# Depression Screening in Adolescents in the United States: A National Study of Ambulatory Office-Based Practice

*Ian S. Zenlea, MD; Carly E. Milliren, MPH; Lauren Mednick, PhD; Erinn T. Rhodes, MD, MPH*

From the Division of Endocrinology, Boston Children's Hospital (Drs Zenlea and Rhodes), Clinical Research Center, Boston Children's Hospital (Ms Milliren), Department of Psychology, Boston Children's Hospital (Dr Mednick), and Department of Pediatrics, Harvard Medical School (Drs Zenlea and Rhodes), Boston, Mass

Dr Rhodes is engaged in research with Merck, and her spouse currently owns stock in Bristol Myers Squibb. Her spouse has also previously owned stock in Bayer, Pfizer, Novartis, and Glaxo Smith Kline. Dr Rhodes's research with Merck is focused on type 2 diabetes mellitus and is therefore unrelated to the subject of this article. The other authors declare that they have no conflict of interest.

Address correspondence to Ian S. Zenlea, MD, Division of Endocrinology, Boston Children's Hospital, 333 Longwood Ave, 6th Floor, Boston, MA 02115 (e-mail: Ian.Zenlea@childrens.harvard.edu).

Received for publication July 24, 2013; accepted November 12, 2013.

## ABSTRACT

***OBJECTIVE:*** To determine the frequency of depression screening during ambulatory, office-based visits for adolescents seen in general/family medicine or pediatric practices in the United States using nationally representative data; to determine the patient-, provider-, and visit-level factors associated with depression screening during ambulatory visits to inform recommendations to promote screening.

***METHODS:*** This cross-sectional study used the 2005–2010 National Ambulatory Medical Care and National Hospital Ambulatory Medical Care Surveys. Data were limited to ambulatory, office-based visits to general/family medicine or pediatrics clinics for adolescents aged 12 to 18 years who did not have a documented diagnosis of depression.

***RESULTS:*** Depression screening was rare (0.2%; 95% confidence interval [CI] 0.1–0.3), and it was 80% less likely to occur during visits for Hispanic compared to non-Hispanic white adolescents (adjusted odds ratio [aOR] 0.2, 95% CI 0.1–0.7). Depression screening was 9.1 times more likely in the Northeast compared to the West (aOR 9.1, 95% CI 2.2–38.1) if there were no visits within past 12 months compared to 6 or more visits (aOR 6.1; 95% CI 1.8–20.4), and if stress management (aOR 24.2, 95% CI 11.8–49.5) or other mental health counseling (aOR 5.2, 95% CI 1.2–23.6) were provided.

***CONCLUSIONS:*** Depression screening for adolescents is rare and is associated with racial/ethnic and regional disparities. The integration of behavioral and mental health services within the patient-centered medical home might assist providers in identifying and treating depression and in addressing such disparities.

**KEYWORDS:** adolescent depression; adolescents; screening

**ACADEMIC PEDIATRICS** 2014;14:186–191

## WHAT'S NEW

Depression screening in adolescents during office-based, ambulatory visits in the United States occurs infrequently and is less likely to occur during visits for Hispanic compared to non-Hispanic white adolescents, and is more likely to occur in the Northeast compared to the West.

DEPRESSIVE DISORDERS ARE highly prevalent among adolescents and carry significant long-term morbidity. National surveys in the United States (US) show that the prevalence of dysthymia or major depressive disorder increases uniformly with age, with a nearly 2-fold increase from ages 13 to 14 (8.4%) to ages 17 to 18 years (15.4%).[1] Depression is associated with decreased academic performance, impaired social and family functioning, and poorer self-perceived general health.[2] In 2009, the United States Preventive Services Task Force (USPSTF) updated its 2002 policy statement on screening for major depressive disorder by recommending that screening be routinely performed for adolescents 12 to 18 years old when systems are in place to ensure accurate diagnosis, psychotherapy, and follow-up.[3] Routine depression screening may help providers identify vulnerable adolescents and increase the proportion who initiate treatment.

To our knowledge, there have been no published studies that have examined office-based depression screening practices for adolescents 12 to 18 years old in the US using nationally representative data. Our objectives were to determine the frequency of depression screening for adolescents who did not already have a documented diagnosis of depression; and to determine the patient-, provider-, and visit-level factors associated with depression screening during ambulatory visits to inform recommendations to promote screening.

