Published in final edited form as:

Patient Educ Couns. 2010 November ; 81(2): 222–228. doi:10.1016/j.pec.2010.02.005.

The impact of limited English proficiency and physician language concordance on reports of clinical interactions among patients with diabetes: the DISTANCE Study

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Abstract

OBJECTIVE—To assess the the association of limited English proficiency (LEP) and physician language concordance with patient reports of clinical interactions.

METHODS—Cross-sectional survey of 8,638 Kaiser Permanente Northern California patients with diabetes. Patient responses were used to define English proficiency and physician language concordance. Quality of clinical interactions was based on 5 questions **drawn from validated scales** on communication, 2 on trust, and 3 on discrimination.

RESULTS—Respondents included 8,116 English-proficient and 522 LEP patients. Among LEP patients, 210 were language concordant and 153 were language discordant. In fully-adjusted models, LEP patients were more likely than English-proficient patients to report suboptimal interactions on 3 out of 10 outcomes, including 1 communication and 2 discrimination items. In separate analyses, LEP-discordant patients were more likely than English-proficient patients to report suboptimal clinician-patient interactions on 7 out of 10 outcomes, including 2 communication, 2 trust, and 3 discrimination items. In contrast, LEP-concordant patients reported similar interactions to English-proficient patients.

CONCLUSIONS—Reports of suboptimal interactions among patients with LEP were more common among those with language discordant physicians.

PRACTICE IMPLICATIONS—Expanding access to language concordant physicians may improve clinical interactions among patients with LEP. Quality and performance assessments should consider physician-patient language concordance.

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BACKGROUND

Providing care that is both responsive to and respectful of patient preferences and cultural values is recognized by the Institute of Medicine as a core component of healthcare quality and an area in which improvements are needed. (1) Interpersonal aspects of the medical encounter predict patient satisfaction (2,3) and have been associated with adherence and self-management (4–9) and improved clinical outcomes (10–12) among patients with chronic diseases. Increasingly, reports of interpersonal care are viewed as important assessments of healthcare quality and targets of quality improvement initiatives. (13)

Language barriers faced by patients with limited English proficiency (LEP), a large and growing segment of the U.S. population, complicate physician-patient interactions. (14) Patients with LEP report decreased satisfaction with communication by healthcare providers (15,16) and may be less likely to understand medical situations (17,18), be scheduled for appropriate follow-up appointments (19), or receive informed consent. (20) Nationwide healthcare quality assessments have consistently noted less favorable reports of care among patients with LEP. (21–23)

Comparatively little research has explored the impact of physician-patient language concordance on reports of interpersonal care. A handful of studies suggest that language concordant clinician-patient interactions may be more patient-centered than interactions requiring the use of an interpreter. (24–27) However, the majority of these studies have been conducted with patients from single language groups in the safety net setting, or among patients with variable access to care, and have been unable to distinguish language barriers from other barriers to communication such as education, cultural differences, illness burden, and access to care.

We expand on this research to explore the association of language barriers and physician language concordance on patient reports of clinician-patient interactions among a large, linguistically diverse cohort of patients with diabetes who have uniform access to care. We examined three unique, yet interconnected components of clinician-patient interactions: communication, trust, and perceived discrimination. (12) Specifically, we used survey data from the Diabetes Study of Northern California (DISTANCE)(28) to assess 1) the association of limited English proficiency with patient reports of clinician-patient communication, trust and discrimination and 2) whether this association is modified by having a language-concordant physician.

METHODS

Subjects and Setting

The Diabetes Study of Northern California (DISTANCE) is a survey follow-up cohort study designed to assess the association of a wide range of social and behavioral factors with disparities in healthcare processes and outcomes for patients with diabetes. Study recruitment procedures have been published previously. (28) Briefly, study subjects were members of Kaiser Permanente Northern California (KPNC), a large not-for-profit health plan serving over 3 million members in Northern California. KPNC complies with federal statutes on language access by offering interpreter services through on-site and remote-access professional medical interpreters, bilingual staff, and commercial language telephone lines at all facilities.

