2-2019

Assessing the Effect of Patient to Provider Language Discordance on Depression Screening Utilizing the Patient Health Questionnaire: An Epidemiology Study.

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Recommended Citation

OXFORD

Primary Care Epidemiology

Assessing the effect of patient to provider language discordance on depression screening utilizing the Patient Health Questionnaire: an epidemiology study

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Abstract

Background. As depression screening becomes a standard in primary care, the question remains of how effective and equitable screening can be implemented to avoid cultural and language-related disparities.

Methods. In this retrospective cohort study, rates of depression screening were compared for 3626 adult patients at a family medicine residency-based health centre in Pennsylvania, USA. The PHQ-2/PHQ-9 modality was verbally administered by nursing staff at the time of patient intake as part of a universal screening initiative. Chi-square analysis was used to determine the univariate associations of performed depression screening with variables of language, ethnicity, gender and number of office visits. A binary logistic regression was then performed to measure whether univariate associations remain significant after correction for other variables.

Results. Chi-square analysis revealed significant differences in screening based on univariate associations of language, gender and number of office visits. No significant difference was found for age or ethnicity. Binary logistic regression revealed the following odds ratio of being screened for depression for each variable: Spanish language (OR = 0.694, CI = 0.559 to 0.862), female gender (OR = 1.155, CI = 1.005 to 1.328) and office visit frequency of three or more office visits per year (OR = 2.103, CI = 1.835 to 2.410).

Conclusions. Spanish-speaking adults were significantly less likely to be screened for depression than their English-speaking counterparts. Women were more likely to be screened than men, and the odds of screening increased with more frequent exposure to the office. Future studies should be directed at validating these findings in multiple clinical settings.

Key words: Depression, family health, health disparities, primary care, risk assessment, screening.

Introduction

Mental health is a growing component of family medicine with many in primary care serving as the *de facto* psychiatrist within resource-limited populations (1,2). There is also increasing literature on the incorporation of psychiatric services within a patient-centred medical home model (PCMH) (3,4). As need for services prompts innovative care delivery models, many patients are receiving increased access to quality care. Despite these advances, an important challenge remains: how to efficiently and effectively screen for depression in busy primary care offices. Moreover, how can providers ensure that screening modalities are administered uniformly throughout their patient population?

The prevalence of depression has been rising in the USA (5). This disease process leads to significant symptomatology which can often affect multiple facets of a patient's life and is the leading cause of disability in persons 15 years and older (6). As a result, the US Preventive Services Task Force recommends universal screening for depression in the adult population to properly identify and treat this prevalent condition (Recommendation B) (6).

A validated modality for depression screening in primary care is the two questions Patient Health Questionnaire (PHQ-2). If the patient answers affirmatively to one question, a longer survey (PHQ-9) is performed to grade severity of depression. The PHQ modality has excellent sensitivity for depression screening, with one meta-analysis reporting a sensitivity of 92% with a specificity of 80% (7). The PHQ was also shown to have higher sensitivity of depression screening/diagnosis when compared with other leading algorithm methods (8). PHQ screening has also proven to be culturally adaptable with validation of use in Latino populations (9–11). This versatility is of paramount importance given rising rates of depression within the Latino population (12–15).

Despite the validation of the PHQ, there have been few studies that compare rates of screening for depression between Latino and Caucasian populations. When studies do examine screening rates along ethnic variances, differences in language are not included in the determinations of screening likelihood (16). This is an important distinction as availability of screening tools does not necessarily imply equity in administration. Previous studies document this concept with observation of screening disparities for colorectal, breast and cervical cancer within the Latino community (17–19).

As depression impacts multiple facets of one's life, underdiagnoses secondary to screening disparities could have far-reaching implications into societal arenas such as substance abuse, poor work productivity or increased absenteeism. Emerging research draws connections between depression and its role in the pathophysiology of other chronic diseases such as diabetes and heart disease (20–23). From this standpoint, under treatment of depression could lead to overall worsening outcomes for other chronic diseases. This would be particularly devastating among the Latino community where there are already disparities in chronic disease outcome measures when compared with non-Latino counterparts (24–27). Because of these far-reaching implications of undiagnosed depression, some hospital networks are now instituting universal depression screening protocols, wherein system-wide quality metrics are linked to percentages of patients screened. The question remains however if such universal screening methods are administered in a manner that minimalizes disparities among differences in language and culture.