## METHODS

### STUDY DESIGN

This study analyzed data from the 2005–2010 National Ambulatory Medical Care Survey (NAMCS) and National

Hospital Ambulatory Medical Care Survey (NHAMCS).[4,5] These are nationally representative surveys conducted by the National Center for Health Statistics regarding use and provision of care in outpatient settings in the US. The details describing the sampling procedure, sampling variation, and estimation procedures for the US NAMCS and NHAMCS are available online.[4,5] Briefly, NAMCS and NHAMCS use a multistage clustered probability sampling approach to sample US geographic regions. Office-based physician practices (stratified by specialty status) and hospital-based outpatient departments are selected within each region, and patient visits are sampled within physician practices and outpatient departments. These public-use data sets include design variables (weights) that can be used to construct national estimates. Within practices, for a 1-week reporting period, physicians complete a 1-page record form for a systematic sample of patient visits. Patient record forms include questions regarding patient demographics, reasons for the visit, diagnoses, diagnostic and screening examinations performed, medications prescribed, and patient education provided. Boston Children's Hospital's institutional review board considered this study exempt.

### Sample and Measures

Office-based visits were used as the units of analysis. Analyses were limited to visits to pediatric or general medicine practices for adolescents 12 to 18 years old who did not have a diagnosis of depression. Visits for adolescents with depression were identified for exclusion by the following: physician diagnosis of depression [International Classification of Disease, 9th edition, Clinical Modification (ICD-9-CM) codes 296.2–296.36; 300.4 or 311]; "depression" provided as the reason for visit; or if the provider marked an "x" for the question, "Regardless of the diagnoses written … does the patient now have: depression?" This item was added for exclusion because the question is intended to supplement the diagnoses related to the visit. Depression screening was indicated by the provider marking an "x" in response to the prompt, "Diagnostic/Screening Services . . . Examinations: Depression screening."

### Statistical Analyses

Descriptive statistics were presented as weighted proportions with 95% confidence intervals (CIs). Estimates were considered reliable if they had a relative standard error less than 30% and if the unweighted sample had at least 30 patient visits. As a result of small sample sizes for some variables, data from 2005 to 2010 NAMCS and NHAMCS were combined. The chi-square test was used for all bivariate analyses. Patient-, provider- and practice-level variables (Tables 1 and 2) deemed clinically important (gender, race/ethnicity, and major reason for visit) or associated with depression screening (at $P \leq .20$) in bivariate analyses were entered into a multivariable logistic regression model to identify factors significantly associated with depression screening at $P < .05$. National estimates, CIs, and $P$ values were derived by using sampling weights from NAMCS/NHAMCS implemented with the SAS survey procedures. Stratification and clustering of visits within geographic region and physician were accounted for by masked design variables provided by NAMCS/NHAMCS. Data analyses were conducted by SAS version 9.3 (SAS, Cary, NC).

## Results

### Ambulatory Visits for Nondepressed Adolescents

Tables 1 and 2 report patient-, provider-, and practice-level characteristics for sampled visits without documented depression. There were 143,280,182 weighted clinic visits (46,347 total sampled visits). Of the weighted clinic visits, adolescents were predominantly non-Hispanic white (60.5%) with private insurance (56.4%). About half of visits were for an acute problem (52.1%).

### Depression Screening Among Nondepressed Adolescents

Depression screening was documented in 0.2% (95% CI 0.1–0.3) of weighted clinic visits (104 sampled visits). The final multivariable logistic regression model revealed racial/ethnic and regional variation in depression screening (Table 3). There was a significantly decreased odds of depression screening among Hispanic patients (adjusted odds ratio [aOR] 0.2, 95% CI 0.1–0.7) compared to non-Hispanic white patients. There was a significantly increased odds of screening in the Northeast compared to the West (aOR 9.1, 95% CI 2.2–38.1). Depression screening was also 6.1 times (95% CI 1.8–20.4) more likely if there were no visits within the past 12 months compared to 6 or more visits, and if stress management (aOR 24.2, 95% CI 11.8–49.5) or other mental health counseling (aOR 5.2, 95% CI 1.2–23.6) was provided. No other patient-, provider-, or practice-level characteristics were significant.

## Discussion

To our knowledge, this is the first study to evaluate the frequency of depression screening during office-based visits for adolescents using nationally representative data in the United States. In this sample, documented screening was rare (0.2% of visits). The infrequent performance of depression screening is surprising when interpreted in the context of a recent American Academy of Pediatrics (AAP) survey, which showed that approximately 90% of pediatricians thought they should be responsible for the identification of depression.[6] This apparent gap between perceived responsibility for identification and the performance of screening is likely the result of previously cited barriers to screening, including lack of time, lack of qualified mental health providers to whom to refer, lack of training, and inadequate reimbursement.[7,8] To address these barriers and improve access, collaboration, and coordination for pediatric mental health care, the AAP and the American Academy of Child and Adolescent