ORIGINAL RESEARCH

Nonemergent Emergency Department Use Among Patients With a Usual Source of Care

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Purpose: **Emergency department (ED) use for nonemergent conditions is associated with discontinuity of care at a greater cost. The objective of this study was to determine whether the quality of patient-provider communication and access to one's usual source of care (USC) were associated with greater nonemergent ED use.**

Methods: **A hurdle model was employed using data from the 2007 to 2009 Medical Expenditure Panel Survey. First, a multivariate logistic regression model was used to identify factors associated with the likelihood of a nonemergent ED visit. Given that one occurrence exists, a second negative binomial model was used to establish whether patient-provider communication or access are related to the frequency of nonemergent ED use.**

Results: **One element of communication, patient-provider language concordance, is associated with fewer nonemergent ED visits ($P < .05$). Several aspects of access are related to reduced ED use for nonemergent purposes. Patients whose USC is available after hours and those who travel less than an hour to get to their USC use the ED less for nonemergent care ($P \leq .05$).**

Conclusions: **Enhancing primary care by expanding interpreter services and access to care after hours may reduce the demand for nonemergent ED services. (J Am Board Fam Med 2013;26:680–691.)**

Keywords: **Delivery of Health Care, Emergency Treatment, Health Services Research, Physician-Patient Relations**

Demand for emergency department (ED) services is growing steadily. After adjusting for age, there were 42 visits per 100 people in 2008, up from 37 visits per 100 people in 1995.[1] Despite popular belief, the literature shows that the growth in ED use is attributable to individuals with a usual source of care (USC).[2–4] Aside from having a true medical emergency, these patients choose to use the ED over other health care sites because of its convenience and accessibility.[5–7] 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, and policies to reduce nonemergent use may not be effective.[8–10]

A few studies have considered how patients' perceptions of quality of care from their USC provider affect ED use. Adults who receive more patient-centered care average fewer ED visits than adults who receive care with less of a patient-centered focus.[11] Parents who are satisfied with their children's health care are less likely to take their children to the ED.[12,13] Urban African American patients with diabetes who are satisfied with the care they receive from their USC similarly are less likely to use the ED.[14] Sarver and colleagues[15] discovered a negative association between satisfaction with one's USC and ED use for nonemergent care at the national level. Sex concordance with a patient's USC has been found to be unrelated to having more than one ED visit.[16]

Researchers also have demonstrated a relationship between barriers to primary care access and ED use. Patients who lack transportation, cannot reach their USC by phone, or cannot obtain a timely appointment with their usual provider are more likely to have an ED visit than those who do

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not perceive these barriers.[7] 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.[17] Extended primary care office hours are associated with lower total health care expenditures but not mortality.[18] It is interesting that type of USC matters: patients of family physicians and general practitioners spend less on health care than patients of internists and subspecialists.[19]

This study adds to the existing literature by using recent data from a nationally representative sample with robust measures of patient-provider communication and detailed information on access to USC providers. We focus specifically on nonemergent ED use since these visits are elective and more likely than emergent ED use to be influenced by patient satisfaction or access to a USC. Given the nature of ED visits (i.e., most people do not have an ED visit during the year), we improve on previous work by employing a 2-part model that is better suited to model the data with excess zeros. We also control for sociodemographic characteristics, enabling resources, and need factors that are associated with ED visits. We seek to establish whether the quality of patient-provider communication and access to one's USC are associated with greater nonemergent use of EDs.

Methods

We used data from the 2007 to 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 reflected an oversampling of Hispanic, black, and Asian populations. Low-income households were oversampled in 2007 and 2008 only.[20–22] We limited our sample to those ≥18 years old who completed the SAQ and have positive person weights. All respondents in the sample had a USC provider that was not in a hospital ED.

The dependent variable was the number of nonemergent ED visits by each individual during the year. We defined nonemergent visits based on criteria adapted from others.[15,23] An ED visit was considered to be nonemergent if (1) the patient was not admitted as an inpatient; (2) the patient did not receive a surgical procedure, radiograph, magnetic resonance imaging scan, computed axial tomography scan, electrocardiogram, or electroencephalogram; and (3) the patient did not report that the reason for the visit was an emergency. The reference group consisted of individuals who reported no ED visits. Individuals who only visited the ED for emergencies were excluded from the analyses.

The main independent variables were patient-provider communication and access to one's USC. Communication was measured by responses to 5 MEPS questions; these items have been used previously in the literature to quantify the quality of the patient-provider interaction.[24–26] The respondents were asked if their USC provider usually does the following: (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 were categorized on an ordinal scale of never, sometimes, usually, or always. The data were highly skewed, so, consistent with the literature, responses were dichotomized to always and not always.[27,28] The other items were dichotomous questions with yes/no responses.

