Patient Factors Associated With Following a Relocated Primary Care Provider Among Older Adults

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Sustained relationships between primary care providers (PCPs) and patients foster the development of meaningful connections that promote the delivery of high-quality comprehensive care.[1] Continuity of care is associated with higher patient satisfaction,[2] lower total healthcare costs,[3] improved care of chronic health conditions,[4,5] enhanced patient adherence to medical regimens,[6] and decreased emergency department use and hospitalizations.[7,8] Specific subgroups of patients, namely, the elderly and patients with chronic medical conditions, seem to particularly value continuity with their physicians.[9,10]

Continuity of care may be threatened when practices downsize, relocate, or close because of economic conditions such as lower reimbursement schedules or higher malpractice premiums.[11-14] Despite their valuing continuity in care, prior research suggests that few patients will spend additional time or money to maintain it.[15] In particular, elderly patients (for whom longer distances present barriers of driving and public transportation) may find it more difficult to follow PCPs who relocate to geographically distant clinical sites.

In this study of patients whose primary care clinic closed, we examined the factors associated with older patients' choosing to follow their PCPs to a more distant site compared with older patients who transferred their care to new PCPs at an affiliated clinic near the original clinic. We hypothesized that patients who were older and sicker and those who overestimated the distance between their home and the distant clinic would sacrifice continuity for the sake of accessing care closer to them.

METHODS

Study Design

We conducted a case-control study comparing older patients who followed their PCPs to a more distant clinic with older patients who transferred their care to a practice close to their original clinic. The former constituted the continuity group, and the latter constituted the proximity group.

Setting and Sampling

The study population comprised patients served by 5 internal medicine PCPs at a freestanding clinic practice in Dundalk, Maryland. Five months

Objectives: To use a natural experiment to identify patient factors associated with the decision to follow one's primary care provider (PCP) to a more distant location after the closure of a medical practice.

Study Design: Case-control study.

Methods: Eight months after the closure of a practice in Dundalk, Maryland, we randomly selected 140 patients older than 60 years from each of the following groups: those who followed their PCP (continuity group) and those who transferred to a closer clinic (proximity group). We designed a survey instrument to collect information about demographics, duration of the patient-PCP relationship, transportation, self-assessed driving proficiency, and patients' estimates of the distance in miles and the driving time in minutes from their homes to both practices. χ^2 Tests and logistic regression analyses were used to determine differences between the groups.

Results: The response rate to the survey was 64%. More than 85% of patients in both groups had been with their original PCP for longer than 2 years. In multivariable analysis, the following 3 factors were associated with being a patient in the proximity group: living alone (adjusted odds ratio [OR], 3.14; 95% confidence interval [CI], 1.35-7.26), having greater physical disability (physical component summary score ≤40; OR, 2.14; 95% CI, 1.04-4.39), and perceiving that travel time from home to the farther clinic would require at least 10 minutes longer than the MapQuest estimate (OR, 4.08; 95% CI, 1.97-8.43).

Conclusion: Older patients who live alone and are weaker seem to be more likely to forgo continuity with their PCP for the sake of convenience when a barrier to access occurs such as relocation of the physician to a more distant office.

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before the closure of the clinic, all patients were invited to follow their PCPs to a new practice 11 miles from the original clinic. Alternatively, they could opt to transfer their care and records to an affiliated primary care clinic located in the same town 2 miles from the original clinic, or they could find another arrangement on their own. Both the distant and nearby primary care group practices were the same as the original clinic in terms of structure, operations, size, and acceptance of the same insurance types.

Eight months after the closure of the primary clinic, it became apparent where the patients had elected to pursue their ongoing care. We used electronic databases to generate the following 2 lists of patients older than 60 years from the original office: (1) those who had followed their PCP to the new farther clinic (continuity group) and (2) those who had transferred their care to a new PCP at the affiliated nearby clinic (proximity group). We chose to study older patients because they have more chronic medical conditions and because the barrier of transportation is more significant among older adults. Patients living in nursing homes or assisted-living communities were excluded from the study.

From each list, we randomly selected 140 patients for inclusion in the study. To do this, we used a random integer generator (http://www.random.org).

Questionnaire Development

The research team used an evidence-based iterative process to develop the questionnaire. We performed a comprehensive literature review on the topics of clinic closings, physician relocation, continuity of care, and patient loyalty to physicians. We organized the questionnaire into the following sections: demographic characteristics, self-reported medical conditions, duration of the patient-PCP relationship, driving proficiency, and patient perceptions about distance and travel time between their home and the 2 clinic sites. The literature review and the experience of the research team (who have also undergone practice location moves) contribute evidence of the instrument's content validity.

