for MDD (OR, 0.51) and receive medication prescriptions (OR, 0.53). However, blacks were more likely than whites to receive MDD treatment in an emergency department (OR, 1.80) and spend at least 1 night in the hospital (OR, 1.56).

DISCUSSION

While most symptom patterns did not vary by race, the differences we identified have implications for treatment. Blacks with MDD were more likely to have insomnia, early-morning awakening, and restlessness compared to whites with MDD. Blacks' higher odds of psychomotor disturbance and difficulty initiating and remaining asleep could suggest that antidepressants with sedating properties may benefit black adults with MDD.[16] Additionally, blacks were significantly less

Table 2. Comorbid Psychiatric and Medical Disorders With *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Revision) 12-Month Major Depressive Disorder Among Black and White Adults (N = 1866)[a]

	Blacks (n = 387)		Whites (n = 1479)		Blacks Compared to Whites[b]	
	%	(SE)	%	(SE)	OR[c]	(95% CI)
Anxiety disorders						
Any anxiety disorder (650)	33.9	(3.9)	37.2	(1.5)	0.83	(0.57-1.21)
Generalized anxiety (85)	5.4	(1.9)	4.7	(0.7)	1.15	(0.48-2.74)
Panic disorder[d] (142)	5.4	(1.6)	8.4	(0.9)	0.62	(0.31-1.26)
Specific phobia (291)	13.9	(2.8)	16.6	(1.2)	0.77	(0.46-1.30)
Social phobia (117)	5.9	(2.3)	7.1	(0.7)	0.78	(0.33-1.87)
Substance use disorders						
Any alcohol use disorder (257)	11.7	(2.5)	14.3	(1.1)	0.75	(0.44-1.26)
Alcohol abuse (111)	3.2	(0.9)	6.2	(0.7)	**0.48**	**(0.26-0.90)**
Alcohol dependence (146)	8.6	(2.4)	8.1	(0.9)	0.99	(0.52-1.90)
Any drug use disorder (82)	5.0	(1.4)	4.1	(0.6)	1.00	(0.51-1.97)
Drug abuse (50)	2.5	(1.2)	2.7	(0.4)	0.75	(0.28-2.05)
Drug dependence (39)	2.6	(1.0)	2.0	(0.4)	1.00	(0.38-2.66)
Medical disorders						
Any medical disorder (1062)	63.6	(3.3)	53.7	(1.5)	**1.71**	**(1.22-2.40)**
Hypertension (470)	32.0	(3.0)	21.2	(1.2)	**2.16**	**(1.48-3.14)**
Other cardiac disease[e] (276)	14.8	(2.2)	14.1	(1.2)	1.08	(0.70-1.67)
Gastritis (144)	8.6	(1.8)	7.7	(0.8)	1.21	(0.71-2.07)
Gastric ulcer (101)	6.1	(1.6)	5.2	(0.7)	1.06	(0.56-2.01)
Liver disease[f] (29)	3.4	(1.6)	1.1	(0.3)	**3.68**	**(1.20-11.30)**
Obesity (558)	40.3	(2.9)	26.8	(1.4)	**1.98**	**(1.45-2.69)**
Arthritis (470)	25.7	(2.9)	24.4	(1.3)	1.09	(0.69-1.70)

Abbreviations: CI, confidence interval; OR, odds ratio; SE, standard error.

[a] Bold type indicates a significant difference (p < .05 for blacks compared to whites).

[b] Whites serve as reference group.

[c] Odds ratios adjusted for sex, age, marital status, education, and income.

[d] Panic disorder includes: panic disorder with agoraphobia and panic disorder without agoraphobia.

[e] Other cardiac disease includes: arteriosclerosis, heart attack, angina, tachycardia, and other heart disease.

[f] Liver disease includes cirrhosis and other liver disease.

likely to report cognitive symptoms (indecisiveness and worthlessness) compared to whites. The lower odds of reporting cognitive symptoms among black adults may be driven by stigma associated with MDD.[14] It may be more acceptable for blacks with MDD to report somatic complaints instead of cognitive symptoms.[18] Associations between somatic and cognitive symptoms, as well as potential racial differences in specific subtypes of MDD (eg, melancholia), should be investigated in the future.

