Prevalence, Treatment, and Control of Depressive Symptoms in the United States: Results from the National Health and Nutrition Examination Survey (NHANES), 2005–2008

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Background: Depression remains a major public health problem that is most often evaluated and treated in primary care settings. The objective of this study was to examine the prevalence, treatment, and control of depressive symptoms in a national data sample using a common primary care screening tool for depression.

Methods: We analyzed a sample of adults (n = 4836) from 2005 to 2008 National Health and Nutrition Examination Survey data. Depressive symptoms were assessed using the Patient Health Questionnaire (PHQ-9) to determine the overall prevalence, rates of treatment, and antidepressant control of mild, moderate, moderately severe, and severe depressive symptoms.

Results: Of the sample, 20.1% reported significant depressive symptoms (PHQ-9) score, ≥5), the majority of whom had mild depressive symptoms (PHQ-9) score, 5–9). Even among individuals with severe depressive symptoms, a large percentage (36.9%) received no treatment from a mental health professional or with antidepressant medication. Of those taking antidepressants, 26.4% reported mild depressive symptoms and 18.8% had moderate, moderately severe, or severe depressive symptoms.

Conclusions: Despite greater awareness and treatment of depression in primary care settings, the prevalence of depressive symptoms remains high, treatment levels remain low, and control of depressive symptoms are suboptimal. Primary care providers need to continue to focus their efforts on diagnosing and effectively treating this important disease. (J Am Board Fam Med 2011;24: 33–38.)

Keywords: Depression, NHANES, PHQ-9

Depression continues to be major cause of illness and disability throughout the world.1–5 The World Health Organization identified depression as the fourth leading cause of total disease burden and the leading cause of disability worldwide.6 In the United States, recent samples estimate a lifetime depression prevalence of 16.2% and a 12-month prevalence of 6.6%.7

In the past, depression was often undiagnosed and untreated by physicians in primary care settings.8 Studies of elderly patients in primary care settings suggest that complex patients with multiple comorbidities have a higher risk of depression, which is more closely associated with their overall burden of illness than with any one specific disease.9 Although rates of treatment are increasing, many people still do not have adequate control of depressive symptoms.7 A recent study of a large national sample found that few Americans diagnosed with depression receive guideline-concor-
dant treatment, with racial/ethnic minority popula-
tions receiving even less treatment than non-Hispanic
whites. However, management and treatment of
depression in primary care settings is an important
issue; previous research has shown that individuals are
more likely to seek mental health treatment in pri-
mary care settings rather than in specialty mental
health clinics. This is particularly true of racial and
ethnic minority populations.

The National Health and Nutrition Examina-
tion Survey (NHANES) has been used to assess
nationwide levels of treatment and control of other
chronic diseases but not depression. According to
Cutler et al, NHANES has become “the principal
means to track progress in preventing, treating, and
controlling hypertension,” guiding national initia-
tives such as the National High Blood Pressure
Education program. In recent versions of the
NHANES, use of the Patient Health Question-
naire (PHQ)-9 has allowed for greater accuracy in
the diagnoses of mild, moderate, moderately se-
vere, and severe depressive symptoms. Gonzales
et al assessed treatment and control rates in a
multiethnic national sample using Collaborative
Psychiatric Epidemiology Survey data, but the di-
gnostic instrument used, the 16-item Quick In-
vventory of Depressive Symptomology—Self Re-
port is not as commonly used in primary care
settings as the PHQ-9. To date, there has been no
published study assessing prevalence, treatment,
and control using the nationally recognized
NHANES dataset and the PHQ-9 instrument,
which is widely used to screen for depression and to
guide ongoing treatment decisions in primary care
and psychiatric settings. Therefore, we examined
prevalence of depressive symptoms, rates of treat-
ment, and overall levels of treatment response us-
ing the PHQ-9 data in 2005 to 2008 NHANES
data.

Methods

Design

The NHANES is designed to assess the health and
nutritional status of Americans by combining inter-
views and physical examinations. The surveys
have been conducted annually by the National
Center for Health Statistics since 1999, using a
complex multistage sampling design to obtain a
representative sample of the civilian, noninstitu-
tionalized population of the United States. The
NHANES oversamples minorities and allows for
population estimates using population totals from
the Current Population Surveys. To obtain an ade-
quate sample size for the analyses we combined
the data from the 2005 to 2006 and 2007 to 2008
NHANES, for a potential total sample size of
11,791 adults aged 18 and older.