Six variables characterized the ability of individuals to access their USC. These covariates included mode of transportation to their USC, how long it takes to get to their USC, and how difficult the respondent perceives it is to travel to their USC. We also included whether the USC provider has office hours during nights or on weekends and how difficult it is for individuals to reach their USC providers by phone or after hours. This builds on the analysis by Jerant et al[18] that examined extended office hours and health care expenditures.

We selected additional demographic variables based on the Behavioral Model of Health Services Use.[29,30] Predisposing characteristics describe the inclination of individuals to use health services. Covariates included age, sex, 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 included 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 consisted of an individual's perceived general health and mental health status, as well as dichotomous variables indicating self-reported diagnosis of any of the following chronic medical conditions: hypertension, heart disease, stroke, emphysema, high cholesterol, diabetes, arthritis, and asthma.

Two independent variables were imputed from the data. Respondents' ability to speak English was determined by the language spoken most at home, whether the whole household is comfortable speaking English, and whether the individual is comfortable speaking English. As in previous research, patient-provider language concordance was assumed to exist if the patient is able to speak English, unless the respondent specifically indicated that discordance exists.[31] The literature on the effect of language concordance on patient satisfaction demonstrates that patients who can communicate with their health care providers in their preferred language report the highest satisfaction ratings compared with patients who cannot.[32,33]

Statistical analyses were performed using Stata statistical software version 12.0 (StataCorp, LP, College Station, TX). All analyses were conducted using longitudinal strata, primary sampling unit identifiers, and MEPS survey weights for the SAQ to adjust for the complex survey design. Bivariate χ^2 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 were particularly interested in assessing first whether a lack of patient-provider communication and barriers to access to a USC were related to the decision to have a nonemergent ED visit and, if so, whether they were associated with a pattern of relying on the ED for nonemergent care. Therefore, we employed a 2-part, or hurdle, model to determine whether these factors were associated with ED use. A hurdle model is a type of count model with 2 processes: The first part of the model involves the decision of the patient to use the ED. The second part of the model involves modeling the number of subsequent visits, which depends on the relationship between the patient and physician.[34] In the first part of the hurdle model, we used a multivariate logistic regression to ascertain the factors that were related to having a nonemergent ED visit. Then, in the second part, we used a negative binomial regression model to allow for overdispersion and excess zeros in the number of nonemergent ED visits.[34–36] We assessed whether unsatisfactory patient-provider communication and poor access were 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 and for whom there are no missing data. Approximately 5% of the sample have ≥1 nonemergent ED visits. Table 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 ($P < .001$) and mental health ($P < .001$) statuses than non-ED users. A greater proportion of ED users are unemployed ($P < .001$), earn less income ($P < .001$), and are covered by public health insurance ($P < .001$).

Data from Table 2 show that both groups are comparable in patient-provider communication scores, yet non-ED users report slightly more decision making with ($P = .007$) and explanations from ($P = .007$) their USC. These differences, although statistically significant, are not large. ED users have poorer access to their USC. They are more likely to be driven to their USC by someone else ($P < .001$), and they perceive greater difficulty getting to their USC ($P < .001$) than non-ED users.

Predisposing Characteristics

Table 3 shows the results from the hurdle model. The coefficients from the logit model determine factors that are related to having a nonemergent ED visit. The coefficients from the negative binomial model determine factors that are associated with the number of nonemergent ED visits. English-speaking patients are significantly more likely to use the ED ($P = .011$) than non-English speakers. Marital status also is linked to ED use. Patients

Table 1. Respondent Demographic Characteristics by Emergency Department (ED) Visit Status

Characteristics	No ED Visit*	At Least 1 Nonemergent ED Visit†	*P* Value
Predisposing characteristics			
Age, years			<.001
8–44	42.1	53.1	
45–64	39.2	30.2	
≥65	18.8	16.7	
Sex			<.001
Female	55.5	66.4	
Race			<.001
White	82.6	74.4	
Black	10.9	19.9	
Other	6.6	5.7	
Hispanic ethnicity			.061
Yes	11.0	12.6	
No	89.0	87.4	
Education			<.001
No degree	12.5	18.2	
GED/high school	49.7	57.3	
Bachelor's degree or more	37.9	24.5	
Employment status			<.001
Employed	68.8	58.0	
Not employed	31.3	42.0	
Marital status			<.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	.558
More likely to take risks			.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			.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 (% of poverty level)			<.001
<100 (poor)	8.5	21.3	
100–199 (low income)	14.8	22.8	
200–399 (middle income)	30.6	30.3	
≥400 (high income)	46.1	25.6	
Health insurance			<.001
Private	75.3	59.0	
Public	16.1	29.5	
Uninsured	8.6	11.5	
Region			.054
Northeast	20.1	16.4	
Midwest	22.6	25.2	
South	35.2	37.4	
West	22.1	21.1	
MSA			.026
Urban	82.5	79.2	
Rural	17.5	20.9	
Need factors			
Health status			<.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			<.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	.005
Coronary heart disease	6.0	8.6	.002
Angina	3.0	4.4	.024
Myocardial infarction	3.9	6.0	.001
Other heart disease	10.8	13.7	.010
Stroke	3.4	7.5	<.001
Emphysema	2.4	5.1	<.001
High cholesterol	36.6	35.8	.662
Diabetes	10.7	14.6	<.001
Arthritis	28.7	35.2	<.001
Asthma	9.6	18.0	<.001