Regarding psychiatric comorbidity, we found that blacks with MDD had significantly *lower* odds of comorbid alcohol abuse compared to whites with MDD, and there were no racial differences in the prevalence of comorbid anxiety or drug use disorders. MDD and alcohol abuse frequently co-occur,[52] and excessive alcohol use can independently contribute to significant depressive symptomatology and poor health-related outcomes.[53] Lower rates of alcohol abuse among blacks with MDD may be due to racial differences in drinking norms.[54] Future investigation is needed to better understand scenarios such as interpersonal conflict,[54] environmental circumstances,[55] and racial factors that may protect against aberrant alcohol use among black adults with MDD. Ultimately, a careful assessment of substance use is crucial with any patient who has depression, but alcohol abuse does not appear to particularly characterize the experience of MDD among black adults.

More than 50% of black and white adults with 12-month MDD had comorbid medical disorders, and blacks had significantly higher odds of any medical disorder, hypertension, obesity, and liver disease. Since depressed blacks have greater medical comorbidity and are more likely to seek mental health treatment in primary care settings than in specialty mental health clinics,[32,34,56] our results magnify the importance of treating MDD among blacks in primary care. However, evidence suggests that primary care physicians are less likely to discuss depression as a possible diagnosis or make changes in depression treatment among patients who have greater physical comorbidity.[57] Greater medical comorbidity among black adults could partially explain why the mental health needs of black patients are less likely to be addressed in primary care compared to those of white patients.[34,58] Integrating collaborative care treatment models into clinics that primarily serve black patients[59] may increase depression treatment rates in

Table 3. Disability Score[a] (Short Form 12, Version 2) Among Black and White Adults With *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Revision) 12-Month Major Depressive Disorder (N = 1866)[b]

	Blacks (n = 387)		Whites (n = 1479)		*P* Value	
	Mean	(SE)	Mean	(SE)	Crude	Adjusted[c]
General health	44.63	(1.0)	46.33	(0.5)	.13	.52
Mental health	40.71	(0.8)	41.84	(0.4)	.21	.60
Role emotional	42.27	(1.0)	43.72	(0.4)	.18	.44
Physical	46.02	(0.9)	48.02	(0.4)	**.04**	.11
Social functioning	42.47	(1.0)	44.67	(0.4)	**.03**	.19

Abbreviations: CI, confidence interval; OR, odds ratio; SE, standard error.

[a] Lower mean scores indicate greater impairment.

[b] Bold type indicates a significant difference ($p < .05$ for blacks compared to whites).

[c] Odds ratios adjusted for age, sex, marital status, education, and income.

Table 4. Treatment Received for *Diagnostic and Statistical Manual of Mental Disorders* (Fourth Revision) 12-Month Major Depressive Disorder Among Black and White Adults (N = 1183)[a]

	Blacks (n = 190)		Whites (N = 993)		Black Compared to Whites[b]	
	%	SE	%	SE	OR[c]	(95% CI)
Any treatment (1183)	48.3	(3.5)	67.3	(1.6)	**0.53**	**(0.38-0.75)**
Counselor, therapist, doctor, other (1045)	40.4	(3.7)	60.2	(1.6)	**0.51**	**(0.36-0.72)**
Prescribed medication (936)	34.5	(3.0)	53.2	(1.7)	**0.53**	**(0.39-0.71)**
Emergency department (196)	16.2	(2.6)	9.6	(0.9)	**1.80**	**(1.12-2.89)**
Hospitalized[d] (219)	15.4	(2.4)	10.4	(0.9)	**1.56**	**(1.00-2.41)**

Abbreviations: CI, confidence interval; OR, odds ratio; SE, standard error.

[a] Bold type indicates a significant difference ($p < .05$ for blacks compared to whites).

[b] Whites serve as reference group

[c] Odds ratios adjusted for age, sex, marital status, education, income, and current health insurance.

