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Prevalence of depressive symptoms and predictors of treatment among U.S. adults from 2005 to 2010

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ABSTRACT

Objectives: To determine nationally representative estimates of the prevalence of depressive symptoms and factors associated with treatment among those with moderate to severe symptoms.
Methods: A cross-sectional, retrospective analysis of adults age ≥18 years in the 2005–2010 National Health and Nutrition Examination Survey data who responded to the Patient Health Questionnaire (PHQ-9) was conducted (n=13,320). Depressive symptoms and severity were defined by PHQ-9 scores. Depression treatment was defined as either receiving antidepressants or seeing a mental health professional. Multivariable logistic regression analyses using population weights identified factors associated with having depressive symptoms and receipt of any treatment.
Results: The prevalence of depressive symptoms increased from 20.92% to 25.66% over 6 years. Among patients with moderate to severe depression, 38.66% received treatment. Multivariable analyses found that being female, other Hispanic, younger age, having certain chronic comorbidities or previous hospitalization, no health insurance and in poverty status were associated with having depressive symptoms (P<.05). Among patients with moderate to severe depression, being female, white, younger age, having comorbidities (arthritis and hypertension) or previous hospitalization were associated with receipt of treatment (P<.05).
Conclusions: The prevalence of depressive symptoms is high, and only a small portion of patients with moderate to severe depression received treatments. Treatment disparities exist and need improvement.

1. Introduction

Depression is a prevalent condition with significant economic burden for patients and their families. According to the World Health Organization, depression affects approximately 350 million people of all ages globally [1]. Findings from the National Health and Nutrition Examination Survey (NHANES) between 2005 and 2008 showed that 21.6% of the U.S. population aged 18 years and older, representing 42 million U.S. adults, had depressive symptoms in the past 2 weeks [2]. The economic burden of depression is reflected by cost to employers from lost workdays and increased health care expenditures [3,4]. Total health care expenditures for depression among U.S. adults were estimated at $22.8 billion in 2009. Specifically, ambulatory expenditures and prescription expenditures accounted for $8.2 and $12 billion, respectively, which was two times higher than the amount in 1999 [5].

Depression increases morbidity and is linked to decreased psychosocial ability, decreased work performance and increased risk of absenteeism in the workplace [6,7]. Depression also is prevalent among patients with other chronic conditions such as cancer, cardiovascular diseases, diabetes and chronic obstructive pulmonary disease (COPD) [1,8–10]. Evidence has shown that the severity of the depressive symptoms is a risk factor of all-cause mortality and cardiovascular-related mortality [11]. In addition, cancer patients with depression had a 2-fold higher mortality rate during 17 years of follow-up [12].

Pharmacotherapy and psychotherapy are the main treatment strategies for depression. Severity of depression should be considered at the initiation of treatment. According to the American Psychiatric Association treatment guidelines, antidepressants are preferred for patients with moderate to severe depressive symptoms [13]. The use of a depression-focused psychotherapy may be considered for patients with mild to moderate severity. Combining both pharmacotherapy and psychotherapy may be more effective than either therapy alone, especially in patients with chronic, severe or complex illness [13]. The evidence from systematic review and meta-analysis suggests that antidepressants and psychotherapeutic treatment appear to be generally safe and have demonstrated efficacy in treating depressive symptoms [14–18]. For instance, Khan and colleagues conducted a systematic review using published and unpublished Food and Drug Administration data and revealed that antidepressants resulted in significant depressive symptoms reduction as compared to placebo (P<.001). Additionally, the combination of antidepressants and

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psychotherapy had significantly superior outcomes compared with antidepressants ($P=.027$) or psychotherapy alone ($P=.022$) [19].

Despite the availability of effective treatments for depression, less than half of the people with depression receive care worldwide [1]. In the U.S., only one third of Americans aged 12 years and older with severe depressive symptoms received an antidepressant treatment [20]. Moreover, less than 50% of patients who received multiple antidepressants have seen a mental health professional in the past year [20]. One study reported that approximately 17% of U.S. adults with moderately severe and severe depressive symptoms received pharmacotherapy, and among them, only 14.8% received both pharmacotherapy and psychotherapy by a mental health professional in the last year [2]. Similarly, this finding is consistent with a study of Medicare patients in which more than 30% of those with depressive symptoms did not receive any treatment [2,21]. Barriers to effective care can be a consequence of lack of resources, such as primary care facilities or physicians, screening, health insurance coverage, formulary restrictions of pharmacotherapy or limited access to psychotherapy and social stigma [22,23].

Recognizing the consequences of depression along with the importance of appropriate treatment, one of the objectives of Healthy People 2020 is to improve the proportion of treated American adults with major depressive episodes to 78.2% [24]. Thus, up-to-date evidence on the national estimates of depressive symptoms, severity and treatment is needed. The objective of this study was to estimate the prevalence of depressive symptoms across time in a nationally representative sample. We also examined factors associated with treatment among patients with moderate to severe depression to gain a better understanding of which types of patients are more or less likely to receive treatment.

