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Longitudinal predictors of first time depression treatment utilization among adults with depressive disorders

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Abstract
Purpose Depressive disorders are a growing public health concern, however, a substantial number of depressed individuals do not receive treatment. This study examined the longitudinal predictors of receiving depression treatment among adults with persistent depressive disorders and no lifetime history of treatment.
Methods The sample included respondents to the National Epidemiologic Survey on Alcohol Related Conditions (NESARC), a large population-based survey, who met criteria for a 12-month major depressive disorder (MDD) or dysthymia (DYS) and had no prior depression treatment. Bivariate and multivariate analyses were conducted examining which socio-demographic and clinical predictors among individuals with depressive disorders and no prior treatment at Wave 1 were associated with receiving depression treatment at Wave 2 ($N = 337$).
Results Only 47.2% of those with MDD or DYS and no prior treatment at Wave 1 had received depression treatment at Wave 2. Females were more likely to have received treatment at Wave 2: those of Hispanic ethnicity, other race, unmarried, 12 years of education, self-rated health of good/very good/excellent and anxiety disorders were less likely to have received treatment at Wave 2. Those with substance use disorders were more likely to have received treatment at Wave 2.
Conclusions This study highlights individuals who would likely benefit from increased efforts to enhance depression treatment utilization.

Keywords Major depressive disorder · Service utilization · Longitudinal predictors

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Introduction

Depressive disorders have been found to be associated with increased impairment in role functioning, poorer quality of life, mortality due to physical illness, and suicide [1–4]. Major depressive disorder (MDD) is one of the most common psychiatric disorders, with a 12-month prevalence estimates ranging from 5 to 10% [5–10]; 12-month prevalence estimates for dysthymic disorder (DYS) ranging from 2 to 5% [5, 6, 9]. Depressive disorders are a growing public health concern, as research has estimated that by 2050 there will be a 35% increase in the lifetime prevalence of depressive disorders in the adult population [11]. Among those with MDD and DYS, a significant proportion are persistently ill, having symptoms lasting longer than 24 months [12, 13]. Those with persistent illness are more likely to have chronic medical conditions and a history of suicidal ideation [12]; therefore, it is important to understand the factors related to receiving treatment among this chronically ill population.

Over the last 20 years, the overall rate of outpatient treatment for depression has increased [14–16]. The proportion of individuals receiving psychiatric medications

has increased [14, 15]; however, the proportion of individuals receiving psychotherapy has declined, as has the mean number of psychotherapy visits [14, 16]. Many of those with depressive disorders who receive treatment receive a combination of both medication and counseling [7, 14]. Despite increases in overall rates of depression treatment, there are still a substantial number of depressed individuals who do not receive treatment. Recent studies report that among those with an MDD diagnosis, only 36–60% received treatment in the past 12 months [7, 8, 10, 17]. Few of those who receive treatment for depressive disorders receive minimally adequate care (21.7–37.5%) [10, 12, 17]. While the mean age of onset for MDD is 30.4 years, the mean age at first treatment is 33.5 years, almost 4 years later [8]. More research is needed to examine the factors related to delaying initiation of depression treatment in order to improve access to treatment among those individuals.

