ABSTRACT

Title of Dissertation: PERCEPTION OF PATIENT-PROVIDER COMMUNICATION AND ITS ASSOCIATION WITH HEALTH SERVICES UTILIZATION

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The Patient Protection and Affordable Care Act of 2010 has generated an unprecedented emphasis on patient satisfaction and patient-centered care. This dissertation is composed of a series of papers on how patients perceive the quality of care delivered by their healthcare providers and its relationship to their usage of health services. The main hypothesis is that higher perceived quality of care is associated with more effective use of health services. The studies use nationally representative data from the Medical Expenditure Panel Survey (MEPS) with the research grounded in Andersen's Behavioral Model of Health Services Use.

In the first study, I explore whether differences in satisfaction between English- and Spanish-speaking Hispanics can be explained by acculturation and concordance with their providers with regard to race, ethnicity, gender, and language. I use the econometric Blinder-Oaxaca decomposition method to quantify the contributions of each measured characteristic for explaining disparities in patient satisfaction.

In the second study, I examine whether a lack of patient-centeredness and poor access to a regular provider are associated with greater nonemergent emergency department (ED) utilization. I employ a hurdle model to account for the two-part decision making process of whether to use the ED and how often to use the ED for nonemergent purposes.

In the third study, I investigate the relationship between patient-centered care and receipt of six recommended clinical preventive services including screening for breast cancer, cervical cancer, colorectal cancer, high cholesterol, hypertension, and vaccination against influenza. I use multivariate logistic regression models to determine the probability of compliance with national prevention guidelines.

The results reveal the importance of how patients perceive interpersonal communication with their healthcare providers. In the first study, acculturation is implicated as a major contributor to differences in patient satisfaction with communication. Furthermore, the results from the second study indicate language concordance between patients and providers is related to less nonemergent ED use. Findings from the third study suggest a pattern of greater compliance with clinical preventive service recommendations when patients perceive receiving patient-centered care from their providers. Implications for policy and practice are presented.

PERCEPTION OF PATIENT-PROVIDER COMMUNICATION AND ITS ASSOCIATION WITH HEALTH SERVICES UTILIZATION

by

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2012

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2012

DEDICATION

I dedicate this dissertation to my children, Ryan and the baby in my belly. Everything I do is for you.

ACKNOWLEDGEMENTS

This dissertation is the culmination of the past four years of training and research. I am grateful for the sage advice, endless positivity, and unswerving support from my dissertation chair, Dr. Karoline Mortensen. She motivated and inspired me. Her ability to empathize with me was invaluable; she understood what it was like to complete doctoral work while raising a young one and defend a dissertation while pregnant. She taught me innumerable lessons and her guidance was vital to my progress.

I would also like to thank my committee for their service. Dr. Jie Chen provided incredibly rapid feedback on the papers as they were finalized. Her comments were instrumental to the quality and comprehensiveness of my work. I had the opportunity to learn from the wisdom of Dr. Jack Meyer in two courses which afforded me a new perspective on the U.S. healthcare system. Dr. Stephen Thomas has also influenced me vis-à-vis the occasions where I have heard him speak, formally and informally, about health disparities. I wish I could have met Dr. Linda Aldoory earlier since her questions were thought-provoking.

Finally, I would like to recognize my husband, Nick. Without his love and support, this dissertation would not be possible.

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LIST OF ABBREVIATIONS

ACIP	Advisory Committee on Immunization Practices
AHRQ	Agency for Healthcare Research and Quality
CAHPS	Consumer Assessment of Healthcare Providers and Systems
CI	Confidence interval
CMS	Centers for Medicare & Medicaid Services
ED	Emergency department
FPL	Federal poverty level
ICD-9	International Classification of Disease, Ninth Revision
MEPS	Medical Expenditure Panel Survey
MSA	Metropolitan Statistical Area
OLS	Ordinary least squares
OR	Odds ratio
PAS-3	Three-item Proxy Acculturation Scale
SAQ	Self-administered questionnaire
USC	Usual source of care
USPSTF	United States Preventive Services Task Force

CHAPTER 1: INTRODUCTION

A central feature of the Patient Protection and Affordable Care Act of 2010 is improving the quality of health care. One key indicator of quality is patient satisfaction. As the U.S. healthcare system implements reform provisions, process-based measures of quality become increasingly important. These measures involve the actions that a healthcare provider takes during the medical visit for prevention, diagnosis, and treatment of their patients. As the recipients of care and the subjects for whom health outcomes are measured, patients are uniquely positioned to assess the quality of the medical interaction. In fact, in October 2012, the Centers for Medicare & Medicaid Services (CMS) started to link hospital reimbursement with patient satisfaction scores through its new Hospital Value-based Purchasing Program. This program will result in an unprecedented emphasis on patient satisfaction.

Two authoritative bodies have identified the importance of the patient's perspective regarding healthcare quality. The Institute of Medicine report, *Crossing the Quality Chasm*, emphasizes the need for patient-centered care along with five other areas for improvement in the healthcare system including safety, effectiveness, timeliness, efficiency, and equity.[1] The report defines patient-centeredness as "providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions." Other motivators for studying the patient's encounter with their provider are Healthy People 2020's Health Communication and Health Information Technology objectives from the U.S. Department of Health and Human Services.[2] One objective is to "increase the proportion of persons who report that their health care providers have satisfactory communication

skills." Another is to "increase the proportion of persons who report that their health care providers always involved them in decisions about their health care as much as they wanted." These calls to action highlight the importance of studying patient-centeredness and patient satisfaction.

Although patient-centered care and patient satisfaction are related, they are distinct concepts.[3] Providers practicing a patient-centered approach to care encourage patients to ask questions and participate in the medical dialogue. This two-way discourse has been linked to higher patient satisfaction and better health outcomes.[4-6] A common fallacy is to point to patients who prefer to take a passive role in the healthcare encounter as an exception to the rule. Some scholars argue that these patients are satisfied, but are not receiving patient-centered care.[7] However, by understanding these patients (who often have low health literacy or poor English proficiency) prefer to be less participatory, their providers are precisely demonstrating patient-centeredness.[8] They are allowing their patients' preferences to guide how they deliver care. Patient-centered care is synonymous with individualized care.

Fortunately, the Medical Expenditure Panel Survey (MEPS) from the Agency for Healthcare Research and Quality (AHRQ) measures both constructs and serves as the data source for the research in this dissertation. The MEPS Household Component is conducted annually across a nationally representative sample of U.S. households. Data are gathered through a series of computer-assisted personal interviews with questions pertaining to health status, demographic characteristics, healthcare utilization, expenditures, access to care, and quality of care.[9] An annual Self-Administered Questionnaire (SAQ) supplements the main survey with additional questions about health

status and healthcare quality. In this dissertation, patient satisfaction with provider communication is measured by four items from the SAQ that originated from AHRQ's Consumer Assessment of Healthcare Providers and Systems (CAHPS) surveys. Patient-centered care is assessed by patients using five items from the main survey pertaining to how often providers engaged their patients in the medical dialogue.

In this dissertation, I pose three distinct, but related, research questions regarding perceived quality of care and its relationship to health services use. In Chapter 2, I concentrate on disparities in patient satisfaction with provider communication due to English language proficiency. I focus my research on Hispanics who report the lowest satisfaction with provider communication compared to blacks and whites. In this study, I explore whether differences in satisfaction between English- and Spanish-speaking Hispanics can be explained by acculturation and concordance with their provider with regard to race, ethnicity, gender, and language. This is the first study to combine these factors into a comprehensive statistical model. Based on the literature, I hypothesize that acculturation and patient-provider concordance contribute to the group differences in satisfaction.

I shift my attention toward the assessment of patient-centered care in Chapter 3. In this study, I examine whether a lack of patient-centeredness and poor access to a regular provider are associated with greater nonemergent emergency department (ED) utilization. Given the nature of ED visits, where many people have no visits, I add to the literature by using a novel methodological approach that is better suited to model ED utilization data with excess zeros. I hypothesize that patients who do not receive patient-

centered care or do not have reliable access to their primary care provider are more likely to use the ED for nonemergent reasons.

In Chapter 4, I investigate the relationship between patient-centered care and receipt of six recommended clinical preventive services including screening for breast cancer, cervical cancer, colorectal cancer, high cholesterol, hypertension, and vaccination against influenza. Using the most recent data currently available from MEPS, I am able to approximate self-reported compliance with these prevention recommendations better than previous researchers who have used MEPS datasets from earlier survey years.[10,11] I hypothesize that patients who receive personalized care from their regular providers are more likely to comply with prevention guidelines.

The theoretical framework underlying the research in this dissertation is based on Andersen's Behavioral Model of Health Services Use.[12,13] According to this model, an individual's utilization of healthcare services is influenced by his/her predisposing characteristics, enabling resources, and need factors. I control for these factors in the analyses in order to disentangle the true relationship of the variables of interest to the outcome.

In this dissertation, I demonstrate the use of advanced statistical methods learned during my coursework and while working on my dissertation. In Chapter 2, I use a Blinder-Oaxaca decomposition to quantify the separate contributions of each measured characteristic for explaining disparities in patient satisfaction. I employ another econometric method in Chapter 3. I use a hurdle model to account for the two-part decision making process of whether to use the ED and how often to use the ED for nonemergent purposes. In Chapter 4, I use multivariate logistic regression models to

ascertain whether patients' perception of quality of care received is related to their utilization of preventive services. I also perform sensitivity analyses for all three studies.

CHAPTER 2:

Villani, J. and Mortensen, K. Decomposing the gap in satisfaction with provider communication between English- and Spanish-speaking Hispanic patients. In press with J Immigr Minor Health. Reprinted with kind permission from Springer Science and Business Media.

Decomposing the gap in satisfaction with provider communication between English- and Spanish-speaking Hispanic patients

Background

Patient-provider communication is the foundation of the clinical encounter. Patients must be able to describe their ailments or concerns, and medical providers must be able to explain diagnoses and treatment courses to patients to maximize health outcomes. Communication is stymied when linguistic and cultural barriers are present.[14,15] The success of this medical dialogue leads to treatment adherence which results in better health.[16,17] Quality of care is improved when providers communicate well with patients allowing them to manage their personal health care.[18,19]

The importance of clear health communication is recognized by Healthy People 2020, the nation's decennial plan for promoting health and disease prevention. Specifically, the Health Communication and Health Information Technology Objective 2 (HC/HIT 2) is a call to "increase the proportion of persons who report that their health care providers have satisfactory communication skills."[2] Progress is measured using four questions from the Medical Expenditure Panel Survey (MEPS). The target is a 10 percent improvement from the baseline in 2007. At the baseline, Hispanics reported the lowest satisfaction with provider communication, followed by whites who rated satisfaction with communication higher, and then blacks who reported the highest

satisfaction.[20] This finding is consistent with previous literature on racial and ethnic disparities in ratings of provider communication.[21-23]

There is a significant literature exploring the contribution of patient-provider concordance to patient satisfaction. For example, several studies focusing on race-concordance identify a positive association with patient satisfaction outcomes.[24-28] However, critics point out that all but two of these studies use the same data source from 1994.[29] Another study finds no association between race concordance among minorities and satisfaction with the last physician they saw.[23] Although the evidence is sparse, ethnic concordance is associated with higher satisfaction with provider communication.[30] Blacks and Spanish-speaking Hispanics tend to prefer an ethnic-concordant provider.[31] The same study also notes that although English-speaking women prefer female providers, men and Spanish-speaking Hispanic women do not express a specific preference for a provider of the same gender. Others find greater satisfaction among patients with providers of the opposite sex.[32] Patients using the same language as their providers generally report higher ratings of quality of care,[33-35] although Hispanics have been found to be more likely to report their providers treat them with disrespect based on how well the patients speak English.[36]

It is important to disentangle how Hispanics perceive their providers' communication skills because they comprise the fastest growing subpopulation in the U.S. In 2006, 15% of the total national population was Hispanic; the proportion of Hispanics is projected to increase to almost 25% by 2050.[37] Satisfaction of Hispanic patients with their providers' communication is well-studied.[35,38-41] However, due to data

limitations, these studies were unable to simultaneously account for factors that influence the clinical encounter.

In addition to demonstrated disparities between racial and ethnic groups, there are also cultural and linguistic differences within Hispanic populations that may lead to disparities in health care. This study seeks to identify the factors that explain the gap in patient satisfaction among Hispanics. The first objective is to determine the extent that satisfaction with provider communication differs between English- and Spanish-speaking Hispanics. The second objective is to determine if differences between these two groups can be explained by acculturation and concordance with their provider or other demographic variables. Group differences in satisfaction are decomposed in order to quantify the separate contributions made by each measured characteristic.

The present study improves upon the literature by combining factors identified by previous research across studies into a comprehensive statistical model. In addition to demographic and socioeconomic characteristics, this study examines the degree of acculturation of the patient[42,43] as well as patient-provider concordance with regard to race,[15,26,27,43] ethnicity,[15,31] gender,[31] and language.[33-35]

The methodology in this study adds to the existing literature. The Blinder-Oaxaca decomposition technique offers a unique statistical approach to understanding how each factor contributes to group differences. This technique was originally designed to study differences in wages between gender and among racial groups, but it is now applied frequently in health services research.[44-48]

Methods

The data we use for this study are from the Household Component of the 2007-2009 MEPS. The MEPS is a nationally representative survey of nearly 15,000 households who participated in the previous year's National Health Interview Survey.[49] Respondents reflect an oversampling of the Hispanic, black, Asian, and low-income populations. Most of the data for this study come from the Self-Administered Questionnaire (SAQ) which is administered to all persons in the sample aged 18 years and older.

Respondents are divided according to a dichotomous variable reflecting their ability to speak English. We impute these data from three variables: the language spoken most at home, whether the whole household is comfortable speaking English, and whether the individual is comfortable speaking English.

Dependent variables

Four outcome variables comprise satisfaction with provider communication as measured by responses to four MEPS questions. If the respondent had a healthcare visit in the past year, they are asked:

1) In the last 12 months, how often did doctors or other health providers listen carefully to you?
2) In the last 12 months, how often did doctors or other health providers explain things in a way you could understand?
3) In the last 12 months, how often did doctors or other health providers show respect for what you had to say?

4) In the last 12 months, how often did doctors or other health providers spend enough time with you?

Responses are categorized on an ordinal scale of "never," "sometimes," "usually," or "always." The data are highly skewed (Table 1.1). Consistent with the literature, responses are dichotomized to "always" and "not always."[23,39,50]

Independent variables

The main independent variables are acculturation and concordance. Our definition of acculturation is "the acquisition of the cultural elements of the dominant society."[51] Many researchers rely on single indicators for acculturation such as language preference, nativity, or number of years residing in the U.S.[52] However, critics argue that these measures, individually, do not adequately represent the complexity of acculturation.[53,54] Following Cruz et al.,[52] we combine three acculturation variables into a validated summary scale.

The respondents' level of acculturation is defined by a three-item Proxy Acculturation Scale (PAS-3) which we calculate using MEPS variables, including the language used for the survey, language spoken at home, and proportion of life spent in the U.S.[52] The scale ranges from 0-5 points. For the language items, two points are assigned for using English while zero points are given for using Spanish. The proportion of life spent in the U.S. is calculated using the number of years the respondent reported living in the U.S. divided by their reported age. The proportion is imputed to equal one for individuals who were born in the U.S. and whose responses are coded as "inapplicable" to the question about how many years they have lived in the U.S. Each individual was given an acculturation score based on the sum of these three items.

Respondents with scores in the bottom 50% are assumed to have low levels of acculturation (scores ranged 0-2.2363) while those in the top 50% are believed to have high levels of acculturation (scores ranged 2.2368-5). Using the median score as the cut-off ensures that only respondents who either complete the survey in English or report using English at home may be considered to have high acculturation levels.

Respondents are also assessed for concordance with their provider on race, ethnicity, gender, and language. Concordance variables are binary indicating whether concordance exists for each pair or not. These items are calculated using MEPS data on physician demographics as provided by the patients. Patient-provider language concordance is assumed if the patient is able to speak English, unless the data specifically indicate discordance.

Additional demographic variables are included in the analysis akin to previous studies.[39,55,56] Covariates include predisposing characteristics such as age, gender, race, highest level of education, marital status; enabling resources such as employment, income level, health insurance coverage, having a usual source of care, Census region, urban/rural residence; and need factors including health status. These variables are selected based on the Behavioral Model of Health Services Use.[12,13]

Analyses

Statistical analyses were performed using Stata 12.0 statistical software (College Station, TX). All analyses used MEPS survey weights for the SAQ to adjust for the complex survey design. First, bivariate chi-square analyses were used to detect differences in the demographic characteristics between the two respondent groups. Next, predictor variables were tested in an OLS regression. Then, logistic regression models

were constructed to identify differences between the two groups for the satisfaction outcome variables. The Blinder-Oaxaca decomposition method was employed to account for the observed differences.

