

Factors Affecting Rural Patients' Compliance with Screening Colonoscopy: Importance of Distance and Physician

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Abstract

Introduction: Rural populations face unique barriers to obtaining colorectal cancer (CRC) screening. This study assessed factors associated with rural patients obtaining a colonoscopy, including distance to services, patient knowledge, and discussion with a physician.

Methods: Self-administered questionnaires were completed by 106 hospital patients scheduled for an outpatient colonoscopy at a rural hospital and 100 general patients in a rural primary care practice. These questionnaires assessed patient characteristics and opinions regarding factors affecting the choice of where to get a colonoscopy. Univariate analyses delineated the importance of distance and other factors, such as knowledge about a colonoscopy, discussion with health care provider, and referral by provider.

Results: Most (95.3%) of hospital patients obtaining a colonoscopy had received information about the procedure from their physician, and two-thirds (66.3%) of general clinic patients had discussions about colonoscopy with their physician. The majority of patients obtaining a colonoscopy (68%) stated they would not have gotten the procedure if it was not near their home. Subjects stated that convenient location was one of the most important factors influencing their decision to obtain a colonoscopy. Being referred by their physician and physician reputation were important whether obtaining a colonoscopy near or far from home.

Conclusions: Travel time (distance) played a significant role in rural patients' decisions to obtain a colonoscopy. Patients having to travel greater distances were less likely to undergo colonoscopy than those traveling shorter distances.

Introduction

Colorectal cancer (CRC) is the third most common cause of cancer death among men and women in the United States. There is a lifetime risk of 5.17% for US men and 4.78% for US women.¹ In 2009, 136,717 people in the United States were diagnosed with CRC, including 70,223 men and 66,494 women. In the same year, 51,848 people in the United States died from CRC, including 26,806 men and 25,042 women.²

Screening can reduce both the incidence of new cases and deaths from CRC.³⁻¹² Screening can detect precancerous polyps which can be removed; precancerous polyps have a high rate of transforming into CRC. People found with localized CRC have a 5-year survival rate of about 90% compared to 66% for people diagnosed with regional involvement and only 9% for people diagnosed with distant metastases.¹³

Screening for CRC requires an ongoing program of appropriate testing and follow-up. Recommendations for CRC screening take into account several factors, including effectiveness, sensitivity, false-positive rate, safety, cost, and patient preference. Three major US guidelines (American Cancer Society, American Gastroenterological Association, and US Preventive Ser-

vices Task Force) have similar recommendations, with screening modalities including fecal occult blood testing (FOBT) annually, sigmoidoscopy and barium enema every 5 years, or colonoscopy every 10 years. However, despite the multitude of screening options, CRC screening adherence remains suboptimal. Rates for CRC screening in the United States for 2010 were 58.6%.¹⁵ Screening rates are higher among adults who are insured, better educated, non-Hispanic, or have a usual source of medical care.¹⁴ Rural residents have lower rates of appropriate CRC screening compared to their urban counterparts.¹⁶ Since rural populations lag in colonoscopy or sigmoidoscopy use as compared to their urban counterparts,¹⁷ rural communities may be at higher risk of CRC due to lower screening rates.¹⁸ Barriers that rural adults face which limit CRC screening include inability to pay for the procedure, inadequate health insurance, low educational attainment, and a limited number of endoscopists.^{19,20} Young et al suggest that visiting a doctor within the last year and counseling by a doctor also contribute to having appropriate CRC screening.²¹ Greiner et al suggest that CRC screening among rural primary care patients is related to adequacy of physician CRC screening discussions but not access or availability to endoscopic procedures.²² Little is known about CRC screening in rural communities where physical distance from health care services is often a barrier. However, Arcury et al point out that distance is a factor in the utilization of health services among rural residents.²³

Many rural communities lack the facilities, the endoscopists, or the staff to provide CRC services. Newman et al have shown that properly trained family physicians are capable of performing colonoscopies safely and competently; however, only 5% of family physicians offer colonoscopy services.²⁴

The goal of this study was to delineate factors associated with rural patients' decisions to get a colonoscopy for CRC screening. Specifically, it considers distance to services, as well as patient knowledge, discussion with health provider, and referral by physician.

