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Epidemiology of Adult *DSM-5* Major Depressive Disorder and Its Specifiers in the United States

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+ **Supplemental content**

IMPORTANCE No US national data are available on the prevalence and correlates of *DSM-5*–defined major depressive disorder (MDD) or on MDD specifiers as defined in *DSM-5*.

OBJECTIVE To present current nationally representative findings on the prevalence, correlates, psychiatric comorbidity, functioning, and treatment of *DSM-5* MDD and initial information on the prevalence, severity, and treatment of *DSM-5* MDD severity, anxious/distressed specifier, and mixed-features specifier, as well as cases that would have been characterized as bereavement in *DSM-IV*.

DESIGN, SETTING, AND PARTICIPANTS In-person interviews with a representative sample of US noninstitutionalized civilian adults (≥18 years) (n = 36 309) who participated in the 2012-2013 National Epidemiologic Survey on Alcohol and Related Conditions III (NESARC-III). Data were collected from April 2012 to June 2013 and were analyzed in 2016-2017.

MAIN OUTCOMES AND MEASURES Prevalence of *DSM-5* MDD and the *DSM-5* specifiers. Odds ratios (ORs), adjusted ORs (aORs), and 95% CIs indicated associations with demographic characteristics and other psychiatric disorders.

RESULTS Of the 36 309 adult participants in NESARC-III, 12-month and lifetime prevalences of MDD were 10.4% and 20.6%, respectively. Odds of 12-month MDD were significantly lower in men (OR, 0.5; 95% CI, 0.46-0.55) and in African American (OR, 0.6; 95% CI, 0.54-0.68), Asian/Pacific Islander (OR, 0.6; 95% CI, 0.45-0.67), and Hispanic (OR, 0.7; 95% CI, 0.62-0.78) adults than in white adults and were higher in younger adults (age range, 18-29 years; OR, 3.0; 95% CI, 2.48-3.55) and those with low incomes ($19 999 or less; OR, 1.7; 95% CI, 1.49-2.04). Associations of MDD with psychiatric disorders ranged from an aOR of 2.1 (95% CI, 1.84-2.35) for specific phobia to an aOR of 5.7 (95% CI, 4.98-6.50) for generalized anxiety disorder. Associations of MDD with substance use disorders ranged from an aOR of 1.8 (95% CI, 1.63-2.01) for alcohol to an aOR of 3.0 (95% CI, 2.57-3.55) for any drug. Most lifetime MDD cases were moderate (39.7%) or severe (49.5%). Almost 70% with lifetime MDD had some type of treatment. Functioning among those with severe MDD was approximately 1 SD below the national mean. Among 12.9% of those with lifetime MDD, all episodes occurred just after the death of someone close and lasted less than 2 months. The anxious/distressed specifier characterized 74.6% of MDD cases, and the mixed-features specifier characterized 15.5%. Controlling for severity, both specifiers were associated with early onset, poor course and functioning, and suicidality.

CONCLUSIONS AND RELEVANCE Among US adults, *DSM-5* MDD is highly prevalent, comorbid, and disabling. While most cases received some treatment, a substantial minority did not. Much remains to be learned about the *DSM-5* MDD specifiers in the general population.

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Over the past 25 years, the US prevalence of adolescent and adult depression indicators has increased.[1,2] However, national epidemiologic information on major depressive disorder (MDD) is limited to pre–*DSM-5* studies conducted more than 15 years ago. The *DSM-IV* diagnosis of MDD was associated with impairment,[3,4] psychiatric and substance use disorders (SUDs),[5-9] poor health,[10,11] mortality,[12] disease and economic burden,[12] and disability-years.[13-16] Updated knowledge is needed on the prevalence of MDD and its association with sociodemographic and clinical characteristics, including other psychiatric disorders, suicidality, impairment, and treatment use.

In 2013, *DSM-IV*[17] was replaced with the fifth edition of the *DSM-5*.[18] Among changes in MDD,[19] *DSM-5* added specifiers. One specifier indicates MDD episodes associated with anxious distress. A second indicates "mixed" MDD episodes (ie, accompanied by manic or hypomanic features not meeting criteria for a bipolar disorder). These specifiers have been studied in patients[20-23] but not national data; the proportion of MDD cases diagnosed as positive after bereavement has also not been studied. The *DSM-IV* and *DSM-5* include a severity specifier (mild, moderate, or severe) not previously examined in national data. Furthermore, *DSM-5* removed the *DSM-IV* MDD exclusion criterion for bereavement. While *DSM-5* does not include bereavement as a new MDD specifier, exploring the potential influence of this change on national rates of *DSM-5* MDD by identifying the proportion of MDD cases that would have been excluded as bereavement under *DSM-IV* rules is of considerable interest.

The National Epidemiologic Survey on Alcohol and Related Conditions III (NESARC-III) is a nationally representative 2012-2013 survey of *DSM-5* psychiatric and SUDs in adults 18 years or older, including MDD and the specifiers described above. Herein, we report NESARC-III findings on the adult prevalence, sociodemographic and clinical correlates, disability, course, and treatment for 12-month and lifetime *DSM-5* MDD, as well as on the specifiers and bereavement.

Methods

Sample and Procedures

The NESARC-III target population was the US noninstitutionalized civilian population aged at least 18 years, including household and selected group quarter residents (eg, group homes and dormitories). Probability sampling was used to select respondents.[24] Primary sampling units were counties or groups of counties, secondary sampling units (SSUs) were groups of US Census–defined blocks, and tertiary sampling units were households within SSUs; within households, eligible adults were randomly selected. African American, Asian, and Hispanic adults were oversampled; in households with at least 4 eligible racial/ethnic minority individuals, 2 were selected (n = 1661). The sample size was 36 309. The total response rate was 60.1%. Data were collected from April 2012 to June 2013 and were analyzed in 2016-2017.