In this study, we examined rates of depression screening for a cohort of patients in a busy family medicine residency program in Pennsylvania, USA. This office had recently been designated as a trial site for a hospital-wide depression screening protocol utilizing the PHQ methodology. The purpose of the study was to determine whether language discordance between providers and patients led to a difference in depression screening between Spanish- and English-speaking patients. Prior studies suggested that certain demographic variables such as gender are associated with disparities in depression screening (16,28); however, this study intends to explore whether language also plays a role after correcting for these other demographic variables.

Methods

Clinical setting

This retrospective cohort study was conducted at a Family Medicine Resident practice designated as a Federally Qualified Patient-Centered Medical Home in Pennsylvania, USA. The population served by this clinic included patients from suburban and urban locations. Approximately, 61% of the office's patient population had insurance through government programs (Medicare or Medicaid), 33.5% had commercial insurance and 5.5% were self-pay. Patients were seen by a provider pool that included 7 family medicine attending physicians and 22 residents. There were a total of seven nurses employed in the practice who were responsible for administering depression screens to all patients. None of the nurses spoke Spanish; however, all had access to licensed interpreters via phones located in the patient rooms. Of note, the lead author of the study was actively seeing patients in the practice during the 1-year study, although there was no prospective knowledge of the evaluation during the study year.

As mentioned above, this practice was designated by its parent hospital system as a trial site for a universal annual depression screening initiative. Per protocol eligibility, all charts of patients >18 were flagged with a yearly reminder to perform a PHQ screen via a health maintenance tab in the EPIC® electronic medical record (EMR). PHQ 2/9 surveys were to be administered to patients regardless of prior diagnosis of depression, anxiety or other psychiatric conditions. When patients arrived for an office visit, nursing staff would see the EMR flag and verbally administer the PHQ 2 screen. No paper surveys were administered. If a patient answered affirmatively to one of the PHQ 2 questions, the nurse would then administer the complete PHQ-9 questionnaire. If the patient spoke Spanish, nurses could administer surveys with the assistance of licensed Spanish interpreters accessible via telephones located in patient rooms. For patients who had a prior diagnosis of depression, the screen was performed to determine severity of the condition. Results of the PHQ-2/9 were entered into the patient's electronic chart. Once the screen was administered, the yearly reminder was satisfied, and the electronic flag was removed from the chart. The internal goal for the protocol was to achieve a 50% screening rate for the entire eligible population within the first year.

Data collection

The EMR mining tools WebFOCUS and SAP® Data Services were used to retrospectively collect data from all patient encounters to the clinical site between the months of December 2014 and 2015. This time range was chosen as it was the first full calendar year of implementation of the universal PHQ screening protocol. Patients under the age of 18 were excluded because depression screening in this population occurred via a different mechanism. With these parameters, there were a total of 3632 patients; although, six patients were excluded from analysis because they did not provide information on ethnicity. The final study population included 3626 patients.

The independent variables that were included in the study were patient age, preferred language, ethnicity, gender and number of encounters with the office during the 1-year time span. These variables were chosen to control for other possible causes of screening discrepancies. The independent variables were categorized in a binary fashion as follows: age listed as <65 versus ≥65. Sixty-five was chosen as this is the age in the USA when most individuals qualify for government health insurance. Language was categorized as Spanish versus English speaking. Ethnicity was Hispanic versus non-Hispanic (note: all Spanish-speaking patients identified as Hispanic while not all patients identifying as Hispanic identified as Spanish speaking). Gender was male and female with no study members identifying as gender other. Number of office visits was divided by those with one to two visits per year compared with those with three or more visits. This categorization was chosen as it divided the population at the

median number of office visits. The dependent variable was a binary output of depression screening status over the study year.

Once data were collected, parameters were generated for considering an individual as screened for depression. The first parameter was the presence of a PHQ-2 or 9 score within the patient's chart during the study year. The patient was also considered screened if he or she had a referral to a mental health provider during the study year. The rationale for this criterion was that even if a PHQ was not recorded, a referral indicated that a conversation regarding mental health had occurred, and thus, the patient was effectively screened for depression. Finally, patients were considered to have met screening requirements if any screening had occurred in the year prior to our study timeframe. This parameter was added to capture patients who would not have been eligible for screening during the study year because they had been screened for depression within the past 12 months.

Statistical analysis

All data analysis was performed in SPSS® v25.0. Demographic analysis was performed on all study variables. Discrete data were reported as count and percentage per category. To explain the predictive aspects of language on screening status, a logistic regression was performed using only the variables found to be significant with the univariate associations with screened status as determined by chi-square analysis. These variables were gender, language and number of visits as covariates. Logistic regression results were reported as β coefficient, *P* value, odds ratio (OR) with 95% confidence interval. References categories were English language, male gender and the category of one to two office visits per year.

