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Access to routine care and risks for 30-day readmission in patients with cardiovascular disease

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Abstract

Background—Studies have shown that access to routine medical care is associated with the prevention, diagnosis, and treatment of chronic diseases. However, studies have not examined whether patient-reported difficulties in access to care are associated with rehospitalization in patients with cardiovascular disease.

Methods—Electronic medical records and a standardized survey were used to examine cardiovascular patients admitted to a large medical center from January 1, 2015 through January 10, 2017 (n = 520). All-cause readmission within 30 days of discharge was the primary outcome for analysis. Logistic regression models were used to examine the association between access to care and 30-day readmission while adjusting for patient demographics, socioeconomic status, healthcare utilization, and health status.

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Results—Nearly 1-in-6 patients (15.7%) reported difficulty in accessing routine medical care; and those who were younger, male, non-white, uninsured, with heart failure, and had low social support were significantly more likely to report difficulty. Patients who reported difficulty in accessing care had significantly higher rates of 30-day readmission than patients who did not report difficulty (33.3% vs. 17.9%; $P = .001$); and the risks remained largely unchanged after accounting for nearly two dozen covariates (unadjusted odds ratio [OR] = 2.29; 95% CI, 1.46-3.60 vs. adjusted OR = 2.17; 95% CI, 1.29-3.66). Risks for readmission were especially high for patients who reported issues with transportation (OR = 3.24; 95% CI, 1.28-8.16) and scheduling appointments (OR = 3.56; 95% CI, 1.43-8.84), but not for other reasons (OR = 1.47; 95% CI, 0.61-3.54).

Conclusions—Cardiovascular patients who reported difficulty in accessing routine care had substantial risks of readmission within 30 days after discharge. These findings have important implications for identifying high-risk patients and developing interventions to improve access to routine medical care.

More than 90 million Americans have cardiovascular disease (CVD) and upwards of 6 million hospitalizations occur each year because of the disease.¹ Although cardiovascular treatments and outcomes have improved greatly in recent decades, high rates of rehospitalization continue to put enormous strain on the U.S healthcare system.¹⁻³ According to recent estimates, approximately 1-in-5 patients hospitalized for cardiovascular care will be readmitted within 30 days after discharge^{1,4-6}; and upwards of 40% to 50% will be readmitted within 6 months.⁷⁻¹⁰ Studies have shown that receiving timely outpatient care is crucial for the effective treatment of CVD and preventing the exacerbation of symptoms that require inpatient care.¹¹⁻¹³ However, more research is needed to better understand whether barriers to medical care may be impediments to disease management that can increase subsequent hospitalizations in CVD patients.^{14,15}

Prior studies have shown that adults who lack adequate access to routine medical care have greater numbers of emergency room visits and higher rates of admission than those with sufficient access to ambulatory care.¹⁶⁻¹⁸ Access to care is a multifactorial measure and much of the existing literature on its association with hospitalization has focused on the availability of healthcare through insurance coverage, physical distance to hospitals, and the number/density of physicians in a location.¹⁹⁻²³ Far fewer studies have assessed patient-reported difficulties in access to care^{24,25} and research focusing exclusively on CVD patients has been limited.^{13,16,26} Moreover, no existing studies have explored whether the reasons for reported difficulties in access to care (e.g., transportation) have implications for the risks of readmission in cardiac patients.

This study used data from cardiovascular patients admitted to a large medical center to investigate the correlates and consequences of inadequate access to routine medical care. The primary objectives of the study were to examine: (1) the overall frequency of CVD patients reporting difficulty in access to routine care; (2) the clinical and non-clinical factors associated with patient-reported difficulties in access to care; (3) the unadjusted and adjusted associations between access to care and risks for 30-day readmission; and (4) whether risks

for readmission vary according to the reasons attributed to difficulty in accessing routine care.