Results

There are 16,243 Hispanics who completed an SAQ. About one-half of these respondents (n=7,889) are coded “inapplicable” to the four satisfaction questions, so they are assumed to not have visited a doctor in the last 12 months. An additional 658 individuals did not respond to one or more of the satisfaction questions and another 5,438 individuals did not provide data for the concordance variables or the acculturation scale. Therefore, a total of 13,985 participants are excluded from the study. Of the respondents, only those with complete demographic data and positive person weights (n=2,242) are included in the study.

Table 2.1 presents descriptive statistics of the sample. The majority of Hispanics in the sample are able to speak English (77%). More Spanish-speaking Hispanics lack a high school degree (68.9%) compared to English-speaking Hispanics (22%). Economically, a greater proportion of Spanish-speakers report incomes below 200% of the federal poverty level (56.6% vs. 29.1%) and no health insurance (13% vs. 7.8%) relative to English-speakers. More Spanish-speaking Hispanics also report fair or poor health (45.8%) than English-speaking Hispanics (17.6%). English-speakers tend to be younger; more than 60% were under 50 years old compared to 32.4% of Spanish-speakers.

Table 2.1 Demographic characteristics of sample by language*

Demographics	English-speaking Hispanics (%) n=1,726† n=12,077,535‡	Spanish-speaking Hispanics (%) n=516† n=2,799,209‡	X^2 p-value
Predisposing characteristics			
Age			<0.001
18 – 29 years	16.6	2.6	
30 – 49 years	45.1	29.8	
50 – 64 years	21.5	27.9	
≥ 65 years	16.8	39.7	
Gender			0.972
Female	59.9	60.0	
Race			0.6749
White	95.1	96.2	
Black	2.6	2.4	
American Indian/Alaska Native	1.9	1.2	
Asian	0.4	0.1	
Pacific Islander	0.1	0.0	
Education			<0.001
No degree	22.0	68.9	
High school	46.7	24.0	
Bachelor's degree or more	31.4	7.1	
Marital status			<0.001
Married	57.4	63.5	
Widowed	6.8	14.7	
Divorced	10.7	5.2	
Separated	2.7	5.3	
Never married	22.4	11.3	
Enabling resources			
Employment status			<0.001
Employed	68.3	40.0	
Not employed	31.7	60.0	
Income			<0.001
< 100% poverty level (poor)	10.0	22.4	
100 – 124% poverty level (near poor)	3.9	10.6	
125 – 199% poverty level (low income)	15.2	23.6	
200 – 399% poverty level (middle income)	32.2	33.3	
≥ 400% poverty level (high income)	38.7	10.2	
Health insurance			<0.001
Private	72.3	34.9	
Public	19.9	52.1	
Uninsured	7.8	13.0	
Region			0.248
Northeast	20.3	22.5	
Midwest	8.9	7.6	
South	41.1	46.0	
West	29.7	23.9	
MSA			0.245
Urban	95.6	94.3	
Rural	4.4	5.7	

Need factors			
Health status			<0.001
Excellent	16.9	4.3	
Very good	30.8	16.7	
Good	34.7	33.3	
Fair	13.3	32.7	
Poor	4.3	13.1	
Patient satisfaction			
Provider listened carefully			0.006
Always	63.7	56.9	
Usually	27.9	37.3	
Sometimes	6.8	4.2	
Never	1.6	1.6	
Provider explained for understanding			0.092
Always	61.5	56.7	
Usually	28.3	33.8	
Sometimes	8.6	6.8	
Never	1.6	2.7	
Provider showed respect			0.086
Always	68.4	63.3	
Usually	25.2	29.2	
Sometimes	5.4	4.9	
Never	1.0	2.6	
Provider spent enough time			0.053
Always	51.5	44.2	
Usually	35.8	43.7	
Sometimes	10.8	9.7	
Never	1.8	2.5	

** Percentages may not total 100% due to rounding*
† Unweighted sample size
‡ U.S. population estimate

Not surprisingly, in Table 2.2, more Spanish-speaking Hispanics report conversing in Spanish at home (95%) relative to English-speaking Hispanics (32%). Spanish-speaking respondents are also more likely to have lived in the U.S. for less than 20 years (38.8%) compared to those who speak English (16.6%). As a result, the two groups are starkly different with respect to their acculturation scores. Most Spanish-speaking Hispanics score low on the acculturation scale (86.2%), whereas most of the English-speaking Hispanics score high on the acculturation scale (83.9%).

Table 2.2 Acculturation statistics of sample by language*

Acculturation	English-speaking Hispanics (%) n=1,726† n=12,077,535‡	Spanish-speaking Hispanics (%) n=516† n=2,799,209‡	X^2 p-value
Language spoken at home			<0.001
English	68.0	5.0	
Spanish	32.0	95.0	
Years lived in U.S.			<0.001
0-19 years	16.6	38.8	
20-39 years	42.2	37.7	
40+ years	41.3	23.6	
PAS-3 Score			<0.001
Low acculturation	16.1	86.2	
High acculturation	83.9	13.8	

** Percentages may not total 100% due to rounding*
† Unweighted sample size
‡ U.S. population estimate

There are no differences between the groups regarding patient-provider racial concordance or gender concordance (Table 2.3). Spanish-speaking Hispanics report more ethnic concordance with their providers (62.9%) relative to their English-speaking counterparts (32.5%). However, the English-speaking group have more language concordance with their providers (100%) compared to the Spanish-speaking group (85.2%).

Table 2.3 Patient-provider concordance statistics by language*

Patient-Provider Concordance	English-speaking Hispanics (%) n=1,726† n=12,077,535‡	Spanish-speaking Hispanics (%) n=516† n=2,799,209‡	X^2 p-value
Race			0.495
Concordant	76.0	78.0	
Discordant	24.1	22.0	
Ethnicity			<0.001
Concordant	32.5	62.9	
Discordant	67.5	37.1	
Gender			0.087
Concordant	52.7	47.7	
Discordant	47.3	52.3	
Language			<0.001
Concordant	100.0	85.2	
Discordant	0.0	14.8	

** Percentages may not total 100% due to rounding*
† Unweighted sample size
‡ U.S. population estimate

Logistic and linear regression models of satisfaction with provider communication show that English-speaking Hispanics report greater satisfaction compared to Spanish-speaking Hispanics (Table 2.4). Two measures of satisfaction yield statistically significant results in preliminary, unadjusted models. The difference between English- and Spanish-speaking Hispanics' satisfaction with their providers' listening skills is 6.8 percentage points. Satisfaction with the amount of time their providers spent with them differs by 7.3 percentage points. The groups have no significant differences in satisfaction with how often providers explained things well or how often providers showed respect.

Table 2.4 Differences in satisfaction with provider communication between English-speaking and Spanish-speaking Hispanics

	Provider always listened carefully	Provider always explained for understanding	Provider always showed respect	Provider always spent enough time
Unadjusted OR (95% CI)				
English	1.3 (1.03-1.7)*	1.2 (0.9-1.6)	1.3 (1.0-1.6)	1.3 (1.1-1.7)*
Spanish	1.0	1.0	1.0	1.0
OLS coefficient				
English	0.637*	0.615	0.684	0.515*
Spanish	0.569*	0.567	0.633	0.442*
Difference	0.068*	0.048	0.051	0.073*

** Statistically significant at p<0.05*

Sensitivity analyses reveal no significant differences in the results between the model that used the PAS-3 and the model with the components of the PAS-3 entered separately.

Using an extension of the Blinder-Oaxaca decomposition technique to nonlinear regression models,[57] the differences in satisfaction are decomposed into a part that is explained by differences in observed characteristics and a part that is unexplained. These

total differences are the same as the differences in the OLS regression coefficients from Table 2.4.

Table 2.5 shows the results of the decomposition. Almost half of the gap between English- and Spanish-speaking Hispanics' satisfaction with their providers' listening skills is explained by group differences in the observed characteristics. Health insurance coverage is the largest factor accounting for 4.4 percentage points of this difference. Spanish-speaking Hispanics have greater proportions of uninsured and publicly insured respondents which explain 64% of the widening of the gap in satisfaction with their providers' listening skills compared to English-speaking Hispanics. On the other hand, differences in age between the two groups (-0.078; -115%) actually reduce the size of the gap (Figure 2.1). That is, the satisfaction difference would be even larger if the model omitted the older Spanish-speaking patients who are generally more satisfied with their providers' listening skills than younger Spanish-speaking patients.

Table 2.5 Non-linear decompositions of and contributions to differences in satisfaction with provider communication between English-speaking and Spanish-speaking Hispanics*†

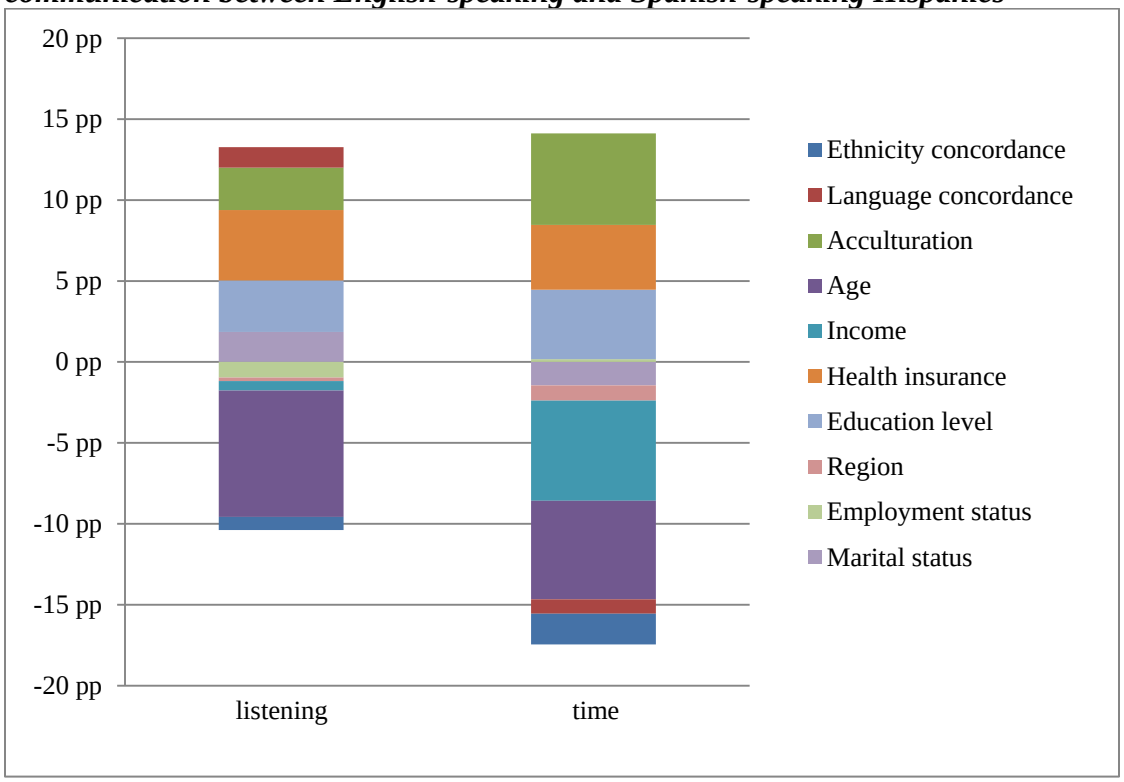
	Provider always listened carefully		Provider always spent enough time	
Total difference	0.068		0.073	
Difference due to unexplained relative advantage	0.040		0.106	
Difference due to observed characteristics	0.028		-0.033	
Race concordance	-0.002	-2%	0.002	3%
Ethnicity concordance	-0.008	-12%	-0.019	-26%
Gender concordance	-0.001	-2%	-0.001	-1%
Language concordance	0.013	19%	-0.009	-12%
Acculturation	0.026	38%	0.057‡	77%
Age	-0.078‡	-115%	-0.061‡	-83%
Gender	-0.000	0%	0.000	0%
Race	-0.000	0%	-0.002	-2%
Income	-0.006	-9%	-0.062‡	-85%
Health insurance	0.044‡	64%	0.040‡	55%
Education level	0.032	47%	0.043‡	59%
Region	-0.002	-3%	-0.009	-13%
MSA	-0.000	0%	-0.001	-2%
Health status	0.002	3%	0.002	3%
Employment status	-0.010	-14%	0.002	2%
Marital status	0.019	27%	-0.015	-20%
Explained component (total)	0.027	41%	-0.033	-44%

** Percentage points may not sum to total due to rounding*

† The proportion of the observed characteristics explained by the model is the ratio of the difference explained by the individual factor over the total difference. For example, the level of acculturation explains 0.057 percentage points of the 0.073 gap in satisfaction between English- and Spanish-speaking Hispanics regarding the amount of time with their provider (0.0565/0.073=77%).

‡ Variable contributes greater than ± 50% of gap

Figure 2.1 Contributions of individual variables to gap in satisfaction with provider communication between English-speaking and Spanish-speaking Hispanics*



** Variables with little or no contribution are not displayed: race concordance, gender concordance, gender, race, MSA, and health status*

The largest gap in satisfaction between English- and Spanish-speaking Hispanics is found in the amount of time their providers spent with them (0.073). Observed characteristics account for narrowing the gap by 44%. Therefore, differences between the two groups that are included in the analysis actually diminish the satisfaction gap. Income (-0.062; -85%) and age (-0.061; -83%) are the main contributors to shrink the disparity in satisfaction. The best predictors of satisfaction are acculturation level (0.057; 77%), education level (0.043; 59%), and health insurance coverage (0.040; 55%).

Discussion

English-speaking Hispanics are more satisfied with provider communication than Spanish-speaking Hispanics. Although previous studies[26,31,34,43] find that patients prefer

providers of the same race, ethnicity, gender, and language, in this analysis, these concordance variables do not explain the difference in satisfaction. The patient's level of acculturation, on the other hand, is a large component of the groups' difference in satisfaction with the amount of time afforded to the patient. One explanation may be that the less acculturated Spanish-speaking Hispanics expect more time than their providers give based on customs from their native countries. Therefore, when medical encounters do not meet their expectations, they are less satisfied compared to their more acculturated, English-speaking counterparts who may expect little time from providers. However, acculturation does not have a significant impact on the other outcome variables, which indicates that Hispanic patients regard providers' demonstration of respect, explanations, and listening skills equally, irrespective of their nativity, household language, or residency.

Health insurance coverage and level of education are the largest contributors to the gap in patient satisfaction with provider communication. This finding concurs with previous research demonstrating patients with private insurance[41,58] or more education[22] tend to be more satisfied . In fact, providers often adjust their communication style based on patient education levels.[59]

Differences in age and income between the two language groups consistently reduce the satisfaction gaps in the present study. Previous studies find patient satisfaction with provider communication is associated with older age.[21,22,60] Likewise, in this study, because most of the Spanish-speakers are older and highly satisfied, their inclusion helps to diminish the satisfaction gap with English-speakers. In the same vein, prior research demonstrates a positive association between patient income and satisfaction.[61] However,

in this study, the most of the Spanish-speakers are poor and actually more satisfied with provider time than the more affluent Spanish-speakers, thus reducing the gap in satisfaction with English-speakers.

This study has several limitations. First, causality cannot be inferred since MEPS data are from a cross-sectional survey. Second, measurement bias may be present. Spanish-speaking Hispanics tend to be more likely to report favorable ratings.[62] Also, it is not possible to ascertain how many or the type of providers that respondents are rating. The questions ask about the actions of "doctors or other health providers." Responses could be gross generalizations of a multitude of healthcare visits, or they could be representative of just the most recent healthcare visit since it may be easier to recall. Third, response bias may exist. This study focuses on Hispanic respondents for whom complete data were available. All of the respondents had a usual source of care and the majority was female. Furthermore, the SAQ is only administered to individuals who visited a healthcare provider in the prior year. Hispanics who have healthcare visits may be different from those without visits. Fourth, although sizeable portions of the language gap in patient satisfaction are explained, there are still components that remain unexplained. For example, observed characteristics only account for 40% of the gap in satisfaction with how often the provider listened carefully. Finally, the present study cannot account for the effect of interpreter services on patient satisfaction, since MEPS data do not distinguish between patients who speak the same language as their provider and those who use an interpreter.

Conclusion

This is the first study to our knowledge that examines the disparity in patient satisfaction between English- and Spanish-speaking Hispanics. Because Spanish-speaking Hispanics are significantly less likely than English-speaking Hispanics to be satisfied with their provider encounters, we investigate the relationship between satisfaction and acculturation, as well as patient-provider concordance with regard to race, ethnicity, gender, and language. Our findings suggest that differences in patient acculturation account for 77% of the gap in satisfaction with the amount of time their providers spent with them. Differences in health insurance and education are consistently associated with differences in satisfaction. Interestingly, patient-provider concordance measures are not significant contributors to the disparities in satisfaction. These findings emphasize the importance of patient acculturation and its relationship to satisfaction.

