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Differences in the Clinical Recognition of Depression in Diabetes Patients: The Diabetes Study of Northern California (DISTANCE)

Darrell L. Hudson, PhD, MPH[1], **Andrew J. Karter, PhD**[2], **Alicia Fernandez, MD**[3], **Melissa Parker, MS**[2], **Alyce S. Adams, PhD**[2], **Dean Schillinger, MD**[3], **Howard H. Moffet, MPH**[2], **Jufen Zhou, MS**[2], and **Nancy E. Adler, PhD**[4]

[1]George Warren Brown School of Social Work, Washington University in St. Louis

[2]Kaiser Permanente Division of Research, Oakland, CA

[3]Division of General Internal Medicine, University of California, San Francisco

[4]Center for Health and Community, University of California, San Francisco

Abstract

Background—It is unknown to what extent the gap between need and care for depression among patients with diabetes differs across racial/ethnic groups.

Objective—We compared, by race/ethnicity, the likelihood of clinical recognition of depression (diagnosis or treatment) of patients who reported depressive symptoms in a well-characterized community-based population with diabetes.

Design—We used a survey follow-up study of 20,188 patients with diabetes from Kaiser Permanente Northern California. Analyses were limited to 910 patients who scored 10 or higher on the Patient Health Questionnaire (PHQ-8) which was included in the survey and who had no clinical recognition of depression in the12 months prior to survey. Clinical recognition of depression was defined by a depression diagnosis, referral to mental health services, or antidepressant medication prescription.

Key Results—Among the 910 patients reporting moderate to severe depressive symptoms on the survey and who had no clinical recognition in the prior year, 12%, 8%, 8%, 14%, and 15% of African American, Asian, Filipino, Latino and white patients were clinically recognized for depression in the subsequent 12 months. After adjusting for sociodemographics, limited English proficiency, and depressive symptom severity, racial/ethnic minorities were less likely to be clinically recognized for depression compared to whites (relative risk: Filipino: 0.30, African American: 0.62).

Conclusions—More work is needed to understand the modifiable patient and provider factors that influence clinical recognition of depression among diabetes patients from different racial/ethnic groups, and the potential impact of low rates of clinical recognition on quality of care.

Introduction

Depression is one of the most common and costly mental disorders among primary care patients in the United States.[1-7] Depression is even more common among people with diabetes,[8-14] among whom it is associated with less adequate self-care (e.g. poorer diet, physical inactivity, medication non-adherence, and poorer glycemic control), and poorer quality of life.[15-20] Comorbid depression and diabetes has also been linked to increased risk

Correspondence to: Darrell L. Hudson.

of mortality and cognitive decline.[21] Findings from the TRIAD study involving 8,790 adults with diabetes enrolled in ten managed care health plans in seven states indicate that depressed patients achieve poorer diabetes control compared to patients who were not depressed.[18,22] Depression is treated less aggressively in patients with multiple co-morbidities[23] and among patients with diabetes, depression is often undertreated, particularly in racial/ethnic minority groups.[24]

Compared to whites, U.S. racial/ethnic minority groups have a greater prevalence of diabetes,[25,26] have greater concerns about medication use,[38] are more likely to have poorly controlled diabetes,[18,27] and experience greater incidence of some of the major complications related to diabetes.[28,29] These groups may also receive less adequate treatment for co-morbid depression. Depression is under-diagnosed in general[30-32] and may be even more so in some racial/ethnic minority groups.[1,33,34] While findings from psychiatric epidemiologic studies indicate that rates of depression diagnosis for racial/ethnic minorities are generally lower than those for whites, members of racial/ethnic minority groups diagnosed with clinical depression report a greater burden of depressive symptoms and rate their depression as more severe and disabling than for whites.[7,35] Higher rates of depressive symptoms among racial/ethnic minorities despite lower rates of diagnoses may indicate disparities in the rate of clinical recognition of depression.[36,37]