Methods

Sample

Data for this study come from patients admitted for the treatment of cardiovascular-related conditions at Duke Heart Center in the Duke University Medical Center. Participants in the study were ages 18 and older upon admission and enrolled from January 1, 2015 through January 20, 2017. Patient data were collected from electronic medical records (EMR) and from a standardized survey. Patient EMRs were extracted using the Duke Enterprise Data Unified Content Explorer (DEDUCE) with support from Duke's Office of Clinical Research. A total of 5387 patients were admitted during the study period and were eligible to participate in the study. Interviews from randomly-selected patients were conducted prior to discharge using a standardized self-administered survey to ascertain detailed information on a range of individual characteristics—including sociodemographic background, psychosocial resources, healthcare utilization, and health status. Overall refusal rates were low (<5%) and the survey responses were collected using a brief (5-10 minutes) self-administered paper questionnaire. Prior research compared patients enrolled in the study with all eligible patients at Duke Heart Center and showed that the two patient groups had similar demographic and clinical profiles.²⁷ No compensation was provided to patients who participated in the study. Further details on subject selection, recruitment, and survey administration have been documented elsewhere.²⁷

The final analytic sample for this study included 520 patients who provided informed written consent to participate in the study and completed the survey. No extramural funding was used to support this work and the authors are solely responsible for the design and conduct of this study, all study analyses, the drafting and editing of the paper and its final contents. The study was approved by the Institutional Review Board at Duke University Medical Center.

Measures

Access to routine medical care was ascertained by the question: "overall, how difficult is it for you to get routine medical care (in a hospital/clinic) when needed?" with the following response categories: (1) extremely difficult, (2) moderately difficult, (3) somewhat difficult, (4) not very difficult, or (5) no problem at all." Most patients (~85%) reported little or no difficulty in accessing routine care^{16,25,28–31}; therefore, responses were dichotomized to those with any reported difficulty in access to care (categories 1, 2, and 3) and those with little or no difficulty (categories 4 and 5). Reasons for difficulty in accessing care were also provided by patients and categorized according to (1) cost, (2) transportation issues, (3) scheduling appointments, and (4) other/unspecified reasons. Other possible reasons included "work issues" and "family issues" and were subsequently categorized as "other" (only one patient indicated work issues).

Detailed measures of the patients' background, utilization, and health characteristics were ascertained from medical records and the completed surveys. Demographic characteristics included age, sex, and race (white vs. non-white). Socioeconomic characteristics included educational attainment (high school [HS] education or less vs. more than HS education), employment status (currently employed, not employed, or retired), and health insurance (no insurance, Medicaid only, Medicare, or other source[s]).

Psychosocial factors included marital status (married or not), social support, life stressors, and depressive symptoms. Social support was measured by summing responses to the questions (a) "is there someone available to you whom you can count on to listen to you when you need to talk?;" (b) "is there someone available to you to give you good advice about a problem?;" (c) "is there someone available to you who shows you love and affection?;" (d) "can you count on anyone to provide you with emotional support (talking over problems or helping make a difficult decision)?;" and (e) "do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide?"^{32,33} The scale ranged from 0 to 20 and had high internal consistency (Cronbach α = .92; McDonald's ω = .94). Life stressors were measured by summing responses to the questions (a) "how often do you feel stress at home?;" (b) "how often do you feel stress because of financial concerns?;" and "how often do you feel stress because of your health?"³⁴ The scale ranged from 0 to 9 and had adequate to high internal consistency (Cronbach α = .65; McDonald's ω = .81). Depressive symptoms were measured using the 8-item version of the Center for Epidemiologic Studies Depression (CES-D) Scale^{35,36}—range = 0 to 24; Cronbach α = .79; and McDonald's ω = .88.