Implications

These findings have valuable implications for healthcare administrators and providers. In October 2012, the Centers for Medicare & Medicaid Services (CMS) started to directly link patient satisfaction scores to hospital reimbursement, resulting in an unprecedented emphasis on patient satisfaction. Therefore, it is critical to better understand factors associated with satisfaction. Hispanic patients are not homogenous in this regard; they perceive their healthcare providers' communication skills differently according to their English language proficiency. This sensitivity highlights the importance of providing health care that is attentive to cultural differences. Offering cultural competency training programs to providers and providing interpreter services for patients are two ways for healthcare organizations to demonstrate a commitment to

improving the healthcare experience for Hispanics. Another recommendation is to increase the proportion of minorities in clinical education in order to increase diversity in the medical workforce to give Hispanic patients more choices and possibly more satisfying clinical interactions.

Important implications for patients can also be gleaned from the results of this study. Less acculturated Hispanic patients may be less satisfied with their medical interactions because they need more time to communicate and establish relationships with their providers. These patients probably have relatively lower health literacy levels stemming largely from their low English language proficiency. Therefore, one recommendation for these patients to improve their health literacy skills is to become more fluent in English. Many churches and community colleges offer English classes for adult speakers of other languages.

Of course, increasing English fluency among Hispanic patients is not a panacea, since being able to speak English and being able to understand medical jargon are not one in the same. Healthcare providers also need to use plain language in their conversations with patients and written instructions for patients. Health insurers already have a requirement to provide benefits information written in plain language to consumers per the Patient Protection and Affordable Care Act of 2010. Health policy can and should go further by requiring plain language elsewhere in the healthcare system, such as for prescription drug information and patient consent forms. Together these steps will enhance all patients' abilities to understand and act on healthcare information.

CHAPTER 3:

Patient-centeredness, access to a usual source of care provider, and nonemergent emergency department use

Background

Demand for emergency department (ED) services is growing steadily. After adjusting for age, there were 42 visits per 100 persons in 2008, up from 37 visits per 100 persons in 1995.[63] Despite popular belief, the literature shows that the growth in ED use is attributable to individuals with a usual source of care (USC).[64-66] Aside from having a true medical emergency, these patients choose to use the ED over other healthcare sites due to convenience and accessibility.[67-69] This may be problematic, however, because using the ED for nonemergent care affects continuity of care and can be more costly than receiving office-based care.[70,71]

A few studies have considered the impact of how patients perceive quality of care from their USC provider on ED use. Parents who identify a high degree of patient-centeredness from their children's health care are less likely to take their children to the ED.[72,73] Similarly, urban African American diabetes patients who are satisfied with the care they receive from their USC providers are less likely to use the ED.[74] At the national level, Sarver and colleagues[75] also discovered a negative association between satisfaction with a USC and ED use for nonemergent care. However, their exploratory study was limited by data availability.

Researchers have also demonstrated a relationship between barriers to primary care access and ED use. Patients of medical providers whose offices are open at least 12 hours on weekday evenings are significantly less likely to use the ED than patients with providers who do not maintain evening office hours.[76] Likewise, patients who lack

transportation, cannot reach their USC provider by phone, or cannot obtain a timely appointment with their USC provider are more likely to have an ED visit than those who do not perceive these barriers.[69]

This study adds to the existing literature by using recent data from a nationally representative sample with robust measures of patient-centered care and access to USC providers. Given the nature of ED visits, where many people have no visits, we improve upon previous work by employing a two-part model which is better suited to model the data with excess zeros. We also disentangle the influences of sociodemographic, enabling resources, and need factors that are associated with ED visits. We seek to establish whether a lack of patient-centeredness and poor access a USC provider are associated with greater nonemergent ED utilization.

Methods

We use data from the 2007-2009 Medical Expenditure Panel Survey (MEPS). The MEPS is a nationally representative survey of health services utilization by members of approximately 15,000 households. Data in this study were collected through computer-assisted personal interviews and completion of a Self-Administered Questionnaire (SAQ). MEPS data are de-identified and publicly available.

Respondents reflect an oversampling of the Hispanic, black, and Asian populations. Low-income households were also oversampled in 2007 and 2008 only.[77-79] We limit our sample to persons aged 18 years and older who completed the SAQ and have positive person weights. All respondents in the sample have a USC provider that is not in the hospital ED.

Dependent variable

The dependent variable is the count of nonemergent ED visits by each individual during the year. We define nonemergent visits based on criteria adapted from others.[75,80] An ED visit is considered to be nonemergent if 1) the patient was not admitted as an inpatient; 2) the patient did not receive a surgical procedure, x-ray, magnetic resonance imaging scan, computed axial tomography scan, electrocardiogram, or electroencephalogram; and 3) the patient did not report the reason for the visit was an emergency. The reference group consists of individuals who reported no ED visits. Individuals who only visited the ED for emergencies are excluded from the analyses.

Independent variables

The main independent variables are patient-centeredness and access to a USC provider. Patient-centered care is measured by responses to five MEPS questions; these items have been used previously in the literature to quantify the quality of the patient-provider interaction.[38,81,82] The respondents are asked if their USC provider usually:

1) asks about prescription medications and treatments other doctors may give them;
2) asks about and shows respect for medical, traditional, and alternative treatments that the person is happy with;
3) asks the person to help make decisions between a choice of treatments;
4) presents and explains all options to the person; and
5) speaks the person's language or provides translator services if the person does not speak English.

Responses to the items on respect and decision making are categorized on an ordinal scale of “never,” “sometimes,” “usually,” or “always.” The data are highly skewed, so consistent with the literature, responses are dichotomized to “always” and “not always.”[23,50] The other items are dichotomous questions with yes/no responses.

Six variables characterize the ability of individuals to access their USC provider. These covariates include mode of transportation to the USC provider, how long it takes to get to the USC provider, and how difficult it is to get to the USC provider. We also include whether the USC provider has office hours on nights or weekends, and how difficult it is for individuals to reach their USC providers by phone or after hours.

We select additional demographic variables based on the Behavioral Model of Health Services Use.[12,13] Predisposing characteristics describe the inclination of individuals to use health services. Covariates include age, gender, race, ethnicity, highest level of education, employment, marital status, ability to speak English, and health beliefs such as willingness to take risks and ability to overcome illness without medical help. Enabling resources describe the ability of individuals to obtain health services. We include personal factors such as income level and health insurance coverage, as well as community attributes such as Census region and urban/rural residence. Need factors consist of individuals’ perceived general health and mental health statuses, as well as dichotomous variables indicating diagnosis of any of the following chronic medical conditions: hypertension, heart disease, stroke, emphysema, high cholesterol, diabetes, arthritis, and asthma.

Two independent variables are imputed from the data. Respondents’ ability to speak English is determined by the language spoken most at home, whether the whole

household is comfortable speaking English, and whether the individual is comfortable speaking English. Patient-provider language concordance is assumed to exist if the patient is able to speak English, unless the respondent specifically indicates discordance exists.

Analyses

Statistical analyses were performed using Stata 12.0 statistical software (College Station, TX). All analyses were conducted using MEPS survey weights for the SAQ to adjust for the complex survey design. Bivariate chi-square analyses were used to detect differences in the demographic characteristics between respondents who had at least one nonemergent ED visit (herein referred to as ED users) and those who had none (non-ED users).

We assumed the decision to visit an ED is independent of the decision about how often to visit the ED, specifically for nonemergent conditions. We were particularly interested in assessing whether a lack of patient-centered care and barriers to access to a USC provider are, first, related to nonemergent ED visits, and if so, if they were associated with a pattern of relying on the ED for nonemergent care. Therefore, we employed a hurdle model to determine whether these factors are associated with ED use while accounting for the two distinct decisions. Hurdle models are a natural fit for modeling healthcare visit count data, given the excess zeros that exist.[83,84] In the first part of the hurdle model, we used a multivariate logistic regression to ascertain the factors that are related to having a nonemergent ED visit. Then, in the second part, we used a negative binomial regression model to deal with the zero-truncated count data of nonemergent ED visits given that one occurrence exists. In this latter model, the hurdle

has been cleared. We assessed whether a lack of patient-centered care and poor access are associated with the repeated use of the ED for nonemergent conditions while controlling for confounding variables.

Results

The study sample includes 27,972 adults who have a USC provider and for whom there are no missing data. Approximately five percent of the sample have one or more nonemergent ED visits. Table 3.1 reports the unadjusted differences in observed characteristics between respondents who had at least one nonemergent ED visit and those who had none. ED users are significantly more likely to report poorer general health ($p<0.001$) and mental health ($p<0.001$) statuses than non-ED users. Economically, a greater proportion of ED users are unemployed ($p<0.001$), earn less income ($p<0.001$), and have public health insurance coverage ($p<0.001$).

Table 3.1 Respondent demographic characteristics by ED visit status*

	No ED visit N=26,619† N=298,545,330‡	At least 1 nonemergent ED visit N=1,353† N=13,089,564‡	p-value
Predisposing characteristics			
Age			<0.001
18 – 44 years	42.1	53.1	
45 – 64 years	39.2	30.2	
≥ 65 years	18.8	16.7	
Gender			<0.001
Female	55.5	66.4	
Race			<0.001
White	82.6	74.4	
Black	10.9	19.9	
Other	6.6	5.7	
Hispanic ethnicity			0.061
Yes	11.0	12.6	
No	89.0	87.4	
Education			<0.001
No degree	12.5	18.2	
High school	49.7	57.3	
Bachelor's degree or more	37.9	24.5	
Employment status			<0.001
Employed	68.8	58.0	
Not employed	31.3	42.0	
Marital status			<0.001
Married	62.0	48.5	
Widowed	6.3	7.4	
Divorced	10.8	13.6	
Separated	1.7	3.9	
Never married	19.3	26.6	
Able to speak English	96.9	96.6	0.558
More likely to take risks			0.031
Disagree strongly	43.7	45.6	
Disagree somewhat	22.8	19.1	
Uncertain	14.0	15.9	
Agree somewhat	15.5	14.5	
Agree strongly	4.0	4.8	
Can overcome illness without medical help			0.001
Disagree strongly	48.4	54.1	
Disagree somewhat	22.5	21.2	
Uncertain	9.7	9.3	
Agree somewhat	16.5	12.0	
Agree strongly	2.8	3.4	
Enabling resources			
Income			<0.001
< 100% poverty level (poor)	8.5	21.3	
100 – 199% poverty level (low income)	14.8	22.8	
200 – 399% poverty level (middle income)	30.6	30.3	
≥ 400% poverty level (high income)	46.1	25.6	

Health insurance			<0.001
Private	75.3	59.0	
Public	16.1	29.5	
Uninsured	8.6	11.5	
Region			0.054
Northeast	20.1	16.4	
Midwest	22.6	25.2	
South	35.2	37.4	
West	22.1	21.1	
MSA			0.026
Urban	82.5	79.2	
Rural	17.5	20.9	
Need factors			
Health status			<0.001
Excellent	22.8	11.9	
Very good	35.6	22.6	
Good	28.9	34.8	
Fair	10.0	19.2	
Poor	2.7	11.5	
Mental health			<0.001
Excellent	35.5	27.0	
Very good	32.7	23.5	
Good	25.1	32.4	
Fair	5.6	13.1	
Poor	1.2	4.0	
Hypertension	36.3	41.7	0.005
Coronary heart disease	6.0	8.6	0.002
Angina	3.0	4.4	0.024
Myocardial infarction	3.9	6.0	0.001
Other heart disease	10.8	13.7	0.010
Stroke	3.4	7.5	<0.001
Emphysema	2.4	5.1	<0.001
High cholesterol	36.6	35.8	0.662
Diabetes	10.7	14.6	<0.001
Arthritis	28.7	35.2	<0.001
Asthma	9.6	18.0	<0.001

** Percentages may not total 100% due to rounding*
† Unweighted sample size
‡ U.S. population estimate

Data from Table 3.2 show that both groups are comparable in patient-centeredness scores, yet non-ED users report slightly more decision making with (p=0.007) and explanations from (p=0.009) their USC providers. ED users have poorer access to their USC providers. They are more likely to be driven to their USC provider by someone else (p<0.001), and they perceive greater difficulty getting to their USC provider (p<0.001) than non-ED users.

Table 3.2 Respondents' perception of quality of care and access to USC provider by ED visit status*

	No ED visit N=26,619† N=298,545,330‡	At least 1 nonemergent ED visit N=1,353† N=13,089,564‡	p-value
Patient-centeredness			
USC asks about other treatments	82.9	84.3	0.280
USC shows respect for treatments			0.217
Always	66.6	64.7	
Usually	24.1	24.1	
Sometimes	6.6	7.7	
Never	2.7	3.5	
USC asks person to help decide			0.007
Always	62.2	58.2	
Usually	23.4	24.1	
Sometimes	9.8	10.9	
Never	4.6	6.8	
USC explains options to person	94.9	93.0	0.007
USC speaks language or provides interpreter services	99.5	99.3	0.483
Access			
Transportation to USC			<0.001
Drives	87.3	77.4	
Is driven	7.5	14.2	
Public transportation	3.0	6.0	
Walks or uses other mode	2.3	2.5	
Time to USC			0.003
<15 minutes	50.8	48.8	
15-30 minutes	39.1	37.8	
31-60 minutes	8.4	10.0	
>60 minutes	1.8	3.4	
USC has office hours on nights and weekends	38.5	35.1	0.052
Difficulty getting to USC			<0.001
Very difficult	0.7	2.1	
Somewhat difficult	3.8	8.5	
Not too difficult	17.1	21.5	
Not at all difficult	78.4	68.0	
Difficulty in contacting USC by phone			<0.001
Very difficult	4.4	6.8	
Somewhat difficult	10.8	13.8	
Not too difficult	27.2	28.6	
Not at all difficult	57.6	50.8	
Difficulty in contacting USC after hours			<0.001
Very difficult	12.2	20.0	
Somewhat difficult	11.5	13.3	
Not too difficult	23.9	24.1	
Not at all difficult	28.3	23.3	
Unsure	24.1	19.3	

** Percentages may not total 100% due to rounding*
† Unweighted sample size
‡ U.S. population estimate

Predisposing characteristics

Table 3.3 shows the results from the hurdle model. English-speaking patients are significantly more likely to use the ED ($p=0.011$) than non-English speakers. Marital status is also linked to ED use. Patients who are separated ($p=0.049$) are more likely to visit the ED than married patients. Females are more likely than males to have a visit to the ED ($p<0.001$). Blacks are more likely to use the ED ($p<0.001$) than whites, yet whites have significantly greater nonemergent visits than blacks ($p=0.001$) and all other races ($p=0.012$). Given they had a nonemergent visit, Hispanics are more likely to visit the ED more often than whites ($p=0.047$). Adults aged 45-64 ($p<0.001$) and those over 65 ($p<0.001$) are less likely to go to the ED for nonemergent health concerns, and they have fewer visits ($p=0.032$ and $p=0.055$, respectively) than younger adults. Patients' health beliefs did not play a significant role in whether they visit the ED.