The survey included the following 2 instruments: (1) the previously validated reliable 12-Item Short-Form Health Survey to measure physical disability (physical component summary [PCS] score) and mental disability[16,17] and (2) Drivers 55 Plus Self-Rating Form, a measure designed by the American Automobile Association to assess driving proficiency and to enhance self-awareness about areas for improvement.[18]

Two survey questions asked patients to approximate the distance in miles and the travel time in minutes from their home to the distant clinic and to the closer clinic. We also verified actual distances and times by entering the patient's home address and both clinic addresses into an online map service, MapQuest.[19]

The final version of the 4-page questionnaire took approximately 20 minutes to complete. To improve the clarity of questions, we conducted pilot testing among elderly patients from the original clinic who were not randomly selected for participation in the study.

Data Collection

We mailed the survey to the study sample 8 months after the closure of the original primary care practice. This time frame was selected such that participants would have interacted with and received care at their new site. We included a consent form to be signed and returned to the investigators. We used repeated mailings to encourage participation. A Johns Hopkins University institutional review board approved the study.

Data Analysis

The continuity group (who followed PCPs to the distant clinic) was compared with the proximity group (who transferred to the closer clinic). χ^2 Tests were used for dichotomous variables and t tests for continuous variables.

We also compared patients' perceptions versus online estimates of distances (in miles) and times (in minutes) from their homes to the clinics. We categorized patients' estimates as overestimates or as underestimates.

Logistic regression modeling was used to identify variables that independently distinguished between continuity and proximity patients. We included variables in the final model that had statistical associations of $P < .10$ in bivariate analyses. We applied stepwise backward selection logistic regression analysis and took into account the change in model χ^2 statistic with the addition and deletion of each variable. Final model variables were examined for evidence of colinearity and for interactions.

We estimated that a sample size of 168 patients (which assumed a 60% response rate from 280 patients surveyed) would be adequately powered to detect meaningful differences between the groups. For example, to detect a 5-point difference (SD, 10) in the PCS score of the 12-Item Short-Form Health Survey with 0.05 significance and 0.80 power requires 63 patients from each group. We conducted all statistical analyses using STATA 8.2 (StataCorp LP, College Station, TX).

RESULTS

Response Rate and Characteristics of Respondents

Surveys were completed by 104 of 140 (74%) continuity patients and by 76 of 140 (54%) proximity patients. Sex and racial/ethnic characteristics of the responders were similar to

■ **Table 1.** Characteristics of Older Adult Patients Who Followed Their Primary Care Provider (PCP) to a Distant Clinic (Continuity Patients) vs Those Who Transferred Their Care to a PCP at a Closer Clinic (Proximity Patients)[a]

Characteristic	Continuity Patients (n = 104)	Proximity Patients (n = 76)	P	Odds Ratio (95% Confidence Interval) for Being a Proximity Patient
Age, y				
Mean (SD)	70.0 (7.4)	74.8 (7.7)	<.001	
Range, No. (%)			.003	
<70	53 (51.0)	21 (28.0)		1 [Reference]
70-79	36 (34.6)	31 (41.3)		2.17 (1.08-4.36)
≥80	15 (14.4)	23 (30.7)		3.86 (1.69-8.81)
Female sex, No. (%)	65 (62.5)	55 (72.4)	.17	1.57 (0.82-2.98)
White race/ethnicity, No. (%)	99 (96.1)	69 (93.2)	.39	0.55 (0.14-2.15)
Marital status, No. (%)			.72	
Married	62 (60.2)	42 (57.5)		1 [Reference]
Single/divorced/widowed	41 (39.8)	31 (42.5)		1.11 (0.61-2.05)
Annual income, $, No. (%)			.20	
≥30,000	30 (36.1)	18 (26.5)		1 [Reference]
<30,000	53 (63.9)	50 (73.5)		1.57 (0.78-3.16)
Living alone, No. (%)	19 (18.5)	29 (38.2)	.003	2.72 (1.38-5.38)
Health insurance, No. (%)				
Other insurance	48 (46.2)	21 (27.6)	.01	1 [Reference]
Medicare only or Medicare with secondary insurance	56 (53.8)	55 (72.4)		2.24 (1.19-4.23)
Overweight/obese, No. (%)	51 (49.5)	34 (46.0)	.64	0.86 (0.47-1.57)
Comorbid conditions, No. (%)			.78	
≤1	23 (22.5)	14 (18.7)		1 [Reference]
2-5	70 (68.6)	53 (70.7)		1.24 (0.58-2.64)
>5	9 (8.8)	8 (10.7)		1.46 (0.45-4.66)
General health, No. (%)			.13	
Excellent/very good/good	74 (73.3)	47 (62.7)		1 [Reference]
Fair/poor	27 (26.7)	28 (37.3)		1.63 (0.85-3.10)
Physical component summary score, mean (SD)	40.3 (12.0)	36.8 (11.2)	.05	
>40, No. (%)	58 (58.0)	30 (41.7)	.04	1 [Reference]
≤40, No. (%)	42 (42.0)	42 (58.3)		1.93 (1.04-3.57)
Mental component summary score, mean (SD)	53.3 (8.2)	52.3 (8.3)	.41	
>40, No. (%)	91 (91.0)	64 (88.9)	.65	1 [Reference]
≤40, No. (%)	9 (9.0)	8 (11.1)		1.26 (0.46-3.45)
Years seeing PCP, No. (%)			.59	
≤2	11 (11.0)	10 (13.7)		1 [Reference]
>2 to 5	53 (53.0)	33 (45.2)		0.68 (0.26-1.78)
>5	36 (36.0)	30 (41.1)		0.92 (0.34-2.45)
				(Continued)