Health-related characteristics included diagnosed hypertension (*ICD-9*: 401; *ICD-10*: I10), diabetes (*ICD-9*: 250; *ICD-10*: E10, E11), acute myocardial infarction (*ICD-9*: 410; *ICD-10*: I21), heart failure (*ICD-9*: 398.91, 428; *ICD-10*: I50), atrial fibrillation (*ICD-9*: 427.31; *ICD-10*: I48), disability in activities of daily living (no [ADL] disability vs any disability), and body mass index (calculated as kg/m²). Healthcare utilization factors included the reported place of routine care (primary care clinic or doctor's office, specialist clinic, urgent care or emergency room, or other place[s]), the number of hospital admissions in the previous year (ascertained from EMRs), and the length of stay (in days) for the current admission.

Preliminary analyses also examined variables for diagnoses of other chronic conditions (eg, chronic obstructive pulmonary disease, hyperlipidemia, etc), smoking history, alcohol consumption, medication adherence, and living arrangement; however, the results were not significant and the variables were dropped from the final analyses. We also used alternative coding strategies for categorical variables (eg, different categories, cut-points, and reference groups) and continuous variables (eg, logged, polynomial, and grouped-ordinal scales) to select measures based on distributional and substantive considerations.

Outcome

All-cause readmission within 30 days of discharge was the primary outcome for analysis.^{37,38} The timing of readmission was calculated by the number of days after discharge from the index admission to a subsequent hospitalization in the Duke University Health System.

Nine patients were identified as having died during the study period. Most of these patients ($n = 7$) were readmitted within 30 days of their index hospitalization and two other patients had died within 60 days of their discharge—and were subsequently categorized into the 30-day readmission group. The rate of readmission (20.2%) in our study of cardiovascular patients was consistent with national estimates and with readmission rates documented at other NC hospitals.^{39,40} Preliminary analyses also assessed 60-day readmissions and the overall results were the same as the 30-day endpoint reported here.

Analysis

The analyses were carried out in four steps. First, the overall distributions of patients were calculated across study measures. Next, we used univariate and multivariate logistic regression models to examine the factors associated with difficulty in accessing routine medical care. The third step of analysis examined the association between reported differences in access to routine care and 30-day readmission. Kaplan-Meier curves were used to demonstrate differences in the risks of readmission after discharge and log-rank tests were used to indicate statistically significant differences between patients with and without difficulty accessing routine medical care. We then estimated unadjusted and adjusted logistic regression models to examine the odds ratios (OR) for (i) the overall difficulty in accessing care and (ii) the reported reasons for difficulty associated with readmission within 30 days after discharge. Finally, predicted probabilities (PP) of 30-day readmission were estimated and plotted from the fully adjusted models.

All models were estimated with robust standard errors and accounted for clustering based on place of residence (county). Preliminary analyses also assessed for possible collinearity and/or over-identification in the estimated models. Results showed that correlations among study covariates were low (avg. coefficient = .14 [range = .00-.49]) and variance inflation factors, condition numbers, and tolerance levels were well below the threshold suggesting multicollinearity (ie, VIFs ≤ 2.5). Missing data were minimal across study measures (3%) and multiple imputation methods were used in the logistic regression models. Differences were considered statistically significant at $P < .05$. All analyses were conducted using Stata 14.2 (StataCorp LP, College Station, TX).

Results

Patients enrolled in the study had a median age of 65 years (interquartile range [IQR] = 19), were predominantly male (61.2%), non-Hispanic white (64.6%), Medicare beneficiaries (64.9%), and a large percentage had a high school (HS) education or less (38.5%) and were not employed (26.9%) (Table I). The majority of patients were married (53.1%) and most reported generally adequate levels of social support and moderate levels of stress and depressive symptoms. In terms of health status, many patients were diagnosed with hypertension (49.0%), diabetes mellitus (27.5%), heart failure (34.0%), acute myocardial infarction (11.4%), and atrial fibrillation (30.3%); and a sizeable percentage of patients had ADL disability (57.0%). Study participants averaged less than 1 hospitalization in the previous year and the median length of the index admission was 5.1 days.