Several studies have examined the socio-demographic characteristics of those with psychiatric disorders generally, and depressive disorders specifically, which are associated with receiving mental health treatment. Past studies of mental health service use among those with psychiatric disorders generally have consistently found that those who are female, non-Hispanic White, and previously married or never married are more likely to receive treatment [17, 18]; however, the findings on how age, education, income, and urbanicity are associated with treatment are inconsistent. One study reported that those who are 18–24 years old are significantly less likely to receive mental health services, but found no relationship between income or urbanicity and treatment [18]. Another study reported that those who are younger than 60 years, do not have a low-average family income, and not living in a rural area are more likely to receive mental health services [17]. In terms of education, several reports show no significant association between education and receipt of "any" treatment for a psychiatric disorder [17–19]; however, less education has been found to be associated with a reduced likelihood of receiving specialty mental health care [17, 18]. A national study examining the overall rate of antidepressant medication treatment between 1996 and 2005 found that there was a significant increase in the rate of antidepressant treatment for males and females, individuals of all ages, marital statuses, educational achievement, health insurance groups, and for the employed and unemployed; however, the rate of antidepressant treatment did not increase significantly for African Americans [15]. Similarly, another national study examining outpatient treatment for depression found that there was a significant increase in the rate of outpatient depression treatment across all socio-demographic groups between 1987 and 1997 [14]. Past research has also found that clinical factors are associated with the receipt of depression treatment in that those with a previous depression diagnosis, psychiatric comorbidity, longer symptom duration, more severe symptoms, and greater role impairments are more likely to receive treatment [7, 10].

Understanding the socio-demographic and clinical characteristics that predict receiving depression treatment is important because untreated depression is associated with societal burden, poor quality of life, and increased morbidity and mortality [3, 7, 20, 21]. To our knowledge, no prior research has examined the longitudinal predictors of receiving depression treatment in a cohort of untreated depressed adults who have persistent symptoms. This chronically ill population is an important group for examination as they may be more susceptible to the negative outcomes associated with untreated depression. Additionally, given data demonstrating that there is a lag between initial diagnosis and receipt of first treatment [8], this study could inform outreach and interventions aimed at depressed individuals who are more likely to delay or forgo depression treatment. This study uses data from the National Epidemiologic Survey on Alcohol Related Conditions (NESARC), a large population-based survey, to examine the socio-demographic and clinical predictors of receipt of depression treatment among individuals with a 12-month MDD or DYS and no prior depression treatment. Given past research on service utilization among those with psychiatric disorders generally, we expect that those who are female, non-Hispanic White, with higher education and incomes, and unmarried will be more likely to receive treatment at follow-up. Additionally, we expect that those with comorbid psychiatric conditions and in poorer health will be more likely to receive treatment at follow-up.

Methods

Sample

The NESARC is a nationally representative face-to-face prospective longitudinal survey conducted by the US Bureau of the Census, for the National Institute on Alcohol Abuse and Alcoholism (NIAAA), via computer assisted personal interviewing (CAPI). The survey methods and study methodology have been previously published [22]. The NESARC collected data from a general population sample of civilian, non-institutionalized populations residing in households and group quarters, 18 years and older, living in the US, including the District of Columbia, Alaska, and Hawaii. Blacks, Hispanics, and young adults (ages 18–24 years old) were oversampled with data adjusted for over sampling and household- and person-level non-response. Once weighted, the data were adjusted

to be representative of the US population for region, age, sex, race, and ethnicity, based on the 2000 Decennial Census of Population and Housing. The US Office of Budget and Management approved the NESARC research protocol, and the University of Michigan Institutional Review Board approved the current secondary data analysis.

Data collection for the NESARC occurred in two Waves. Wave 1 was conducted between 2001 and 2002, in which 43,093 individuals were interviewed with a response rate of 81.0%. Wave 2 was conducted between 2004 and 2005, consisted of 34,653 individuals, with a response rate of 86.7%. The present analyses focused on the individuals who met criteria for a 12-month MDD or DYS in the Wave 1 NESARC, reported that they had never received any prior treatment related to their diagnosis of MDD or DYS at Wave 1 ($N = 1286$), and had persistent symptoms between Waves 1 and 2 which elicited query of MDD and DYS treatment on the Wave 2 survey ($N = 337$).