Key Points

Question What is the national prevalence of *DSM-5* major depressive disorder, the *DSM-5* anxious/distressed and mixed-features specifiers, and their clinical correlates?

Findings In this national survey of 36 309 US adults, the 12-month and lifetime prevalences of major depressive disorder were 10.4% and 20.6%, respectively, with most being moderate (6-7 symptoms) or severe (8-9 symptoms) and associated with comorbidity and impairment. The anxious/distressed specifier characterized 74.6% of major depressive disorder cases, and the mixed-features specifier characterized 15.5%; almost 70% with lifetime major depressive disorder received some type of treatment.

Meaning Major depressive disorder remains a serious US health problem, with much to be learned about its specifiers.

Data were adjusted for oversampling and nonresponse and weighted to represent the US civilian population based on the 2012 American Community Survey.[25] Weighting adjustments compensated for nonresponse.[24] Comparing participants with the total eligible sample (including nonrespondents), no significant differences were found in percentages of African American, Asian, or Hispanic individuals or in population density, vacancy rate, or proportion in group quarters or renters. Compared with the eligible sample, respondents included slightly different percentages of men (46.2% vs 48.1%) and those aged 30 to 39 years (17.4% vs 16.7%), 40 to 49 years (18.3% vs 18.1%), and 60 to 69 years (12.6% vs 13.7%), respectively.[24] The sample sociodemographic characteristics are reported elsewhere.[24]

Interviewer field methods and quality control included structured training, supervision, and random respondent verification callbacks, as previously reported.[24] Oral informed consent was recorded, and respondents received $90. The National Institutes of Health and Westat, Inc (NESARC-III contractor) institutional review boards approved the protocols.

DSM-5 Diagnostic Interview

The National Institute on Alcohol Abuse and Alcoholism *DSM-5* version of the Alcohol Use Disorder and Associated Disabilities Interview Schedule 5 (AUDADIS-5)[26,27] was used. This fully structured interview for lay interviewers was used to measure *DSM-5* mood, anxiety, substance use, and personality disorders.

DSM-5 MDD

Major depressive episode was diagnosed when at least 2 weeks of persistent depressed mood, anhedonia, or hopelessness occurred (reported by self or observed by others), plus additional symptoms from criterion A, for a total of 5 of the 9 *DSM-5* major depression criteria[26] and the clinical significance criterion. Lifetime *DSM-5* MDD was defined as at least one lifetime major depressive episode without full *DSM-5* manic, mixed, or hypomanic episodes,[26,28] excluding substance-induced and medical-induced disorders. Those with at least one episode in the prior 12 months were classified as having 12-month MDD.

In a test-retest study[26] of NESARC-III participants, interviewers blinded to the initial interview results conducted separate retest AUDADIS-5 interviews with 1006 NESARC-III participants (test-retest interval, 1-10 weeks; mean, 2.86 weeks). Test-retest reliability of AUDADIS-5 *DSM-5* MDD was fair[29] (κ = 0.40)[26]; reliability of the corresponding dimensional MDD measure was higher (intraclass correlation [ICC], 0.59).[26] Clinical validity was assessed through concordance with blinded clinician reappraisals using the Psychiatric Research Interview for Substance and Mental Disorders, *DSM-5* version (PRISM-5)[30,31] (the eAppendix in the Supplement provides details on PRISM-5 and the clinical validity study). Concordance for binary MDD diagnoses was fair[29] (κ = 0.35-0.46)[30] and higher with corresponding *DSM-5* MDD dimensional scales (ICC, 0.60-0.64).[30]

DSM-5 MDD Specifiers

Severity Specifier
The *DSM-5* does not state the number of MDD symptoms required for each severity level, so these levels were defined as follows: mild is 5 symptoms (minimum for a diagnosis), moderate is 6 to 7 symptoms, and severe is 8 to 9 symptoms. The *DSM-5* also states that distress and impairment should increase across levels but without clear definitions. Therefore, we used the symptom count only, which is clear. The symptom count was based on the lifetime MDD episode when mood or anhedonia was the worst.

Anxious/Distressed Specifier
The *DSM-5* defines this specifier as at least 2 of the following 5 anxiety or distress symptoms during an episode: feeling keyed up or tense, being unusually restless, having trouble concentrating due to worry, fearing something awful would happen, and thinking one might lose control of oneself. These symptoms were required for at least 2 weeks during the episode when mood or anhedonia was the worst (a lesser threshold than the actual *DSM-5* definition, which requires symptoms on more days than not).

Mixed-Features Specifier
The *DSM-5* defines this specifier as at least 3 of the following symptoms during episodes not meeting criteria for mania or hypomania: elevated or expansive mood, inflated self-esteem or grandiosity, unusual talkativeness or pressure to keep talking, flight of ideas or racing thoughts, increased energy or goal-directed activity, involvement in activities (eg, financial or sexual) with potential for painful consequences, and decreased need for sleep (rested despite sleeping less). These symptoms were required for most days during at least one lifetime episode.

Bereavement
Bereavement is not a *DSM-5* specifier, and cases of bereavement were not excluded in estimates of MDD reported herein. However, participants meeting criteria for *DSM-5* MDD were coded positive on a variable representing bereavement if all MDD episodes began just after someone close died and lasted less than 2 months, consistent with *DSM-IV* and previous reports.[32]

Other Psychiatric Disorders
The AUDADIS-5 *DSM-5* anxiety disorder diagnoses (panic, agoraphobia, social phobia, specific phobia, and generalized anxiety disorder) excluded substance-induced and medical-induced disorders, consistent with *DSM-5*. The *DSM-5* posttraumatic stress disorder (PTSD) generally followed the *DSM-5* definition, but criteria C and D more strictly required at least 3 positive criteria rather than at least 2 positive criteria. Test-retest reliability of these diagnoses was fair to good (κ = 0.35-0.54),[26] with higher reliability for associated *DSM-5* dimensional scales (ICC, 0.50-0.79).[26] Clinical validity (concordance with PRISM-5) was fair to good (κ = 0.20-0.59) and was greater for corresponding dimensional scales (ICC, >0.53 for all).[30] The *DSM-5* schizotypal, borderline, and antisocial personality disorders were assessed as defined in *DSM-IV*, as described previously.[33-35] Test-retest reliability of these personality disorders was very good (κ = 0.67-0.71), was higher for corresponding dimensional measures (κ = 0.71-0.79),[36,37] and was validated by associations with psychiatric comorbidity and disability.[33-35]