Methods

Study Setting

This study was conducted in Page County, Virginia. This region is secluded in the Shenandoah Mountains of West Central Virginia. It is bordered on the west by the Shenandoah National Park and on the east by the Massanutten Mountain Range. It has a limited road system, high rates of poverty, and poor health.²⁵ According to the US Department of Health and Human Services, a region with an Index of Medical Underservice score of 62 or less is considered a medically underserved area. Page County is a medically underserved area with an Index of Medical Underservice score of 52.²⁶ The county had an estimated population of 23,895 in 2012, and the city of Luray, the county seat, had a population of 4,878.²⁷ The county has one hospital, Page Memorial Hospital, which is designated as a Critical Access Hospital by the Centers for Medicare and Medicaid Services.²⁸

Participants

Two patient samples were recruited to this study: hospital ambulatory surgery patients scheduled for a screening colonoscopy and general clinic patients. Patients attending an ambulatory surgery setting at Page Memorial Hospital between January 2012 and December 2012 were asked to participate. Patients who were ages 50 to 75 years (the generally accepted age range for CRC screening with a colonoscopy) were provided a one-page, anonymous questionnaire to complete in the waiting area prior to their screening colonoscopy. A total of 106 hospital patients were recruited. Second, patients in a Luray outpatient clinic between April 2012 and December 2012 were asked to participate. Patients were invited to complete a one-page questionnaire if they were 50 to 75 years old; one 48-year-old patient was included because of a family history of CRC. A total of 100 clinic patients were recruited. No hospital or clinic patients refused participation. The research protocol was reviewed and approved by the Valley Health Institutional Review Board. Valley Health is the parent hospital system of Page Memorial Hospital.

Data Collection

Clinic and hospital participants completed self-administered surveys. Each survey included items addressing personal and health characteristics and factors affecting their choice of a hospital for a colonoscopy.

Measures

Patient personal and health characteristics included gender, age (44-54, 55-59, 60-64, 65-69, 70-79), annual family income (<\$30,000, \$30,000 to \$50,000, >\$50,000), education (<high school, high school, >high school), health insurance, and having seen a primary care provider in the past 12 months (Table 1). Knowledge about colonoscopy included whether the hospital and clinic patients reported being up to date on CRC screening. Hospital patients also indicated whether they understood why they were getting a colonoscopy and from whom they received information about the procedure (discussion with physician, self-study, or other). Clinic patients indicated whether they knew what a colonoscopy was and if their health care provider had spoken to them about a colonoscopy.

Hospital patients reported on factors related to where they wanted to get a colonoscopy, including whether they would have gotten the procedure if it were not available near home, how far in minutes they drove that day to get the procedure (0-10, 11-15, 16 or more minutes), distance in minutes they would be willing to drive for a colonoscopy (30, 45, or 60-90 minutes), and whether they were more likely to get the procedure because it was close to their home (strongly agree, agree, disagree/distance did not matter). Hospital patients also selected the three top factors that influenced their decision to have a colonoscopy at Page Memorial Hospital from a list that included convenient location, physician reputation, physician referral, staff reputation, and flexible scheduling.

Clinic patients selected the three top factors that would influence whether they might have a colonoscopy at three different types of hospitals. The possible factors included convenient location, physician reputation, physician referral, staff reputation, flexible scheduling. The three types of hospitals were local (Page Memorial Hospital), regional (Harrisonburg or Winchester Hospitals), and statewide (University of Virginia Hospital, Charlottesville).

Analysis

Frequency counts and percentages were computed for personal and health characteristics (Table 1), knowledge about colonoscopies for hospital and clinic samples, factors related to where participants want to get colonoscopies in the hospital sample (Table 2), and factors important to both hospital and clinic patients in getting a colonoscopy (Table 3). Frequency counts and percentages were also computed for cross tabulations between variables in Tables 1 through 3 and between indicators of propinquity importance for hospital patients in getting a colonoscopy and personal and health characteristics. Univariate analyses associated with each cross tabulation were conducted using chi-squared or Fisher's exact test where appropriate. Multiple testing was adjusted for using a Bonferroni correction, and a resulting significance level of 0.0001 was used for all tests. All analyses were conducted using SAS 9.1 (SAS Institute, Cary, NC).

Results

Personal and Health Characteristics

Hospital and clinic samples possessed similar personal characteristics (Table 1). About 55% of both samples were female, and they included the same distributions of ages. They were also similar in annual family income with half having annual family incomes of less than \$30,000 and about 20% having family incomes of more than \$50,000. Most (82.1%) of the hospital participants had a high school education or greater. Most (89.9%) of the clinic participants had health insurance. Almost all hospital and clinic participants had seen a primary care provider in the past 12 months.