Measures

Diagnostic assessment

All diagnoses in the NESARC were made according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition [23], by using The National Institute on Alcohol Abuse and Alcoholism Use Disorder and Associated Disabilities Interview Schedule-DSM-IV Version (AUDADIS-IV), a diagnostic interview designed for use by lay interviewers [24]. The test–retest reliabilities of AUDADIS-IV measures of DSM-IV mood and anxiety disorders are fair to good ranging from $k = 0.42$ for specific phobia to $k = 0.64$ for major depression. The sample for this study included survey respondents who met criteria for a primary diagnosis of 12-month MDD or dysthymic disorder, ruling out substance-induced episodes or episodes due to a general medical condition.

Mental health service use assessment

At both Waves 1 and 2 NESARC respondents were asked if they (1) went to a counselor, therapist, physician, psychologist, or person like that to get help to improve mood, (2) stayed overnight in a hospital because of depression, (3) went to an emergency department for help because of depression, or (4) had a doctor prescribe them medicine/drug to improve mood/make them feel better for MDD and dysthymia. An affirmative answer to *any* of these questions was utilized as an indicator of having received treatment. Respondents who answered no to *all* of these questions were considered as not having received any depression treatment. The service utilization questions from Wave 1 were used to define the sample of individuals who met criteria for a 12-month MDD or DYS and had no prior history of depression treatment (the study sample). The Wave 1 questions asked about the respondents' lifetime service use. The service utilization questions from Wave 2 were used to identify the individuals who received treatment for MDD or DYS for the first time between Waves 1 and 2 (outcome variable).

Socio-demographic and clinical variables

The socio-demographic variables examined included sex, age (18–34, 35–54, >55), race/ethnicity (White, Black, Hispanic, and other), marital status (married/cohabitating, divorced/widowed/separated, never married), education (≤12, some college or more), personal income (0–19,999; 20,000–34,999; >35,000), and insurance (public, private, none). The "other" race variable included individuals who identified themselves as American Indian/Alaska Native, Asian/Native Hawaiian, or Pacific Islander. Individuals who had both public and private insurance were included in the private insurance sub-category ($N = 14$). The clinical variables included self-rated health (good/very good/excellent), mania/hypomania (yes/no), anxiety disorders (yes/no), and substance use disorders (yes/no). The anxiety disorders variable included those who met DSM-IV criteria during the AUDADIS-IV assessment for: panic without agoraphobia, panic with agoraphobia, agoraphobia without panic, social phobia, specific phobia, and generalized anxiety disorder. These were diagnoses that were not substance or illness induced. The substance use variable included those who met DSM-IV criteria during the AUDADIS-IV assessment for: alcohol abuse/dependence, amphetamine abuse/dependence, sedative abuse/dependence, tranquilizer abuse/dependence, cocaine abuse/dependence, inhalant or solvent abuse/dependence, hallucinogen abuse/dependence, cannabis abuse/dependence, heroin abuse/dependence, and "other drug" abuse/dependence. We excluded nicotine and caffeine abuse/dependence from the substance use variable.

Analysis procedures

Descriptive information is provided for the sample of individuals at Wave 1 who met criteria for a 12-month MDD or DYS diagnosis, reported no lifetime treatment, and had symptoms that persisted between Waves 1 and 2. Chi-square tests were conducted examining the bivariate associations between the socio-demographic and clinical variables and receipt of treatment for MDD or DYS at Wave 2. Additionally, multivariable logistic regression analyses were conducted examining the relative impact of each predictor, controlling for all other predictors, on the likelihood of receiving treatment between Waves 1 and 2.

All analyses were conducted using Stata 11.0. We implemented a Taylor series linearization to adjust standard errors of estimates for complex survey sampling design effects including clustered data. Frequency weights, strata, and primary sampling units were used to adjust the parameter estimates and their variances, so that the results would reflect nationally representative relationships. An α level of $p \leq 0.05$ was used for all analyses.

Results

Of the 43,093 NESARC respondents in Wave 1, 3,418 (7.7%) met criteria for a 12-month MDD or dysthymia and 1,286 (37.6%) of those with past 12-month MDD or DYS had not previously received any form of treatment in their lifetime. Of these individuals, 337 had symptoms that persisted between Waves 1 and 2 and, therefore, had valid data on the measures of treatment utilization at Wave 2; this sample of 337 was used for all remaining analyses. Socio-demographic and clinical characteristics of the sample are provided in Table 1.