The KPNC Diabetes Registry was established in 1994 to identify and follow health plan members with diabetes. An ethnically-stratified, random sample of patients was selected from the approximately 200,000 Diabetes Registry members at KPNC to receive the DISTANCE survey. Within each strata (White, Black, Asian, Latino, and Other), patients were randomly

assigned consecutive study identification numbers using a computerized random number generator, and the survey was administered to patients in that order within each strata. The survey was in the field during 2005 and 2006 and had a response rate of 62%. (28) Few baseline variables differed between respondents and nonrespondents. (28) Participation was somewhat lower among minorities and patients with lower levels of education, but somewhat higher among patients with limited English proficiency. There were 17,795 respondents to the long version of the survey, which included 184 questions administered via computer-assisted telephone interview, or self-administered in written form, depending on the respondent's preference. The written survey was available in English only. The computer-assisted telephone interview script was translated into Spanish, Cantonese, Mandarin, and Tagalog by an independent firm using certified medical translators. All translations were edited against the English text by a second translator, with disagreements resolved by a third linguist. Because the questions about communication, trust and perceived discrimination asked about interpersonal care in the past year and experiences with a personal physician, we included only patients who reported having a personal physician and at least one healthcare visit to KPNC in the past 12 months (N=8,729). Of these, 8,638 patients answered one or more of the outcome questions, and this sample provided the basis for the current analysis. The DISTANCE study was approved by the Institutional Review Boards of the Kaiser Foundation Research Institute and the University of California, San Francisco.

Measurements

Clinician-Patient Interactions—Our outcomes of interest for this study were ten questions about clinician-patient interactions, all of which come from validated scales. (see Appendix A) These included five questions about communication (13, 21–23, 29), two questions about trust (30), and three questions about perceived discrimination. (13, 31) For each question, patients were asked to report their experiences over the past year on a four-point Likert scale ranging from “never” to “always”. Responses were dichotomized based on the distribution of the sample: responses of *never/sometimes/usually* for positive characteristics and *always/usually/sometimes* for negative characteristics were defined as suboptimal clinician-patient interactions.

English Proficiency and Language Concordance—English proficiency was assessed by asking: “How often do you have difficulty understanding or speaking English?” Patients who answered “sometimes,” “rarely” or “never” were designated as English-proficient, while those who answered “always” or “often” were considered to have limited English proficiency (LEP). Among patients with LEP, physician language concordance was assessed by asking: “Without using an interpreter, how well does your personal physician speak your language?” Patients who answered “excellently,” “very well,” or “well” were considered to have language concordant physicians (LEP-concordant), while those who answered “fair,” “poorly,” “does not speak my language” or “don’t know” were considered to have language discordant physicians (LEP-discordant).

Demographic and Clinical Characteristics—Demographic information including race, education and annual income were determined from patient survey responses. The survey included the 8-item Patient Health Questionnaire (PHQ-8) used to evaluate depressive symptoms. Based on previously established categories, patients who scored ≥ 10 were classified as having moderate to severe depressive symptoms. (32) We used the comorbidity measure DxCG, an established proprietary risk assessment tool calculated at the individual patient level and designed to quantify the patient's illness burden. (33) Nationwide, DxCG scores range from 0.15 to 12, with higher scores indicating higher illness burden. (22)

Statistical Analysis

Our goal was to assess the independent association of LEP status with reports of communication, trust, and discrimination and to determine whether having a language concordant physician modified this association.

We compared reports of “suboptimal” clinician-patient interactions by English proficiency and by language concordance in four bivariate models (English-proficient vs LEP; English-proficient vs LEP-concordant; English-proficient vs LEP-discordant; and LEP-concordant vs LEP-discordant) using chi-squared tests. We then used logistic regression models with generalized estimating equations (GEE) that account for clustering of patients by physicians to determine the independent association of limited English proficiency and language concordance with reports of suboptimal clinician-patient interactions. Models were adjusted for demographic (age, sex, race, education, income) and clinical (comorbidity score and depression) characteristics hypothesized *a priori* to be associated with patient reports of clinician-patient interactions (34,35) and included categories for missing variables. The model comparing LEP-concordant and LEP-discordant participants was adjusted for all variables except for race, due to small sample sizes and the colinearity of race and language.

In order to determine if our results were sensitive to our definitions of LEP, language concordance, and suboptimal clinician-patient interactions, we performed three sensitivity analyses. In the first we included patients who reported “sometimes” having difficulty with English in the LEP group. In the second, we included patients who reported that their physician spoke their language “well” in the LEP-discordant group. In the third, we defined suboptimal clinician-patient interactions as responses of *never/sometimes* for positive characteristics and *always/usually* for negative characteristics.

RESULTS

Our study sample included 8,638 patients cared for by 1,333 primary care physicians from 48 facilities. Of these patients, 8116 were English-proficient and 522 reported limited English proficiency. Seventy percent (n=363) of the patients with limited English proficiency answered the question on physician language skills. Of these, 210 had a language concordant physician (LEP-concordant) and 153 did not have a language concordant physician (LEP-discordant). LEP-concordant patients were cared for by 134 physicians and LEP-discordant patients were cared for by 137 physicians.