Hospital and clinic patients differed somewhat in their knowledge of colonoscopy screening. Although most (72.9%) of the hospital patients were up to date with CRC screening, fewer than half (48.5%) of the clinic patients were up to date. Almost all (99.0%) of the hospital patients noted that they knew why they were getting a colonoscopy, and almost all (94.0%) of the clinic patients stated that they knew what a colonoscopy was. Almost all of the hospital patients (95.3%) had received information about the procedure through discussion with their physician, but only 66.3% of the clinic patients noted that their health care provider had spoken with them about a colonoscopy.

Table 1: Personal and Health Characteristics for Hospital and Clinic Samples

Personal and Health Characteristics	Hospital		Clinic	
	n	%	n	%
Gender				
Female	55	54.5	55	55.0
Male	46	45.5	45	45.0
Age (years)				
44-54	27	25.7	18	18.0
55-59	22	21.0	28	28.0
60-64	13	12.4	15	15.0
65-69	21	20.0	23	23.0
70-79	22	21.0	16	16.0
Annual Family Income				
< \$30,000	51	50.0	41	50.0
\$30,000 to \$50,000	31	30.4	21	25.6
>\$50,000	20	19.6	20	24.4
Education				
<High school	19	17.9	-	-
High school	43	40.6	-	-
>High school	44	41.5	-	-
Health Insurance				
No	-	-	10	10.1
Yes	-	-	89	89.9
Seen Primary Care Provider in Past 12 Months				
No	2	2.1	5	5.2
Yes	93	97.9	91	94.8

Factors Affecting Where Patients Want to Have Colonoscopies

Travel time (distance to services), and location were extremely important to hospital patients when getting a colonoscopy (Table 2). Most (68.0%) stated they would not have gotten the procedure if it was not near to their home. Most noted that they

had driven 15 or fewer minutes to get the procedure, with 33.0% having driven 0 to 10 minutes and 43.6% having driven 11 to 15 minutes. Most (65.4%) indicated that they would be willing to travel 30 minutes to get a colonoscopy. Only 16.4% indicated that they would be willing to travel 45 minutes and 18.3% indicated that they would be willing to travel 60 or 90 minutes. Finally, most strongly agreed (46.2%) or agreed (39.6%) that they were more likely to get the test because it was close to home. The importance of these factors did not have statistically significant differences by any of the personal and health or colonoscopy knowledge characteristics. However, stating that they would not get the procedure if it were not near home was significantly correlated with stating that they would be willing to drive 30 minutes to get a colonoscopy (84.1% agreement, $p < 0.0001$), and with strongly agreeing (58.6%) and agreeing (35.7%) that they were more likely to get the test because it was close to home ($p < 0.0001$).

Table 2: Factors Related to Where Participants Want to Get Colonoscopies: Hospital Sample

Factors Related to Getting a Colonoscopy	n	%
Gotten Procedure If It Was Not Near Home		
No	70	68.0
Yes	33	32.0
How Far Did You Drive Today (Minutes)		
0-10	31	33.0
11-15	41	43.6
16 or more	22	23.4
Distance (Minutes) Willing to Drive to Get a Colonoscopy		
30	68	65.4
45	17	16.4
60 or 90	19	18.3
More likely to get test because it was close to my home		
Strongly agree	49	46.2
Agree	42	39.6
Disagree/ distance didn't matter	15	14.1

Most of the hospital patients (84.9%) selected convenient location as one of the three top factors important to whether they would get a colonoscopy at Page Memorial Hospital. Also important were physician reputation (63.2%), and physician referral (57.6%). Staff reputation and flexible scheduling were

important to few patients (6.6% for both) in getting a colonoscopy at Page Memorial Hospital. The importance of these factors did not have statistically significant differences by any of the personal and health characteristics, colonoscopy knowledge characteristics, or most factors related to where patients want to get colonoscopies.

Most of the clinic patients (89.0%) selected convenient location as one of the three top factors that might influence their decision to have a colonoscopy at Page Memorial Hospital (Table 3). Other important factors listed among clinic patients in whether they would get a colonoscopy at Page Memorial Hospital were physician reputation, selected by 83.0% of patients, and physician referral, selected by 69.0% of patients. Staff reputation (27.0%) and flexible scheduling (32.0%) were also selected by sizable numbers of clinic patients as important in a decision to get a colonoscopy at Page Memorial Hospital.