2. Methods

2.1. Study design and sample

This study is a cross-sectional, retrospective study using the NHANES data from 2005 to 2010. The NHANES is a nationally representative survey conducted in 2-year increments since 1999. It consists of interviews and physical examinations. The survey uses a complex, stratified, multistage, probability sampling design. Participants are assigned a weight, and application of this sampling weight allows generalization for a representative sample of the civilian, non-institutionalized U.S. population [25]. Detailed information on NHANES data is published and available at the Centers for Disease Control and Prevention (CDC) website [25]. We pulled 3 cycles, representing 6 years, of NHANES data spanning 2005–2006, 2007–2008 and 2009–2010. Initially, a total sample size, which consisted of participants who were asked to complete the questions for the depression screener questionnaire, was 17,689 (weighted $n=194,685,449$). Next, those who did not have complete data for relevant demographic or health-related factors (e.g., comorbid diseases, hospitalization and poverty status) were excluded from the depressive symptoms cohort ($n=2518$, 14.23%). Consequently, the depressive symptoms cohort included a total sample of 15,171 (weighted $n=194,294,923$) U.S. participants who were 18 years old or older. We used the previously validated Patient Health Questionnaire (PHQ-9) to identify depression symptoms and severity. Participants who did not respond to the PHQ-9 were excluded from the study ($n=1851$, 12.20%). The final sample size included 13,320 (weighted $n=173,305,587$) U.S. adult participants.

2.2. Measures

2.2.1. Diagnosis and severity of depressive symptoms

Depressive symptoms were determined based on responses to the PHQ-9 questionnaire in the NHANES. The PHQ-9 questionnaire is a brief and valid tool that is comparable to the clinician administered version of the PRIME-MD interview [26]. The PHQ-9 is an instrument for diagnosis of depression in primary care settings based on the diagnostic criteria for a major depressive episode in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* [27–29]. It is a standard 9-item self-report depression scale that asks questions about the frequency of symptoms of depression over the past 2 weeks and has a score range from 0 to 27. Depressive symptoms were defined by PHQ-9 score of ≥ 5 [26]. Severity was defined by the PHQ-9 score, with scores of 5–9, 10–14, 15–19 and 20 or above indicating mild, moderate, moderately severe and severe depressive symptoms, respectively [26]. PHQ-9 scores previously have been used by Shim and colleagues to define depression severity [2]. According to Kroenke and colleagues, PHQ-9 scores of ≥ 10 (moderate to severe depressive symptoms) reflect patients that are particularly appropriate for pharmacotherapy and/or psychotherapy [30].

2.2.2. Depression treatment

Receipt of depression treatment was defined as patients either receiving antidepressants or seeing a mental health professional. Use of prescribed medication was ascertained through the NHANES questions in the Prescription Medication questionnaire asking if the participant had taken prescribed medication in the past month. Use of antidepressants was defined by a positive response (i.e., yes) to at least one prescribed antidepressant, including monoamine oxidase inhibitors, phenylpiperazine, selective serotonin reuptake inhibitors, serotonin–norepinephrine reuptake inhibitors, tetracyclic, tricyclic and miscellaneous antidepressants as coded and classified by the Lexicon Plus in Multum Lexicon Database [31]. Seeing a mental health professional was defined by a positive response (i.e., yes) to the NHANES questions in the hospital utilization and access to care questionnaire asking "During the past 12 months have you seen or talked to a mental health professional such as a psychologist, psychiatrist, psychiatric nurse or clinical social worker about your health?" [2]. This approach previously has been used by the CDC and Shim and colleagues [2,7].

2.2.3. Predictors

We identified potential predictors for depressive symptoms and treatment. Predictors included demographics (age, gender and race), comorbidities, socioeconomic factors (in poverty and insurance status) and health services utilizations (previous hospitalization) available in the NHANES survey. Age was categorized into four categories as 18–39, 40–59, 60–79 and 80 years and above. Gender (male and female) and race (white, Mexican American, other Hispanic American, African American and other) were categorized based on participants' responses. Individual comorbid disease statuses, including asthma, arthritis, cancer, heart failure, coronary heart disease (CHD), COPD, diabetes, high blood pressure and stroke, were ascertained as a positive response to NHANES questions on medical conditions that ask "Has a doctor or other health professional ever told you that you have [disease]?". CHD was defined as a positive response to at least one of CHD, angina or heart attack [32]. COPD was defined as a positive response to either chronic bronchitis or emphysema with negative response to current asthma [32]. Another chronic condition, obesity, was defined from the calculation based on weight and height as body mass index≥ 30 kg/m^2 [33].

Two socioeconomic factors, in poverty and insurance status, were also defined. Participants were classified as in poverty based on an index for the ratio of family income to poverty according to the Department of Health and Human Services (HHS) poverty guidelines [34]. Participants were categorized as poverty values ≤ 1.0 (being in poverty) and >1.0 (not being in poverty). Responses to having health insurance or having prescription insurance during the past 12 months were used to define health insurance and prescription insurance