■ Table 1. Characteristics of Older Adult Patients Who Followed Their Primary Care Provider (PCP) to a Distant Clinic (Continuity Patients) vs Those Who Transferred Their Care to a PCP at a Closer Clinic (Proximity Patients) *(Continued)*[a]

Characteristic	Continuity Patients (n = 104)	Proximity Patients (n = 76)	P	Odds Ratio (95% Confidence Interval) for Being a Proximity Patient
Specialists seen in the past year, No. (%)			.34	
0	23 (24.0)	16 (25.4)		1 [Reference]
1-2	51 (53.1)	27 (42.9)		0.76 (0.34-1.67)
≥3	22 (22.9)	20 (31.7)		1.30 (0.54-3.14)
Still driving, No. (%)	80 (77.7)	47 (66.2)	.09	0.56 (0.28-1.10)
55-Plus driving score, mean (SD)[b]	15.7 (1.8)	15.2 (2.0)	.18	
≤Overall mean of 15.4, No. (%)	24 (34.3)	22 (50.0)		1 [Reference]
>Overall mean of 15.4, No. (%)	46 (65.7)	22 (50.0)		0.52 (0.24-1.12)
Overestimation of the distance in miles from home vs underestimation or correct estimation, No. (%)				
To distant clinic	42 (41.6)	34 (51.5)	.21	1.49 (0.79-2.78)
To closer clinic	38 (39.2)	31 (43.7)	.56	1.67 (0.70-3.95)
Overestimation of the travel time by ≥10 min from home vs overestimation by <10 min, No. (%)				
To distant clinic	24 (24.0)	39 (56.5)	<.001	4.12 (2.12-7.97)
To closer clinic	8 (8.2)	7 (9.6)	.74	1.19 (0.41-3.45)

[a]The denominator used for calculating percentages varies because of missing responses.
[b]55-Plus driving score: a self-assessed driving test developed by American Automobile Association.[18]

the population characteristics of the suburban town of Dundalk, and nonresponders were similar to respondents in terms of age, sex, and race/ethnicity (*P* >.05 for all).

Characteristics of the proximity and continuity patients are given in **Table 1**. In bivariate analyses, proximity patients were older than continuity patients (mean age, 75 vs 70 years; *P* <.001). Proximity patients were more likely to live alone (38% vs 19%, *P* = .003) and to have Medicare only or Medicare with secondary insurance (72% vs 54%, *P* = .01). Proximity patients also had lower 12-Item Short-Form Health Survey PCS scores, indicating greater disability (mean, 36.8 vs 40.3; *P* = .05).

The percentages of patients still driving (*P* = .09) and their self-assessed driving proficiency scores (*P* = .18) were high and were not significantly different between the groups (Table 1). However, proximity patients were more likely to overestimate the driving time that it would take to reach the more distant clinic from their home (*P* <.001).

Multivariable Analysis

Characteristics that were associated with increased odds of being a proximity patient (*P* <.10) were included in the

multivariable model. **Table 2** summarizes the modeling that included and adjusted for all such variables. The following 3 variables were independently associated with being a proximity patient: living alone (odds ratio [OR], 3.14; 95% confidence interval [CI], 1.35-7.26), having greater physical disability (PCS score ≤40; OR, 2.14; 95% CI, 1.04-4.39), and perceiving that travel time from home to the farther clinic would require at least 10 minutes longer than the MapQuest estimate (OR, 4.08; 95% CI, 1.97-8.43). No colinearity was found among the variables in the final model.