Measures

Depressive symptoms were assessed using the
PHQ-9, a 9-item screening tool that asks partici-
pants to choose 1 of 4 responses about the fre-
cuency of depressive symptoms during the previous
2 weeks. Those scoring ≥10 were characterized
as having moderate, moderately severe, or severe
depressive symptoms.

Antidepressant use was defined as taking at least
one prescribed antidepressant medication in the
past 30 days, as characterized by the Multum Lex-
icon Drug Database. During the household in-
terview, survey participants were asked if they had
taken a medication in the past month for which
they needed a prescription. Those who answered
“yes” were asked to show the interviewer the med-
ication containers of all the medications used.

Although the NHANES does not provide de-
tails on psychological counseling, we defined coun-
seling and various types of therapy as treatment
with a mental health professional, which was mea-
sured by the survey question, “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?”

Because evidenced-based treatment recommen-
dations for prescribing antidepressant medication
and/or administering psychotherapy exist for indi-
viduals with PHQ-9 scores ≥15, we specifically
examined all forms of treatment among respon-
dents that scored ≥15 on the PHQ-9. Evidence-
based treatment recommendations for individuals
with a PHQ-9 score <10 involve a strategy of
watchful waiting and reassessment for antidepres-
sant treatment or psychotherapy after 2 months.
Triangle Park, NC). First, overall prevalence of depressive symptoms and prevalence of the different depressive symptom severity categories were assessed for the entire adult population. Treatment (mental health professional and/or antidepressant) use by depressive symptom severity was then assessed. Prevalence of depressive symptoms, depressive symptom severity, and treatment among different age-sex groups was also examined.

Results
Among the total sample, 10,283 adults completed the PHQ-9. Based on their scores, 2,399 had depressive symptoms, representing 42,116,283 US adults (21.6%; 95% CI, 20.1–23.3), with 14.8% endorsing mild depressive symptoms, 4.52% endorsing moderate depressive symptoms, 1.8% endorsing moderately severe depressive symptoms, and 0.6% endorsing severe depressive symptoms. Table 1 shows the percentage of the population with depressive symptoms, categorized by age and sex.

Among individuals with moderately severe and severe depressive symptoms (for which guidelines recommend treatment with an antidepressant), 17.0% (95% CI, 12.7–22.6) received treatment with an antidepressant only; 17.6% (95% CI, 12.0–25.1) had seen a mental health professional only; and 14.8% (95% CI, 10.8–19.9) received ideal treatment of antidepressant and treatment by a mental health professional. Even among adults with the most severe depressive symptoms (PHQ-9 score ≥20), only 24.8% (95% CI, 12.1–44.0) had combined treatment with an antidepressant and a mental health professional, whereas a large percentage (36.9%; 95% CI, 24.8–51.0) received no form of treatment either from a mental health professional or with antidepressant medication (see Table 2).

Of the 10.4% of the US population currently taking antidepressant medications, 54.9% (95% CI, 51.2–58.5) were not currently experiencing depressive symptoms. Ongoing mild depressive symptoms continued to be reported by 26.4% (95% CI, 23.6–29.4); 11.9% (95% CI, 9.5–14.7) endorsed moderate depressive symptoms; 4.9% (95% CI, 3.8–6.3) endorsed moderately severe depressive symptoms; and 2.0% (95% CI, 1.2–3.3) endorsed severe depressive symptoms.

Discussion
This study demonstrates the significant gap between optimal depression care and population-based, real-world measures of care. Given that such a large segment of the US population (roughly 1 in 5 adults, or 42.1 million Americans) screened positive for at least mild depressive symptoms, it may be seen as a major challenge to our nation’s health if such a burdensome disease is so frequently undiagnosed, untreated, or undertreated. In many ways it is analogous to the gap between prevalence of elevated blood pressure in the population and levels with the most severe depressive symptoms (PHQ-9 score ≥20), only 24.8% (95% CI, 12.1–44.0) had combined treatment with an antidepressant and a mental health professional, whereas a large percentage (36.9%; 95% CI, 24.8–51.0) received no form of treatment either from a mental health professional or with antidepressant medication (see Table 2).