Randomized controlled trials investigating the efficacy of different depression treatment modalities suggest that reductions in the recurrence of depression may lead to improvements in diabetes related outcomes such as hemoglobin A1C,[38,39] and a recent trial of patient-centered management of depression and chronic disease showed significantly improved control of medical disease and depression, suggesting the utility of depression treatment when tailoring care.[40]

Despite the well-documented clinical importance of depression for patients with diabetes and epidemiologic evidence of racial/ethnic disparities in diabetes prevalence, diabetes control, and outcomes, there is relatively little research regarding racial/ethnic disparities in the recognition and care of depression among multi-ethnic populations with diabetes in usual care settings. We evaluated whether there were significant racial/ethnic differences in the likelihood that patients with diabetes who self-reported significant depressive symptoms would be diagnosed or treated for depression during a 12 month follow-up. The current study is based on a sample drawn from a single, integrated healthcare delivery system, which may reduce confounding by access to care.

Methods

Data

Study participants were drawn from the Diabetes Study of Northern California (DISTANCE), a follow-up study among members of the Kaiser Permanente Northern California Diabetes Registry conducted in 2005-2006. Kaiser Permanente, an integrated, non-profit, group-practice health care delivery organization, provides comprehensive medical services to over three million members in Northern California, more than 25% of the region's population. Care is provided by more than 7,000 providers at 19 hospitals and 152 medical offices. Kaiser Permanente members are predominantly employed or retired individuals and closely approximate the general population of the region ethnically and socioeconomically except for the extreme tails of the income distribution.

DISTANCE was designed to assess the association of patient, provider and health system factors with health outcomes among patients with diabetes from five racial/ethnic groups. A randomly selected, ethnically stratified sample of members with diabetes receiving care

from Kaiser Permanente Northern California ("Kaiser Permanente") was invited in 2005-2006 to complete the survey. Of these, 20,188 patients (62% response rate among eligible members) completed surveys: 3,420 African Americans (16.9%), 2,312 Asians (excluding Filipinos) (11.4%), 4,602 Whites (22.8%), 2,404 Filipinos (11.9%)[5], 3,717 Latinos (18.4%), 2,222 multiracial (11.0%) and 1,511 other (7.5%). Demographic, clinical, behavioral and census data were available for all invited participants. No response bias was detected when comparing, among responders versus non-responders, the associations of poor glycemic control (A1C>9%) to race (p=0.55); subsequent assessments of selection bias also failed to detect response biases.[41]

The DISTANCE survey took an average of 45-60 minutes to complete and included four modes of administration: 1) a computer-assisted telephone interview (CATI) administered by a third party, 2) a password-enabled, internet-accessible survey ('web survey') maintained on a secure server at the Kaiser Division of Research, 3) a self-administered, written survey or 4) a short version of the written survey (the short written version was abridged and contained 40 questions). Offering the survey by oral interview in multiple languages was intended to mitigate the language and/or literacy barriers. The written and web surveys were in English only, but the CATI was available in English, Spanish, Cantonese, Mandarin and Tagalog using certified translations of an English script. The content of each survey mode was identical except for slight adjustments in wording as needed. Details on study recruitment procedures and sample characteristics have been published previously.[42] The DISTANCE study was approved by the Institutional Review Boards of the Kaiser Foundation Research Institute and the University of California, San Francisco.

Self-Reported Depressive Symptoms

The survey included the 8-item Patient Health Questionnaire (PHQ-8), a validated screener for depression, which has been found to function similarly across different racial and ethnic groups.[43] The PHQ-8 yields a valid proxy of depression diagnosis compared with other, longer clinician-administered diagnostic instruments and is widely used in clinical practices, including Kaiser Permanente.[44] The PHQ-8 was used to identify current depressive symptoms. The self-report questionnaire consists of eight out of the nine DSM-IV depressive disorder criteria: anhedonia, depressed mood, trouble sleeping, loss of energy, changes in appetite, trouble concentrating, and psychomotor retardation or agitation experienced over the last two weeks. In line with current practice, patients who scored ≥ 10 were classified as meeting criteria for depression care.[43] We also examined severity of depressive symptoms using validated cut points for depression severity: moderate [PHQ score 10–14], moderate-severe [PHQ score 15–19] and severe [PHQ score >19].[43]