Table 3.3 Estimation results of two-part models of the frequency of emergency department visits

	Binary hurdle model (Logit)		Zero-truncated negative binomial model	
	Coefficient	*t*-value	Coefficient	*t*-value
Constant	**-2.382***	**-2.81**	**-17.329***	**-5.52**
Predisposing characteristics				
Age				
45 – 64 years	**-0.651***	**-7.76**	**-0.490***	**-2.15**
≥ 65 years	**-0.738***	**-5.39**	-0.717	-1.93
Gender				
Female	**0.339***	**4.51**	0.244	1.23
Race				
Black	**0.386***	**4.06**	**-0.701***	**-3.33**
Other	-0.123	-0.79	**-0.853***	**-2.51**
Hispanic ethnicity				
Yes	-0.010	-0.10	**0.532***	**2.00**
Education				
High school	0.155	1.47	**0.490***	**2.08**
Bachelor's degree or more	-0.078	-0.57	**0.825***	**2.70**
Employment status				
Employed	-0.043	-0.44	0.187	0.93
Marital status				
Widowed	0.035	0.20	0.479	1.37
Divorced	0.059	0.51	-0.215	-0.73
Separated	**0.313***	**1.98**	0.248	0.56
Never married	0.126	1.29	0.173	0.79
Ability to speak English				
Yes	**0.416***	**2.54**	0.926	1.67
More likely to take risks				
Yes	0.061	0.61	0.206	0.94
Can overcome illness without medical help				
Yes	-0.167	-1.71	-0.264	-1.15
Enabling resources				
Income				
< 100% poverty level (poor)	**0.716***	**5.15**	0.177	0.59
100 – 199% poverty level (low income)	**0.495***	**3.98**	0.098	0.41
200 – 399% poverty level (middle income)	**0.279***	**2.30**	0.321	1.23
Health insurance				
Public	0.177	1.60	0.294	1.36
Uninsured	0.064	0.54	0.503	1.92
Region				
Midwest	**0.285***	**2.23**	0.028	0.10
South	0.088	0.67	-0.188	-0.71
West	0.148	1.11	-0.033	-0.11
MSA				
Urban	-0.090	-0.86	0.295	1.34
Need factors				
Health status				
Very good	**0.280***	**2.07**	-0.350	-0.95
Good	**0.777***	**5.57**	0.120	0.37
Fair	**1.047***	**6.31**	0.713	1.87
Poor	**1.689***	**8.26**	**0.857***	**1.96**

Mental health				
Very good	**-0.216***	**-2.09**	0.234	0.88
Good	-0.086	-0.74	0.220	1.00
Fair	0.045	0.32	-0.185	-0.63
Poor	0.045	0.22	0.412	0.97
Hypertension	-0.105	-1.10	-0.233	-0.91
Coronary heart disease	-0.103	-0.70	-0.104	-0.25
Angina	0.119	0.52	**1.044***	**2.02**
Myocardial infarction	-0.132	-0.73	0.224	0.49
Other heart disease	-0.011	-0.09	-0.647	-1.94
Stroke	**-0.468***	**-2.85**	-0.539	-1.46
Emphysema	-0.041	-0.22	-0.211	-0.66
High cholesterol	0.054	0.55	**0.724***	**3.36**
Diabetes	-0.025	-0.21	0.356	1.39
Arthritis	-0.066	-0.73	0.126	0.67
Asthma	**-0.335***	**-3.42**	-0.310	-1.52
Patient-centeredness				
USC asks about other treatments	0.164	1.79	-0.152	-0.76
USC shows respect for treatments	0.062	0.69	0.161	0.78
USC asks person to help decide	-0.075	-0.83	0.179	0.90
USC explains options to person	-0.154	-1.09	-0.316	-0.90
USC speaks language or provides interpreter services	-0.344	-0.83	**-2.063***	**-2.28**
Access				
Transportation to USC				
Is driven	0.047	0.39	0.209	0.87
Public transportation	0.155	0.90	0.065	0.20
Walks or Other	-0.161	-0.66	0.715	1.47
Time to USC				
15-30 minutes	-0.077	-0.99	-0.211	-1.13
31-60 minutes	-0.044	-0.33	0.418	1.20
>60 minutes	0.262	1.13	**0.974***	**2.43**
USC has office hours on nights and weekends	0.051	0.62	**0.324***	**2.02**
Difficulty getting to USC	**0.323***	**2.45**	-0.144	-0.53
Difficulty in contacting USC by phone	0.144	1.50	-0.297	-1.18
Difficulty in contacting USC after hours	**0.180***	**2.29**	**0.387***	**1.96**

** $p<0.05$*

Enabling resources

Low-income patients are more likely to have a nonemergent ED visit ($p<0.001$). Uninsured patients visit the ED more frequently than those with private health insurance, but the difference was not significant ($p=0.055$). Region of the U.S. is also related to ED use. Patients in the Midwest are more likely to use the ED compared to those in the Northeast ($p=0.026$).

Need factors

Patients in poorer general health are more likely to seek care at the ED for nonemergent health concerns ($p<0.001$). Those who have been diagnosed with angina ($p=0.044$) or high cholesterol ($p=0.001$) use the ED more frequently than individuals without these diagnosed chronic conditions.

Patient-centeredness

Patient-centered care from a USC provider plays a small role in nonemergent ED use. The logistic regression model shows that patient-centeredness is not associated with patients' likelihood of using the ED. However, in the negative binomial count model, Table 3.3 reveals language concordance with a USC provider is associated with fewer nonemergent ED visits ($p=0.023$).

Access to care

Access to a USC provider is more strongly associated with ED utilization. Patients who have difficulty physically getting to their USC are more likely to use the ED ($p=0.015$). Similarly, patients who experience difficulty contacting their USC after hours are also more likely to have an ED visit ($p=0.023$) and use the ED more for nonemergent purposes ($p=0.05$). Patients whose USC providers do not maintain office hours on nights or weekends use the ED more often ($p=0.044$). Furthermore, patients for whom it takes over an hour to travel to their USC provider use the ED more frequently ($p=0.016$).

We verified the robustness of the results by performing sensitivity analyses. We broadened the sample's inclusion criteria and combined individuals who only visited the ED for emergencies with those who never used the ED during the study period. We

compared them to individuals who used the ED for nonemergent conditions and found no substantial differences in the results (see Appendix).

Discussion

Receipt of patient-centered care from a USC provider is not strongly associated with nonemergent ED utilization. Of the five measures of patient-provider communication, only one factor (i.e., language concordance) has a significant relationship to the frequency of nonemergent ED visits given that one occurrence exists. Patients who do not speak English or do not receive interpreter services from their USC provider are significantly more likely to use the ED multiple times. This finding is reinforced by the finding that Hispanics are more likely to have more than one nonemergent visit than whites. Non-English speakers' proclivity for emergency services may stem from better language access in hospitals. Title VI of the Civil Rights Act requires providers and healthcare organizations that receive federal funds to provide interpretation services for patients with limited English proficiency.[85] Hospitals generally fall into this category, but not all healthcare providers receive federal funds, and therefore are not required to provide language services to their patients.

On the other hand, barriers to access to a USC provider are distinctly related to the decision to seek emergency care for nonemergent problems. Patients tend to go to the ED for care if it is difficult to get to their USC provider's office. Convenience is one of the major reasons people choose to obtain care from the ED.[67] Similarly, patients who travel more than one hour to get to their USC provider are more likely to have multiple nonemergent ED visits relative to patients who need less time. These patients report

significantly poorer health ($p<0.001$), which may explain their increased ED use (data not shown).

Difficulty in contacting a USC provider after hours is another barrier that is associated with excessive nonemergent ED visits. This finding confirms the importance of timely access to a USC provider, as established by prior research.[69,76] In fact, patients who receive care from their USC provider are more satisfied than those who go to the ED.[86] In order to reduce the burden on hospital EDs, patients who seek nonemergent care after hours should obtain professional medical advice over the telephone or be channeled to nonemergent outpatient clinics instead.

Previous research suggests that patient dissatisfaction with the quality of care and perceived barriers to access to a USC provider are related to nonemergent ED use.[75] The present study did not find much evidence to support a link between quality of care and nonemergent ED visits. This discrepancy may be due to the differences in factors that constituted quality of care or the methods used for analyses. Sarver et al.[75] described the patient-provider relationship using a four-item scale based on satisfaction with the quality of the USC provider and the provider's staff, confidence in the provider's ability, and whether the provider listens. Taken together, they found this dissatisfaction scale to be significantly related to the likelihood of having an ED visit in a multiple logistic regression. In contrast, we define the patient-provider relationship according to whether the USC provider asks about other treatments, shows respect for other treatments, asks the patient to help with decision making, explains the options to the patient, and speaks the patient's language or provides interpretation services. These domains of patient-centeredness were analyzed separately in a two-part model. Like the results from Sarver

et al.,[75] we found the separate quality of care variables were not related to having a nonemergent visit. However, taking the analysis a step further with a negative binomial model, we found the individual effect of patient-provider language concordance to be associated with more than one ED visit.

This study has a few limitations. First, a sampling bias may exist. The analyses only included respondents who had visited a healthcare provider in the past 12 months. Those without a visit or who failed to complete the SAQ may differ from our sample. Second, as other researchers have pointed out, using MEPS data may overestimate adults with USC providers because it may not reach the homeless and undocumented immigrants.[69] Finally, there is no gold standard for determining the urgency of an ED visit. We considered applying the algorithm developed by researchers at New York University[87] but the algorithm requires fully specified codes from the International Classification of Disease, Ninth Revision (ICD-9) that are not publicly available through MEPS. In addition, it was not designed to determine appropriateness of ED visits. Therefore, we combined the self-reported reason for the ED visit in MEPS with several indicators of the services performed during the ED visit to determine *a posteriori* if the visit was emergent. This method garnered high specificity; it classified 25 percent of all ED visits as nonemergent. In comparison, using a similar method, Sarver et al.[75] noted 40% of ED visits were nonemergent and Cunningham et al.[80] found 39.5% of visits were nonemergent.

Conclusion and implications

We conclude that nonemergent ED utilization can potentially be reduced by improving access to USC providers and other sources of outpatient care. Of the two

barriers that are associated with frequent nonemergent ED use, one is a patient factor (i.e., how far patients are from their USC) and one is a provider factor (i.e., how accessible providers are after hours). Alleviating these barriers may result in less nonemergent ED use. In addition, expanding interpreter services in outpatient settings may improve patients' perception of the quality of care received from their USC provider and help discourage frequent ED users from making unnecessary visits. Enhancing primary care may result in reduced demand for emergency care, savings in healthcare costs, and better continuity of care.

From a policy perspective, the Patient Protection and Affordable Care Act of 2010 may help to reduce nonemergent ED use. As discussed earlier, growth in ED use stems from patients who have USC providers but cite convenience and accessibility as reasons to opt for the ED instead. However, this healthcare reform law provides $11 billion to community health centers over five years to increase preventive and primary care health services and build new centers across the nation. The expansion of community health centers may mean access to more professional interpreters and the addition of evening hours for care. With the added convenience and accessibility that patients will have to community health centers, this provision could reduce demand for nonemergent ED visits.

CHAPTER 4:

Evaluating the relationship between patient-centered care and receipt of preventive services

Background

Clinical preventive services, such as immunizations and screening tests, are essential to reducing the burden of preventable disease.[88] Vaccines help to prevent the onset of disease, while screening tests allow clinicians to detect illnesses in earlier, more treatable stages. Fortunately, Medicare, Medicaid, and many private insurers cover most of the cost of clinical preventive services.

Yet healthcare disparities persist with regard to utilization of preventive services. Access stands out as a main factor. Individuals with a usual source of care (USC) are more likely to receive preventive screenings than those without.[10,89,90] Likewise, a greater proportion of those with health insurance obtain preventive screenings compared to the uninsured.[89,91] Previous research has found individuals with higher educational attainment and greater income are more likely to receive preventive care than their counterparts.[91-93] Racial and ethnic disparities have also been reported. Blacks and Hispanics are less likely to get vaccinated for influenza or screened for colorectal cancer than whites.[94,95]

The literature contains little evidence regarding whether patients' perceptions of quality of care received influences their utilization of preventive services. Women who are satisfied with interactions with their providers are more likely to get mammograms than those who are not satisfied.[96] Similarly, women who trust their providers are more likely to get mammograms.[97] Researchers also provide evidence that improved patient-

provider communication may help increase service delivery.[98] Specifically, patients who feel they are treated with respect are more likely to get preventive screens.[99]

Using recent data from a nationally representative survey, we study the relationship between patient-centered care and receipt of six recommended clinical preventive services. This dataset provides the closest approximation for determining compliance with these prevention recommendations than previous survey years of this dataset. For this reason, this study offers the first opportunity to assess the association between patient-centeredness and patient compliance with clinical recommendations, and not presumed compliance. In order to focus on the quality of care received, we limit our analyses to individuals who have a usual source of care to ensure some degree of parity with regard to access to care.

Methods

This study is based on data collected from the Household Component of the 2009 Medical Expenditure Panel Survey (MEPS). MEPS data are gathered through a series of computer-assisted personal interviews of a nationally representative sample of U.S. households.[9] The questions focus on health status, demographic characteristics, healthcare utilization, expenditures, access to care, and quality of care. Since the data are de-identified and publicly available, this study did not require review by the institutional review board.

The sample includes persons aged 18 years and older who have positive person weights, and for whom we have complete data. All members of the sample have a USC provider. Each preventive service outcome is analyzed separately with its own unique inclusion criteria for each sample that will be described next.

Dependent variables

This study assesses the self-reported utilization of six preventive services recommended for adults age 18 and older. Two services are recommended for women only, and four services are for both men and women. All apply to specific age ranges as determined by the U.S. Preventive Services Task Force (USPSTF) or the Advisory Committee on Immunization Practices (ACIP). We chose to study the 2008 recommendations because data from the 2009 MEPS cohort is based on utilization of preventive services during the time period in which these guidelines were in place. We limited our study to preventive services that have an A or B rating from the USPSTF, with the exception of influenza vaccination which does not have a rating. The USPSTF defers to ACIP for immunization recommendations. Ratings of A or B signify that the USPSTF recommends that clinicians offer or provide the service. The outcome variables are dichotomous indicating either the respondent has received the screening as recommended or not.

In 2008, the USPSTF recommended women 40 years and older receive a mammogram every 1-2 years to screen for breast cancer (B recommendation).[100] In addition, women aged 21-65 years old who have a uterus were encouraged to have a pap smear every three years to screen for cervical cancer (A recommendation).[101] Cholesterol screening was recommended every five years for men 35 and older and women 45 and older (A recommendation).[102] Men and women aged 18 years and older should be screened for high blood pressure every two years (A recommendation).[103] The USPSTF recommended colorectal cancer screening for men and women 50 years and older (A recommendation).[104] The preferred methods included either an annual fecal occult blood

test, a colonoscopy every 10 years, or a flexible sigmoidoscopy every five years with a fecal occult blood test every three years. ACIP recommended an annual influenza vaccine for men and women 50 years of age and older.[105] The samples sizes are outlined for each preventive service in Table 4.1.

Table 4.1 Samples for each preventive service

Preventive service	**Gender**	**Ages**	**N**	**Weighted N**
Mammography	Female	40+	4,793	46,333,054
Pap smear	Female	21-65	4,735	43,193,254
Cholesterol	Male and Female	35+ and 45+, respectively	8,066	81,154,737
Flu vaccination	Male and Female	50+	5,941	60,531,373
Colonoscopy, sigmoidoscopy, and fecal occult blood test	Male and Female	50+	5,914	60,296,441
Blood pressure	Male and Female	18+	12,778	124,787,939

Independent variables

We measure quality of care with four MEPS items pertaining to patient-centeredness. The respondents are asked if their USC provider usually:

1) asks about prescription medications and treatments other doctors may give them;
2) asks about and shows respect for medical, traditional, and alternative treatments that the person is happy with;
3) asks the person to help make decisions between a choice of treatments; and
4) presents and explains all options to the person.

Responses to items 2 and 3 are categorized on an ordinal scale of “never,” “sometimes,” “usually,” or “always.” The data are highly skewed, so consistent with the literature, responses are dichotomized to “always” and “not always.”[23,39,50] Items 1 and 4 are

dichotomous questions with yes/no responses. These same items have also been used by others to describe the quality of care from USC providers.[81,82]

We control for additional demographic variables selected under the framework of the Behavioral Model of Health Services Use.[12,13] Predisposing characteristics describe the inclination of individuals to use health services. Variables include gender, age, race (white, black, Asian, other), Hispanic ethnicity, highest level of education (no degree, high school diploma or equivalent, Bachelor's degree or more), employment status (employed, not employed), marital status (married, widowed, divorced, separated, never married), and health beliefs such as willingness to take risks and ability to overcome illness without medical help. Enabling resources describe the ability of individuals to obtain health services. Variables include individual factors such as income level and health insurance coverage (any private, public only, uninsured), as well as community attributes such as Census region (Northeast, Midwest, South, West) and residence in an urban or rural area as defined by metropolitan statistical areas. Need factors include individuals' perceived general health and mental health statuses, and the presence of any chronic medical conditions such as hypertension, heart disease, stroke, emphysema, bronchitis, high cholesterol, cancer, diabetes, arthritis, and asthma.

Analyses

We performed bivariate analyses to estimate the rates of preventive services utilization by demographic characteristics and patient-centeredness for each study sample. We conducted separate multivariate logistic regression analyses for each preventive service to determine whether receiving patient-centered care from a USC provider was related to receipt of the screenings. Odds ratios were calculated for each

independent variable. We analyzed each component of patient-centeredness individually since an index variable for the four measures garnered poor internal reliability with a Cronbach's alpha of 0.49. All statistical analyses were performed using MEPS survey weights. We used Stata 12.0 statistical software (College Station, TX) to fit statistical models using complex survey data.