Substance Use Disorders
AUDADIS-5 operationalizes *DSM-5* criteria for alcohol and drug-specific disorders for 10 drug classes,[26] aggregated herein. In *DSM-5*, the 12-month or lifetime diagnoses of alcohol or drug disorders require at least 2 of 11 criteria within a 12-month period.[38] These diagnoses had fair to good test-retest reliability (κ = 0.40-0.62); reliability of dimensional criteria scales was fair to excellent (ICC, 0.45-0.85).[26] Clinical validity (concordance with PRISM-5) was fair to good for alcohol and drug use disorders (κ = 0.40-0.66) and higher for their dimensional counterparts (ICC, 0.68).[30]

Impairment
Impaired functioning was assessed with version 2 of the 12-Item Short Form Health Survey (SF-12v2), a reliable, valid, widely used measure of impairment in the prior 30 days.[39] The SF-12v2 scales include mental health, social functioning, role-emotional functioning, and mental component summary, with norm-based scores (mean [SD], 50 [10]; range, 0-100). Lower scores indicate poorer functioning.

Statistical Analysis
Weighted means and percentages were computed for continuous and categorical correlates of 12-month and lifetime *DSM-5* MDD and the *DSM-5* specifiers. Adjusted odds ratios (aORs) from multivariable logistic regressions were used to test associations of MDD with sociodemographic characteristics, controlling for all others, as was done previously in NESARC studies.[5,24,28,40-43] Similar logistic regression models were used to test psychiatric comorbidity with MDD, adjusted first for sociodemographic characteristics and then also for other substance use and psychiatric disorders, as was done previously.[24,28,41-44] Eating disorders and persistent depression were too rare to report separately but were included as covariates in adjusted comorbidity analyses. Logistic regressions indicating the association between SF-12v2 scores and MDD were adjusted for sociodemographic characteristics and other psychiatric disorders. Odds ratios (ORs), computed with

Table 1. Prevalence and OR of 12-Month and Lifetime *DSM-5* MDD by Sociodemographic Characteristics[a]

Sociodemographic Characteristic	12-mo MDD (n = 3963)		Lifetime MDD (n = 7432)	
	Prevalence, % (SE)	OR (95% CI)	Prevalence, % (SE)	OR (95% CI)
Total	10.4 (0.25)	NA	20.6 (0.37)	NA
Sex				
Male	7.2 (0.26)	0.5 (0.46-0.55)	14.7 (0.40)	0.5 (0.46-0.53)
Female	13.4 (0.37)	1 [Reference]	26.1 (0.50)	1 [Reference]
Race/ethnicity				
White	10.8 (0.35)	1 [Reference]	23.1 (0.47)	1 [Reference]
African American	9.3 (0.42)	0.6 (0.54-0.68)	15.2 (0.49)	0.5 (0.46-0.55)
Native American	15.9 (1.86)	1.2 (0.87-1.63)	28.2 (2.12)	1.1 (0.89-1.35)
Asian/Pacific Islander	6.8 (0.53)	0.6 (0.45-0.67)	12.2 (0.83)	0.4 (0.36-0.50)
Hispanic	10.0 (0.40)	0.7 (0.62-0.78)	16.2 (0.55)	0.6 (0.52-0.64)
Age, y				
18-29	12.9 (0.47)	3.0 (2.48-3.55)	20.2 (0.55)	1.9 (1.65-2.10)
30-44	11.2 (0.40)	3.0 (2.54-3.54)	22.0 (0.61)	2.2 (1.92-2.44)
45-64	10.7 (0.39)	2.7 (2.30-3.10)	22.9 (0.54)	2.1 (1.91-2.33)
≥65	5.4 (0.33)	1 [Reference]	14.4 (0.56)	1 [Reference]
Marital status				
Married or cohabiting	8.2 (0.30)	1 [Reference]	18.7 (0.40)	1 [Reference]
Widowed, separated, or divorced	13.8 (0.49)	1.7 (1.49-1.84)	25.9 (0.65)	1.5 (1.38-1.59)
Never married	13.2 (0.47)	1.4 (1.21-1.60)	20.7 (0.57)	1.2 (1.07-1.30)
Educational level				
<High school	11.4 (0.54)	1.2 (1.01-1.32)	17.8 (0.65)	0.9 (0.79-0.97)
High school	11.0 (0.47)	1.1 (0.98-1.20)	19.3 (0.60)	0.9 (0.82-0.96)
≥Some college	9.9 (0.28)	1 [Reference]	21.8 (0.44)	1 [Reference]
Family income, $				
0-19 999	14.1 (0.49)	1.7 (1.49-2.04)	22.5 (0.61)	1.3 (1.13-1.39)
20 000-34 999	11.4 (0.39)	1.5 (1.30-1.72)	20.8 (0.61)	1.2 (1.06-1.28)
35 000-69 999	9.9 (0.38)	1.3 (1.16-1.50)	20.1 (0.55)	1.1 (0.98-1.18)
≥70 000	7.5 (0.41)	1 [Reference]	19.6 (0.58)	1 [Reference]
Urbanicity				
Urban	10.5 (0.29)	1.1 (0.95-1.28)	20.5 (0.42)	1.1 (0.93-1.21)
Rural	9.9 (0.54)	1 [Reference]	21.1 (0.98)	1 [Reference]
Region				
Northeast	10.7 (0.67)	1.0 (0.85-1.17)	21.8 (0.81)	1.0 (0.89-1.16)
Midwest	9.9 (0.51)	0.9 (0.75-0.99)	20.6 (0.90)	0.9 (0.78-1.01)
South	10.4 (0.47)	0.9 (0.82-1.06)	20.1 (0.62)	0.9 (0.84-1.04)
West	10.6 (0.35)	1 [Reference]	20.5 (0.65)	1 [Reference]

Abbreviations: MDD, major depressive disorder; NA, not applicable; OR, odds ratio.