Clinically Recognized Depression (CRD)

Clinically recognized depression (CRD) was our outcome of interest. Similar to previous studies, CRD was determined by the presence of a diagnosis, referral or treatment of depression in the patients' medical records. [45] More explicitly, CRD was defined by the presence of any of the following within 12 months following respondents' participation in the DISTANCE survey: 1) the diagnosis of depression in patients' history/ medical chart (ICD-9 codes 296.2X, 296.3X, 296.5X, 296.8X, 296.9X, 300.4X, 309.0X, 309.1X, 309.2X, 311, 648.4X, V790, and 307.44), 2) physician referral to mental health services for

[5]We examined Filipinos separately from the broader Asian racial/ethnic group because Filipinos had a significantly different sociodemographic profile compared to the Asian group. While the DISTANCE sample did include other Pacific Islander groups, the numbers were substantially lower, so they were combined into one category which also included Native Americans, Eskimo, multiracial, and other/unknown.

depression treatment captured electronically within the Kaiser Permanente system, and/or 3) prescription written for first line anti-depressant medications (citalopram, fluoxetine, fluvoxamine, paroxetine, sertraline, and escitalopram). We included diagnoses and treatments regardless of the clinical setting from which they were generated (e.g. primary care visits or mental health visits).

Study Sample

There were 10,543 DISTANCE respondents who self-identified as African American/Black, Asian, Filipino, Latino, or white. Of these, 1370 (13%) met criteria for moderate to severe depression according to the PHQ-8 (score ≥10)[43] on the DISTANCE survey. We excluded the 33.1% (460/1370) of these who had been clinically recognized by a Kaiser Permanente provider in the 12 months prior to DISTANCE survey participation and limited our analyses to the remaining 910 patients with self-reported depressive symptoms and no diagnosis, referral or treatment for depression in the prior year. Within our study cohort, 24% (217/910) had an earlier history (i.e., more than 12 months prior to the survey) of CRD within Kaiser medical records.

Covariates

Covariates included sociodemographic factors, including respondents' age and gender, depression symptom severity, limited English proficiency, number of medical visits, and patients' level of medical illness severity using the Deyo version of the Charlson comorbidity index.[46,47] Age at survey completion was included as a continuous variable. Limited English proficiency (LEP) was a binary variable defined as respondents' self-reported difficulty in reading or speaking English.

Data analysis

All data were analyzed using SAS version 9.13.[48] We evaluated whether there were racial/ethnic differences in the likelihood of CRD during 12 months of follow-up after the survey among patients who self-reported significant depressive symptoms in the DISTANCE survey. We used modified Poisson regression models to obtain relative risk estimates to examine the association between race/ethnicity and likelihood of CRD.[49,50] Results from previous studies suggest that modified Poisson regression is a superior method to log binomial regression for estimating relative risks when examining prospective data with binary outcomes.[51] Estimated relative risk (RR) and 95% confidence intervals were generated using a robust error variance procedure known as sandwich estimation,[50] which was implemented using the SAS PROC GENMOD procedure with the REPEATED statement.[48] We first created unadjusted Poisson regression models to test for racial/ethnic differences in CRD. Given the race-stratified random sampling design, all models were weighted for sampling fractions (expansion weighting). Weighting for sampling fractions compensates for the unequal probability potential respondents in the sample population had in being selected into the DISTANCE study.[52-54] Although the clinical recognition of depression should not depend on whether someone is of a particular race/ethnicity, sex, age or clinical state, we specified additional models adjusted for age, sex, depression symptom severity, number of visits, and limited English proficiency. Finally, we examined whether there was effect modification by sex by specifying interaction terms between race/ethnicity and sex.