English-proficient patients and patients with LEP differed on several demographic and clinical characteristics (Table 1). Of note, English-proficient patients were more likely to be male, be more educated and have higher incomes. Patients with LEP were more likely to report depressive symptoms. Demographic and clinical characteristics were similar for LEP patients by physician language concordance, with the exception of comorbidity scores (slightly higher among LEP-discordant patients) and depressive symptoms (more common among LEP-discordant patients).

In bivariate analysis, patients with LEP were significantly more likely than English-proficient patients to report suboptimal clinician-patient interactions on six out of 10 outcomes (Table 2), including three communication items (physicians not explaining, patient not involved in decisions, physician not understanding), one trust item (physician not putting medical needs above other considerations) and two discrimination items (patient treated poorly because of race/ethnicity and patient treated poorly because of language). Patients with LEP were *less* likely than English-speakers to report suboptimal clinician-patient interactions on one communication item (physicians not listening).

When comparing patients with LEP to English-proficient patients by language concordance (Table 2), LEP-discordant patients were more likely than English-proficient patients to report suboptimal interactions on eight out of 10 outcomes, including three communication items (physicians not explaining, patient not involved in decisions, physician not understanding), two trust items (lack of confidence/trust, physician not putting medical needs above other considerations), and three discrimination items (patient treated poorly because of race/ethnicity, patient treated poorly because of language, physicians not showing respect). In contrast, LEP-concordant patients were more likely than English-proficient patients to report suboptimal interactions on five out of 10 outcomes (two communication items - physician not explaining and physician not understanding problems; one trust item - physician not putting medical needs above other considerations; and two discrimination items - patient treated poorly because of race/ethnicity and patient treated poorly because of language) but *less* likely than English-proficient patients to report suboptimal interactions on two out of 10 outcomes (one communication item - physicians not listening and one trust item - lack of confidence/trust).

In comparing reports of clinician-patient interactions among patients with LEP by language concordance (Table 2), LEP-discordant patients were more likely than LEP-concordant patients to report suboptimal interactions on four out of 10 outcomes, including one communication item (physicians not understanding), one trust item (lack of confidence/trust) and two discrimination items (patient treated poorly because of language and physicians not showing respect).

After adjusting for age, sex, race, education, income, comorbidity index and depressive symptoms and accounting for clustering by physician, patients with LEP as a group remained more likely than English-proficient patients to report suboptimal clinician-patient interactions on three out of 10 outcomes, including one communication item (physician not understanding) and two discrimination items (patient treated poorly because of race/ethnicity and patient treated poorly because of language). (Table 3) In a separate analysis with LEP patients categorized by physician language concordance, LEP-concordant patients reported worse clinician-patient interactions than English-proficient patients on two outcomes (one communication item - physician not understanding and one discrimination item - patient treated poorly because of language), and better clinician-patient interactions on one outcome (trust item - lack of confidence/trust), but were otherwise similar to English-proficient patients. In contrast, LEP-discordant patients reported worse clinician-patient interactions than English-proficient patients on seven out of 10 outcomes, including two communication items (physicians not explaining, physician not understanding), two trust items (lack of confidence/trust, physician not putting medical needs above other considerations), and three discrimination items (patient treated poorly because of race/ethnicity, treated poorly because of language, and physicians not showing respect).

In multivariate adjusted comparison of LEP patients, LEP-discordant patients remained more likely than LEP-concordant patients to report suboptimal clinician-patient interactions on three out of 10 outcomes, including one communication item (physician not understanding problems), one trust item (lack of confidence/trust), and one discrimination item (patient treated poorly because of language). (Table 3)

In sensitivity analyses, including patients who reported “sometimes” having difficulty with English in the LEP group resulted in slightly increased odds of suboptimal interactions among LEP as compared to English-proficient patients. Including patients who reported that their physician spoke their language “well” in the LEP-discordant group did not significantly alter our results. Redefining suboptimal clinician-patient interactions as responses of *never/sometimes* for positive characteristics and *always/usually* for negative characteristics resulted

in fewer reports of suboptimal interactions overall, but increased odds of suboptimal interactions among LEP as compared to English-proficient patients (data not shown).