[a] Controlling for all other sociodemographic characteristics.

statistical software (SUDAAN, version 11.0; RTI International)[45] to take the sample design into account, were considered statistically significant when 95% CIs excluded 1.00.

Results

DSM-5 MDD Prevalence and Sociodemographic Correlates

Of the 36 309 adult participants in NESARC-III, the 12-month and lifetime prevalences of *DSM-5* MDD were 10.4% and 20.6%, respectively (**Table 1**). The respective 12-month and lifetime prevalences were 13.4% and 26.1% among women and 7.2% and 14.7% among men. As summarized in Table 1, men had significantly lower odds of 12-month MDD (OR, 0.5) than women. Compared with white adults, odds of 12-month MDD were lower among African American, Asian, and Hispanic adults. Compared with respondents 65 years or older, odds of 12-month MDD were greater for younger age groups. Compared with the highest income category ($70 000 or higher), odds of 12-month MDD were greater in each successively lower household income category (higher categories differed little from $70 000 or higher) (eTable in the Supplement). The associations between lifetime MDD and sociodemographic characteristics were similar (Table 1).

Associations With Other Psychiatric Disorders

All disorders were significantly associated with 12-month and lifetime MDD (**Table 2**). The aORs were larger for drug use disorder than for alcohol or nicotine use disorders and were larger for borderline than other personality disorders. Additional

Table 2. Twelve-Month and Lifetime Prevalence of Other Psychiatric Disorders Among Those With *DSM-5* MDD[a]

Comorbid Psychiatric Disorder	12 mo			Lifetime		
	Prevalence (SD)[b]	aOR (95% CI)[c]	Adjusted aOR (95% CI)[d]	Prevalence (SD)[b]	aOR (95% CI)[c]	Adjusted aOR (95% CI)[d]
Any substance use disorder	45.3 (0.86)	2.0 (1.84-2.16)	1.4 (1.24-1.52)	57.9 (0.75)	2.2 (2.02-2.31)	1.5 (1.35-1.57)
Alcohol use disorder	22.2 (0.86)	1.8 (1.63-2.01)	1.2 (1.06-1.33)	40.8 (0.86)	2.0 (1.88-2.20)	1.3 (1.16-1.40)
Any drug use disorder	10.1 (0.57)	3.0 (2.57-3.55)	1.5 (1.20-1.79)	17.6 (0.65)	2.5 (2.21-2.78)	1.3 (1.14-1.49)
Nicotine use disorder	32.8 (0.94)	1.9 (1.69-2.07)	1.3 (1.12-1.41)	38.9 (0.83)	1.9 (1.75-2.02)	1.2 (1.12-1.34)
Any anxiety disorder	36.4 (0.96)	4.2 (3.81-4.57)	2.2 (1.94-2.44)	37.3 (0.70)	3.9 (3.57-4.17)	2.2 (2.05-2.43)
Panic	11.4 (0.59)	4.4 (3.73-5.25)	1.8 (1.45-2.21)	12.8 (0.53)	3.4 (3.05-3.89)	1.6 (1.40-1.86)
Agoraphobia	05.6 (0.44)	4.2 (3.28-5.27)	1.3 (1.05-1.70)	05.0 (0.33)	3.7 (3.04-4.54)	1.3 (1.07-1.64)
Social phobia	09.4 (0.64)	3.9 (3.32-4.66)	1.5 (1.19-1.76)	08.7 (0.46)	3.4 (2.95-3.86)	1.4 (1.22-1.61)
Specific phobia	11.6 (0.59)	2.1 (1.84-2.35)	1.0 (0.86-1.15)	12.2 (0.40)	2.3 (2.10-2.57)	1.3 (1.10-1.41)
Generalized anxiety disorder	19.9 (0.76)	5.7 (4.98-6.50)	2.4 (2.10-2.83)	20.5 (0.57)	4.9 (4.39-5.47)	2.5 (2.18-2.78)
Posttraumatic stress disorder	16.3 (0.85)	4.4 (3.92-5.03)	1.8 (1.54-2.12)	15.6 (0.64)	4.1 (3.70-4.63)	1.9 (1.67-2.23)
Any personality disorder[e]	40.9 (1.13)	4.6 (4.12-5.03)	2.4 (2.10-2.70)	31.9 (0.86)	3.9 (3.58-4.29)	2.0 (1.83-2.25)
Schizotypal	18.4 (0.94)	3.8 (3.33-4.30)	1.2 (1.04-1.46)	13.6 (0.68)	3.4 (2.90-3.88)	1.2 (1.03-1.47)
Borderline	35.7 (1.06)	5.2 (4.70-5.74)	2.6 (2.28-2.94)	26.6 (0.73)	4.4 (4.02-4.81)	2.2 (1.94-2.43)
Antisocial	08.4 (0.56)	2.3 (1.92-2.72)	0.9 (0.76-1.15)	07.4 (0.39)	2.5 (2.15-2.84)	1.2 (0.97-1.35)

Abbreviations: aOR, adjusted odds ratio; MDD, major depressive disorder.

[a] The aORs indicate associations of MDD with other psychiatric disorders.

[b] Prevalence of the given disorder among those with MDD in the corresponding time frame (eg, prevalence of 12-month disorders among those with 12-month MDD).