Results

There were some significant differences in sociodemographic characteristics of the racial/ethnic groups. African Americans were, on average, older and Latinos were younger compared to the other racial/ethnic groups (see Table 1), while African American, Latino

and Filipino subgroups had relatively higher proportions of women versus men compared to Asians and whites. Education also varied; Latinos were the least likely to have completed high school while Filipinos, Asians, and whites were the most likely to report having a college degree. There were no significant racial/ethnic differences in the distribution of depression symptom severity based on the self-reported screener (PHQ-8). There were significant differences in the number of medical visits across racial/ethnic groups. On average, African Americans had the highest number of visits during the follow-up period and Asians had the fewest number of visits. This utilization pattern tracked the significant differences in comorbidity burden, with the highest levels in African Americans, lowest in Asians, and intermediate and similar in Filipinos, Latinos, and Whites.

Our first finding concerns the rate of CRD during the 12 months after self-reporting moderate to severe depressive symptoms (PHQ-8 ≥10) on our survey, among those whose depression was not currently recognized in the medical system (i.e., no CRD in the prior 12 months). In this sample, 12% (110/910) overall (12%, 8%, 8%, 14%, and 15% of African American, Asian, Filipino, Latino, and white patients, respectively), were clinically recognized (i.e. diagnosed, referred or treated for depression) within 12 months of each individual's survey date. The second finding concerns the relative differential in rates of clinical recognition across racial/ethnic groups (Table 2). In the unadjusted model, patients from each of the four racial/ethnic minority groups were less likely than whites to be clinically recognized for depression within 12 months, although the absolute differences in rates were small and was statistically significant only for Filipinos (RR: 0.33; CI: 0.17 to 0.65). Across all models, Filipinos remained significantly less likely to have CRD compared to whites. While Asians were less likely to have CRD compared to whites, these differences were not significant in any model. For Latinos and African Americans, differences were evident in some models but not others. Latinos were less likely than whites to have CRD when adjusted for age and sex in Model 2 (RR: 0.58; CI: 0.36 to 0.95) and for age, sex, depression severity and limitations on English proficiency in Model 3 (0.53; CI: 0.29 to 0.97), but was not significant either in the initial unadjusted model or when further adjusted for medical visits in Model 4 (RR: 0.57; CI:0.31 to 1.04) and Charlson index in Model 5 (RR: 0.57; CI:0.31 to 1.05). Differences in CRD between African Americans and whites were not significant in Models 1-3, but became significant once analyses were further adjusted for medical visits in Model 4 (RR= 0.58; CI: 0.35 to 0.97) and remained significant in Model 5 after adjusting for the Charlson index (RR= 0.58; CI: 0.35 to 0.97).

Finally, we tested whether the race/ethnic differences in CRD were modified by sex but we found no statistically significant interactions between race/ethnicity and gender in our models of CRD, indicating that the patterns of clinical recognition variation across racial/ethnic groups were similar for men and women (analysis not shown).

Discussion

The first finding from this study was that among patients with diabetes who had significant depressive symptoms and who had not been clinically recognized with depression in the prior year, few (less than 15%) were clinically recognized any time during the following year. This finding is consistent with the prior evidence regarding the under-recognition of depression in populations with diabetes from primary care settings.[55] In the current study design, we excluded the 34% (460/1370) of subjects with PHQ8 scores consistent with depression who had been clinically recognized in the previous 12 months; this exclusion may have resulted in a study sample with a lower likelihood of subsequent depression recognition. Rates of recognition may also have increased in recent years within the Kaiser system with the subsequent introduction of regular screening and prioritization of care for depressive symptoms in routine diabetes care within the Kaiser system.

Low rates of clinically recognized depression may be due to provider or patient factors; both may be uncomfortable about discussing symptoms of depression and patients may want to avoid the stigma sometimes associated with a diagnosis of depression. There may also be cultural differences in communication style and in what is seen as appropriate to share in a medical encounter.

The second finding involved differences in clinical recognition of patients from different racial/ethnic groups. While the absolute differences in the rate of clinical recognition of depression was not marked across race/ethnic groups, there were noteworthy relative differences. In models adjusted for age, sex, limited English proficiency, depression symptom severity, and number of medical visits, Filipino and African-Americans both had significantly lower CRD than did whites. The finding that Filipinos but not Asians had significantly lower CRD points to the importance of analyzing these groups separately when studying health disparities.[56]

Outpatient visit frequency differed by race/ethnicity, with African-Americans having more visits. The greater number of outpatient visits among African Americans should provide more opportunities for clinical recognition of depression and we expected that controlling for the number of visits would, if anything, reduce the difference in CRD for African-Americans versus whites. However, adjusting for the number of medical visits had minimal impact on point estimates, and the difference in the risk of being clinically recognized became significantly different in comparison to whites. Further adjustment for comorbidity burden did not alter the point estimates in a substantive way and thus did not confound or explain the observed patterns.