DISCUSSION

The objective of this study was to investigate, after the closure of a primary care clinic, the factors associated with older patients following their established PCP to a more distant clinic compared with older patients transferring their care to a closer clinic with a new PCP. We hypothesized that more frail patients and those with barriers to travel would not follow their PCP to the distant site. We found that living alone, having a lower PCS score (or more disability), and overestimating the time required to travel from one's home to the dis-

■ **Table 2.** Characteristics Associated With Being a Proximity Patient

Characteristic	Odds Ratio (95% Confidence Interval) for Being a Proximity Patient	
	Unadjusted	**Adjusted[a]**
Age, y		
≥80 vs <70	3.86 (1.69-8.81)	1.47 (0.49-4.41)
70-79 vs <70	2.17 (1.08-4.36)	1.19 (0.48-2.98)
Living alone vs not living alone	2.72 (1.38-5.38)	**3.14 (1.35-7.26)**
Physical component summary score ≤40 vs >40	1.93 (1.04-3.57)	**2.14 (1.04-4.39)**
Medicare only or Medicare with secondary insurance vs other insurance	2.24 (1.19-4.23)	1.67 (0.70-3.95)
Still driving	0.56 (0.28-1.10)	0.72 (0.31-1.68)
Overestimation of the travel time by ≥10 min from home to distant clinic vs overestimation by <10 min	4.12 (2.12-7.97)	**4.08 (1.97-8.43)**

[a]Adjusted for all variables in the table. Boldface indicates statistical significance (P >.05).

tant clinic were the only 3 variables that were independently associated with older patients who chose to forgo continuity with their PCPs for the practicality of a closer clinic site.

Prior research has suggested that the elderly and those with chronic medical conditions especially value continuity of care with their PCPs.[1,9,10] In a longitudinal cohort study, Mold et al[10] demonstrated that older patients have greater satisfaction in longer relationships with their PCPs and tend to stay with their PCPs until forced to change; the impetuses for change most commonly observed were insurance-related issues and physician retirement or relocation. Our study adds to the literature in that it focused in a natural experiment solely on older adults at a time when a change in their healthcare delivery options was forced on them.

The findings of the study suggest that older patients may forgo continuity because of perceptions of inconvenience in traveling to a relocated PCP. The elderly may have difficulty finding safe, affordable, and efficient transportation.[20,21] Even among those who drive, the elderly may be less willing to travel greater perceived distances because of reduced driving confidence, higher crash rates among older adults, and increased morbidity and mortality from motor vehicle crashes.[22] The prospect of having to drive longer distances to see one's PCP when acutely ill and feeling sick may be particularly concerning for some. Individualized decisions about the relative value of proximity versus continuity are complex and require careful reflection about priorities.

Several limitations of this study should be considered. First, this study relied exclusively on self-report for demographic, health, and driving characteristics. Second, this study included older patients affected by the closure of a single clinic in a specific geographic area, and our findings may not be generalizable to other populations. Third, the timing of the inquiry purposely occurred 8 months after the change so that patients had the opportunity to settle into a new primary care home. However, this delay may have introduced some recall bias. Fourth, all actual driving times and distances were estimated using an online map service. These services default to the most direct and quickest routes; however, the older patients in this cohort may take alternate courses (such as avoiding highways) and may travel at slower speeds such that their estimates may in fact be informed by their own driving practices and experiences. Fifth, cross-sectional studies[23] demonstrate that associations and causality cannot be implied from the results. Sixth, we did not specifically assess the patients' perceptions of the quality of the relationship that they had with their original PCP. However, approximately 90% had been seeing that PCP for more than 2 years, and this may be viewed as a proxy for satisfaction.

In conclusion, this study adds to our understanding of the patient factors associated with decisions made by older patients related to maintaining continuity with a PCP. Perhaps

Take-Away Points

Patients who elect to maintain continuity with their primary care provider (PCP) even when a barrier such as relocation of the physician to a more distant office is imposed differ from those who forgo continuity of care for the sake of convenience.

■ This study adds to the understanding of the factors associated with decisions made by older patients related to maintaining continuity with a PCP.

■ Organizations may want to be particularly mindful of and sensitive to patients' needs when planning changes that will be disruptive to or affect continuity of care.

more should be done to help older patients to make accurate assessments of the actual distance and time required to reach a new clinic location when their PCPs are relocated. Future research could investigate how to support continuity of care for older adults and other vulnerable populations in the face of major changes in the healthcare delivery systems. Organizations may want to be particularly mindful of and sensitive to patients' needs when planning changes that will be disruptive to or affect continuity of care.

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