Results

The results in Table 4.2 show the breakdown of each sample by demographic characteristics. Of the women in our sample who are over 40 years old and recommended to receive mammograms, the majority of them are white (83.7%), married (59.1%), employed (55.9%), and have private health insurance (70.1%). Women aged 21-65 years in our sample who are eligible for cervical cancer screening have a similar demographic composition. The samples for the other four preventive services are comparable. Most of the respondents are white (80.6-85.4%), married (58.8-66.2%), and are privately insured (68.7-77.7%). While most are employed, the respondents who are advised to get colorectal cancer screening and those who should get flu vaccines are more evenly split between employed and unemployed. Perceived health statuses are similar across all six preventive services. The two services that are recommended for younger individuals, namely blood pressure screening and cervical cancer screening, have a greater proportion of respondents with no chronic conditions than the other services (32.0% and 43.6%, respectively).

Table 4.2 Demographic characteristics of sample recommended to receive preventive services*

	Breast cancer screening n=4,793†	Cervical cancer screening n=4,735†	Cholesterol screening n=8,066†	Flu vaccination n=5,941†	Colorectal cancer screening n=5,914†	Blood pressure screening n=12,778†
Gender						
Male	0.0	0.0	50.9	45.1	45.2	43.5
Female	100.0	100.0	49.1	54.9	54.8	56.5
Age	*40+* *40-64* 69.4 *65+* 30.6	*21-65* *21-44* 58.1 *45-65* 41.9	*Men 35+* *35-64* 74.8 *65+* 25.2 *Women 45+* *45-64* 64.4 *65+* 35.6	*50+* *50-64* 58.6 *65+* 41.4	*50+* *50-64* 59.0 *65+* 41.1	*18+* *18-44* 41.3 *45-64* 38.6 *65+* 20.2
Race						
White	83.7	80.6	84.5	85.3	85.4	82.5
Black	11.3	12.4	10.2	10.0	10.0	11.3
Asian	3.3	4.5	3.3	2.8	2.8	3.7
Other	1.8	2.5	2.0	1.8	1.8	2.5
Hispanic ethnicity	9.1	12.3	9.0	7.7	7.7	10.7
Education						
No degree	13.5	8.2	12.8	14.5	14.4	13.6
HS diploma	50.1	47.0	49.9	50.4	50.4	49.7
Bachelor's degree or more	36.5	44.8	37.2	35.1	35.2	36.7
Employment status						
Employed	55.9	76.7	60.1	50.4	50.8	65.8
Unemployed	44.1	23.4	39.9	49.6	49.2	34.2
Marital status						
Married	59.1	59.2	66.2	64.2	64.4	58.8
Widowed	15.7	2.2	10.9	14.4	14.3	7.3
Divorced	15.5	12.9	13.4	13.8	13.8	11.2
Separated	2.4	2.7	2.0	1.9	1.9	2.0
Never married	7.3	23.0	7.5	5.7	5.7	20.7
Risk taking						
Disagree	74.1	70.4	68.3	70.5	70.5	65.5
Uncertain	13.1	14.6	13.4	13.2	13.2	14.5
Agree	12.9	15.1	18.3	16.2	16.3	20.0
Overcome illness without medical help						
Disagree	78.0	70.2	75.5	79.3	79.2	71.0
Uncertain	7.5	10.2	8.2	7.0	7.0	10.0
Agree	14.5	19.6	16.3	13.7	13.8	19.0
Income						
<199% FPL	27.2	26.8	24.0	25.3	25.1	26.2
200-399% FPL	28.6	29.6	29.1	28.1	28.1	30.2
>=400% FPL	44.2	43.6	47.0	46.6	46.9	43.6

Health insurance						
Any private	70.1	77.7	72.2	68.7	69.1	72.9
Public	23.3	12.2	21.2	25.8	25.4	18.4
Uninsured	6.6	10.0	6.6	5.6	5.6	8.7
Region						
Northeast	20.8	22.0	20.8	20.2	20.1	20.4
Midwest	23.2	23.9	23.2	22.8	22.9	23.6
South	34.6	31.9	34.7	35.3	35.3	34.2
West	21.3	22.3	21.3	21.7	21.7	21.9
MSA						
Urban	82.5	84.4	82.4	81.8	81.7	83.2
Rural	17.5	15.7	17.6	18.2	18.3	16.8
Health status						
Excellent	16.4	23.0	17.9	16.1	16.1	21.6
Very Good	32.6	36.5	31.8	30.9	31.1	33.1
Good	32.2	28.9	32.1	33.0	33.0	30.0
Fair	14.0	9.0	13.6	15.0	14.8	11.5
Poor	4.8	2.7	4.5	5.0	4.9	3.7
Mental health status						
Excellent	30.4	36.4	32.4	30.5	30.6	35.2
Very Good	31.0	31.0	30.7	30.2	30.3	30.4
Good	29.2	25.3	27.9	29.2	29.1	26.1
Fair	7.3	5.9	7.2	8.2	8.1	6.7
Poor	2.2	1.5	1.8	2.0	1.9	1.7
Chronic conditions						
One or more	81.1	56.4	82.6	89.0	89.1	68.0
None	18.9	43.6	17.4	11.0	10.9	32.0

** Percentages may not total 100% due to rounding*
† Unweighted sample size

Table 4.3 shows the proportion of each sample who received recommended preventive services tabulated by demographic characteristics. Of the female-specific screenings, women are more likely to be compliant with receiving pap smears (90.5%) than mammograms (76.6%). Black women have the highest utilization rates for both services compared to other races. Women with greater education and higher income are more likely to receive breast and cervical cancer screens. Married women are most compliant (92.8% and 81.2%, respectively) while those who are widowed are least compliant (78.3% and 66.2%, respectively). Resources influence respondents' utilization of pap smears and mammograms. Receipt of services is highest for women with private health insurance (92.4% and 80.8%, respectively), followed by women with public health

insurance (87.8% and 68.9%, respectively), and then uninsured women (79.3% and 58.4%, respectively). Women who perceive better health and mental health statuses are also more likely to have pap smears and mammograms.

Table 4.3 Percentage of sample who reported having received preventive services according to USPSTF and ACIP guidelines by demographic characteristics

	Breast cancer screening n=4,793†	Cervical cancer screening n=4,735†	Cholesterol screening n=8,066†	Flu vaccination n=5,941†	Colorectal cancer screening n=5,914†	Blood pressure screening n=12,778†
Gender						
Male			92.3	55.1	65.8	93.0
Female	76.6	90.5	95.9	62.9	64.0	97.1
Age	*40+* *40-64* 78.0 *65+* 73.3	*21-65* *21-44* 92.1 *45-65* 88.3	*Men 35+* *35-64* 90.2 *65+* 98.6 *Women 45+* *45-64* 94.5 *65+* 98.5	*50+* *50-64* 50.1 *65+* 72.5	*50+* *50-64* 58.4 *65+* 74.1	*18+* *18-44* 92.0 *45-64* 97.0 *65+* 98.8
Race						
White	76.5	90.3	94.1	60.7	65.9	95.3
Black	78.9	94.3	95.2	47.7	63.1	96.5
Asian	71.0	86.5	94.2	60.4	48.8	92.6
Other	78.7	85.0	87.8	57.3	50.4	94.6
Hispanic ethnicity	77.3	91.8	94.1	52.4	52.9	93.1
Education						
No degree	64.9	86.4	94.0	59.6	55.0	93.2
HS diploma	74.6	87.5	93.1	57.9	62.6	94.7
Bachelor's degree or more	83.6	94.4	95.4	61.3	72.1	96.9
Employment status						
Employed	79.8	91.4	92.0	50.7	61.1	94.4
Unemployed	72.5	87.5	97.2	68.2	68.7	97.0
Marital status						
Married	81.2	92.8	94.4	59.4	66.6	96.3
Widowed	66.2	78.3	97.8	73.3	65.1	99.4
Divorced	72.2	88.2	92.6	51.4	61.5	97.2
Separated	69.5	88.1	92.2	39.8	59.6	95.6
Never married	73.3	87.4	88.6	49.7	54.3	89.9
Risk taking						
Disagree	77.6	90.9	95.2	61.1	65.8	96.3
Uncertain	76.5	89.7	91.6	60.0	60.6	94.1
Agree	70.6	89.4	91.5	51.1	64.1	93.0

Overcome illness without medical help						
Disagree	78.5	91.7	95.6	62.2	67.3	96.6
Uncertain	70.3	84.5	92.2	52.1	55.6	92.1
Agree	69.7	89.5	88.1	46.4	55.2	92.1
Income						
<199% FPL	67.1	88.5	92.5	58.7	57.1	94.5
200-399% FPL	73.4	90.2	92.2	58.3	62.3	94.1
>=400% FPL	84.5	92.0	96.0	60.4	70.5	96.7
Health insurance						
Any private	80.8	92.4	94.5	59.2	67.2	95.9
Public	68.9	87.8	96.3	65.7	64.5	97.3
Uninsured	58.4	79.3	81.9	32.3	37.0	86.6
Region						
Northeast	80.1	91.4	96.5	57.7	64.6	96.2
Midwest	76.4	89.3	92.1	62.8	65.3	95.2
South	75.7	90.0	94.2	59.3	64.3	95.4
West	74.8	91.7	93.5	57.4	65.5	94.3
MSA						
Urban	77.3	91.0	94.9	58.6	65.6	95.5
Rural	73.3	88.0	90.3	62.6	61.4	94.0
Health status						
Excellent	81.5	92.2	92.3	51.9	66.4	92.3
Very Good	79.6	91.6	93.5	60.1	67.6	94.9
Good	76.6	89.7	94.6	60.7	63.2	96.5
Fair	67.9	87.1	95.8	62.0	62.0	97.6
Poor	64.8	81.5	96.1	61.6	62.0	99.4
Mental health status						
Excellent	82.1	92.4	93.8	57.3	68.9	93.8
Very Good	79.2	91.9	93.8	61.7	66.9	95.2
Good	72.0	89.0	94.7	58.5	60.7	96.8
Fair	67.6	80.5	94.6	61.3	59.1	97.4
Poor	53.6	81.0	92.8	59.7	55.3	97.9
Chronic conditions						
One or more	77.2	90.7	96.4	61.9	67.1	98.0
None	74.1	90.4	83.0	39.1	46.4	89.6

† Unweighted sample size

Cholesterol and blood pressure screenings have very high compliance rates relative to the other preventive services studied. Women are more likely to get screened for both services than men (95.9% vs. 92.3% and 97.1% vs. 93.0%, respectively). There is very little difference in receipt of these screenings by race or education level. Unemployed respondents are more compliant with cholesterol and blood pressure screenings than their employed counterparts (97.2% vs. 92.0% and 97.0% vs. 94.4%,

respectively). Individuals with health insurance also have higher utilization for both services than those who are uninsured. Unlike the female-specific screenings, respondents with a greater need for cholesterol and blood pressure screens are more likely to receive them. Those who reported poorer health statuses or having one or more chronic conditions are more likely to be compliant than those in good health or who have no chronic conditions.

Colorectal cancer screening and influenza vaccination are both recommended by the USPSTF or ACIP for adults 50 years and older, yet respondents report the lowest compliance with them compared to the other four services. Adults 65 years of age and older have higher utilization than adults aged 50-64 years. Men report slightly better compliance with colorectal cancer screening (65.8% vs. 64.0%) while women report better compliance with influenza vaccination (62.9% vs. 55.1%). Over 60% of whites and blacks are current on their colorectal cancer screens, yet less than 50% of other races are current. Influenza vaccination is highest for whites (60.7%) and Asians (60.4%) relative to blacks (47.7%). Unemployed respondents have higher utilization for both colorectal cancer screening (68.7% vs. 61.1%) and influenza vaccination (68.2% vs. 50.7%) than employed respondents.

In unadjusted analyses, respondents who perceive the receipt of higher quality of care report higher utilization of preventive services (Table 4.4). Receipt of mammograms is significantly higher for women who reported receiving all four dimensions of patient-centered care. For example, women who have a USC provider that asks about other treatments are more compliant on the breast cancer screening recommendations ($p=0.001$). Women who feel their USC provider shows respect for other treatments also

have greater utilization of mammograms (p=0.003). A greater proportion of patients whose USC provider asks them to help make medical decisions get mammograms compared to patients whose USC providers do not solicit their help with decision making (p<0.001). Patients with providers who explain the options to them are more likely to have mammograms (p=0.023). Women who feel their USC provider always asks them for help with decision making are also more likely to receive screening for cervical cancer (p=0.040). Both men and women with USC providers who explain clinical options to them are more compliant with blood pressure screening (p=0.049). More patients whose USC providers ask them about past treatments receive colorectal cancer screening as recommended by the USPSTF (p=0.020).

Table 4.4 Percentage of sample who reported having received preventive services by patient-centered care domains

	USC asks about other treatments		USC shows respect for treatments		USC asks patient to help decide		USC explains options to patient	
	Yes	No	Always	Not always	Always	Not always	Yes	No
Breast cancer screening	77.5*	72.1*	78.0*	73.6*	79.1*	72.3*	77.0*	68.7*
Cervical cancer screening	90.9	88.8	90.7	90.2	91.3*	89.2*	90.6	88.7
Cholesterol screening	94.3	92.9	94.4	93.4	94.7	93.1	94.1	93.5
Flu vaccination	59.9	56.7	59.7	58.6	60.7	57.0	59.5	56.4
Colorectal cancer screening	65.7*	60.9*	65.2	64.0	64.8	64.9	65.1	58.9
Blood pressure screening	95.4	94.9	95.5	94.9	95.4	95.1	95.4*	93.2*

** p<0.05*

After controlling for confounding variables, patient-centeredness did not maintain as strong of an association with receipt of preventive services. Only one dimension has a

statistically significant association with breast cancer screening. Table 4.5 shows that women whose USC providers always ask them to help make decisions have 1.29 greater odds of receiving a mammogram per the USPSTF guidelines than women whose USC providers do not always ask them to help with decision making (p=0.006).

Table 4.5 Multivariate logistic regression model predicting the association of patient-centeredness with use of breast cancer screening

Variable		Reference category	β coefficient	*t*-value	P>|*t*|	e^{β} (OR)
Constant		--	1.960	4.61	<0.001	--
USC asks about other treatments		No	0.169	1.68	0.094	1.18*
USC always shows respect for treatments		Not always	0.081	0.84	0.401	1.08
USC always asks patient to help decide		Not always	0.256	2.79	0.006	1.29**
USC explains options to patient		No	0.148	0.72	0.472	1.16
Predisposing characteristics						
Age	40 – 64 years	≥ 65 years	0.091	0.88	0.378	1.10
Race	Black	White	0.491	4.57	<0.001	1.63**
	Asian		-0.160	-0.80	0.424	0.85
	Other		0.369	1.43	0.155	1.45
Hispanic ethnicity		None	-0.546	-4.18	<0.001	0.58**
Education	High school	No degree	0.288	2.36	0.019	1.33**
	Bachelor's degree or more		0.643	4.62	<0.001	1.90**
Employed		Not employed	-0.018	-0.17	0.866	0.98
Marital status	Never married	Married	-0.427	-2.70	0.008	0.65**
	Widowed/Divorced/Separated		-0.405	-3.65	<0.001	0.67**
More likely to take risks		No/ Uncertain	-0.201	-1.39	0.165	0.82
Can overcome illness without medical help		No/ Uncertain	-0.393	-3.32	0.001	0.67**
Enabling resources						
Income	< 199% FPL	400%+ FPL	-0.463	-3.42	0.001	0.63**
	200 – 399% FPL		-0.430	-3.61	<0.001	0.65**
Health insurance	Public only	Any private	-0.182	-1.54	0.125	0.83
	Uninsured		-0.786	-5.37	<0.001	0.46**
Region	Midwest	Northeast	-0.245	-1.53	0.127	0.78
	South		-0.235	-1.51	0.133	0.79
	West		-0.281	-1.81	0.072	0.75*
MSA	Urban	Rural	0.077	0.71	0.478	1.08
Need factors						
Health status	Very good/Good	Excellent	-0.093	-0.57	0.566	0.91
	Fair/Poor		-0.317	-1.57	0.118	0.73
Mental health	Very good/Good	Excellent	-0.210	-1.86	0.065	0.81*
	Fair/Poor		-0.415	-2.45	0.015	0.66**
One or more chronic conditions		None	0.534	4.86	<0.001	1.71**

** p<0.10*
*** p<0.05*

In addition, patient involvement with decision making approaches statistical significance with receipt of three preventive services in adjusted analyses. In Table 4.6, women whose providers always ask them to participate in the clinical decision making have a 31% increase in the odds of getting screened for cervical cancer (p=0.089). Table 4.7 indicates the odds of getting a cholesterol screening test are 36 percent higher for patients whose USC providers always ask them to help with making decisions compared to patients whose providers do not always ask (p=0.068). According to Table 4.8, patients whose USC providers always ask them to help make decisions have an 18 percent increase in the odds of getting a flu vaccine (p=0.066).