The respondents in this study were drawn from an integrated, not-for-profit, health care delivery system that includes mental health care treatment services and uses established treatment protocols, both of which should reduce inequities in recognition of depression. Despite this, some differences in CRD were found which were statistically significant although relatively small in absolute terms. It is unclear the extent to which the racial/ethnic differences observed here reflect differences in a patient's willingness to communicate depressive symptoms to their healthcare provider, differences in likelihood of offered treatment or differences in a clinician's elicitation or assessment of patient reports of depressive symptoms across racial/ethnic groups. A special strength of this study is that the two indicators of CRD based on offered care (i.e., referral to a mental health specialist and a prescription for an antidepressant) is based on the electronic referral and prescribing systems and does not depend on utilization (i.e., the patient actually attending that mental health visit or picking up that prescription).

Limitations

Several potential limitations could affect the results of this study. While there are advantages of having data from a single integrated, health care delivery system, this limits the generalizability of findings to patients with diabetes receiving care in other types of health care settings (e.g., safety net or for-profit settings) and in other areas of the U.S. It is also likely that the rates of clinical recognition, and possibly race/ethnic differences, we observed here would be worse for patients in more fragmented health systems or population-based studies.

Aspects of the study design could have contributed to an underestimation of the actual rate of clinical recognition of depression. Although a PHQ-8 score of ≥ 10 has high sensitivity and specificity (88%) for major depression in comparison to interviews by mental health professionals,[22,43] the PHQ-8 does not ensure that respondents would be considered as clinically depressed by a provider. Additionally, because we excluded patients who had

already been clinically recognized with depression during the 12 months prior to the survey, participants could be at higher risk for unrecognized depression, including being reticent to discuss mental health symptoms with providers. Patients were surveyed confidentially about their depressive symptoms and, in accordance with our agreement with those responding to the survey, the results were not shared with their providers. Finally, there is no way to gauge how long the self-reported depressive symptoms may have lasted after participation in the survey. Katon et al. found that 62% of patients with diabetes who reported symptoms consistent with major depression had been experiencing a chronic form of depression (dysthymia) in the previous 2 years or more years.[45] Additionally, we are unable to ascertain whether patients received a diagnosis and/or treatment outside this health delivery system. While this potentially limits the overall inferences that could be drawn from these data regarding the rate of clinical recognition, we have no reason to expect this would differ substantively across race/ethnicity.

Accounting for differences in diagnoses & treatment

The mental health services literature provides several potential explanations for racial/ethnic disparities in clinical recognition of depression. One issue could be that responses on the PHQ-8 are less prognostic of depression for racial/ethnic groups other than whites, resulting in more false positives among racial/ethnic minorities. However, evidence from previous studies does not indicate significant racial/ethnic differences in the factor structure of the PHQ-8 or in correlations with level of depression symptom severity.[35,57] A second issue raised in population-based studies is whether access to and quality of mental health care services account for racial/ethnic disparities in rates of depression recognition.[58,59] However, all participants in the current sample were drawn from the same integrated healthcare delivery system, so some quality of care and care access issues such as insurance coverage should be reduced. Finally, although language barriers could lead to poorer depression recognition in some racial/ethnic groups,[60] we found no differences in effect estimates when we adjusted for patient limited English proficiency.