Results

The breakdown of total patients within each independent variable category is exhibited in Table 1. There were overall more females (62.7%) than males (37.3%) and more patients <65 (84.8%) than >65 (15.2%). A total of 35.6% of the study population identified as Hispanic with 10.7% listing Spanish as their primary language. Per study criteria, the total number of patients screened for depression during the study year was 2171 (59.9%). A total of 2138 were

screened by PHQ, whereas 33 were determined screened by way of being referred to psychiatry. The overall screening rate exceeded the internal goal of 50% screening within the first year of the universal protocol. Of those screened for depression, 66 patients had severe depression scores as classified by a PHQ >20. A total of 88 patients had moderate-severe depression scores (PHQ 15–19), 122 patients had moderate depression scores (PHQ 10–14) and 149 had mild depression scores (PHQ 5–9)

The results of chi-square analysis for univariate association between independent variables and depression screening are listed in Table 2. For the variable of language, 60.6% of English-speaking patients were screened for depression compared with 53.7% of Spanish-speaking patients (*P* value = 0.009). Regarding gender, 61.4% of females were screened compared with 57.2% of males (*P* value = 0.012). Finally, depression screening occurred in 68.7% of patients seen in the office three or more times per year compared with 51.3% of patients seen for one to two encounters (*P* < 0.001).

Univariate associations with *P* values > 0.05 included age and ethnicity. The percentage of patients <65 who were screened for depression was 60.3%, while 57.5% of patients 65 and older were screened. The difference of depression screening within the Hispanic and non-Hispanic was even closer with percentages of 60.7% and 59.4%, respectively.

The results of the binary logistic regression for statistically significant variables from the chi-square analysis are displayed in Table 3. With English as the reference category, the OR for depression screening in Spanish-speaking patients was 0.694 with CI = 0.559 to 0.862 (*P* value = 0.001). The OR for screening in females was 1.155 with CI = 1.005 to 1.328 (*P* value = 0.043). Finally, those who had three visits or more to the office within the study year had a depression screening OR of 2.103 with CI = 1.835 to 2.410 (*P* value <0.001).

Discussion

The results of this study reflect the differential odds of being screened for depression among selected demographic variables. The effect of language discordance between patient and nurses administering depression screens was the focal point. The chi-square univariate analysis of association showed two variables that did not have significant

Table 1. Demographic data of study population during study year 2014–15

Variable	Category	Count	Percentage
Gender	Male	1354	37.3
	Female	2272	62.7
Age	<65	3075	84.8
	65+	551	15.2
Ethnicity	Not Hispanic	2336	64.4
	Hispanic	1290	35.6
Language	English	3237	89.3
	Spanish	389	10.7
Office visits per year	1–2	1836	50.6
	3+	1790	49.4
Screened for depression	Yes	2171[a]	59.9
	No	1455	40.1
Depression scores for patients screened with PHQ	0–5	1713	80.1
	Mild 5–9	149	7.0
	Moderate (10–14)	122	5.7
	Moderate-severe (15–19)	88	4.1
	Severe (20–27)	66	3.1

[a]Those considered screened for depression included 2138 patients screened by PHQ and 33 patients who were referred to psychiatry without a PHQ screen.

Table 2. Comparison of univariate associations in depression screening rates within demographic subcategories

Variable	Category	Screened for depression	Not screened for depression	Percentage screened	*P* value
Gender	Male	775	579	57.2	0.012
	Female	1396	876	61.4	
Age	<65	1854	1221	60.3	0.223
	65+	317	234	57.5	
Ethnicity	Not Hispanic	1388	948	59.4	0.452
	Hispanic	783	507	60.7	
Language	English	1962	1275	60.6	0.009
	Spanish	209	180	53.7	
Office visits per year	1–2	941	895	51.3	<0.001
	3+	1230	560	68.7	

Table 3. Results of binary logistic regression for the association of depression screening with demographic variables that exhibited statistically significant univariate associations

Variable	Category	β	*P* value	Odds ratio	95% CI lower bound	95% CI upper bound
Language	English	Ref				
	Spanish	−0.365	0.001	0.694	0.559	0.862
Gender	Male	Ref				
	Female	0.144	0.043	1.155	1.005	1.328
Visits	1–2	Ref				
	3+	0.743	<0.001	2.103	1.835	2.410

associations with depression screening as defined by *P* values >0.05. These variables were age and ethnicity. The variables that did show significance were language (*P* = 0.009), gender (*P* = 0.012) and office visits per year (*P* < 0.001). A binary logistic regression was then run on the significant variables from chi-square analysis to correct for confounding relationships. The results of this analysis revealed that significant associations to depression screening were maintained for the variables of language, gender and frequency of office visits.