Data are percentages. Values may not add up to 100% because of rounding.
*Unweighted sample size, n = 26,619; US population estimate, n = 298,545,330.
†Unweighted sample size, n = 1,353; US population estimate, n = 13,089,564.
MSA, metropolitan statistical area.

who are separated ($P = .049$) are more likely to visit the ED than married patients. Women are more likely than men to have a visit to the ED ($P < .001$). Blacks are more likely to use the ED ($P < .001$) than whites, yet whites have significantly greater

Table 2. Respondents' Perceptions of Quality of Care and Access to Usual Source of Care (USC) by Emergency Department (ED) Visit Status

	No ED Visit*	At Least 1 Nonemergent ED Visit†	*P* Value
Patient-provider communication			
USC asks about other treatments	82.9	84.3	.280
USC shows respect for treatments			.217
Always	66.6	64.7	
Not always	33.4	35.3	
USC asks person to help decide			.007
Always	62.2	58.2	
Not always	37.8	41.8	
USC explains options to person	94.9	93.0	.007
USC speaks language or provides interpreter services	99.5	99.3	.483
Access			
Transportation to USC			<.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, minutes			.003
<15	50.8	48.8	
15–30	39.1	37.8	
31–60	8.4	10.0	
>60	1.8	3.4	
USC has office hours on nights and weekends	38.5	35.1	.052
Difficulty getting to USC			<.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			<.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			<.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	

Data are percentages. Values may not add up to 100% because of rounding.
*Unweighted sample size, n = 26,619; US population estimate, n = 298,545,330.
†Unweighted sample size, n = 1,353; US population estimate, n = 13,089,564.

nonemergent visits than blacks ($P = .001$) and all other races ($P = .012$). Given they had a nonemergent visit, Hispanics are more likely to visit the ED more often than whites ($P = .047$). Adults aged 45 to 64 years ($P < .001$) and those older than 65 ($P < .001$) are less likely to go to the ED for nonemergent health concerns, and they have fewer visits ($P = .032$ and .055, respectively) than younger adults. Patients' health beliefs did not play a significant role in whether they visit the ED.

Enabling Resources

Low-income patients are more likely to have a nonemergent ED visit ($P < .001$). Uninsured pa-

Table 3. Estimation Results of the Two-Part Model of the Frequency of Nonemergent Emergency Department (ED) 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, years				
45–64	−0.651*	−7.76	−0.490*	−2.15
≥65	−0.738*	−5.39	−0.717	−1.93
Female sex	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	−0.010	−0.10	0.532*	2.00
Education				
GED/high school	0.155	1.47	0.490*	2.08
Bachelor's degree or more	−0.078	−0.57	0.825*	2.70
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
Able to speak English	0.416*	2.54	0.926	1.67
More likely to take risks	0.061	0.61	0.206	0.94
Can overcome illness without medical help	−0.167	−1.71	−0.264	−1.15
Enabling resources				
Income (% of poverty level)				
<100 (poor)	0.716*	5.15	0.177	0.59
100–199 (low income)	0.495*	3.98	0.098	0.41
200–399 (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
Urban MSA	−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

Continued

Table 3. Continued

	Binary Hurdle Model (Logit)		Zero-Truncated Negative Binomial Model	
	Coefficient	*t* Value	Coefficient	*t* Value
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-provider communication				
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, minutes				
15–30	−.077	−0.99	−0.211	−1.13
31–60	−0.044	−0.33	0.418	1.20
>60	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

*$P < .05$.
MSA, metropolitan statistical area; USC, usual source of care.

tients visit the ED more frequently than those with private health insurance, but the difference was not significant ($P = .055$). Region of the United States is also related to ED use. Patients in the Midwest are more likely to use the ED compared with those in the Northeast ($P = .026$).