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Table 1. Population with Mild, Moderate, Moderately Severe, and Severe Depressive Symptoms from Patient Health Questionnaire (PHQ)-9 Scores, by Age and Sex

<table>
<thead>
<tr>
<th>Depressive Symptoms</th>
<th>Mild (PHQ-9 score = 5–9)</th>
<th>Moderate (PHQ-9 score = 10–14)</th>
<th>Moderately Severe (PHQ-9 score = 15–19)</th>
<th>Severe (PHQ-9 score ≥20)</th>
<th>Total (Any Severity) (PHQ-9 score ≥5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (yr)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>18–54</td>
<td>435 (13.31)</td>
<td>142 (3.48)</td>
<td>38 (1.04)</td>
<td>16 (0.39)</td>
<td>631 (18.23)</td>
</tr>
<tr>
<td>≥55</td>
<td>208 (10.45)</td>
<td>72 (3.65)</td>
<td>35 (1.44)</td>
<td>6 (0.20)</td>
<td>321 (15.73)</td>
</tr>
<tr>
<td>All ages</td>
<td>643 (12.52)</td>
<td>214 (3.52)</td>
<td>73 (1.15)</td>
<td>22 (0.34)</td>
<td>952 (17.53)</td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (yr)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–54</td>
<td>586 (16.93)</td>
<td>242 (6.24)</td>
<td>103 (2.68)</td>
<td>37 (0.90)</td>
<td>968 (26.75)</td>
</tr>
<tr>
<td>≥55</td>
<td>335 (17.06)</td>
<td>89 (3.77)</td>
<td>40 (1.56)</td>
<td>15 (0.44)</td>
<td>479 (22.82)</td>
</tr>
<tr>
<td>All ages</td>
<td>921 (16.97)</td>
<td>331 (5.47)</td>
<td>143 (2.33)</td>
<td>52 (0.75)</td>
<td>1447 (25.52)</td>
</tr>
</tbody>
</table>

Values provided as n (%).
*Data from the National Health and Nutrition Examination Survey, 2005 to 2008.
of detection, treatment, and “treat-to-target” control of hypertension. Although impressive gains have been made (for example, the proportion of hypertensive patients with at least partially controlled blood pressure, defined by blood pressure \( <160/95 \), rose from 16% in 1972 to 67% in 1991); still, only 34% of patients with hypertension have blood pressure completely under control, 25% are partially treated but uncontrolled, 11% are taking no medication, and 30% are unaware that they even have high blood pressure. Eisenberg and Power used the phrase “voltage drop” to describe the gap between potentially achievable outcomes and those outcomes actually achieved in real-world practice settings, and ultimately in community-based populations.

Primary care clinicians approach patients not as single disease or risk factors, but as whole persons, understanding that depression confers a direct burden of suffering but also complicates the management of various other chronic diseases or risk factors. For example, the epidemiologic evidence for an association between depression and cardiovascular risk is quite strong. Depression prevalence is also higher among individuals with diabetes, and depression is correlated with poor glycemic control. Depression and metabolic syndrome are correlated as well, and each is an independent predictor of adverse cardiac outcomes.

Beyond considering depression as a risk factor, however, depression is also a disabling disease unto itself, accounting for disability, reduced quality of life, loss of work days, damage to relationships, and even suicide. Although recognition of depression has improved, our data show that more than half of US adults with depressive symptoms are untreated, and 3 of 4 people with severe depressive symptoms are not taking antidepressant medications. Treatment to remission significantly reduces relapse rates in depression; however, almost half of people taking antidepressants have not achieved remission of depressive symptoms.

Formal screening protocols in primary care practices identify many more patients with depressive symptoms than are diagnosed in usual care models. There is an emerging body of evidence to suggest that although screening protocols do detect more cases of depression, they do not by themselves reduce the burden of disease or even improve outcomes. The US Preventive Services Task Force only recommends screening adults for depression in clinical practices that have systems to ensure accurate diagnosis, effective treatment, and follow-up. However, when coupled with structured approaches to depression care management such as the 3-component model, which integrates nurse care managers and mental health professionals into the primary care practice team, improved outcomes can be achieved. The (Prevention of Suicide in Primary Care Elderly: Collaborative Trial) study showed that medical complexities and comorbid chronic disease common to general internal medicine practices affect treatment outcomes for depression in usual-care settings, but that the impact of comorbidities on depression outcomes can be eliminated with a more intensive approach to depression care.