DISCUSSION AND CONCLUSION

Discussion

We found that limited English proficiency was independently associated with reports of suboptimal clinician-patient interactions among patients with diabetes receiving uniform access to care at healthcare facilities offering several forms of interpreter services. However, reports of suboptimal communication, trust, and perceived healthcare system discrimination among patients with LEP differed significantly by physicians' language concordance and were more common among those with language discordant physicians. While all patients with LEP were more likely than patients with English proficiency to report physicians not always understanding their problems in carrying out treatments and perceived discrimination because of race/ethnicity or language, LEP-discordant patients reported additional problems with physicians not explaining, lack of confidence or trust in their personal physicians, physicians not putting their medical needs above other considerations, and physicians not showing respect. In contrast, reports of suboptimal interactions among LEP-concordant patients did not differ substantively from English-proficient patients. Our study confirms and expands on results from smaller studies within a single language group (25,36), demonstrating that language concordant physicians appear to improve interpersonal care for patients with LEP to a level comparable to that of patients with English proficiency.

Communication, trust, and perceived healthcare system discrimination are three separate but interconnected components of clinician-patient interactions, each with important effects on health outcomes among patients with diabetes. A previous study demonstrated that perceived discrimination was strongly associated with poor communication and poor glycemic control. (12) In another study, trust in physicians was an important moderator of the association between medication costs and medication adherence. (8) Clinician-patient communication, including the provision of information and efforts to involve patients in clinical decision-making, has been associated with diabetes self-management and glycemic control. (5,10,37) A previous study conducted in a managed care setting found no association between patient primary language and clinical outcomes for Caucasian and Latino patients with diabetes. (38) This study, however, was characterized by a high level of clinician-patient language concordance, which may have contributed to the result. Our finding of worse reported interaction among LEP-discordant patients in all three components studied - communication, trust, and perceived healthcare system discrimination - highlights the potential for additional problems with patient-centered and clinical outcomes in this group.

Increasingly, healthcare organizations collect data on patient satisfaction as a marker of healthcare quality. Surveys of patients' experiences have consistently noted lower satisfaction and reports of less patient-centered care among patients from racial and linguistic minority groups. (15,21–23) Our study confirms the importance of considering patients with LEP as a vulnerable group and offers important information about the interpretation of satisfaction data for this population. Reports of worse clinician-patient interactions among patients with LEP when considered as a group may be largely driven by patients with LEP who are cared for by language discordant physicians. Alternatively, reports of equivalent clinician-patient interactions between English-proficient patients and patients with LEP when considered as a group may mask findings of worse interactions among patients with LEP and language discordant physicians. Health care organizations should be aware that the relative prevalence of language concordant and discordant clinicians will impact reports of patient satisfaction among patients with LEP.

Our findings should be considered in light of several limitations. First, clinician-patient communication, trust, and perceived discrimination were based on patient self-report; we did not directly observe clinical interactions. However, patient perceptions of clinician-patient interactions are important in and of themselves (39) and have been shown to correlate with direct observation of clinical encounters (40,41) as well as clinical outcomes. (12) Second, while questions about clinician-patient interactions were drawn from validated scales and grouped conceptually as related to communication, trust and perceived discrimination, we did not include complete scales and cannot ensure that these items represent three single constructs. Third, this study addressed only patient-centered outcomes; further research is needed to evaluate the effects of language concordance on clinical outcomes such as glycemic control among LEP patients with diabetes. Fourth, we had data on language concordance from only a subset of survey participants, limiting our power to explore differences among patients with LEP by language concordance. Fifth, language concordance was determined by patient report; we did not verify the language competency of physicians via direct assessment or physician report. Sixth, while our study sample offered the advantages of linguistically-diverse participants with uniform access to care, we were unable to stratify our results by individual language and cannot exclude differences in experiences by language group. Seventh, we were unable to evaluate the race/ethnicity or cultural competence of clinicians, which may also impact patient reports of communication, trust, and perceived discrimination. (42,43) Eighth, we had no data on the use of interpreters in language-discordant encounters. Interpreters were available at all facilities. However, professional interpreters may be underused, even when available. (44) While our results are consistent with studies that have found interpreter-mediated interactions to be less patient-centered (45) and less satisfactory to patients (27), we were unable to determine the association of interpreter use with reports of suboptimal interactions in this study. Finally, given the cross-sectional nature of this study we were unable to determine causality, and therefore cannot exclude the possibility that patients who were more satisfied with clinical interactions rated the language ability of their physicians more highly.