Overall, 47.2% of untreated adults with persistent depressive disorders received treatment between Waves 1 and 2. Of those with persistent MDD, 36.3% reported going to a counselor, 6.6% reported staying overnight in a hospital, 9.4% reported going to an emergency department, and 34.6% reported having a doctor prescribe medication for help with their mood. Of those with persistent DYS, 47% reported going to a counselor, 4.6% reported staying overnight in a hospital, 3.6% reported going to an emergency department, and 42% reported having a doctor prescribe medication for help with their mood (data not presented).

Table 2 presents unadjusted associations between Wave 1 patient characteristics and depression treatment utilization at Wave 2. In bivariate analyses, those who received treatment were significantly more likely to be female, White, and married/cohabitating. Additionally, treatment was significantly more likely among those who did not have a substance use disorder.

Results of the multivariable logistic regression analyses are presented in Table 3. Those who were female (OR 1.55; 95% CI 1.01–2.39) were more likely to receive treatment for depression between Waves 1 and 2. Those who were Hispanic (OR 0.47; 95% CI 0.37–0.59) and other race (OR 0.21; 95% CI 0.13–0.36) were less likely to receive treatment than those who were White. Those who were divorced/separated/widowed (OR 0.50; 95% CI 0.34–0.76) and never married (OR 0.44; 95% CI 0.30–0.63) were less likely to receive treatment than those

Table 1 Wave 1 descriptive characteristics of NESARC respondents with persistent depressive disorders ($N = 337$)

	%*	SE*	$N^{\#}$
Sex			
Male	31.60	2.07	94
Female	68.40	2.07	243
Age			
18–34	50.94	1.80	160
35–54	36.24	1.96	119
>55	12.82	0.77	58
Race/ethnicity			
White	60.71	1.39	167
Black	15.13	0.95	81
Hispanic	13.76	0.54	65
Other	10.40	0.84	24
Marital status			
Married/cohabitating	42.88	2.14	122
Divorced/separated/widowed	20.44	1.52	94
Never married	36.68	1.67	121
Education			
≤12	62.14	1.92	210
Some college or more	37.86	1.92	127
Employment			
Employed	76.15	1.53	248
Unemployed	23.85	1.53	89
Personal income			
0–19,999	70.05	1.90	231
20,000–34,999	16.38	1.05	64
≥35,000	13.57	1.90	42
Insurance status			
Public	17.97	1.36	76
Private	51.21	1.78	165
None	30.83	1.45	96
Self-rated health			
Fair/poor	28.63	1.76	100
Good/very good/excellent	71.37	1.76	236
Mania/hypomania			
No	82.92	1.36	278
Yes	17.08	1.36	59
Anxiety disorders			
No	59.43	1.61	210
Yes	40.57	1.61	127
Substance use disorders			
No	82.53	1.25	276
Yes	17.47	1.25	61

Persistent depressive disorders refers to respondents who met criteria for a depressive disorder at Waves 1 and 2

* Based on weighted data

Based on unweighted data

Table 2 Bivariate analysis of socio-demographic and clinical predictors of receipt of depression treatment at Wave 2 among those with persistent depressive disorders at Wave 1 and no previous treatment ($N = 337$)