Table 3: Factors Important in Deciding Where to get a Colonoscopy among Clinic Participants for Local, Regional and Statewide Hospitals

Colonoscopy Locations and Factors	n	%
Local: Page Memorial Hospital		
Convenient Location	89	89.0
Physician Reputation	83	83.0
Physician Referral	69	69.0
Staff Reputation	27	27.0
Flexible Scheduling	32	32.0
Regional: Harrisonburg or Winchester Hospitals		
Convenient Location	28	28.6
Physician Reputation	84	85.7
Physician Referral	81	82.7
Staff Reputations	48	49.0
Flexible Scheduling	43	43.9
Statewide: University of Virginia Hospital, Charlottesville		
Convenient Location	15	15.6
Physician Reputation	78	81.3
Physician Referral	74	77.1
Staff Reputation	58	60.4
Flexible Scheduling	39	40.6

Convenient location became much less important when clinic patients noted the three top factors important to whether they would get a colonoscopy at a regional hospital (Harrisonburg or Winchester) (28.6%) or statewide hospital (University of Virginia, Charlottesville) (15.6%). Physician reputation maintained its importance for whether a subject would get a colonoscopy at a regional (85.7%) or statewide hospital (81.3%), and physician referral gained in importance (82.7% and 77.1%, respectively, compared to 69.0% in selecting Page Memorial Hospital). More clinic patients selected staff reputation (49.0% and 60.0%, respectively, compared to 27.0% in selecting Page) and flexible scheduling (43.9 and 40.6%, respectively, compared to 32.0% in selecting Page) as an important factor in selecting the regional or statewide hospitals. The importance of these factors did not have statistically significant differences by any of the personal and health characteristics, colonoscopy knowledge characteristics, or most factors related to where patients want to get colonoscopies.

Discussion

This study relates distance to services (travel time) to rural patients' likelihood of obtaining colonoscopies for CRC screening. This study demonstrates the positive influence that patient knowledge about colonoscopies and physician-patient discussions about colonoscopies have in influencing rural patient behavior when deciding to get appropriate CRC screening.

Little research addresses the importance of service availability and distance for rural residents in getting appropriate CRC screening. Arcury et al indicate the general importance of distance to care in rural communities.²³ Simpson et al report that improving access to health care at the county and individual levels through expanded health insurance coverage could improve CRC screening, but they do not address the effects of distance on access.²⁹ One study that considered distance to services and obtaining a colonoscopy for rural populations found no significant correlation between distance and service utilization; however, it did not discern actual differences in geographic distance to services or travel time to services.¹⁹

This analysis indicates that patients in rural hospital and clinic settings consistently considered convenient location an important factor in deciding to have a colonoscopy. They were much more likely to get a colonoscopy if it were available within a 30 minute travel time. Many subjects, when asked in the hospital setting, said that they would not have gotten a colonoscopy if it were not available nearby. Location and availability play a pivotal role in patients obtaining a colonoscopy; having this procedure available in rural areas will increase the rates of CRC screening. However, providing procedures like colonoscopies in rural areas is always a challenge. As described earlier, few family physicians are adequately trained to offer colonoscopy services. However, they are capable of performing colonoscopies safely and competently compared to their specialist counterparts.²⁴ Ways to increase availability would include continued training of endoscopic skills for primary care physicians in rural areas.

Previous studies have shown that physician reputation and referral by a physician were also important to patients getting a colonoscopy.^{30,31} Similarly, this study suggests that physician reputation and being referred by one's physician were rated as important factors in getting a colonoscopy.

Previous studies have shown how important physician discussions with patients are to patients obtaining colonoscopies.^{19,20,32} Almost all of the patients in the hospital setting had received information about a colonoscopy from their physician, but only 66.3% of the clinic patients noted that their health care provider had spoken with them about a colonoscopy.

Another finding shows that the patient population getting the procedure at the local hospital had the highest percentage of patients considering convenient location (travel time) as more important (89%). Thus they were less likely to travel to the regional and university hospital. Those who chose to go to the regional and university hospitals placed more importance on physician reputation than convenient location (travel time) in their decision to go for colonoscopy. In developing policies or public education materials, these differences should be taken into consideration.

This study has limitations. It was a cross-sectional study and the major outcome variables were determined by self-report. However, prior validation studies of self-reported CRC screening have shown good correspondence to chart and billing record audits.^{33,4} The study was conducted in a single rural county, and it utilized a systematic, but not a randomized, sampling technique. Therefore, generalizations of the results must be made with caution.

These results indicate that patients consider location and distance when assessing if or where they will have a colonoscopy. They also show the importance of provider referral and provider reputation.

Comparative studies are needed to compare CRC screening rates in rural communities in which colonoscopies are available to rates in other rural communities where they are not. This research should investigate the importance of patient-physician discussion and physician provided education in patients' decisions to have a colonoscopy in these communities.

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