Table 4.6 Multivariate logistic regression model predicting the association of patient-centeredness with use of cervical cancer screening

Variable		Reference category	β coefficient	*t*-value	P>|*t*|	e^{β} (OR)
Constant		--	2.840	4.47	<0.001	--
USC asks about other treatments		No	0.095	0.53	0.594	1.10
USC always shows respect for treatments		Not always	-0.145	-0.82	0.414	0.87
USC always asks patient to help decide		Not always	0.270	1.71	0.089	1.31*
USC explains options to patient		No	-0.003	-0.01	0.991	1.00
Predisposing characteristics						
Age	21 – 44 years	45-65 years	0.627	4.21	<0.001	1.87**
Race	Black	White	0.922	5.07	<0.001	2.51**
	Asian		-0.668	-2.70	0.008	0.51**
	Other		-0.395	-1.10	0.273	0.67
Hispanic ethnicity		None	-0.427	-2.11	0.036	0.65**
Education	High school	No degree	-0.014	-0.08	0.938	0.99
	Bachelor's degree or more		0.778	3.40	0.001	2.18**
Employed		Not employed	-0.198	-1.29	0.198	0.82
Marital status	Never married	Married	-0.825	-5.44	<0.001	0.44**
	Widowed/Divorced/Separated		-0.526	-2.91	0.004	0.59**
More likely to take risks		No/ Uncertain	0.020	0.10	0.918	1.02
Can overcome illness without medical help		No/ Uncertain	-0.211	-1.38	0.170	0.81
Enabling resources						
Income	< 199% FPL	400%+ FPL	0.365	1.86	0.064	1.44*
	200 – 399% FPL		0.047	0.28	0.782	1.05
Health insurance	Public only	Any private	-0.190	-0.86	0.390	0.83
	Uninsured		-1.051	-5.87	<0.001	0.35**
Region	Midwest	Northeast	-0.207	-0.91	0.364	0.81
	South		-0.117	-0.52	0.607	0.89
	West		0.186	0.76	0.448	1.20
MSA	Urban	Rural	0.228	1.48	0.140	1.26
Need factors						
Health status	Very good/Good	Excellent	-0.024	-0.10	0.918	0.98
	Fair/Poor		-0.044	-0.15	0.880	0.96
Mental health	Very good/Good	Excellent	-0.100	-0.54	0.592	0.90
	Fair/Poor		-0.846	-2.84	0.005	0.43**
One or more chronic conditions		None	0.229	1.54	0.125	1.26

** p<0.10*
*** p<0.05*

Table 4.7 Multivariate logistic regression model predicting the association of patient-centeredness with use of cholesterol screening

Variable		Reference category	β coefficient	*t*-value	P>|*t*|	e^{β} (OR)
Constant		--	2.873	5.13	<0.001	--
USC asks about other treatments		No	0.240	1.67	0.096	1.27*
USC always shows respect for treatments		Not always	-0.013	-0.08	0.935	0.99
USC always asks patient to help decide		Not always	0.305	1.84	0.068	1.36*
USC explains options to patient		No	-0.347	-1.40	0.164	0.71
Predisposing characteristics						
Gender	Women	Men	0.443	3.44	0.001	1.56**
Age	35 – 64 years	≥ 65 years	-1.025	-4.34	<0.001	0.36**
Race	Black	White	0.387	1.93	0.055	1.47*
	Asian		0.278	1.05	0.296	1.32
	Other		-0.707	-1.95	0.052	0.49*
Hispanic ethnicity		None	-0.661	-4.08	<0.001	0.52**
Education	High school	No degree	0.121	0.69	0.492	1.13
	Bachelor's degree or more		0.554	2.54	0.012	1.74**
Employed		Not employed	0.770	4.88	<0.001	2.16**
Marital status	Never married	Married	-0.521	-2.70	0.008	0.59**
	Widowed/Divorced/Separated		-0.179	-1.14	0.257	0.84
More likely to take risks		No/ Uncertain	-0.066	-0.44	0.658	0.94
Can overcome illness without medical help		No/ Uncertain	-0.706	-4.30	<0.001	0.49**
Enabling resources						
Income	< 199% FPL	400%+ FPL	-0.846	-5.02	<0.001	0.43**
	200 – 399% FPL		-0.650	-4.19	<0.001	0.52**
Health insurance	Public only	Any private	-0.352	-1.63	0.105	0.70
	Uninsured		-0.893	-4.87	<0.001	0.41**
Region	Midwest	Northeast	-0.679	-2.52	0.012	0.51**
	South		-0.518	-2.18	0.030	0.60**
	West		-0.650	-2.79	0.006	0.52**
MSA	Urban	Rural	0.600	2.87	0.004	1.82**
Need factors						
Health status	Very good/Good	Excellent	0.071	0.35	0.724	1.07
	Fair/Poor		0.340	1.36	0.175	1.40
Mental health	Very good/Good	Excellent	-0.089	-0.54	0.588	0.92
	Fair/Poor		-0.400	-1.52	0.130	0.67
One or more chronic conditions		None	1.411	11.75	<0.001	4.10**

* *p<0.10*
** *p<0.05*

Table 4.8 Multivariate logistic regression model predicting the association of patient-centeredness with use of flu vaccination

Variable		Reference category	β coefficient	*t*-value	P>|*t*|	e^{β} (OR)
Constant		--	-1.187	-3.06	0.002	--
USC asks about other treatments		No	0.124	1.36	0.175	1.13
USC always shows respect for treatments		Not always	-0.032	-0.34	0.736	0.97
USC always asks patient to help decide		Not always	0.170	1.85	0.066	1.18*
USC explains options to patient		No	-0.053	-0.32	0.752	0.95
Predisposing characteristics						
Gender	Women	Men	0.298	4.89	<0.001	1.35**
Age	50 – 64 years	≥ 65 years	-0.698	-7.24	<0.001	0.50**
Race	Black	White	-0.476	-4.82	<0.001	0.62**
	Asian		0.114	0.59	0.558	1.12
	Other		-0.078	-0.26	0.796	0.92
Hispanic ethnicity		None	0.141	1.14	0.255	1.15
Education	High school	No degree	0.032	0.30	0.765	1.03
	Bachelor's degree or more		0.304	2.39	0.018	1.36**
Employed		Not employed	0.478	5.49	<0.001	1.61**
Marital status	Never married	Married	-0.176	-1.25	0.213	0.84
	Widowed/Divorced/Separated		-0.021	-0.26	0.793	0.98
More likely to take risks		No/ Uncertain	-0.248	-2.79	0.006	0.78**
Can overcome illness without medical help		No/ Uncertain	-0.465	-4.83	<0.001	0.63**
Enabling resources						
Income	< 199% FPL	400%+ FPL	-0.307	-2.94	0.004	0.74**
	200 – 399% FPL		-0.220	-2.35	0.020	0.80**
Health insurance	Public only	Any private	-0.172	-1.69	0.092	0.84*
	Uninsured		-0.741	-5.49	<0.001	0.48**
Region	Midwest	Northeast	0.219	1.75	0.081	1.24*
	South		0.033	0.30	0.767	1.03
	West		-0.006	-0.05	0.959	0.99
MSA	Urban	Rural	-0.155	-1.37	0.171	0.86
Need factors						
Health status	Very good/Good	Excellent	0.254	2.34	0.020	1.29**
	Fair/Poor		0.291	2.36	0.019	1.34**
Mental health	Very good/Good	Excellent	-0.041	-0.43	0.664	0.96
	Fair/Poor		-0.032	-0.25	0.805	0.97
One or more chronic conditions		None	0.640	6.01	<0.001	1.90**

** p<0.10*
*** p<0.05*

Similarly, after adjusting for confounders, receipt of three preventive services approach statistical significance for patients who report their USC providers ask them about treatments and prescriptions from other clinicians. Table 4.5 presents the odds of receiving a mammogram are 18 percent higher for women whose providers ask about

past treatments relative to women whose providers do not ask (p=0.094). Table 4.7 shows the odds of getting a cholesterol screening test are 27 percent higher for patients whose providers ask about treatments they have had in the past (p=0.096). Also, in Table 4.9, patients have a 19 percent increase in the odds of receiving colorectal cancer screening as recommended when their USC providers ask about previous treatments compared to patients whose providers do not ask (p=0.074).

Table 4.9 Multivariate logistic regression model predicting the association of patient-centeredness with use of colorectal cancer screening

Variable		Reference category	β coefficient	*t*-value	P>|*t*|	e^{β} (OR)
Constant		--	-0.693	-1.89	0.060	--
USC asks about other treatments		No	0.173	1.80	0.074	1.19*
USC always shows respect for treatments		Not always	0.062	0.73	0.468	1.06
USC always asks patient to help decide		Not always	-0.124	-1.56	0.121	0.88
USC explains options to patient		No	0.167	1.06	0.291	1.18
Predisposing characteristics						
Gender	Women	Men	-0.064	-0.89	0.376	0.94
Age	50 – 64 years	≥ 65 years	-0.688	-8.25	<0.001	0.50**
Race	Black	White	0.131	1.30	0.195	1.14
	Asian		-0.821	-5.24	<0.001	0.44**
	Other		-0.571	-2.40	0.017	0.56**
Hispanic ethnicity		None	0.251	2.10	0.037	1.29**
Education	High school	No degree	0.267	2.29	0.023	1.31**
	Bachelor's degree or more		0.736	5.54	<0.001	2.09**
Employed		Not employed	0.338	4.03	<0.001	1.40**
Marital status	Never married	Married	-0.347	-2.09	0.038	0.71**
	Widowed/Divorced/Separated		-0.094	-1.11	0.268	0.91
More likely to take risks		No/ Uncertain	0.069	0.73	0.463	1.07
Can overcome illness without medical help		No/ Uncertain	-0.494	-4.77	<0.001	0.61**
Enabling resources						
Income	< 199% FPL	400%+ FPL	-0.523	-5.32	<0.001	0.59**
	200 – 399% FPL		-0.321	-3.85	<0.001	0.73**
Health insurance	Public only	Any private	-0.258	-2.51	0.013	0.77**
	Uninsured		-0.727	-5.06	<0.001	0.48**
Region	Midwest	Northeast	0.022	0.19	0.853	1.02
	South		-0.042	-0.41	0.681	0.96
	West		0.118	1.01	0.312	1.13
MSA	Urban	Rural	0.124	1.16	0.247	1.13
Need factors						
Health status	Very good/Good	Excellent	0.015	0.13	0.898	1.01
	Fair/Poor		0.071	0.47	0.641	1.07
Mental health	Very good/Good	Excellent	-0.206	-2.03	0.043	0.81**
	Fair/Poor		-0.359	-2.36	0.019	0.70**
One or more chronic conditions		None	0.781	6.96	<0.001	2.18**

** p<0.10*
*** p<0.05*

The regression results for one preventive service indicate no association with quality of care. We found patient-centered care is not related to screening for blood pressure (Table 4.10).

Table 4.10 Multivariate logistic regression model predicting the association of patient-centeredness with use of blood pressure screening

Variable		Reference category	β coefficient	*t*-value	P>|*t*|	e^{β} (OR)
Constant		--	0.899	1.58	0.116	--
USC asks about other treatments		No	-0.009	-0.06	0.949	0.99
USC always shows respect for treatments		Not always	0.073	0.57	0.570	1.08
USC always asks patient to help decide		Not always	-0.044	-0.35	0.730	0.96
USC explains options to patient		No	0.355	1.58	0.116	1.43
Predisposing characteristics						
Gender	Women	Men	0.901	7.91	<0.001	2.46**
Age	18 – 44 years	≥ 65 years	-0.574	-2.01	0.046	0.56**
	45 – 64 years		-0.346	-1.26	0.211	0.71
Race	Black	White	0.464	2.76	0.006	1.59**
	Asian		-0.453	-1.91	0.058	0.64*
	Other		0.229	0.78	0.434	1.26
Hispanic ethnicity		None	-0.020	-0.13	0.894	0.98
Education	High school	No degree	0.132	0.89	0.375	1.14
	Bachelor's degree or more		0.611	3.09	0.002	1.84**
Employed		Not employed	0.236	1.73	0.086	1.27*
Marital status	Never married	Married	-0.422	-3.27	0.001	0.66**
	Widowed/Divorced/Separated		0.178	1.03	0.302	1.19
More likely to take risks		No/ Uncertain	-0.040	-0.27	0.788	0.96
Can overcome illness without medical help		No/ Uncertain	-0.272	-2.14	0.034	0.76**
Enabling resources						
Income	< 199% FPL	400%+ FPL	-0.456	-2.66	0.009	0.63**
	200 – 399% FPL		-0.507	-2.97	0.003	0.60**
Health insurance	Public only	Any private	0.005	0.03	0.976	1.01
	Uninsured		-0.869	-5.71	<0.001	0.42**
Region	Midwest	Northeast	-0.135	-0.63	0.527	0.87
	South		-0.228	-1.13	0.260	0.80
	West		-0.357	-1.81	0.072	0.70*
MSA	Urban	Rural	0.300	2.13	0.034	1.35**
Need factors						
Health status	Very good/Good	Excellent	0.265	1.48	0.141	1.30
	Fair/Poor		0.697	2.93	0.004	2.01**
Mental health	Very good/Good	Excellent	0.070	0.46	0.648	1.07
	Fair/Poor		0.152	0.56	0.574	1.16
One or more chronic conditions		None	1.224	8.88	<0.001	3.40**

** p<0.10*
*** p<0.05*

Discussion

We examined the association of four elements of quality of care with timely receipt of five screening tests and one immunization. Only one domain of patient-centered care was strongly associated to patient compliance with the USPSTF

recommendations. In the present study, women who are asked to help with medical decisions are more likely to receive regular mammography than women whose providers do not seek their help with decision making. Other researchers have also demonstrated the importance of good rapport between patients and providers, specifically, for mammogram screening.[96,97]

Two domains of patient-centered care, providers asking for help with decision making and providers asking about other treatments patients have received, did not demonstrate statistically significant associations with other preventive services. However, the results established a pattern suggesting greater receipt of recommended screenings and vaccinations for these measures of quality of care. These findings concur with previous research in showing the value of effective interactions between patients and their providers for promoting preventive care.[96-99] Both of these elements involve the provider soliciting a response from the patient which may encourage patient activation and facilitate receipt of preventive care.

The other two domains of patient-centeredness were not related to receipt of the six clinical preventive services studied. One reason may be that there was not a large enough difference in the perception of quality of care received in our sample between the group that was compliant with the prevention recommendations and the group that was not compliant. For instance, there were no statistically significant differences in how often patients reported their providers showing respect for other treatments they have undergone for five of the six services we studied (Table 4.4). Another explanation may be that the element of patient-centered care is not relevant to whether or not patients receive preventive services. Table 4.4 shows patients whose providers explain healthcare

options to them are equally likely to be compliant with four of the six clinical prevention guidelines we studied. This finding is logical because the recommendations for clinical preventive services are clear and there are often no other options for patients to consider.

Not surprisingly, there is no difference in the provision of blood pressure screening between patients who perceive patient-centered care and those who do not. Because they have a usual source of care, patients in the sample report remarkably high compliance with the USPSTF recommendations on blood pressure screening. Furthermore, blood pressure measurement is frequently performed by a nurse prior to a patient seeing their provider. So the patient-provider relationship often has no relevance to whether a patient is screened for hypertension or not.

Expanding the analyses to other types of preventive services may yield more statistically significant results. For example, a qualitative study found that preventive services involving patient counseling were more likely to be associated with higher patient satisfaction than screening services.[106] Because counseling services rely on effective patient-provider communication, the authors surmise that patients who have better interpersonal interactions with their providers are more likely to receive these types of services.

This study has several limitations. There is a possibility of recall bias due to the reliance on self-reported data on preventive services use. However, systematic bias is unlikely since MEPS data collection for quality of care occurs in a different survey round than data collection for preventive service use. Also, we use cross-sectional data and therefore, cannot ascertain a causal relationship between quality of care and receipt of preventive services. Another limitation is that we did not differentiate between the types

of providers that respondents considered as their USC providers. The primary audience for USPSTF recommendations includes providers in the fields of preventive medicine and primary care. Likewise, ACIP recommendations are geared towards primary care providers, infectious disease specialists, and other clinicians who may order vaccinations. It may be misleading to include respondents who consider their surgeon, for instance, as their USC provider since surgeons may not be the target audience for the clinical preventive service recommendations we studied. However, by even the most liberal estimates, this limitation applies to less than 3% of the sample.