There are limitations to our study. The use of a national survey provides generalizable data we can apply to the entire noninstitutionalized US population, but it does lack the clinical specificity that might be obtained from direct review of clinical

<table>
<thead>
<tr>
<th>Depressive Symptoms</th>
<th>Moderate (PHQ-9 score = 10–14)</th>
<th>Moderately Severe (PHQ-9 score = 15–19)</th>
<th>Severe (PHQ-9 score ≥ 20)</th>
<th>Moderately Severe and Severe (PHQ-9 score ≥ 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacologic treatment only</td>
<td>16.9 (13.1–21.5)</td>
<td>17.9 (13.0–24.1)</td>
<td>14.4 (6.5–28.9)</td>
<td>17.0 (12.7–22.6)</td>
</tr>
<tr>
<td>Mental health professional only</td>
<td>13.3 (9.3–18.9)</td>
<td>15.6 (9.9–23.7)</td>
<td>23.9 (13.9–37.9)</td>
<td>17.6 (12.0–25.1)</td>
</tr>
<tr>
<td>Both pharmacologic treatment and mental health professional</td>
<td>11.1 (7.9–15.5)</td>
<td>11.6 (8.1–16.4)</td>
<td>24.8 (12.1–44.0)</td>
<td>14.8 (10.8–19.9)</td>
</tr>
<tr>
<td>Neither pharmacologic treatment nor mental health professional</td>
<td>58.8 (51.9–60.6)</td>
<td>54.9 (47.3–62.2)</td>
<td>36.9 (24.8–51.0)</td>
<td>50.6 (43.8–57.4)</td>
</tr>
</tbody>
</table>

Values provided as % (95% CI).

*Based on Patient Health Questionnaire (PHQ)-9 scores. Data from the National Health and Nutrition Examination Survey, 2005 to 2008.
The PHQ-9 is a self-administered instrument validated for screening, diagnosis, and assessment of the severity of depressive symptoms, with a sensitivity and specificity of 88% each for major depression. It is more easily adapted to high-volume primary care settings than instruments such as the Zung or Hamilton Depression Rating Scales.

Using a PHQ-9 score ≥5 to indicate mild, moderate, moderately severe, or severe depressive symptoms, NHANES provides a higher prevalence estimate (21.6%, or more than 40 million Americans) than other recent surveys. However, combining only moderate, moderately severe, and severe depressive symptoms gives a point prevalence of 6.8%, which is more consistent with other national estimates of a prevalence over a 12-month period of 6.6%. This may indicate that other instruments are not detecting mild depressive symptoms, or that the PHQ-9 threshold of 5 may be overly sensitive but not specific.

It is possible that individuals who screened positive on the NHANES PHQ-9 underreported treatment, either because of recall errors or additional factors (eg, stigma associated with mental illness and its treatment). In addition, individuals who report taking an antidepressant drug may be taking it for conditions other than depressive symptoms and therefore have low PHQ-9 scores. This would lead to an overestimate of the proportion of the population treated to remission, which is already low. We also have no repeated measures or longitudinal tracking to assess the impact of treatment on recently diagnosed individuals, or to estimate the rate of partial response to treatment (>50% reduction in PHQ-9 score).

Furthermore, individuals with bipolar depression may have elevated PHQ-9 scores, but may be prescribed mood stabilizers rather than antidepressants for treatment of depressive symptoms. Although this represents an extremely small number of individuals, it could lead to a slight underestimate of antidepressant treatment rates for individuals with moderately severe or severe depressive symptoms.

Conclusion

Despite these limitations, these nationally representative data provide a cross-sectional US population estimate of the prevalence of mild, moderate, moderately severe, and severe depressive symptoms. They also demonstrate that a substantial proportion of persons with symptoms of depression in the United States remain untreated or undertreated. The burden of illness represented by depression care, as well as new evidence suggesting that care and outcomes systematically can be improved, suggest important opportunities for optimizing the treatment of depression in primary care and community health settings as a means of improving overall population health.

References