Conclusion

In summary, we found that 1) despite uniform access to care and interpreter services, patients with diabetes and limited English proficiency more often report suboptimal clinician-patient interactions than do patients with English proficiency and 2) reports of suboptimal clinician-patient interactions among patients with LEP are driven largely by patients with LEP who have language discordant physicians, whereas reports of clinician-patient interactions among patients with LEP who have language concordant physicians do not differ substantively from English-proficient patients.

Practice Implications

Two important implications emerge from our results. First, expanding access to language concordant clinicians – through programs that promote increased training and hiring of multilingual clinicians or programs that actively link patients who do not speak English with providers that speak their language – may improve clinician-patient interactions observed among patients with limited English proficiency. Second, quality and performance assessments should consider physician-patient language concordance, as failure to do so may lead to misinterpretations of the association of race or language with patient-centered outcomes.

Acknowledgments

Funds for the DISTANCE Study were provided by National Institute of Diabetes, Digestive and Kidney Diseases [R01 DK65664] and National Institute of Child Health and Human Development [R01 HD046113].

Dr. Schenker was supported by the General Internal Medicine Fellowship at UCSF, funded by the Department of Health and Human Services, Health Resources and Services Administration (DHHS HRSA D55HP05165).

Dr. Schillinger was supported by a grant from the NIH (UL1 RR02413).

Dr. Karter, Warton MPH, Moffet MPH and Dr. Ahmed were supported by R01 DK65664 and R01 HD046113.

Dr. Fernandez was supported by an NIH Career Development Award (K23-RR01832401).

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Appendix A

Survey Questions

Communication

In the last 12 months, how often did doctors or health care providers listen carefully to you? (CAHPS Health Plan Survey 3.0)(46)

In the last 12 months, how often did doctors or health care providers explain things (directly or through an interpreter) in a way you could understand? (CAHPS Health Plan Survey 3.0)

In the last 12 months, how often did your doctors or health care providers spend enough time with you? (CAHPS Health Plan Survey 3.0)

In the last 12 months, how often did your personal physician involve you in making decisions about your care as much as you wanted? (Adapted from IPC in Diverse Populations)(29)

In the last 12 months, how often did your personal physician seem to understand the kinds of problems you have in carrying out recommended treatments? (Adapted from IPC in Diverse Populations)(29)

Trust

In the last 12 months, how often have you felt confidence and trust in your personal physician?
(Adapted from Trust in Physician Scale)(30)

In the last 12 months, how often did you feel that your personal physician was putting your medical needs above all other considerations when treating your medical problems?

(Adapted from Trust in Physician Scale)

Discrimination

In the past 12 months, how often have you felt that doctors or health care providers treated you poorly or made you feel inferior because of your race or ethnicity? (Self-reported experiences of discrimination)(31,47)

In the past 12 months, how often have you felt that doctors or health care providers treated you poorly or made you feel inferior because of your language? (Self-reported experiences of discrimination)

In the last 12 months, how often did doctors or health care providers show respect for what you had to say? (CAHPS Health Plan Survey 3.0)

Table 1
Demographic characteristics of participants by English proficiency and language concordance*

Characteristics	English Proficient (N=8116)	LEP (N=522)	P value	LEP-LC (N=210)	LEP-LD (N=153)	P value
Age, y, mean $\pm$ SD	59 $\pm$ 10	59 $\pm$ 11	.89	58 $\pm$ 11	59 $\pm$ 10	.90
Male	3981 (49)	207 (40)	<.0001	78 (37)	59 (39)	.78
Race/Ethnicity			<.0001			.27
White	2096 (26)	22 (4)		4 (2)	3 (2)	**
Black	1633 (20)	43 (8)		1 (.5)	2 (1)	
Asian	1849 (23)	143 (27)		66 (31)	34 (22)	
Latino	1413 (17)	254 (49)		121 (58)	98 (64)	
Other	1096 (14)	60 (11)		18 (9)	16 (10)	
High school graduate	7018 (88)	255 (50)	<.0001	75 (37)	64 (42)	.28
Annual income < 25K	1275 (17)	205 (44)	<.0001	94 (50)	58 (44)	.31
Comorbidity measure (DxCG), mean $\pm$ SD	5.0 $\pm$ 5.6	4.7 $\pm$ 5.5	.21	3.8 $\pm$ 3.5	4.9 $\pm$ 6.0	.05
Moderate-Severe Depressive Symptoms (PHQ-8 $\geq$ 10)	971 (13)	127 (27)	<.0001	42 (21)	43 (31)	.04

* Chi-square test used for categorical variables and t-tests used for continuous variables. All numbers given as N (%) except where indicated otherwise.