Practice implications

This study has important implications for the promotion of disease prevention. Greater patient involvement in the clinical encounter can translate into increased odds of receiving preventive services. In fact, patient activation has been found to be associated to preventive screenings.[107] Therefore, clinicians should strive to enhance patient engagement by encouraging dialogue with patients. Another avenue for involving patients, specifically with interactive preventive health records, has been linked to the delivery of more preventive services as well.[108]

Conclusion

Quality of care as it relates to patient-provider communication is associated with receipt of regular mammograms. Findings from this study also suggest a pattern of greater compliance with clinical preventive service recommendations when patients perceive patient-centered care. In light of these results, medical providers should continue to recommend primary and secondary prevention measures per the USPSTF and ACIP guidelines. Providers should consider their interpersonal communication with their

patients as an additional inducement for patients to stay current on their screenings and immunizations.

CHAPTER 5: CONCLUSION

The purpose of this dissertation was to explore how patients perceive the quality of care delivered by their healthcare providers and its relationship to their health services utilization. This dissertation comprised three research papers emanating from the main hypothesis that higher perceived quality of care is associated with more effective use of health services. Quality of care was assessed using ratings of patient satisfaction with provider communication and patient-reported data on how often providers delivered patient-centered care.

In the first study, I investigated whether differences in satisfaction between English- and Spanish-speaking Hispanics could be explained by acculturation and patient-provider concordance. I constructed logistic and linear regression models to identify differences between the two groups for the satisfaction outcomes. Then I employed the Blinder-Oaxaca decomposition method to account for the observed differences. The results indicated that Hispanic patients perceive their healthcare providers' communication skills differently according to their English language proficiency. English-speaking Hispanics were more satisfied with provider communication than Spanish-speaking Hispanics. Patient-provider concordance with regard to race, ethnicity, gender, or language did not explain the difference in satisfaction. The patient's level of acculturation, on the other hand, was a large contributor to the difference in satisfaction between the two groups.

In the second study, I examined whether patients who perceived a lack of patient-centeredness and poor access to a regular provider were more likely to use the emergency department (ED) for nonemergent purposes. Given the nature of ED visits, where many

people have no visits, I used a hurdle model which is better suited to model the data with excess zeros. My research was based on the assumption that the decision to visit an ED is independent of the decision about how often to visit the ED, specifically for nonemergent conditions. Therefore, in the first part of the hurdle model, I used a multivariate logistic regression to ascertain the factors that are related to having a nonemergent ED visit. Then, in the second part of the model when the hurdle has been cleared, I used a negative binomial regression model to deal with the zero-truncated count data of nonemergent ED visits given that one occurrence exists. The results showed that patients' perception of patient-centered care from a regular provider played a small role in nonemergent ED use. Only patient-provider language concordance had a statistically significant association with fewer nonemergent ED visits. In contrast, access to a regular provider was strongly related to ED utilization.

In the third study, I probed the relationship between patient-centered care and receipt of six recommended clinical preventive services. My research focused on screening for breast cancer, cervical cancer, colorectal cancer, high cholesterol, hypertension, and vaccination against influenza. I conducted separate multivariate logistic regression analyses for each preventive service to determine the probability of compliance with national prevention guidelines given the provision of four domains of patient-centered care. The results indicated only receipt of mammography had a statistically significant association with one particular element of patient-centeredness: providers asking patients to help with decision making. Although not statistically significant, the results from this study also established a pattern suggesting greater receipt of recommended screenings and vaccinations for these measures of quality of care.

The findings from these studies reveal many implications for healthcare practice and policy. Results from the first study highlight the value of providing care that is sensitive to cultural and linguistic differences. Providers should receive training to develop cultural competence and be able to appreciate the values of patients from other backgrounds. In addition, providers should use plain language when talking with all patients, not just patients who are less acculturated or who speak English as a second language. Furthermore, educators and policy makers should continue to work together to find ways to increase the proportion of minorities in clinical education in order to increase the diversity of the healthcare workforce. The result will give patients more choices when selecting a regular provider and may lead to more satisfying medical interactions.

Similarly, findings from the second study suggest healthcare providers who serve as a usual source of care should provide professional interpreter services for patients who speak a different language. Providing primary care that focuses on patients' linguistic needs was found to be related to reduced nonemergent ED use. Another way for providers to reduce nonemergent ED visits is to improve their accessibility. Expanding their office hours or providing a way for patients to reach them after hours will also demonstrate a provider's commitment to improving patients' healthcare experiences. There is a difference for patients between having a regular provider and having one available when they are needed. The stimulus funding from the Patient Protection and Affordable Care Act of 2010 will increase the reach of community health centers. This expansion may play a key role in improving access to care thereby reducing nonemergent ED use.

Furthermore, findings from the third study indicate that the delivery of patient-centered care may translate into more timely receipt of preventive services for patients. In light of these results, healthcare providers should encourage dialogue to enhance patient activation and facilitate compliance of preventive care guidelines.

This dissertation provides original contributions to the field of health services research. The findings reveal the value of understanding how patients perceive interpersonal communication with their healthcare providers. Their perception may impact continuity of care and adherence to medical advice. The significance of this research is also underscored by the imminent reliance on how patients assess their healthcare experiences to determine Medicare reimbursement as a result of the Patient Protection and Affordable Care Act of 2010. With this healthcare reform, the U.S. healthcare system now faces an opportunity to continuously improve quality of care by incentivizing the practice of patient-centered care. This change could mark the beginning of a major paradigm shift in how health care is delivered.

APPENDIX

Table 3.4 Respondent demographic characteristics by ED visit status (sensitivity analysis)*

	No ED visit + only emergent ED visits N=30,682† N=341,773,231‡	At least 1 nonemergent ED visit N=1,381† N=13,343,639‡	p-value
Predisposing characteristics			
Age			<0.001
18 – 44 years	41.8	53.1	
45 – 64 years	38.7	30.0	
≥ 65 years	19.5	16.9	
Gender			<0.001
Female	55.7	66.2	
Race			<0.001
White	82.4	74.6	
Black	11.2	19.7	
Other	6.4	5.7	
Hispanic ethnicity	10.9	12.7	0.045
Education			<0.001
No degree	13.8	18.9	
High school	49.8	56.9	
Bachelor's degree or more	36.5	24.3	
Employment status			<0.001
Employed	67.1	57.6	
Not employed	32.9	42.4	
Marital status			<0.001
Married	60.6	48.2	
Widowed	6.8	7.6	
Divorced	11.0	13.3	
Separated	1.8	3.9	
Never married	19.9	26.9	
Able to speak English	97.0	96.5	0.302
More likely to take risks			0.085
Disagree strongly	44.0	45.5	
Disagree somewhat	22.3	19.3	
Uncertain	14.1	15.9	
Agree somewhat	15.6	14.6	
Agree strongly	4.1	4.8	
Can overcome illness without medical help			0.011
Disagree strongly	49.4	53.9	
Disagree somewhat	22.1	20.9	
Uncertain	9.7	9.6	
Agree somewhat	16.0	12.2	
Agree strongly	2.8	3.3	
Enabling resources			
Income			<0.001
< 100% poverty level (poor)	9.2	21.4	
100 – 199% poverty level (low income)	15.4	23.0	
200 – 399% poverty level (middle income)	30.6	30.2	
≥ 400% poverty level (high income)	44.7	25.4	

Health insurance			<0.001
Private	74.1	58.5	
Public	17.4	29.7	
Uninsured	8.5	11.7	
Region			0.025
Northeast	20.4	16.2	
Midwest	22.8	25.7	
South	35.0	37.1	
West	21.8	21.0	
MSA			0.033
Urban	82.4	79.1	
Rural	17.6	20.9	
Need factors			
Health status			<0.001
Excellent	21.8	11.8	
Very good	34.2	22.3	
Good	29.3	34.7	
Fair	11.1	19.5	
Poor	3.5	11.8	
Mental health			<0.001
Excellent	34.6	26.6	
Very good	32.0	23.4	
Good	25.6	32.8	
Fair	6.3	13.2	
Poor	1.5	4.0	
Hypertension	37.4	41.6	0.031
Coronary heart disease	6.9	8.6	0.042
Angina	3.6	4.4	0.247
Myocardial infarction	4.5	5.9	0.046
Other heart disease	11.8	13.8	0.087
Stroke	4.2	7.6	<0.001
Emphysema	2.7	5.1	<0.001
High cholesterol	37.2	35.6	0.334
Diabetes	11.5	14.8	0.003
Arthritis	30.0	35.1	0.002
Asthma	10.2	17.9	<0.001

** Percentages may not total 100% due to rounding*
† Unweighted sample size
‡ U.S. population estimate

Table 3.5 Respondents' perception of quality of care and access to USC provider by ED visit status (sensitivity analysis)*

	No ED visit + only emergent ED visits N=30,682† N=341,773,231‡	At least 1 nonemergent ED visit N=1,381† N=13,343,639‡	p-value
Patient-centeredness			
USC asks about other treatments	82.8	84.0	0.344
USC shows respect for treatments			0.201
Always	66.4	64.4	
Usually	24.2	24.3	
Sometimes	6.6	7.8	
Never	2.7	3.5	
USC asks person to help decide			0.019
Always	62.0	58.2	
Usually	23.4	24.2	
Sometimes	9.9	10.9	
Never	4.7	6.7	
USC explains options to person	94.9	93.0	0.010
USC speaks language or provides interpreter services	99.5	99.3	0.402
Access			
Transportation to USC			<0.001
Drives	86.0	77.2	
Is driven	8.7	14.6	
Public transportation	3.0	5.9	
Walks or uses other mode	2.3	2.4	
Time to USC			0.002
<15 minutes	50.3	48.5	
15-30 minutes	39.6	38.2	
31-60 minutes	8.4	10.0	
>60 minutes	1.8	3.4	
USC has office hours on nights and weekends	38.1	34.9	0.064
Difficulty getting to USC			<0.001
Very difficult	0.8	2.2	
Somewhat difficult	4.0	8.4	
Not too difficult	17.3	21.3	
Not at all difficult	77.8	68.1	
Difficulty in contacting USC by phone			<0.001
Very difficult	4.6	6.9	
Somewhat difficult	11.0	13.7	
Not too difficult	27.1	28.5	
Not at all difficult	57.3	50.9	
Difficulty in contacting USC after hours			<0.001
Very difficult	12.6	20.1	
Somewhat difficult	11.6	13.2	
Not too difficult	23.8	23.9	
Not at all difficult	28.1	23.4	
Unsure	23.8	19.5	

** Percentages may not total 100% due to rounding*
† Unweighted sample size
‡ U.S. population estimate

Table 3.6 Estimation results of two-part models of the frequency of emergency department visits (sensitivity analysis)

	Binary hurdle model (Logit)		Zero-truncated negative binomial model	
	Coefficient	*t*-value	Coefficient	*t*-value
Constant	**-3.144***	**-3.80**	**-17.107***	**-7.83**
Predisposing characteristics				
Age				
45 – 64 years	**-0.620***	**-7.53**	**-0.513***	**-2.28**
≥ 65 years	**-0.686***	**-5.27**	**-0.749***	**-2.02**
Gender				
Female	**0.307***	**4.26**	0.209	1.09
Race				
Black	**0.362***	**3.82**	**-0.728***	**-3.52**
other	-0.110	-0.78	**-0.900***	**-2.68**
Hispanic ethnicity				
Yes	-0.013	-0.13	**0.530***	**2.03**
Education				
High school	0.155	1.53	**0.519***	**2.29**
Bachelor's degree or more	-0.059	-0.45	**0.850***	**2.89**
Employment status				
Employed	-0.021	-0.22	0.159	0.80
Marital status				
Widowed	0.001	0.01	**0.512***	**1.52**
Divorced	0.035	0.30	-0.182	-0.62
Separated	**0.304***	**2.00**	0.248	0.55
Never married	0.109	1.11	0.203	0.93
Ability to speak English				
Yes	**0.289***	**1.76**	0.788	1.55
More likely to take risks				
Yes	0.026	0.26	0.161	0.73
Can overcome illness without medical help				
Yes	-0.119	-1.23	-0.293	-1.29
Enabling resources				
Income				
< 100% poverty level (poor)	**0.652***	**4.77**	0.170	0.59
100 – 199% poverty level (low income)	**0.468***	**3.78**	0.078	0.33
200 – 399% poverty level (middle income)	**0.272***	**2.24**	0.295	1.14
Health insurance				
public	0.170	1.59	0.297	1.40
uninsured	0.101	0.85	0.481	1.85
Region				
Midwest	**0.341***	**2.69**	0.014	0.05
South	0.158	1.24	-0.174	-0.66
West	0.202	1.51	-0.027	-0.09
MSA				
urban	-0.105	-1.03	0.280	1.32
Need factors				
Health status				
Very good	**0.270***	**1.99**	-0.406	-1.11
Good	**0.738***	**5.35**	0.061	0.19
Fair	**0.978***	**5.97**	0.593	1.56
Poor	**1.502***	**7.45**	0.725	1.68

Mental health				
Very good	**-0.201***	**-1.96**	0.255	0.96
Good	-0.050	-0.43	0.243	1.12
Fair	0.030	0.22	-0.121	-0.42
Poor	-0.060	-0.30	0.447	1.08
Hypertension	-0.084	-0.88	-0.247	-0.95
Coronary heart disease	-0.096	-0.66	-0.081	-0.20
Angina	0.207	0.94	**1.017***	**1.99**
Myocardial infarction	-0.024	-0.13	0.174	0.38
Other heart disease	0.023	0.20	-0.632	-1.90
Stroke	**-0.332***	**-2.10**	-0.507	-1.41
Emphysema	-0.117	-0.67	-0.222	-0.72
High cholesterol	0.061	0.65	**0.705***	**3.40**
Diabetes	-0.014	-0.12	0.323	1.27
Arthritis	-0.036	-0.41	0.132	0.71
Asthma	**-0.283***	**-2.92**	-0.324	-1.60
Patient-centeredness				
USC asks about other treatments	0.145	1.60	-0.119	-0.58
USC shows respect for treatments	0.040	0.46	0.127	0.64
USC asks person to help decide	-0.060	-0.67	0.205	1.08
USC explains options to person	-0.146	-1.08	-0.332	-0.94
USC speaks language or provides interpreter services	-0.350	-0.88	**-2.130***	**-2.62**
Access				
Transportation to USC				
Is driven	-0.016	-0.14	0.228	0.96
Public transportation	0.190	1.11	0.081	0.25
Walks or Other	-0.183	-0.76	0.728	1.50
Time to USC				
15-30 minutes	-0.073	-0.97	-0.196	-1.05
31-60 minutes	-0.023	-0.18	0.404	1.16
>60 minutes	0.296	1.29	**1.014***	**2.53**
USC has office hours on nights and weekends	0.045	0.56	0.307	1.91
Difficulty getting to USC	**0.265***	**2.03**	-0.164	-0.61
Difficulty in contacting USC by phone	0.113	1.22	-0.313	-1.24
Difficulty in contacting USC after hours	**0.163***	**2.04**	**0.390***	**2.01**

* *$p<0.05$*

REFERENCES

1. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC; 2001.

2. U.S. Department of Health & Human Services. Health Communication and Health Information Technology - Healthy People. http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicid=18. Accessed Apr 29, 2011.

3. Kupfer JM, Bond EU. Patient satisfaction and patient-centered care: necessary but not equal. JAMA 2012;308:139-40.

4. Roter DL. Patient question asking in physician-patient interaction. Health Psychol 1984;3:395-409.

5. Stewart M, Brown JB, Donner A, et al. The impact of patient-centered care on outcomes. J Fam Pract 2000;49:796-804.

6. Wolf DM, Lehman L, Quinlin R, Zullo T, Hoffman L. Effect of patient-centered care on patient satisfaction and quality of care. J Nurs Care Qual 2008;23:316-21.

7. Epstein RM, Street RL, Jr. The values and value of patient-centered care. Ann Fam Med 2011;9:100-3.

8. Stewart M. Towards a global definition of patient centred care. BMJ 2001;322:444-5.

9. Cohen JW, Cohen SB, Banthin JS. The medical expenditure panel survey: a national information resource to support healthcare cost research and inform policy and practice. Med Care 2009;47:S44-50.

10. Xu KT. Usual source of care in preventive service use: a regular doctor versus a regular site. Health Serv Res 2002;37:1509-29.

11. Vaidya V, Partha G, Karmakar M. Gender differences in utilization of preventive care services in the United States. J Womens Health 2012;21:140-5.

12. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? J Health Soc Behav 1995;36:1-10.

13. Aday LA, Andersen R. A framework for the study of access to medical care. Health Serv Res 1974;9:208-20.

14. Baker DW, Parker RM, Williams MV, Coates WC, Pitkin K. Use and effectiveness of interpreters in an emergency department. JAMA 1996;275:783-8.

15. Ferguson WJ, Candib LM. Culture, language, and the doctor-patient relationship. Fam Med 2002;34:353-61.

16. Kaplan SH, Greenfield S, Ware JE, Jr. Assessing the effects of physician-patient interactions on the outcomes of chronic disease. Med Care 1989;27:S110-27.