	No W2 treatment (%)	W2 treatment (%)	χ^2	p value
Sex				
Male	36.00	26.69	246.33	0.05
Female	64.00	73.31		
Age				
18–34	51.31	50.52	51.22	0.36
35–54	34.66	38.01		
>55	14.03	11.47		
Race/ethnicity				
White	53.78	68.45	920.72	<0.001
Black	14.62	15.70		
Hispanic	16.78	10.39		
Other	14.82	5.47		
Marital status				
Married/cohabitating	35.63	50.99	662.78	<0.001
Divorced/separated/ widowed	21.20	19.59		
Never married	43.18	29.42		
Education				
≤12	61.11	63.30	12.54	0.56
Some college or more	38.89	36.70		
Employment				
Employed	74.01	78.53	69.06	0.16
Unemployed	25.99	21.47		
Personal income				
0–19,999	70.31	69.76	4.29	0.91
20,000–34,999	16.54	16.20		
≥35,000	13.15	14.04		
Insurance status				
Public	18.01	17.92	45.93	0.49
Private	49.39	53.24		
None	32.60	28.84		
Self-rated health				
Fair/poor	26.82	30.63	43.55	0.27
Good/very good/ excellent	73.18	69.37		
Mania/hypomania				
No	81.18	84.86	58.84	0.18
Yes	18.82	15.14		
Anxiety disorders				
No	58.49	60.47	10.04	0.48
Yes	41.51	39.53		
Substance use disorders				
No	85.60	79.11	179.70	0.01
Yes	14.40	20.89		

who were married/cohabitating. Depressed adults with some college education or more (OR 0.71, 95% CI 0.53–0.97) were less likely to receive treatment than those with a high school education or less. Depressed adults who self-reported their health as good/very good/excellent (OR 0.64, 95% CI 0.46–0.90) and without an anxiety disorder (OR 0.69, 95% CI 0.53–0.90) were less likely to receive treatment than those who self-reported their health as fair/poor and with an anxiety disorder. Finally, those with substance use disorders (OR 2.60, 95% CI 1.80–3.75) were more likely to have received treatment between Waves 1 and 2 than those without a substance use disorder.

Discussion

This study examined longitudinal predictors of receiving depression treatment among adults with a 12-month MDD or DYS diagnosis and no prior depression treatment history, using NESARC, a large population-based survey. Among those with a 12-month MDD or DYS diagnosis at Wave 1, 37.6% had no prior lifetime treatment at Wave 1, and only 47.2% of those had received treatment 3–4 years later at Wave 2. Females were more likely than males to have received treatment at Wave 2. Those who were, Hispanic ethnicity, other race, unmarried, and with some college education or more were less likely than those who were White, with high school education or less, and married/cohabitating to have received treatment at Wave 2. Depressed adults who rated their health as good or better and did not have an anxiety disorder were less likely to have received treatment at Wave 2, while those who had a substance use disorder were more likely to have received treatment at Wave 2. These results highlight the characteristics of individuals with persistent depression who are more likely to delay or forgo receipt of depression treatment and point to groups of individuals who may benefit from outreach.

Past studies using data from the National Comorbidity Survey (NCS) and National Comorbidity Survey-Replication (NCS-R) have examined the trends in treatment for psychiatric disorders generally. However, this the first study of which we are aware to examine the longitudinal impact of socio-demographic and clinical characteristics on receipt of treatment, among individuals with persistent MDD and DYS with no prior depression treatment. The findings from this study that those who were female were more likely to receive depression treatment at Wave 2 and those who were Hispanic and other race were less likely to receive depression treatment at Wave 2, are consistent with our hypotheses and cross-sectional results reported from the NCS and NCS-R [17, 18]. It has been well documented

Table 3 Multivariate analysis of socio-demographic and clinical predictors of receipt of depression treatment at Wave 2 among those with persistent depressive disorders and no history of prior treatment ($N = 337$)