In the binary regression analysis, gender differences in screening were notable with women having a screening OR of 1.155 (CI = 1.005 to 1.328) when compared with males. Again, this association was found to be significant even after accounting for differences in frequency of office visits per year and language. This finding is consistent with prior literature indicating that women are more likely than men to be screened for depression (16,28). While protocol dictates that all-comers be screened, these results point to possible underlying biases among health care providers in their prioritization of who receives screening during a busy office session. It should be noted here that a possible underlying contributor to this bias is the fact that all nurses administering screens in our office were female. Therefore, a differential level of comfort may exist with gender concordant screening.

Another significant variable in the binary regression analysis was the association between frequency of office visits and odds of being screened for depression. The results revealed that those who had three or more office visits per year had an OR of 2.103 for being screened (CI = 1.835 to 2.410) compared with the reference category of 1–2 office visit per year. The association of greater odds of depression screening for those with more office visits per year is certainly logical as greater exposure to the office would result in more opportunities to be screened. The main purpose of including this visit frequency variable was to control for its possible confounding effects on the other variables of the analysis. As mentioned previously, the binary nature of this variable was chosen because it reflected the median amount of office visits per year for the study population.

The main outcome of interest for the study was the comparison of screening rates between Spanish and English speakers. As noted

previously, all Spanish-speaking patients self-identified as Hispanic, while English-speaking patients consisted of a mix of Hispanic and non-Hispanic ethnicities. When comparing univariate associations by chi-square analysis, there was no statistical difference in screening between those identifying as Hispanic versus non-Hispanic. When comparing language associations, we found Spanish-speaking patients had lower rates of screening than English-speaking patients. This association remained even after binary logistic regression with an OR of 0.694 (CI = 0.559 to 0.862) for Spanish-speaking patients.

The results of this analysis suggest an association of poorer screening rates of depression for Spanish-speaking patients even after accounting for differences in gender and number of office visits per year. When considering the screening protocol, nurses were expected to screen all patients for depression in addition to their other rooming duties such as taking vitals, medication reconciliation and determining chief compliant. While none of the nurses spoke Spanish, they had access to live telephone interpreters to assist in administering the survey. However, in a busy clinical setting, time spent on communicating through a third party diminishes the overall patient time allotment that is shared between physician and nurses. With competing interests including chronic and acute disease management, it is easy to envision preventative or 'non-urgent' tasks being triaged to later appointments. Unfortunately, the data suggest that screening does not always occur for Spanish-speaking patients at a later visit as the cycle likely repeats itself.

Another possible contributor to poorer rates of screening in Spanish-speaking patients is the sensitive nature of verbally administering a depression screen. The PHQ questionnaire probes difficult topics such as feelings of inadequacy and suicidality. The thought of attempting to navigate these questions through an interpreter may seem insensitive to some practitioners, and thus, he or she will opt to not administer the screen. Our study suggests that the unintended consequence of this action at a population level is that less Spanish-speaking patients are screened. This can lead to underdiagnoses of a serious chronic condition in an already vulnerable population. One possible solution to this barrier of screening is to administer written

PHQ surveys to patients in their preferred language. This would help save time as it would alleviate the need for an interpreter and provide some level of privacy. One drawback would be that the written surveys would not be functional in patients with low literacy.

This study had several limitations for external application. One such constraint is that the results are specific to this clinic population. Values reflect the care protocols of this office and the demographics of the staff. Despite this fact, certain trends in screening disparities were similar to results from prior studies as discussed above. Another limitation is that because of restrictions in our EMR mining tools, we could not accurately incorporate additional variables such prior history of mental illness. This constraint exists because of the multiple different variations in anxiety, depression and mental health billing codes that would make it exceedingly difficult to ensure all diagnoses have been included in the mining algorithm. Regardless, the current ability of EMR mining is a great tool for primary care physicians to study trends in their own population for the purposes of quality improvement.

Conclusion

The present study examines the effect of language on rates of screening for depression. Current results indicate that those who speak Spanish are significantly less likely to be screened for depression than their English-speaking counterparts. Furthermore, our study indicates that women are more likely to be screened than man and that odds of screening increase with increasing exposure to the office. Future studies should be directed at validating these findings in multiple clinical settings. Exploration of depression screening rates in language-concordant provider–patient interactions will also be germane in further delineating factors that contribute to disparities in screening.

Acknowledgements

Declarations

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