17. Stewart MA. Effective physician-patient communication and health outcomes: a review. CMAJ 1995;152:1423-33.

18. Trummer UF, Mueller UO, Nowak P, Stidl T, Pelikan JM. Does physician-patient communication that aims at empowering patients improve clinical outcome? A case study. Patient Educ Couns 2006;61:299-306.

19. Street RL, Jr., Makoul G, Arora NK, Epstein RM. How does communication heal? Pathways linking clinician-patient communication to health outcomes. Patient Educ Couns 2009;74:295-301.

20. National Center for Health Statistics. Health Indicators Warehouse. National Center for Health Statistics. http://www.healthindicators.gov/Indicators/Health-Care_Provider-Communication_138/Selection. Accessed Aug 26, 2011.

21. Jensen JD, King AJ, Guntzviller LM, Davis LA. Patient-provider communication and low-income adults: age, race, literacy, and optimism predict communication satisfaction. Patient Educ Couns 2010;79:30-5.

22. Merrill RM, Allen EW. Racial and ethnic disparities in satisfaction with doctors and health providers in the United States. Ethn Dis 2003;13:492-8.

23. Saha S, Arbelaez JJ, Cooper LA. Patient-physician relationships and racial disparities in the quality of health care. Am J Public Health 2003;93:1713-9.

24. Saha S, Komaromy M, Koepsell TD, Bindman AB. Patient-physician racial concordance and the perceived quality and use of health care. Arch Intern Med 1999;159:997-1004.

25. LaVeist TA, Carroll T. Race of physician and satisfaction with care among African-American patients. J Natl Med Assoc 2002;94:937-43.

26. Laveist TA, Nuru-Jeter A. Is doctor-patient race concordance associated with greater satisfaction with care? J Health Soc Behav 2002;43:296-306.

27. Cooper LA, Roter DL, Johnson RL, Ford DE, Steinwachs DM, Powe NR. Patient-centered communication, ratings of care, and concordance of patient and physician race. Ann Intern Med 2003;139:907-15.

28. Cooper-Patrick L, Gallo JJ, Gonzales JJ, et al. Race, gender, and partnership in the patient-physician relationship. JAMA 1999;282:583-9.

29. Meghani SH, Brooks JM, Gipson-Jones T, Waite R, Whitfield-Harris L, Deatrick JA. Patient-provider race-concordance: does it matter in improving minority patients' health outcomes? Ethn Health 2009;14:107-30.

30.van Wieringen JC, Harmsen JA, Bruijnzeels MA. Intercultural communication in general practice. Eur J Public Health 2002;12:63-8.

31. Garcia JA, Paterniti DA, Romano PS, Kravitz RL. Patient preferences for physician characteristics in university-based primary care clinics. Ethn Dis 2003;13:259-67.

32. Schmittdiel J, Grumbach K, Selby JV, Quesenberry CP, Jr. Effect of physician and patient gender concordance on patient satisfaction and preventive care practices. J Gen Intern Med 2000;15:761-9.

33. Gonzalez HM, Vega WA, Tarraf W. Health care quality perceptions among foreign-born Latinos and the importance of speaking the same language. J Am Board Fam Med 2010;23:745-52.

34. Fernandez A, Schillinger D, Grumbach K, et al. Physician language ability and cultural competence. An exploratory study of communication with Spanish-speaking patients. J Gen Intern Med 2004;19:167-74.

35. Arauz Boudreau AD, Fluet CF, Reuland CP, Delahaye J, Perrin JM, Kuhlthau K. Associations of providers' language and cultural skills with Latino parents' perceptions of well-child care. Acad Pediatr 2010;10:172-8.

36. Johnson RL, Saha S, Arbelaez JJ, Beach MC, Cooper LA. Racial and ethnic differences in patient perceptions of bias and cultural competence in health care. J Gen Intern Med 2004;19:101-10.

37. U.S. Census Bureau. Hispanics in the United States. http://www.census.gov/population/www/socdemo/hispanic/hispanic_pop_presentation.html. Accessed Sept 15, 2011.

38. Wallace LS, DeVoe JE, Heintzman JD, Fryer GE. Language preference and perceptions of healthcare providers' communication and autonomy making behaviors among Hispanics. J Immigr Minor Health 2009;11:453-9.

39. Wallace LS, DeVoe JE, Rogers ES, Malagon-Rogers M, Fryer GE, Jr. The medical dialogue: disentangling differences between Hispanic and non-Hispanic whites. J Gen Intern Med 2007;22:1538-43.

40. Wallace LS, DeVoe JE, Rogers ES, Protheroe J, Rowlands G, Fryer GE, Jr. Digging deeper: quality of patient-provider communication across Hispanic subgroups. BMC Health Serv Res 2009;9:240.

41. Morales LS, Cunningham WE, Brown JA, Liu H, Hays RD. Are Latinos less satisfied with communication by health care providers? J Gen Intern Med 1999;14:409-17.

42. Tarn DM, Meredith LS, Kagawa-Singer M, et al. Trust in one's physician: the role of ethnic match, autonomy, acculturation, and religiosity among Japanese and Japanese Americans. Ann Fam Med 2005;3:339-47.

43. Saha S, Taggart SH, Komaromy M, Bindman AB. Do patients choose physicians of their own race? Health Aff 2000;19:76-83.

44. Jimenez-Rubio D, Hernandez-Quevedo C. Inequalities in the use of health services between immigrants and the native population in Spain: what is driving the differences? Eur J Health Econ 2011;12:17-28.

45. Vargas Bustamante A, Chen J, Rodriguez HP, Rizzo JA, Ortega AN. Use of preventive care services among Latino subgroups. Am J Prev Med 2010;38:610-9.

46. Kirby JB, Taliaferro G, Zuvekas SH. Explaining racial and ethnic disparities in health care. Med Care 2006;44:I64-72.

47. Rodriguez HP, Chen J, Rodriguez MA. A national study of problematic care experiences among Latinos with diabetes. J Health Care Poor Underserved 2010;21:1152-68.

48. Mortensen K, Song PH. Minding the gap: a decomposition of emergency department use by Medicaid enrollees and the uninsured. Med Care 2008;46:1099-107.

49. Ezzati-Rice T, Rohde F, Greenblatt J. Sample Design of the Medical Expenditure Panel Survey Household Component, 1998–2007. Rockville, MD; 2008.

50. Mosen DM, Carlson MJ, Morales LS, Hanes PP. Satisfaction with provider communication among Spanish-speaking Medicaid enrollees. Ambul Pediatr 2004;4:500-4.

51. Lara M, Gamboa C, Kahramanian MI, Morales LS, Bautista DE. Acculturation and Latino health in the United States: a review of the literature and its sociopolitical context. Annu Rev Public Health 2005;26:367-97.

52. Cruz TH, Marshall SW, Bowling JM, Villaveces A. The validity of a proxy acculturation scale among US Hispanics. Hispanic J Behav Sci 2008;30:425-46.

53. Arcia E, Skinner M, Bailey D, Correa V. Models of acculturation and health behaviors among Latino immigrants to the US. Soc Sci Med 2001;53:41-53.

54. Cabassa LJ. Measuring acculturation: Where we are and where we need to go. Hisp J Behav Sci 2003;25:127-46.

55. Doescher MP, Saver BG, Franks P, Fiscella K. Racial and ethnic disparities in perceptions of physician style and trust. Arch Fam Med 2000;9:1156-63.

56. Xu KT, Borders TF. Does being an immigrant make a difference in seeking physician services? J Health Care Poor Underserved 2008;19:380-90.

57. Sinning M, Hahn M, Bauer TK. The Blinder-Oaxaca decomposition for nonlinear regression models. Stata J 2008;8:480-92.

58. Rutten LJ, Augustson E, Wanke K. Factors associated with patients' perceptions of health care providers' communication behavior. J Health Commun 2006;11 Suppl 1:135-46.

59. Fiscella K, Goodwin MA, Stange KC. Does patient educational level affect office visits to family physicians? J Natl Med Assoc 2002;94:157-65.

60. DeVoe JE, Wallace LS, Fryer GE, Jr. Patient age influences perceptions about health care communication. Fam Med 2009;41:126-33.

61. DeVoe JE, Wallace LS, Fryer GE, Jr. Measuring patients' perceptions of communication with healthcare providers: do differences in demographic and socioeconomic characteristics matter? Health Expect 2009;12:70-80.

62. Hayes RP, Baker DW. Methodological problems in comparing English-speaking and Spanish-speaking patients' satisfaction with interpersonal aspects of care. Med Care 1998;36:230-6.

63. National Center for Health Statistics. Health, United States, 2010: with special feature on death and dying. Hyattsville, MD; 2011.

64. Weber EJ, Showstack JA, Hunt KA, et al. Are the uninsured responsible for the increase in emergency department visits in the United States? Ann Emerg Med 2008;52:108-15.

65. Newton MF, Keirns CC, Cunningham R, Hayward RA, Stanley R. Uninsured adults presenting to US emergency departments: assumptions vs data. JAMA 2008;300:1914-24.

66. Weber EJ, Showstack JA, Hunt KA, Colby DC, Callaham ML. Does lack of a usual source of care or health insurance increase the likelihood of an emergency department visit? Results of a national population-based study. Ann Emerg Med 2005;45:4-12.

67. Ragin DF, Hwang U, Cydulka RK, et al. Reasons for using the emergency department: results of the EMPATH Study. Acad Emerg Med 2005;12:1158-66.

68. Guttman N, Zimmerman DR, Nelson MS. The many faces of access: reasons for medically nonurgent emergency department visits. J Health Polit Policy Law 2003;28:1089-120.

69. Rust G, Ye J, Baltrus P, Daniels E, Adesunloye B, Fryer GE. Practical barriers to timely primary care access: impact on adult use of emergency department services. Arch Intern Med 2008;168:1705-10.

70. Mehrotra A, Liu H, Adams JL, et al. Comparing costs and quality of care at retail clinics with that of other medical settings for 3 common illnesses. Ann Intern Med 2009;151:321-8.

71. Thygeson M, Van Vorst KA, Maciosek MV, Solberg L. Use and costs of care in retail clinics versus traditional care sites. Health Affair 2008;27:1283-92.

72. Brousseau DC, Hoffmann RG, Nattinger AB, Flores G, Zhang Y, Gorelick M. Quality of primary care and subsequent pediatric emergency department utilization. Pediatrics 2007;119:1131-8.

73. Brousseau DC, Gorelick MH, Hoffmann RG, Flores G, Nattinger AB. Primary care quality and subsequent emergency department utilization for children in Wisconsin Medicaid. Acad Pediatr 2009;9:33-9.

74. Gary TL, Maiese EM, Batts-Turner M, Wang NY, Brancati FL. Patient satisfaction, preventive services, and emergency room use among African-Americans with type 2 diabetes. Dis Manag 2005;8:361-71.

75. Sarver JH, Cydulka RK, Baker DW. Usual source of care and nonurgent emergency department use. Acad Emerg Med 2002;9:916-23.

76. Lowe RA, Localio AR, Schwarz DF, et al. Association between primary care practice characteristics and emergency department use in a medicaid managed care organization. Med Care 2005;43:792-800.

77. Agency for Healthcare Research and Quality. MEPS HC-113: 2007 Full Year Consolidated Data File. http://meps.ahrq.gov/mepsweb/data_stats/download_data/pufs/h113/h113doc.pdf. Accessed May 23, 2012.

78. Agency for Healthcare Research and Quality. MEPS HC-121: 2008 Full Year Consolidated Data File. http://meps.ahrq.gov/mepsweb/data_stats/download_data/pufs/h121/h121doc.pdf. Accessed May 23, 2012.

79. Agency for Healthcare Research and Quality. MEPS HC-129: 2009 Full Year Consolidated Data File. http://meps.ahrq.gov/mepsweb/data_stats/download_data/pufs/h129/h129doc.pdf. Accessed May 23, 2012.

80. Cunningham PJ, Clancy CM, Cohen JW, Wilets M. The use of hospital emergency departments for nonurgent health problems: a national perspective. Med Care Res Rev 1995;52:453-74.

81. Shin J, Moon S. Quality of care and role of health insurance among non-elderly women with disabilities. Women Health Iss 2008;18:238-48.

82. Nguyen HT, Markides KS, Winkleby MA. Physician advice on exercise and diet in a U.S. sample of obese Mexican-American adults. Am J Health Promot 2011;25:402-9.

83. Moineddin R, Meaney C, Agha M, Zagorski B, Glazier RH. Modeling factors influencing the demand for emergency department services in Ontario: a comparison of methods. BMC Emerg Med 2011;11:13.

84. Pohlmeier W, Ulrich V. An Econometric-Model of the 2-Part Decision-Making Process in the Demand for Health-Care. J Hum Resour 1995;30:339-61.

85. Perkins J. Ensuring linguistic access in health care settings: an overview of current legal rights and responsibilities. Kaiser Family Foundation. http://www.kff.org/uninsured/loader.cfm?url=/commonspot/security/getfile.cfm&pageID=22093. Accessed April 17, 2012.

86. Howard M, Goertzen J, Hutchison B, Kaczorowski J, Morris K. Patient satisfaction with care for urgent health problems: a survey of family practice patients. Ann Fam Med 2007;5:419-24.

87. The Center for Health and Public Service Research website. http://wagner.nyu.edu/chpsr/index.html?p=25. Accessed May 1, 2012.

88. National Prevention Council. National Prevention Strategy. Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General; 2011.

89. DeVoe JE, Fryer GE, Phillips R, Green L. Receipt of preventive care among adults: insurance status and usual source of care. Am J Public Health 2003;93:786-91.

90. Blewett LA, Johnson PJ, Lee B, Scal PB. When a usual source of care and usual provider matter: adult prevention and screening services. J Gen Intern Med 2008;23:1354-60.

91. Sambamoorthi U, McAlpine DD. Racial, ethnic, socioeconomic, and access disparities in the use of preventive services among women. Prev Med 2003;37:475-84.

92. Katz SJ, Hofer TP. Socioeconomic disparities in preventive care persist despite universal coverage. Breast and cervical cancer screening in Ontario and the United States. JAMA 1994;272:530-4.

93. Agency for Healthcare Research and Quality. National Healthcare Disparities Report. Rockville, MD; 2011. Report No.: AHRQ Publication No. 12-0006.

94. Lees KA, Wortley PM, Coughlin SS. Comparison of racial/ethnic disparities in adult immunization and cancer screening. Am J Prev Med 2005;29:404-11.

95. White A, Vernon SW, Franzini L, Du XL. Racial and ethnic disparities in colorectal cancer screening persisted despite expansion of Medicare's screening reimbursement. Cancer Epidemiol Biomarkers Prev 2011;20:811-7.

96. Somkin CP, McPhee SJ, Nguyen T, et al. The effect of access and satisfaction on regular mammogram and Papanicolaou test screening in a multiethnic population. Med Care 2004;42:914-26.

97. Musa D, Schulz R, Harris R, Silverman M, Thomas SB. Trust in the health care system and the use of preventive health services by older black and white adults. Am J Public Health 2009;99:1293-9.

98. Flach SD, McCoy KD, Vaughn TE, Ward MM, Bootsmiller BJ, Doebbeling BN. Does patient-centered care improve provision of preventive services? J Gen Intern Med 2004;19:1019-26.

99. Beach MC, Sugarman J, Johnson RL, Arbelaez JJ, Duggan PS, Cooper LA. Do patients treated with dignity report higher satisfaction, adherence, and receipt of preventive care? Ann Fam Med 2005;3:331-8.

100. Screening for breast cancer: recommendations and rationale. Ann Intern Med 2002;137:344-6.

101. Screening for cervical cancer: recommendations and rationale. Am Fam Physician 2003;67:1759-66.

102. Screening for lipid disorders in adults: recommendations and rationale. Am Fam Physician 2002;65:273-6.

103. Screening for high blood pressure: U.S. Preventive Services Task Force reaffirmation recommendation statement. Ann Intern Med 2007;147:783-6.

104. Screening for colorectal cancer: recommendation and rationale. Ann Intern Med 2002;137:129-31.

105. Recommended adult immunization schedule--United States, October 2007--September 2008. MMWR Morb Mortal Wkly Rep 2007;56:Q1-Q4.

106. McFall SL, Solomon TG, Smith DW, Kelley M. Preventive services and satisfaction of Cherokee Nation patients. J Public Health Manag Pract 2001;7:76-83.

107. Greene J, Hibbard JH. Why does patient activation matter? An examination of the relationships between patient activation and health-related outcomes. J Gen Intern Med 2012;27:520-6.

108. Krist AH, Woolf SH, Rothemich SF, et al. Interactive preventive health record to enhance delivery of recommended care: a randomized trial. Ann Fam Med 2012;10:312-9.