Need Factors

Patients in poorer general health are more likely to seek care at the ED for nonemergent health concerns ($P < .001$). Those who have been diagnosed with angina ($P = .044$) or high cholesterol ($P = .001$) use the ED more frequently than individuals without these chronic conditions.

The quality of patient-provider communication plays a small role in nonemergent ED use. The logistic regression model shows that communication is not associated with patients' likelihood of using the ED. However, the negative binomial count model (Table 3) reveals language concordance with a USC provider is associated with fewer nonemergent ED visits ($P = .023$).

Access to a USC is more strongly associated with ED utilization. Patients who have difficulty physically getting to their USC are more likely to use the ED ($P = .015$). Patients who experience difficulty contacting their USC after hours are similarly more likely to have an ED visit ($P = .023$) and use the ED more for nonemergent purposes ($P = .05$). Patients whose USC providers do not maintain office hours on nights or weekends use the ED more often ($P = .044$). Furthermore, patients for

whom it takes longer than an hour to travel to their USC use the ED more frequently ($P = .016$).

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 this broader group to individuals who used the ED for nonemergent conditions and found no substantial differences in the results (see Table 4).

Discussion

Satisfactory communication with a USC is not strongly associated with nonemergent ED utilization. Of the 5 measures of patient-provider communication, only one factor—language concordance—has a significant relationship to the frequency of nonemergent ED visits given that one occurrence exists. Patients who do not speak their provider's language or do not receive interpreter services from their USC provider are significantly more likely to use the ED multiple times. 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 health care organizations that receive federal funds to provide interpretation services for patients with limited English proficiency.[35] Hospitals generally fall into this category, but not all health care 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 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 the office of their USC. Convenience is one of the major reasons people choose to obtain care from the ED.[5] Patients who travel longer than 1 hour to get to their USC are similarly more likely to have multiple nonemergent ED visits relative to patients who need less time. These patients report significantly poorer health ($P < .001$), which may explain their increased ED use (data not shown).

Difficulty 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, as established by prior research.[7,17,18] In fact, patients who receive care from their USC are more satisfied than those who go to an ED.[36] 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 are related to nonemergent ED use.[15] This 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[15] described the patient-provider relationship using a 4-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, using multiple logistic regression they found this dissatisfaction scale to be significantly related to the likelihood of having an ED visit. 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 satisfaction were analyzed separately in a 2-part model. Like the results of Sarver et al, we found that 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 several limitations. First, a sampling bias may exist. The analyses only included respondents who had visited a health care provider in the past 12 months. Those without a visit or who failed to complete the SAQ may differ from our sample. Second, using MEPS data may overestimate adults with a USC because it may not reach the homeless and undocumented immigrants.[7] Finally, there is no gold standard for determining the urgency of an ED visit. We considered applying an algorithm developed by researchers at New York University (available from: http://wagner.nyu.edu/faculty/billings/nyued-download.php), but the algorithm requires fully specified *International Classification of Diseases, Ninth Revision*, codes that are not publicly available through MEPS. In addition,

Table 4. Sensitivity Analysis of Results of the Two-Part Model of the Frequency of Nonemergent Emergency Department (ED) Visits, Including Individuals With Emergent ED Visits

	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, years				
45–64	−0.620*	−7.53	−0.513*	−2.28
≥65	−0.686*	−5.27	−0.749*	−2.02
Female sex	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	−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
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
Able to speak English	0.289	1.76	0.788	1.55
More likely to take risks	0.026	0.26	0.161	0.73
Can overcome illness without medical help	−0.119	−1.23	−0.293	−1.29
Enabling resources				
Income (% of poverty level)				
<100 (poor)	0.652*	4.77	0.170	0.59
100–199 (low income)	0.468*	3.78	0.078	0.33
200–399 (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
Urban MSA	−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

Continued

Table 4. Continued

	Binary Hurdle Model (Logit)		Zero-Truncated Negative Binomial Model	
	Coefficient	*t* Value	Coefficient	*t* Value
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-provider communication				
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 to 30 minutes	−0.073	−0.97	−0.196	−1.05
31 to 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

*$P < .05$.
MSA, metropolitan statistical area; USC, usual source of care.

the algorithm 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% of all ED visits as nonemergent. In comparison, using a similar method, Sarver et al[15] noted that 40% of ED visits were nonemergent and Cunningham et al[23] found that 39.5% of visits were nonemergent.

Conclusions

We conclude that nonemergent ED use can potentially be reduced by improving access to USCs and other sources of outpatient care. Of the 2 barriers that are associated with frequent nonemergent ED use, one is a patient factor (ie, how far patients are from their USC) and one is a provider factor (ie, 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 and help discourage frequent ED users from making unnecessary visits. Enhancing primary care may result in reduced demand for emergency care, savings in health care costs, and better continuity of care.

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