Most patients (84.3%) reported little or no difficulty in accessing routine care. However, 15.7% of study participants reported that their access to routine medical care was somewhat to extremely difficult. Of those, the most common cited reasons for this difficulty were transportation issues (20.0%) and scheduling appointments (27.1%). Forty-two percent of patients provided other/unspecified reasons for the difficulty. Patients who were younger, male, non-white, and uninsured were significantly more likely to report difficulty in access to care than their respective counterparts (Table II). Patients with higher levels of social support were significantly less likely to report difficulty in getting care; whereas, patients with more stressors, depressive symptoms, heart failure, and those who typically received their care outside of primary or specialty care settings were significantly more likely to report difficulty in accessing routine care. Results from the multivariate model showed that inadequate access was negatively associated with social support (OR = 0.92; 95% CI, 0.88-0.97) and BMI (OR = 0.97; 95% CI, 0.94-0.99); and positively associated with depressive symptoms (OR = 1.06; 95% CI, 1.00-1.13), emergency/urgent care (OR = 2.38; 95% CI, 1.32-4.30), and other places of routine care (OR = 2.55; 95% CI, 1.07-6.08).

The overall 30-day readmission rate was 20.2% for study participants. Patients who reported difficulty in accessing routine care had significantly higher rates of readmission within 30 days than patients who did not report difficulty (33.3% vs. 17.9%, respectively; $P = .001$) (Figure 1). These differences were robust and remained largely unchanged after accounting for nearly two dozen covariates (OR [unadjusted] = 2.29; 95% CI, 1.46-3.60 vs. OR [adjusted] = 2.17; 95% CI, 1.29-3.66) (Table III). In particular, risks for 30-day readmissions were significantly elevated in patients who reported transportation issues (OR = 3.24; 95% CI, 1.28-8.16) and scheduling appointments (OR = 3.56; 95% CI, 1.43-8.84). Predicted probabilities (PP) of readmission from the fully adjusted models showed that approximately 18% ($=100 \times [PP = .18; 95\% \text{ CI } 0.14-0.22]$) of patients who reported little or no difficulty in access to routine care were readmitted within 30 days after discharge (Figure 2). Conversely, 39% ($=100 \times [PP = .39; 95\% \text{ CI } 0.16-0.63]$) of patients who reported difficulty due to transportation were readmitted within 30 days. The readmission rate was similarly high for patients who reported difficulty due to scheduling appointments (40% = $100 \times [PP = .40; 95\% \text{ CI } 0.21-0.59]$) but much less so for other reasons (PP = .22; 95% CI 0.05-0.40).

Discussion

Cardiovascular disease is the leading cause of hospitalization in older adults and high rates of rehospitalization have put enormous strain on the U.S. healthcare system.¹⁻⁴ In our study of a large medical center, we found that nearly 1-in-6 patients with CVD reported difficulty in accessing routine medical care. In addition, we found that patient-reported difficulties in accessing care—and the reasons for these difficulties—were strongly associated with the likelihood of being readmitted within 30 days after discharge. These risks remained largely unchanged after accounting for nearly two dozen covariates and the risks were not uniform according to the barriers identified in accessing care.

Several studies have demonstrated that inadequate access to healthcare can increase hospitalizations among patients with ambulatory care-sensitive conditions (eg, asthma, diabetes, pulmonary diseases, heart failure).⁴¹⁻⁴³ To date, most studies have defined access

to care based on insurance coverage or spatial factors (ie, urban/rural residence, distance-to-hospitals, physician density) and few have focused exclusively on patients with cardiovascular disease.^{13,16,19,20} This study was the first to show that patient-reported barriers to routine healthcare may have significant consequences for CVD patients. We found that one-third (33.3%) of patients who reported difficulty in getting routine medical care were readmitted within 30 days after discharge; compared with less than 18% of patients who reported little or no difficulty in accessing care. Moreover, these risks were independent of the patients' sociodemographic background, health insurance status, psychosocial resources, and health status.