[c] All aORs represent the odds of having a specific comorbid disorder among individuals with MDD relative to the odds of having specific comorbid disorder

among individuals who do not have MDD. The aORs were adjusted for sex, race/ethnicity, age, marital status, educational level, family income, urbanicity, and region.

[d] The aORs were adjusted for sex, race/ethnicity, age, marital status, educational level, family income, urbanicity, region, and psychiatric disorders other than bipolar I disorder.

[e] Personality disorders assessed on a lifetime basis.

adjustment for other psychiatric disorders decreased all aORs (some substantially), but most remained significant.

MDD Characteristics

As summarized in **Table 3**, the mean (SE) age at onset of MDD was 29.05 (0.21) years. Overall, a mean (SE) of 3.86 (0.10) lifetime episodes were reported. The median duration of lifetime longest or only episode was 25.9 weeks.

Treatment

Treatment for MDD was reported by 69.4% of participants with a lifetime MDD diagnosis (Table 3); 53.1% reported using medication, 62.5% reported talking with a professional, 14.9% reported receiving nonprofessional support (ie, self-help or support group, hotline, or internet chat room), 10.2% reported going to an emergency department, and 11.8% reported being hospitalized overnight or longer. The mean age at first treatment for MDD was 32.0 years, resulting in a mean delay from onset to first treatment of 47.5 months. While the prevalence of different types of treatment was lower among those whose only MDD was within the past 12 months, more than 50% of these received some type of treatment for MDD.

Suicidality

During the lifetime MDD episode when mood or anhedonia was at its worst, 34.8% thought about their own death, 46.7% wanted to die, and 39.3% contemplated suicide; among those with MDD only within the past year, 28.8%, 32.1%, and 22.8% had these thoughts, respectively (Table 3). Lifetime and

past-year suicide attempts were reported by 13.6% and 4.8%, respectively.

Functioning

Table 4 lists SF-12v2 scores overall and by severity level of MDD among those whose only episodes of MDD occurred in the prior 12 months. Mental health, social functioning, role-emotional functioning, and mental component summary scores ranged from 42.1 to 43.9 (approximately 0.8 SD below the mean), indicating significantly poorer functioning ($P < .001$) than in participants without MDD (range, 49.3-53.1). Moderate and severe cases had worse functioning, with scores for severe cases (range, 38.6-40.4) approximately 1 SD below the national mean. In participants whose only MDD episode extended into the prior 30 days (Table 4), scores were poorer overall (range, 38.5-40.2), especially among severe cases (range, 35.3-36.6).

DSM-5 Specifiers and Bereavement

When mood or anhedonia was at its worst during lifetime MDD (Table 3), 10.8% of the episodes were at the mild severity level (5 MDD symptoms), 39.7% were moderate (6-7 symptoms), and 49.5% were severe (8-9 symptoms). Among those whose only MDD episode was in the prior 12 months, 14.4%, 38.8%, and 46.8% were mild, moderate, and severe, respectively. The anxious/distressed specifier characterized 74.6% of those with lifetime MDD and 70.0% of those with only 12-month MDD, while the mixed-features specifier characterized 15.5% of those with lifetime MDD and 20.6% of those with only 12-month MDD. Of participants who ever had MDD, 12.9% had all their

episodes characterized as bereavement (ie, started just after someone close died and lasted <2 months); among participants with only 12-month MDD, 15.5% had all their MDD episodes characterized as bereavement.

Table 5 lists clinical correlates of the anxious/distressed specifier and the mixed-features specifier. Both specifiers were significantly associated with earlier onset, number of episodes, longest duration, severity, MDD treatment overall and by type, suicidality, and poorer SF-12v2 scores. Most of these correlates remained significant when controlling for sociodemographic characteristics and MDD severity.

Discussion

In 2012-2013, over 10% of US adults experienced *DSM-5* MDD in the prior 12 months, and over 20% experienced lifetime *DSM-5* MDD. Major depressive disorder was associated with other psychiatric disorders, especially generalized anxiety disorder and borderline personality disorder, associations found in previous studies.[5,46-49] On average, episodes lasted more than 6 months. Few were mild; most were moderate or severe. Of those with MDD, approximately 75% had the anxious/distressed specifier during their worst episode, while 15.5% had the mixed-features specifier during any episode. Only among 12.9% did all MDD episodes begin just after someone close died and last less than 2 months. Almost 70% with lifetime MDD reported lifetime treatment for MDD; more than 13% attempted suicide during their worst episode. Major depressive disorder was associated with impaired functioning, especially in severe cases. Therefore, MDD remains a widespread, serious US health problem.

Demographic correlates were consistent with previous surveys.[2,5] Major depressive disorder was more prevalent among women, possibly related to gender discrimination,[50] differential exposure to childhood or adult adversities[51] such as sexual abuse,[52] differential exposure to a complex host of different developmentally organized risk factors,[53] or biologically different stress responses.[54] Greater prevalence was found among younger adults and among white adults and Native American adults than among African American, Asian American, and Hispanic adults. Reasons for racial/ethnic differences in MDD remain unclear[55] but do not reduce the importance of treatment for minorities, among whom treatment disparities remain.[56]

This study found association between low income and 12-month MDD, consistent with other studies conducted within the last 3 years.[1,57,58] While this association could be due to depression-impaired functioning leading to lower income, the increases in depression and suicide that have accompanied growing income inequality suggest that the relationship of low income to MDD is due to stress from inadequate financial resources for life necessities or pessimism about improved future prospects.[1] If so, while treatment can benefit those with MDD, prevention may require change in larger societal processes.[59,60]

Major depressive disorder was associated with anxiety disorders, particularly panic disorder and generalized anxiety disorder, as well as with PTSD. Associations were strongest with models adjusting only for sociodemographic characteristics. Further adjusting for psychiatric comorbidity reduced asso-