Future Directions

Future research should work towards developing patient-centered and culturally sensitive approaches to recognition of depression in primary care. The observed race/ethnic differences in clinical recognition of depression may be attributable to patient factors, provider factors, or both. For instance, racial/ethnic differences in likelihood of clinical recognition could be attributable to cultural norms regarding expression of distress and communication with providers.[36,37,61,62] Several studies have suggested that differences in the manifestation of depressive symptoms, including reporting somatic symptoms, may be related to under-diagnosis of depression, particularly among Latinos and Asian Americans.[33,35,63,64] Depressive symptoms have been misinterpreted as diabetes distress in previous studies.[65-67] Greater research efforts pursuing deeper investigations of culture-bound presentations within different racial/ethnic groups are necessary to address both issues.

Future research should also explore how physician-patient communication affects a provider's ability to recognize depression. Depression may impede effective communication making it more difficult for clinicians to elicit and assess depressive symptoms.[68] There may also be cultural differences in a patient's terminology in expressing depressive symptoms, in beliefs about the causes and expression of depression, in norms about the communication of depressive feelings outside of the privacy of the home and in patients' treatment preferences and acceptability of depression treatment.[69-71] Overcoming these barriers will require education of providers about cultural experiences and expression of depressive symptoms

and of patients to reduce stigma around mental health and encourage patient awareness of depression and willingness to seek help when they experience depressive symptoms.

Additionally, researchers should continue to examine how factors such as perceptions of racial discrimination within the healthcare system and mistrust of providers could affect patients' willingness to share experiences of depressive symptoms with physicians. Provider bias has been shown to affect whether individuals from different racial/ethnic groups are diagnosed with depression and what type of care is offered.[34,36,72,73] For instance, some researchers have argued that the greater rates of schizophrenia diagnosis and lower rates of depression diagnosis among African Americans could be attributed to differences in the perspectives of clinicians versus patients as well as in clinical presentation.[34,36,74,75]

Conclusions

Our study is consistent with a previous publication by Katon et al [55] which also reported large gaps in recognition of depression among patients with comorbid depression and diabetes in a similar healthcare delivery system. The current study also suggests that these gaps in clinical recognition are particularly apparent for certain minority groups. All patients in this sample self-reported depressive symptoms, as indicated by scores on the PHQ-8, and had not been clinically recognized in the previous 12 months. Their depressive symptoms would reasonably warrant subsequent attention from providers. These patients with diabetes were likely to be seeing their physicians more often than patients without chronic diseases, and would have more opportunities to be clinically recognized. Even if the exclusion of participants who had been clinically recognized in the previous 12 months may have increased the chances that those in the sample were a select sample more prone to not being clinically recognized, our findings that approximately 85% of the patients showed no evidence of clinical recognition within the year following the survey indicates a need to explore ways to increase rates of clinical recognition. Further, our finding that clinical recognition differs by race/ethnicity suggests that cultural differences or communication style may be important.

The failures to diagnose or treat depression among patients with diabetes may add to their already substantial health burden, impact negatively their quality of life and potentially contribute to future diabetes-related complications. Moreover, differences in depression recognition across race/ethnic groups may be modifiable and deserve further investigation. Our ability to effectively and uniformly recognize depression in a timely fashion among patients with diabetes is particularly important given the evidence of effective interventions to treat both depression and diabetes. [40]

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Takeaway Points

88% of patients with no clinical recognition of depression in the prior year and reporting moderate to severe depressive symptoms on a research survey were not clinically recognized within the subsequent 12 months; Filipinos and African Americans were less likely to be clinically recognized with depression than whites.

Table 1

Sociodemographic Characteristics among survey respondents meeting depression criteria on the screener and not clinically recognized in the previous 12 months, by Race/Ethnicity* n= 910