Our results also demonstrated that risks for 30-day readmission were especially high in patients who reported issues with transportation and scheduling appointments, but not for other reasons. We found that patients with difficulties due to transportation were more than twice as likely to be readmitted within 30 days than patients who reported no difficulty accessing care (41.2% vs. 17.8%, respectively)—and the differences remained largely unchanged after multiple adjustments. Previous studies have suggested that an inability to drive independently, extended travel times, fuel expenses, and the availability/costs of parking are important contributing factors that may limit a patient's access to routine care.^{44–47} Accordingly, further analysis of our data showed that most patients with transportation issues had relatively low SES, low levels of social support, and disproportionately more ADL limitations. However, these and other factors included in the study did not account for the association between transportation difficulties and rehospitalization; therefore, we encourage additional research to further investigate the potential mechanisms at play.

Patients who reported difficulty scheduling appointments had the highest rate of readmission within 30 days (43.5%). Although the challenges of scheduling doctor visits have not been as widely documented in the literature, previous studies suggest that the lack of timely appointments, prolonged waiting periods, and the general difficulties involved in navigating follow-up care are the most commonly cited barriers in scheduling appointments for medical care.^{25,44,48–50} The degree to which these factors played a role in the findings is unclear without additional qualitative data on the explicit reasons attributable to difficulties in making appointments. Nevertheless, our analysis adjusted for a broad range of factors—e.g., socioeconomic background, psychosocial resources, utilization history, and health status—and the results remained largely unchanged. Additional studies are needed to build on these findings and provide further insights into the most pressing obstacles in scheduling routine care.

The results from this study have potentially important implications. Our results suggest that screening patients for difficulties in access to care may help identify those at increased risk for rehospitalization after discharge. Subsequent analyses of our data showed that almost all patients with transportation issues reported that their usual place of care was a primary care clinic. This suggests that efforts to improve transportation services, provide reimbursement for parking/fuel, or identifying other methods to alleviate transportation difficulties may be cost-effective approaches to improving patients' access to routine care and ultimately preventing poor health outcomes. We also found that having difficulty scheduling appointments was not limited to patients in the primary care setting and included those who

reported visiting specialty clinics for their routine care. Accordingly, studies have shown that more coordinated discharge planning and scheduling of early physician follow-ups can significantly improve patient outcomes and lower subsequent readmissions.^{11,13,51,52} Therefore, greater clinical and administrative assistance could be provided to help patients make follow-up appointments with their primary care provider or specialist.

Several limitations of the study should be acknowledged. First, we recognize that the findings are limited to patients admitted for cardiac care at Duke Heart Center and may not be generalizable to all cardiovascular patients. Relatedly, additional larger studies are needed to assess whether and to what extent patients with certain forms of CVD (eg, heart failure, acute MI, etc) may be more/less impacted by difficulty in accessing routine medical care. Third, our study lacked data on follow-up care or procedures that patients may have received within 30 days after discharge that may have influenced their risk of readmission. Finally, the 30-day readmissions identified in our study were limited to the Duke University Health System and may not have captured all rehospitalizations of study patients admitted to the Heart Center. As noted above, the rate of readmission in our study of cardiovascular patients was consistent with national estimates and with readmission rates documented at other NC hospitals.^{39,40} Preliminary analyses also assessed the proximity of the patients' residential location with the Duke healthcare system (ie, surrounding areas, distal areas, and out-of-state) and we found it had no association with readmission and did not change the final results.

Conclusion

To our knowledge, this study provides the first evidence of how patient-reported difficulties in accessing care—and the reasons for these difficulties—are associated with 30-day readmission in cardiovascular patients. The results from our analysis of a large medical center provide strong evidence for the importance of routine care to improve patient outcomes and we encourage future studies to further validate and build on these findings. A greater understanding of patients' access (and barriers) to medical care has the potential to assist in clinical decision-making, improve transitions of care, and ultimately improve the lives of those living with CVD.