	Depression treatment = yes				
	OR	Coef.	95% CI		*p* value
Sex (ref: male)					
Female	1.554	0.441	1.009	2.393	0.045
Age (ref: 18–34)					
35–54	0.842	−0.172	0.601	1.179	0.308
>55	0.685	−0.379	0.462	1.015	0.059
Race or ethnicity (ref: White)					
Black	0.757	−0.278	0.503	1.141	0.178
Hispanic	0.465	−0.765	0.369	0.586	0.000
Other	0.214	−1.543	0.128	0.357	0.000
Marital status (ref: married/cohabitating)					
Divorced/separated/widowed	0.504	−0.686	0.336	0.756	0.001
Never married	0.437	−0.827	0.305	0.627	0.000
Education (ref: ≤12)					
Some college or more	0.713	−0.338	0.527	0.966	0.030
Personal income (ref: 0–19,999)					
20,000–34,999	1.056	0.054	0.749	1.487	0.750
≥35,000	1.383	0.325	0.750	2.551	0.290
Insurance status (ref: public)					
Private	1.105	0.099	0.702	1.739	0.660
None	0.789	−0.237	0.482	1.292	0.337
Self-rated health (ref: fair/poor)					
Good/very good/excellent	0.642	−0.443	0.459	0.899	0.011
Mania/hypomania (ref: No)					
Yes	0.707	−0.347	0.430	1.162	0.166
Anxiety disorders (ref: No)					
Yes	0.692	−0.368	0.531	0.901	0.007
Substance use disorders (ref: No)					
Yes	2.602	0.956	1.805	3.750	0.000

All variables listed within the table were entered simultaneously into the same equation

Design $df = 39$

$F(17, 23) = 13.00$

Prob > $F = 0.000$

that females are more likely to participate in mental health treatment, and this study suggests that these findings are consistent when examining a persistently depressed population longitudinally. Past studies have suggested that racial/ethnic minorities may have a preference for informal supports rather than traditional mental health services [25]. Additionally, racial/ethnic minorities may be more susceptible to the impact of stigma related to having a psychiatric disorder and receiving treatment for the disorder [26]. Taken together, these findings suggest that there is a need to improve outreach efforts in order to promote participation in treatment among depressed individuals from racial/ethnic minority backgrounds. One step in this direction may be to provide psychoeducation about the symptoms of depression and available treatments to high risk minority populations. In contrast to the NCS and NCS-R findings that those who were separated/divorced/widowed or never married were more likely to receive depression treatment [17, 18]; this study found that those who were separated/divorced/widowed or never married were less likely to receive depression treatment at Wave 2. It may be that spousal support is an important factor in facilitating the receipt of treatment among adults with persistent symptoms of depression.

In contrast with our hypotheses, individuals with depression and no prior treatment history at Wave 1 with at least some college education were less likely to have received treatment at Wave 2 than those with a high school education or less. While this study did not examine the impact of education on receipt of different types of treatment due to concerns about low power, prior research examining recent trends in depression treatment reported that overall treatment for depression among those with <12 years of education has been increasing; however, receipt of psychotherapy and a combination of psychotherapy and antidepressants for those with <12 years of education has been decreasing [16]. Although income and insurance status were not significant in this study, it is

important to consider the impact of education within the context of income and insurance. Prior research has found that those with low-average income are less likely to receive mental health treatment [17], and those with public insurance are more likely to use services than those with private insurance, suggesting that public insurance provides a useful mechanism for individuals to receive treatment for mental health problems [27, 28]. It may be that those with more education and higher incomes are more likely to have private insurance with expensive co-pays or inadequate mental health coverage. More research is needed examining the interrelationships between education, income, and insurance on different types of mental health service use.