	Asian (n=96)	African American (n=209)	Filipino (n= 139)	Latino (n= 252)	White (n= 214)	p-value
Age	58.57(10.0)	60.14(10.1)	57.31(9.6)	54.81(11.4)	58.66(9.6)	<.0001
Sex						
FEMALE	49(51.0)	128(61.2)	83(59.7)	155(61.5)	107(50.0)	0.0461
Education						
NO DEGREE EARNED	9(9.5)	35(17.2)	3(2.2)	115(46.4)	31(14.6)	<.0001
HIGH SCHOOL/GED	27(28.4)	76(37.4)	28(20.4)	67(27.0)	72(34.0)	
SOME COLLEGE	25(26.3)	60(29.6)	36(26.9)	58(23.4)	57(26.9)	
COLLEGE GRAD/POST GRAD	34(35.8)	32(15.8)	70(51.1)	8(3.2)	52(24.5)	
Income						
LESS THAN $25,000	29(32.6)	75(38.7)	31(23.6)	96(42.1)	42(20.9)	<.0001
$25,000 TO $49,999	20(22.5)	63(32.5)	39(30.0)	78(34.2)	58(28.9)	
$50,000 TO $79,999	17(19.1)	32(16.5)	32(24.6)	37(16.2)	47(23.4)	
$80,000 AND GREATER	23(25.8)	24(12.4)	28(21.5)	17(7.5)	54(26.9)	
Employment Status						
EMPLOYED	44(47.3)	67(32.5)	71(53.8)	107(43.7)	105(49.3)	0.0012
NOT IN WORKFORCE	46(49.5)	132(64.1)	53(40.2)	125(51.0)	104(48.8)	
UNEMPLOYED	3(3.2)	7(3.4)	8(6.1)	13(5.3)	4(1.9)	
Limited English Proficiency	12(12.5)	10(4.8)	7(5.0)	64(25.4)	4(1.9)	<.0001
Depression Severity						
MODERATE: PHQ10-14	63(65.6)	148(70.8)	96(69.1)	169(67.1)	166(77.6)	0.2487
MODERATELY SEVERE:PHQ15-19	23(24.0)	47(22.5)	31(22.3)	67(26.6)	36(16.8)	
SEVERE:PHQ 20+	10(10.4)	14(6.7)	12(8.6)	16(6.4)	12(5.6)	
Mean Medical Visits	8.75 (10.56)	13.74 (13.75)	10.61 (10.31)	10.94 (9.98)	10.55 (10.18)	<.0001
Charlson Score	1.05 (1.40)	1.73 (2.06)	1.26 (1.61)	1.29 (1.54)	1.28 (1.55)	<.006
Clinically Recognized Depression in subsequent 12 months	8(8.3)	25(12.0)	11(7.9)	34(13.5)	32(15.0)	<.0001

*Mean ± standard deviation for continuous variables.

†N and column percent for categorical variables. P values were calculated using the chi square test.

Table 2

Adjusted Relative Risk Estimates of being diagnosed or treated for depression by clinician among survey respondents meeting depression criteria on the screener and not clinically recognized in the previous 12 months

	Model 1	Model 2†	Model 3‡	Model 4ǂ	Model 5ƃ
Variable	**Relative Risk (95% Confidence Interval)**	**Relative Risk (95% Confidence Interval)**	**Relative Risk (95% Confidence Interval)**	**Relative Risk (95% Confidence Interval)**	**Relative Risk (95% Confidence Interval)**
Race/ethnicity (ref= Whites)					
African American	0.64 (0.39 to 1.07)	0.62 (0.37 to 1.03)	0.60 (0.36 to 1.00)	0.58 (0.35 to 0.97)	0.58 (0.35 to 0.97)
Asian	0.47 (0.21 to 1.07)	0.46 (0.20 to 1.04)	0.43 (0.18 to 1.03)	0.46 (0.19 to 1.09)	0.47 (0.20 to 1.11)
Filipino	0.33 (0.17 to 0.65)	0.31 (0.16 to 0.61)	0.30 (0.15 to 0.59)	0.32 (0.16 to 0.64)	0.32 (0.16 to 0.64)
Latino	0.66 (0.41 to 1.06)	0.58 (0.36 to 0.95)	0.53 (0.29 to 0.97)	0.57 (0.31 to 1.04)	0.57 (0.31 to 1.05)

† Adjusted for age and sex;

‡ Adjusted for age, sex, depressive symptom severity and limited English proficiency

ǂ Adjusted for age, sex, depressive symptom severity, limited English proficiency and patient medical visits

ƃ Adjusted for age, sex, depressive symptom severity, limited English proficiency, patient medical visits, and Charlson score