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Figure 1. Kaplan-Meier Plots for Risks of Readmission after Discharge by Reported Difficulty in Access to Routine Care among Patients with Cardiovascular Disease (n = 516) Note: Log-rank tests indicated statistically significant differences between groups ($p = .001$).

Figure 2.

Predicted Probability (95% CI) of 30-Day Readmission by Reported Difficulty in Access to Routine Care and the Reported Reasons for Difficulty among Patients with Cardiovascular Disease (n = 520). Abbreviation: CI, confidence interval. Notes: Adjusted models included age, sex, race, educational attainment, employment status, health insurance, marital status, social support, life stressors, depressive symptoms, hypertension, diabetes mellitus, acute myocardial infarction, heart failure, atrial fibrillation, ADL disability, body mass index, place of routine medical care, number of prior admissions, and length of stay (in days) for current admission. *Category includes patients who reported difficulty due to “cost” (n = 5).

Table I

Characteristics of study participants (n = 520)

	Total	Missing
Demographic characteristics		
Age, median (IQR)	65	(19)
Male	318	(61.15)
White	336	(64.62)
Socioeconomic Characteristics		
HS or less education	198	(38.45) 5 (0.96)
Employment status		6 (1.15)
Currently employed	104	(20.23)
Not employed	138	(26.85)
Retired	272	(52.92)
Health insurance		7 (1.35)
No insurance	10	(1.95)
Medicaid only	28	(5.46)
Medicare	333	(64.91)
Other source(s)	142	(27.68)
Psychosocial characteristics		
Married	276	(53.08)
Social support, mean (SD)	16.53	(4.00) 9 (1.73)
Life stressors, mean (SD)	3.08	(2.07) 13 (2.50)
CES-D symptoms, mean (SD)	7.60	(4.50) 16 (3.08)
Health-related characteristics		
Hypertension	255	(49.04)
Diabetes	143	(27.50)
Acute MI	58	(11.39)
Heart failure	173	(33.99)
Atrial fibrillation	154	(30.26)
ADL disability	288	(57.03) 15 (2.88)
Body mass index, mean (SD)	30.32	(7.99) 2 (0.38)
Healthcare utilization		
Place of routine care		
Primary care clinic	357	(68.65)
Specialized care clinic	97	(18.65)
Emergency/urgent care	39	(7.50)
Other place(s)	27	(5.19)
Prior admissions, mean (SD)	0.68	(1.20)
Length of hospital stay, median (IQR) *	5.11	(6.88) 1 (0.19)
Access to routine care		4 (0.77)
Not difficult	435	(84.30)
Difficult	81	(15.70)

	Total	Missing
Cost [†]	5	(5.88)
Transportation issues [†]	17	(20.00)
Scheduling appointments [†]	23	(27.06)
Other/unspecified [†]	36	(42.35)
Readmission at 30 days	105	(20.19)

Abbreviations: IQR, Interquartile range; SD, standard deviation; HS, high school; CES-D, Center for Epidemiological Studies Depression scale; MI, myocardial infarction; ADL, activities of daily living.

Note: Values reported as number (percentages) unless noted otherwise.

* Reported in days for the current admission.

[†] For those who reported difficulty in access to routine care (n = 81).

Table II
Patient Characteristics Associated with Reported Difficulty in Access to Routine Care (n = 520)