Table 3. MDD Characteristics, Clinical Correlates, Specifiers, and Treatment

Characteristic	Lifetime MDD (n = 7432)	MDD Began in Past 12 mo (n = 448)
Age at onset of first episode, mean (SE), y	29.05 (0.21)	39.14 (1.01)
No. of lifetime episodes, mean (SE)	3.86 (0.10)	1.48 (0.05)
Duration of longest or only lifetime episode, median (SE), wk	25.90 (1.47)	8.81 (0.69)
2-3	8.59 (0.38)	18.34 (1.96)
4-8	12.26 (0.47)	20.01 (2.48)
9-12	9.24 (0.42)	14.72 (2.20)
13-25	11.66 (0.44)	20.97 (2.64)
26-51 (Half-year or more but <1 y)	14.17 (0.50)	25.96 (2.70)
52-103 (Year or more but <2 y)	14.40 (0.42)	NA
≥104 (≥2 y)	29.68 (0.81)	NA
DSM-5 **Specifiers and Bereavement, % (SE)**		
Severity[a]		
Mild (5 symptoms)	10.80 (0.41)	14.38 (1.98)
Moderate (6-7 symptoms)	39.67 (0.78)	38.81 (3.11)
Severe (8-9 symptoms)	49.53 (0.72)	46.81 (2.97)
Anxious/distressed specifier[a]	74.63 (0.61)	70.04 (2.22)
Mixed-features specifier[b]	15.53 (0.63)	20.63 (2.36)
Bereavement (*DSM-IV*)[c]	12.91 (0.46)	15.50 (1.80)
Lifetime Treatment		
Any treatment for MDD, % (SE)	69.42 (0.71)	51.93 (3.15)
Medication	53.11 (0.80)	36.93 (2.98)
Talk therapy with a professional	62.49 (0.79)	44.01 (2.95)
Nonprofessional organized support	14.93 (0.53)	5.77 (1.13)
Emergency department	10.15 (0.47)	3.82 (1.04)
Hospitalized overnight or longer	11.84 (0.46)	2.60 (0.88)
Age at first MDD treatment, mean (SE), y	31.98 (0.29)	40.19 (1.54)
Duration from onset to first treatment, mean (SE), mo	47.54 (1.63)	01.18 (0.32)
Suicidality, % (SE)[a]		
Thought a lot about one's own death	34.78 (0.72)	28.79 (2.69)
Wanted to die	46.74 (0.91)	32.05 (2.45)
Thought a lot about suicide	39.31 (0.80)	22.75 (2.19)
Attempted suicide	13.62 (0.58)	4.77 (1.09)

Abbreviations: MDD, major depressive disorder; NA, not applicable.

[a] When mood or anhedonia was at its worst.

[b] Mixed features do not meet full criteria for either mania or hypomania and could characterize any MDD episode.

[c] All or only episodes began just after someone close died and were less than 2 months in duration.

ciations by a factor of approximately 50%, although ORs remained statistically significant. These findings reflect the underlying association of anxiety disorders with each other and MDD within the internalizing component of the transdiagnostic spectrum.[61]

Major depressive disorder was associated with SUDs, particularly drug disorders, as found previously for cannabis,[40,62] nonmedical prescription opioids,[5,57,63] and drug use disorders.[41] With increasingly positive attitudes toward substance use[64-66] and increasing rates of adult SUDs

Table 4. MDD and SF-12v2 Norm-Based Disability Scores[a]

Variable	Mental Health		Social Functioning		Role-Emotional Functioning		Mental Component Summary	
	Mean (SE) Score	P Value	Mean (SE) Score	P Value	Mean (SE) Score	P Value	Mean (SE) Score	P Value
MDD in Past 12 mo[b]								
No lifetime MDD (n = 28 877)	53.12 (0.09)	NA	51.65 (0.09)	NA	49.31 (0.13)	NA	52.16 (0.09)	NA
Any MDD (n = 448)	42.29 (0.71)	<.001	43.85 (0.80)	<.001	42.94 (0.70)	<.001	42.10 (0.76)	<.001
Severity of worst episode in past 12 mo[c]								
Mild (5 symptoms) (n = 65)	47.25 (1.74)	.004	46.62 (1.53)	.003	47.82 (1.46)	.62	47.19 (1.72)	.02
Moderate (6-7 symptoms) (n = 188)	44.46 (1.06)	<.001	46.96 (1.05)	.002	44.81 (0.96)	.003	44.41 (1.00)	<.001
Severe (8-9 symptoms) (n = 218)	38.95 (1.01)	<.001	40.42 (1.19)	<.001	39.90 (1.08)	<.001	38.61 (1.14)	<.001
MDD in Past 30 d[d]								
No lifetime MDD (n = 28 877)	53.12 (0.09)	NA	51.65 (0.09)	NA	49.31 (0.13)	NA	52.16 (0.09)	NA
Single episode of MDD extending into past month (n = 411)	39.59 (0.89)	<.001	40.15 (0.93)	<.001	38.52 (0.89)	<.001	38.80 (0.83)	<.001
Mild (5 symptoms) (n = 35)	45.52 (2.78)	.01	43.86 (3.27)	.03	44.63 (2.73)	.29	44.75 (2.89)	.03
Moderate (6-7 symptoms) (n = 143)	43.32 (1.21)	<.001	45.30 (1.39)	<.001	42.62 (1.15)	<.001	43.15 (1.13)	<.001
Severe (8-9 symptoms) (n = 233)	36.58 (1.12)	<.001	36.59 (1.20)	<.001	35.26 (1.09)	<.001	35.42 (1.08)	<.001

Abbreviations: MDD, major depressive disorder; NA, not applicable; SF-12v2, version 2 of the 12-Item Short Form Health Survey,

[a] Tests for differences with participants who had no lifetime MDD using linear regression models, adjusted for sociodemographic characteristics (sex, race/ethnicity, age, marital status, educational level, family income, urbanicity, and region) and other *DSM-5* psychiatric disorders (alcohol use disorder, any drug use disorder, nicotine use disorder, panic disorder, agoraphobia, social phobia, specific phobia, generalized anxiety disorder, posttraumatic stress disorder, schizotypal personality disorder, borderline personality disorder, and antisocial personality disorder).