Previous studies have shown that people with psychiatric disorders are more likely to be in poor health [29]. The results of this study indicate that persons who rated their health as fair/poor were more likely to receive depression treatment at Wave 2. Individuals with co-occurring health problems may be more likely to perceive a need for care than those who are in good health. These findings suggest that efforts to integrate mental health into primary care, including screening for mental health symptoms within primary care, treating those with milder symptoms within primary care, and referring those with need to specialized mental health treatment are important. Other studies that have examined the impact of comorbid psychiatric disorders indiscriminately have found that those with comorbid psychiatric conditions are more likely to receive mental health treatment [7, 10]; however, this study expands upon these prior works by demonstrating that those with a comorbid anxiety disorder were less likely to have received treatment, those with a substance use disorder were more likely to have received treatment, and comorbid mania/hypomania had no significant effect. In supplemental analyses, we found that among those with a 12-month MDD or DYS and no prior lifetime history of treatment; 48% ($N = 152$) had a comorbid mania/hypomania or anxiety diagnosis. The majority of these individuals reported having received treatment for a comorbid condition at both Waves. This finding is consistent with past research that has demonstrated that those with psychiatric comorbidity, and more severe symptoms are more likely to receive treatment [7, 10]. While the treatments for these comorbid conditions may have aided somewhat in the treatment of depressive symptoms in this population, the fact that this group continued to have persistent symptoms of depression 3–4 years after the first interview suggests that condition-specific, evidence-based treatments are warranted. In supplemental analysis, we also found that the most common comorbid anxiety disorders were specific phobia (20%), generalized anxiety (17%), and social phobia (12%). It would be informative for future studies with a larger sample to examine the relative impact of different types of comorbid anxiety disorders on mental health treatment. Additionally, this study examined the longitudinal predictors of receipt of depression treatment generally (counseling, medication, emergency room, hospitalization), rather than receipt of minimally adequate treatment or receipt of specific depression treatment interventions. Future studies could expand upon the presented findings by examining the longitudinal predictors of receiving better quality care and evidence-based treatments for depression.

Although the results of this report clearly suggest that socio-demographic and clinical characteristics are important in predicting future depression treatment among those with persistent depression, the study has several limitations. Although diagnostic assessments were made on the basis of DSM-IV criteria, lay interviewers were used in the administration of the survey, which may have affected the reliability of the depressive diagnoses. Recall bias may have influenced the reporting of symptoms of depression or service utilization. Some of the respondents who reported not having received any services could have received services other than the four types of service that were queried. Additionally, the process of engaging in a diagnostic interview at Wave 1 for MDD and/or dysthymia could have increased respondents' concerns about their symptoms and prompted them to receive treatment, which could potentially bias the results of the Wave 2 assessment. Due to the design of the survey, service utilization among individuals who reported a 12-month depression at Wave 1, but did not report depression between Waves 1 and 2, could not be assessed. The number of participants who reported persistent depression was low, limiting the power to detect predictors of treatment utilization. Similarly, predictors of counseling, medication, hospitalization, and emergency room treatments may differ but these categories were collapsed due to the low number of respondents reporting any form of treatment. We were also unable to assess if those who did receive care, received minimally adequate care. It is also possible that black box warnings for antidepressant medications that came out between Waves 1 and 2 affected rates of treatment utilization in this population. There may have been other factors that were not examined, such as concrete barriers (time, transportation), which may have influenced the receipt of depression treatment. Future studies should seek to examine the relative impact of these factors on receipt of depression treatment over time. Finally, the data used in the study is now somewhat dated; however, it is the most recent of large scale epidemiological studies and it is unlikely that there have been drastic changes to the prevalence of persistent depression and rates of treatment since the collection of this data.

Conclusions

Despite these limitations, this is one of the first studies to examine the socio-demographic and clinical characteristics associated with the receipt of depression treatment over time using a large population-based survey. The findings indicate that individuals with untreated depression at Wave 1 who were Hispanic ethnicity, other race, divorced/separated/widowed or never married, some college education or more, self-rated health of good/very good/excellent, and with anxiety disorders were less likely to have received treatment at Wave 2. These findings suggest that it would be beneficial to increase efforts aimed at helping these individuals to access and engage in depression treatment. These efforts may be in the form of providing psychoeducation to underserved populations about signs and symptoms of depression and available treatment options, increased screening for depression in primary care clinics, improving follow-up with patients on missed appointments, including spouses and other family members to facilitate participation in treatment, and reducing concrete barriers.

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