	Univariate		Multivariate	
	OR (95% CI)	P	OR (95% CI)	P
Demographic Characteristics				
Age	0.98 (0.97–0.99)	.000	0.97 (0.94–1.00)	.090
Male	1.61 (1.09–2.39)	.017	1.48 (0.95–2.30)	.084
White	0.56 (0.36–0.85)	.007	0.69 (0.38–1.25)	.220
Socioeconomic Characteristics				
HS or less education	1.05 (0.69–1.57)	.832	0.85 (0.50–1.44)	.544
Employment status				
Currently employed (ref.)	1.00		1.00	
Not employed	1.31 (0.80–2.15)	.286	0.88 (0.42–1.83)	.734
Retired	0.93 (0.51–1.69)	.809	1.50 (0.64–3.53)	.353
Health insurance				
Medicare (ref.)	1.00		1.00	
No insurance	6.41 (2.12–19.3)	.001	3.55 (0.88–14.3)	.075
Medicaid only	2.38 (0.75–7.51)	.141	1.56 (0.28–8.70)	.614
Other source(s)	1.22 (0.74–2.02)	.442	0.97 (0.46–2.07)	.945
Psychosocial Characteristics				
Married	0.63 (0.39–1.00)	.052	1.07 (0.62–1.86)	.806
Social support	0.89 (0.86–0.93)	.000	0.92 (0.88–0.97)	.002
Life stressors	1.18 (1.09–1.29)	.000	1.10 (0.95–1.26)	.203
CES-D symptoms	1.11 (1.05–1.17)	.000	1.06 (1.00–1.13)	.036
Health-Related Characteristics				
Hypertension	0.81 (0.54–1.23)	.333	0.80 (0.52–1.22)	.296
Diabetes	1.40 (0.90–2.18)	.137	1.58 (0.89–2.81)	.117
Acute MI	1.51 (0.78–2.91)	.218	1.30 (0.61–2.79)	.499
Heart failure	1.77 (1.09–2.88)	.022	1.62 (0.96–2.71)	.069
Atrial fibrillation	0.63 (0.34–1.17)	.146	0.79 (0.39–1.58)	.501
ADL disability	1.01 (0.59–1.72)	.980	0.89 (0.46–1.72)	.739

	Univariate		Multivariate	
	OR (95% CI)	P	OR (95% CI)	P
Body mass index	0.98 (0.96–1.01)	.233	0.97 (0.94–0.99)	.012
Healthcare Utilization				
Place of routine care				
Primary care clinic (ref.)	1.00		1.00	
Specialized care clinic	1.16 (0.68–1.98)	.577	1.28 (0.71–2.29)	.415
Emergency/urgent care	3.45 (1.88–6.34)	.000	2.38 (1.32–4.30)	.004
Other place(s)	3.56 (1.66–7.64)	.001	2.55 (1.07–6.08)	.034
Prior admissions	0.98 (0.71–1.34)	.889	0.95 (0.67–1.35)	.773
Length of hospital stay*	1.01 (0.99–1.03)	.426	1.00 (0.97–1.02)	.812

Abbreviations: OR, Odds ratio; CI, confidence interval; HS, high school; CES-D, Center for Epidemiological Studies Depression scale; MI, myocardial infarction; ADL, activities of daily living.

* Reported in days for the current admission.

Table III

Unadjusted and Adjusted Odds Ratios for the Association between Access to Routine Care and 30-Day Readmission in Patients with Cardiovascular Disease (n = 520)

	Unadjusted		Adjusted*	
	OR (95% CI)	P	OR (95% CI)	P
Access to Routine Care				
Not difficult	1.00		1.00	
Difficult	2.29 (1.46–3.60)	.000	2.17 (1.29–3.66)	.004
Difficult due to:				
Transportation issues	3.24 (1.28–8.16)	.013	3.15 (1.05–9.44)	.040
Scheduling appointments	3.56 (1.43–8.84)	.006	3.26 (1.26–8.43)	.015
Other/unspecified [†]	1.47 (0.61–3.54)	.387	1.33 (0.50–3.52)	.570

Abbreviations: OR, Odds ratio; CI, confidence interval.

* Adjusted for age, sex, race, educational attainment, employment status, health insurance, marital status, social support, life stressors, depressive symptoms, hypertension, diabetes mellitus, acute myocardial infarction, heart failure, atrial fibrillation, ADL disability, body mass index, place of routine medical care, number of prior admissions, and length of stay (in days) for current admission.

[†] Category includes patients who reported difficulty due to “cost” (n = 5).