[d] Spent at least 1 night in the hospital.

these settings. Collaborative care is a structured intervention that involves active cooperation between primary care physicians, mental health specialists, and a case manager.[60-62] A recent meta-analysis of 37 randomized controlled trials of collaborative care in the United States and abroad found that such programs significantly improved depression outcomes when compared with usual mental health treatment in primary care.[60]

Regarding disability, we showed that the greater impairment among black adults with MDD in social and physical functioning is explained primarily by socioeconomic status. After adjusting analyses by sociodemographic factors, racial differences in disability were no longer significant. This indicates that our initial crude results, and possibly those of previous studies,[10,16,19] were confounded by socioeconomic status. We conducted post hoc analyses and found that the factors accounting for most of the variance in disability were the respondents' education level and personal income. Additional post hoc analyses revealed no racial difference in severity of MDD, as measured by number of *DSM-IV* symptoms. Since blacks are overrepresented among impoverished individuals,[30,31,63] assessing sociodemographic stressors is essential in this population. Rehabilitative programs that alleviate financial and educational constraints, such as creating job opportunities and addressing poverty,[64] may prove more beneficial for depressed blacks with low socioeconomic status than traditional treatment strategies. Social interventions deserve further research among black adults with MDD.

Black Americans were less likely than white Americans to receive any treatment for MDD, which is consistent with previous studies.[12,35,65,66] Specifically, blacks were less likely than whites to receive outpatient services for MDD (talk with a counselor, therapist, doctor, or other person), while blacks were more likely than whites to receive MDD treatment in an emergency department or be hospitalized at least overnight. Blacks' reliance on emergency department services for mental health needs has been well documented.[56,67] Our replication at the national level of blacks' reliance on emergency services for MDD treatment, even after controlling for sociodemographic factors and current health insurance, underscores the importance of implementing ways to engage and retain blacks in outpatient MDD treatment.[67]

We also found that blacks were less likely to be prescribed medications than whites to treat MDD, even though medications are a mainstay of depression treatment.[12,19,68] Evidence suggests that blacks are reluctant to take psychiatric medications due to specific beliefs about their side effects and efficacy.[69] Therefore, offering medications to blacks with MDD in equal rates as whites with MDD may not singularly reduce these treatment disparities.[36] We recommend that clinicians more fully investigate attitudes about psychotropic medication and provide sufficient education about side effects and expected treatment response before using pharmacological interventions to treat MDD among black adults. Conversely, since blacks have expressed a preference for psychotherapy to treat MDD,[70] more rigorous research is needed to assess the feasibility and acceptability of adapting cultural preferences (eg, spirituality) into evidence-based psychotherapy for MDD.[71] Black adults are 3 times more likely than white adults to cite spirituality as an extremely important element of depression care.[72]

Our study must be assessed in light of several limitations. First, while the sample was national in scope, the numbers of those with MDD in ethnic subgroups (ie, African Americans or Caribbean blacks) were too limited to further disaggregate subgroups of blacks with MDD. Second, medical disorders were assessed by patient self-report and neither diagnostic tests nor medical charts were reviewed to confirm medical diagnoses. Thus, we only included medical conditions that respondents stated had been reportedly confirmed by a physician or other health care provider in the year preceding the interview. Despite limiting analyses of medical disorders in this way, our results may be subject to recall bias or may underestimate the prevalence of comorbid medical disorders if respondents did not receive a medical evaluation. Third, we did not address differences in the longitudinal course between blacks and whites with MDD. This is a topic that should be addressed in future studies.

Despite these limitations, our study has important strengths. The NESARC provided a sample large enough to limit cases of MDD to those that took place within the past year and was therefore not subject to the recall bias affecting prevalence estimates that identify cases of MDD over a person's lifetime. The sample size was also large enough to examine the prevalence of psychiatric and medical disorders comorbid with MDD that have typically not been studied among black Americans. Since the study participants were drawn from a nationally representative sample, the results are more generalizable than those drawn from a single community.[15]

Taken together, we identified several racial differences in the characteristics and treatment of 12-month MDD in one of the largest nationally representative community surveys conducted in the United States. The results in this paper have important public health implications, as they can guide clinical practice and future research studies to increase treatment for MDD among black Americans.

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