** Due to small cell sizes, white and black races were combined in the chi-square calculation.

Abbreviations: LEP, limited English proficiency; LEP-LC, limited English proficiency with language concordant physician; LEP-LD, limited English proficiency with language discordant physician; DxCG, Diagnostic Cost Group; PHQ, Patient Health Questionnaire

Table 2
Suboptimal clinician-patient interactions by English proficiency and language concordance

	English Proficient (N=8116)	LEP (N=522)	P value	LEP-LC (N=210)	LEP-LD (N=153)	P value
Communication						
Physicians not listening	2649 (33)	144 (28)	.02	54 (26) [†]	48 (32)	.24
Physicians not explaining	2358 (29)	187 (36)	.0009	75 (36) [†]	65 (43) [†]	.17
Not enough time spent with patient	3335 (41)	207 (40)	.53	81 (39)	72 (48)	.10
Patient not always involved in decisions about care	3567 (46)	259 (51)	.02	103 (50)	87 (58) [†]	.12
Physician not always understanding problems in carrying out treatments	2458 (38)	165 (48)	.0001	57 (48) [†]	64 (63) [†]	.03
Trust						
Lack of confidence and trust in personal physician	2108 (26)	127 (25)	.37	34 (16) [†]	54 (35) [†]	<.0001
Personal physician not putting medical needs above other considerations	2568 (33)	203 (41)	.0004	81 (41) [†]	70 (48) [†]	.17
Perceived Discrimination						
Patient treated poorly because of race or ethnicity	352 (4)	56 (11)	<.0001	16 (8) [†]	21 (14) [†]	.05
Patient treated poorly because of language	165 (2)	61 (12)	<.0001	18 (9) [†]	30 (20) [†]	.001
Physicians not showing respect	2237 (28)	154 (30)	.31	60 (29)	59 (39) [†]	.04

* All data given as number (percentage)

[†] p ≤ .05 for comparison with English-proficient patients

Abbreviations: LEP, limited English proficiency; LEP-LC, limited English proficiency with language concordant physician; LEP-LD, limited English proficiency with language discordant physician

Table 3

Odds of suboptimal clinician-patient interactions by English proficiency and language concordance*

	LEP vs English-proficient	LEP-LC vs English-proficient	LEP-LD vs English-proficient	LEP-LD vs LEP-LC**
Communication				
Physicians not listening	.83 (.67, 1.03)	.81 (.56, 1.15)	1.00 (.71, 1.41)	1.30 (.79, 2.13)
Physicians not explaining	1.12 (.92, 1.36)	1.09 (.79, 1.49)	1.45 (1.05, 2.01)	1.25 (.78, 2.01)
Not enough time spent with patient	.95 (.78, 1.16)	.93 (.67, 1.29)	1.32 (.94, 1.86)	1.47 (.90, 2.39)
Patient not always involved in decisions about care	1.02 (.84, 1.23)	.91 (.68, 1.21)	1.31 (.93, 1.84)	1.46 (.93, 2.28)
Physician not always understanding problems in carrying out treatments	1.45 (1.16, 1.82)	1.46 (1.02, 2.10)	2.62 (1.71, 4.03)	1.92 (1.09, 3.36)
Trust				
Lack of confidence and trust in personal physician	.93 (.74, 1.16)	.58 (.39, .85)	1.55 (1.08, 2.23)	2.76 (1.68, 4.54)
Personal physician not putting medical needs above other considerations	1.20 (.97, 1.47)	1.14 (.81, 1.59)	1.59 (1.12, 2.25)	1.38 (.84, 2.26)
Perceived Discrimination				
Patient treated poorly because of race or ethnicity	1.95 (1.40, 2.72)	1.29 (.75, 2.22)	2.56 (1.51, 4.33)	1.93 (.96, 3.92)
Patient treated poorly because of language	3.39 (2.35, 4.88)	1.88 (1.11, 3.20)	6.14 (3.70, 10.19)	2.47 (1.38, 4.44)
Physicians not showing respect	1.06 (.86, 1.31)	1.02 (.73, 1.43)	1.62 (1.15, 2.30)	1.45 (.91, 2.33)

* GEE models account for clustering by physician and adjusted for age, sex, race, education, income, comorbidity index and depression

** Adjusted for all variables except for race due to small sample sizes and the collinearity of race and language

Abbreviations: LEP, limited English proficiency; LEP-LC, limited English proficiency with language concordant physician; LEP-LD, limited English proficiency with language discordant physician