[b] Includes participants whose only episodes of MDD occurred in the past 12 months. Participants with episodes before the past 12 months were excluded from the analysis.

[c] Worst lifetime episode, defined as when mood was lowest or anhedonia was at its worst.

[d] Participants with multiple episodes of MDD and those whose single episode ended before the past 30 days were excluded from the analysis.

and associated problems,[24,41,42,67-69] MDD comorbidity with SUDs remains a substantial public health[24,70] and economic[16] burden. Evidence suggests that efforts to self-manage depression with cannabis are increasing[71-75] (also Aaron L. Sarvet, MPH, written communication, January 2, 2018) despite lack of evidence that cannabinoids are effective for this purpose[76,77]; prospectively, cannabis worsens the course of depressive disorders.[78] The likelihood of treatment for depression is reduced in those with SUDs.[79] However, dual-focused treatment is more effective when 2 disorders are present.[70] Therefore, clinician education and training in dual-disorder screening and treatment should be prioritized.

Of participants with lifetime *DSM-5* MDD, 69.4% received any treatment for their disorder, slightly higher than in the 2001-2002 NESARC (60.6%).[5] This result is higher than the treatment rate in one recent study[80] that used less specific measures to identify depression but is consistent with rates from other studies published in the last 4 years.[81,82] The NESARC-III treatment rates are plausible given the extent of direct-to-consumer advertising of antidepressants[83] and widespread distribution through primary care.[79] However, with 30% of patients still untreated, improved treatment delivery for MDD remains needed; much distress or social or economic burden is avoidable through behavioral and pharmacologic MDD treatment.[12,84] Studies should examine the demographic and clinical correlates of treatment and whether these factors are changing over time.

This study contributes novel information about the epidemiology of 2 new *DSM-5* major depression specifiers. That almost three-quarters of those with MDD had the anxious/distressed specifier confirms clinical observation and research.[46] We also provide the first nationally representative information on demographic and clinical correlates of these specifiers. In patient samples, the anxious/distressed specifier predicts a poor course of MDD.[20,21] Clearly, more information on both specifiers is needed.

Limitations

This study has limitations. The study was cross-sectional; associations do not necessarily indicate causal relationships. Lifetime associations of MDD with other psychiatric disorders may be influenced by recall bias, although this possibility is less likely for 12-month findings, which were similar. Some groups were not included (eg, homeless and prisoners), so NESARC-III may underestimate MDD prevalence. Also, as noted,[85] *DSM-5* left differentiating MDD from normal bereavement to clinical judgment. The NESARC-III interviews were conducted by lay interviewers, precluding clinical judgments. Therefore, all cases of MDD beginning shortly after the

Table 5. Associations Between MDD Specifiers, Clinical Correlates, Treatment, and Impaired Functioning in 7432 Participants With Lifetime MDD[a]

Characteristic	Anxious/Distressed Specifier[b]					Mixed-Features Specifier[c]				
	No (n = 1901)	Yes (n = 5531)	P Value Model 1[d]	Model 2[e]	Model 3[f]	No (n = 6235)	Yes (n = 1197)	P Value Model 1[d]	Model 2[e]	Model 3[f]
Age at onset of first episode, mean (SE), y	31.16 (0.35)	28.34 (0.23)	<.001	<.001	<.001	29.60 (0.22)	26.11 (0.47)	<.001	.009	.17
No. of lifetime episodes, mean (SE)	2.70 (0.12)	4.26 (0.13)	<.001	<.001	<.001	3.69 (0.12)	4.81 (0.36)	.006	.009	.09
Duration of longest or only lifetime episode, median (SE), wk	22.60 (1.19)	33.43 (2.99)	.001	.002	.08	25.70 (0.12)	51.41 (0.39)	.002	<.001	<.001
DSM-5 Specifiers, % (SE)										
Severity[a]										
Mild (5 symptoms)	23.53 (1.17)	6.48 (0.41)				12.06 (0.47)	3.93 (0.55)			
Moderate (6-7 symptoms)	53.53 (1.25)	34.96 (0.87)	<.001	<.001	NA	42.12 (0.80)	26.32 (1.55)	<.001	<.001	NA
Severe (8-9 symptoms)	22.95 (1.16)	58.57 (0.90)				45.82 (0.74)	69.75 (1.61)			
Anxious/distressed specifier[a]	NA	NA	NA	NA	NA	71.29 (0.72)	92.83 (0.84)	<.001	<.001	<.001
Mixed-features specifier[b]	4.39 (0.47)	19.32 (0.85)	<.001	<.001	<.001	NA	NA	NA	NA	NA
Lifetime Treatment										
Any treatment for MDD, % (SE)	61.06 (1.40)	72.27 (0.84)	<.001	<.001	<.001	68.82 (0.79)	72.72 (1.83)	.05	<.001	.02
Medication	42.26 (1.40)	56.80 (0.88)	<.001	<.001	<.001	52.52 (0.85)	56.33 (1.92)	.06	<.001	.05
Talk therapy with a professional	54.79 (1.49)	65.11 (0.92)	<.001	<.001	<.001	61.99 (0.89)	65.22 (1.73)	.10	<.001	.02
Nonprofessional organized support	9.87 (0.83)	16.65 (0.65)	<.001	<.001	<.001	13.48 (0.55)	22.83 (1.52)	<.001	<.001	<.001
Emergency department	5.06 (0.61)	11.88 (0.62)	<.001	<.001	<.001	9.07 (0.46)	16.02 (1.38)	<.001	<.001	.001
Hospitalized overnight or longer	6.23 (0.63)	13.75 (0.58)	<.001	<.001	<.001	10.60 (0.49)	18.60 (1.41)	<.001	<.001	<.001
Age at first MDD treatment, mean (SE), y	33.74 (0.48)	31.46 (0.34)	<.001	<.001	.008	32.56 (0.29)	29.02 (0.62)	<.001	.04	.17
Duration from onset to first treatment, mean (SE), mo	41.36 (3.83)	49.37 (1.73)	.06	.09	.31	46.27 (1.83)	54.02 (4.28)	.11	.04	.07
Suicidality, % (SE)[a]										
Thought a lot about one's own death	19.97 (1.14)	39.82 (0.87)	<.001	<.001	<.001	31.55 (0.80)	52.36 (1.58)	<.001	<.001	<.001
Wanted to die	31.39 (1.45)	51.95 (1.08)	<.001	<.001	.07	43.82 (0.91)	62.59 (1.76)	<.001	<.001	<.001
Thought a lot about suicide	25.90 (1.23)	43.87 (0.96)	<.001	<.001	.02	36.85 (0.83)	52.68 (1.77)	<.001	<.001	.002
Attempted suicide	6.27 (0.74)	16.12 (0.70)	<.001	<.001	<.001	11.97 (0.64)	22.59 (1.52)	<.001	<.001	<.001
SF-12v2 Score, Mean (SE)										
Mental health	49.14 (0.31)	45.58 (0.19)	<.001	<.001	<.001	46.93 (0.17)	44.05 (0.45)	<.001	<.001	.006
Social functioning	49.55 (0.31)	45.82 (0.20)	<.001	<.001	<.001	47.39 (0.19)	43.41 (0.42)	<.001	<.001	<.001
Role-emotional functioning	47.72 (0.25)	44.20 (0.18)	<.001	<.001	<.001	45.71 (0.18)	41.73 (0.42)	<.001	<.001	<.001
Mental component summary	48.70 (0.29)	44.86 (0.17)	<.001	<.001	<.001	46.40 (0.16)	42.75 (0.44)	<.001	<.001	<.001

Abbreviations: MDD, major depressive disorder; NA, not applicable; SF-12v2, version 2 of the 12-Item Short Form Health Survey.

[a] Dichotomous row variables were modeled with logistic regression. Continuous row variables were modeled with linear or log-linear regression.

[b] During the lifetime episode when mood or anhedonia was at its worst.

[c] Mixed features do not meet full criteria for either mania or hypomania and could characterize any MDD episode.

[d] Crude association.

[e] Controls for sociodemographic variables (sex, race/ethnicity, age, marital status, educational level, family income, urbanicity, and region).

[f] Controls for sociodemographic variables (sex, race/ethnicity, age, marital status, educational level, family income, urbanicity, and region) and severity (mild, moderate, or severe).

death of someone close and remitting in less than 2 months were characterized as bereavements, as was done in previous research.[32] Other studies with relevant data could explore other bereavement definitions. Our definition of the anxious/distressed specifier used a lower threshold than *DSM-5*, which may have somewhat inflated the rates, an issue meriting future study using different data. AUDADIS-5 used a slightly different algorithm for PTSD than the final *DSM-5* definition, caused by a last-minute *DSM-5* change that occurred too late to implement in NESARC-III. Furthermore, we defined the *DSM-5* severity specifier by MDD symptom counts, which are straightforward, transparent, and replicable. This approach enabled us to examine the association between these severity levels and SF-12v2 impairment scores. The *DSM-5* also suggests incorporation of distress and impairment levels into the severity classifications but defines these vaguely. Future studies should develop brief, psychometrically sound measures of these domains for epidemiologic studies. Also, a response rate greater than 60.1% would be preferable. However, NESARC-III response rates compare favorably with other recent national health surveys.[86-88] Finally, methodological studies addressing the addition of hopelessness and symptoms observed by others but not subjectively experienced would contribute useful information, as would future surveys using *DSM-5* footnotes to MDD on bereavement to develop a new bereavement instrument or incorporating complicated grief measures (eg, those by Shear and colleagues).[89] These limitations are offset by the large sample, reliable and valid measures of psychiatric and substance disorders, and rigorous study methods. NESARC-III is also unique in providing current, comprehensive national information on *DSM-5* MDD and its specifiers that is unavailable from any other source.

The NESARC-III 12-month and lifetime MDD prevalences (10.4% and 20.6%, respectively) are higher than those of the 2001-2002 NESARC (5.3% and 13.2%, respectively). Increases between surveys can occur for many reasons,[90] including methodological (eg, *DSM* changes and unspecified survey effects) or substantive (eg, true increases, perhaps due to growing economic insecurities[1] or other societal changes). Removing the bereavement exclusion in *DSM-5* could have accounted for a small amount of the prevalence increase in NESARC-III, but not for all of it by any means. Studies examining methodological issues would be valuable but are beyond the present scope. The likelihood that NESARC-III indicates valid increases in prevalence is supported by the coherence of its results with 6 other reports showing national increases in depression indicators[1,2] (also Katherine M. Keyes, PhD, written communication, January 2, 2018) and suicidality.[1,86,91,92] Based on this consistent picture of increasing depression indicators from multiple sources, we suggest that a prudent public health response would be to take these increases seriously in formulating service delivery and policy rather than dismissing all of the findings, including the NESARC to NESARC-III increases, on methodological grounds. Of some interest is whether participants diagnosed as having MDD in NESARC and NESARC-III differ on severity indicators, including suicide attempts and hospitalization rates, a useful topic to address in a future study.

Conclusions

This study on MDD prevalence, demographic and psychiatric correlates, disability, treatment use, and specifiers can inform policymakers, clinicians, and the public, as well as stimulate investigation in several areas. While many with MDD receive treatment, others remain untreated. The high prevalence of MDD among US adults is a substantial concern given the personal, public health, and economic burdens that the disorder imposes. Therefore, the need to reduce the prevalence of this disorder remains.

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