

Increasing Colonoscopy Screening for Latino Americans Through a Patient Navigation Model: A Randomized Clinical Trial

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Abstract Latinos have a higher rate of mortality and lower rate of colorectal cancer (CRC) screening than most racial groups in the United States. This study examines the predictors of screening colonoscopy (SC) for CRC among Latinos in a patient navigation (PN) intervention. Participants were randomized to either a culturally-targeted PN group ($n = 225$) or a standard PN group ($n = 167$). Each completed an interview assessing sociodemographic and intrapersonal information. There was no difference in SC completion between PN groups (80.9 and 79.0 %). Logistic regression revealed that low language acculturation (OR = 2.22) and annual income above \$10,000 (OR = 1.97) were independent predictors of completion. Both standard and culturally-targeted PN successfully increased SC completion by nearly 30 % above the recent estimation for physician-referred patients. Our findings suggest a need to further reduce barriers to SC in low income and highly acculturated Latino groups.

Keywords Latinos · Colorectal cancer screening · Patient navigation · Health disparities

Introduction

Colorectal Cancer Prevalence and Mortality Among Latinos

Colorectal cancer (CRC) is the second leading cause of cancer death for Latinos [1]. This is discouraging because

CRC can be prevented through endoscopic screening (i.e. colonoscopy) with the removal of identified polyps during the procedure. According to the American Cancer Society, only 47 % of Latinos have been screened for CRC, compared to 61.5 % of Non-Latino whites [1]. Consequently, Latinos are more likely to be diagnosed with CRC at a later stage than other minorities which decreases the probability of survival after diagnosis [1]. Early detection and removal of cancerous and precancerous polyps through screening colonoscopy (SC) can significantly reduce the incidence and stage at diagnosis of CRC, thus improving survival.

Barriers to Participation in Colonoscopy Screening

Barriers to SC can be conceptualized from an ecological perspective [2], where behavior (i.e. participation in screening) is thought to be determined by intrapersonal (individual characteristics such as knowledge, attitudes, behavior, and self-concept), interpersonal (social networks and social support systems), institutional (characteristics of social and organizational institutions), community (relationships among organizations, institutions and informal networks) and policy (local, state and national laws) factors. Barriers influencing CRC screening in general have been well documented in the literature, but few studies have assessed barriers specific to Latino populations, especially among participants of a SC intervention.

Previous literature has identified barriers associated with SC that fall mainly within the intrapersonal and interpersonal levels of the ecological model; such as socioeconomic and other demographic factors, socio-cultural and psychological factors. For example, a qualitative study of mostly Spanish-speaking Latinos identified fear of pain or diagnosis and lack of motivation as barriers to screening [3]. A general fear of CRC and fear of the colonoscopy

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procedure itself have also been identified as barriers to CRC screening [4]. Similarly, another study [5] identified ignorance about CRC and the colonoscopy procedure, cancer insecurity, mistrust, machismo, fear of exam, time, embarrassment, lack of symptoms and myths about cancer as barriers among urban Latinos. In low-income Latinos, the mentality of fatalism and a lack of health literacy were also prevalent factors that affected their rates of CRC screening [6].

Due to the large proportion of foreign-born Latino immigrants now living in the United States (US), acculturation and its relation to Latino health is important to examine regarding CRC screening participation. Acculturation can be described as the process by which an individual adopts the attitudes, values, customs, beliefs and behaviors of another culture [7]. Research has demonstrated that Latinos who are more acculturated tend to have better health [8]. However, there are mixed findings regarding acculturation and CRC screening among Latinos. Lower acculturation has been associated with more colonoscopy screening [9], but has also been related to the underutilization of screening [10], and has been found to vary by national origin [11]. Another study found that acculturation was unrelated to screening rates among immigrant Latino patients, but factors such as length of time in the US and nativity status were more likely to predict SC participation [4].

English language preference is often used as an indicator of acculturation [12]. A language barrier presents a potential communication gap between healthcare providers and patients; language incongruence has been identified as a significant predictor of CRC screening [13, 14]. Numerous studies have shown that English-speaking Latinos are more likely to be adherent to screening recommendations, including endoscopy, compared to Spanish-speaking Latinos [4, 8, 15–17]. However, others have found that language preference does not predict cancer screening uptake [18, 19].

Increasing Colorectal Cancer Screening Through Patient Navigation

While colonoscopy is often promoted as the gold standard of CRC screening tests, the procedure has disadvantages including invasiveness, need for physician referral, and complex pre-exam preparation. One study found that, even with physician referral, only 50 % of patients completed the procedure [20]. The disparity in Latino CRC screening rates may be influenced by many factors including socio-demographic and intrapersonal level psychological barriers associated with participating in the colonoscopy procedure itself.

Patient navigation (PN) interventions have been used to address barriers associated with SC. PN has been effective

at overcoming many of the barriers that may contribute to disparities in screening and mortality in Latino populations [21–23] and has increased Latino screening above rates seen with usual care. Few studies have examined the influence of psychosocial factors on SC among Latinos when structural level barriers are reduced through a PN intervention. Overall there are mixed findings regarding the relationship of fear, fatalism and cancer worry to screening adherence among Latinos. For example, one study [24] found that fatalism and cancer worry were higher among non-adherent Latinas. Another [4] found that higher levels of cancer worry were associated with screening adherence among immigrant Latinos. However, there remains need to further explore the attitudes, beliefs and characteristics of Latinos who complete a SC. This information will help to further understand what makes navigation successful for some and provide insight about those who do not complete the procedure.

Thus, the purpose of this study was to investigate predictors of non-completion among Latino participants in a PN intervention for CRC screening through colonoscopy. This study will consider the impact of socio-demographic and intrapersonal factors on the completion of colonoscopy screening.

Methods

Study Setting and Recruitment

In this IRB approved, randomized clinical trial, Latino patients who visited Mount Sinai's primary care clinic between May 2008 and December 2011 and were referred for a SC by their primary care physician were potentially eligible for recruitment. After referral, patients met with research assistants at the clinic to learn more about the study, determine eligibility, and sign a consent form for participation if they were interested. CONSORT guidelines were followed for the duration of the study (See Fig. 1) [25]. Denominators of the percentages shown in Fig. 1 are defined by the number of participants in the preceding box.

Latino patients over the age of 50 with no history of inflammatory bowel disease or CRC and no significant comorbid conditions were eligible. In addition, patients must not have had any form of CRC screening (e.g. colonoscopy, FOBT, or flexible sigmoidoscopy) in the previous 5 years, an interval based on the clinical practice at our institution. Nurses in the Division of Gastroenterology (GI) reviewed medical eligibility of all recruited patients to confirm there were no contraindications to colonoscopy or sedation. A total of 623 patients were referred to our study and 91.5 % ($N = 570$) consented and enrolled. All patients were recruited and navigated in their preferred language (English or Spanish).

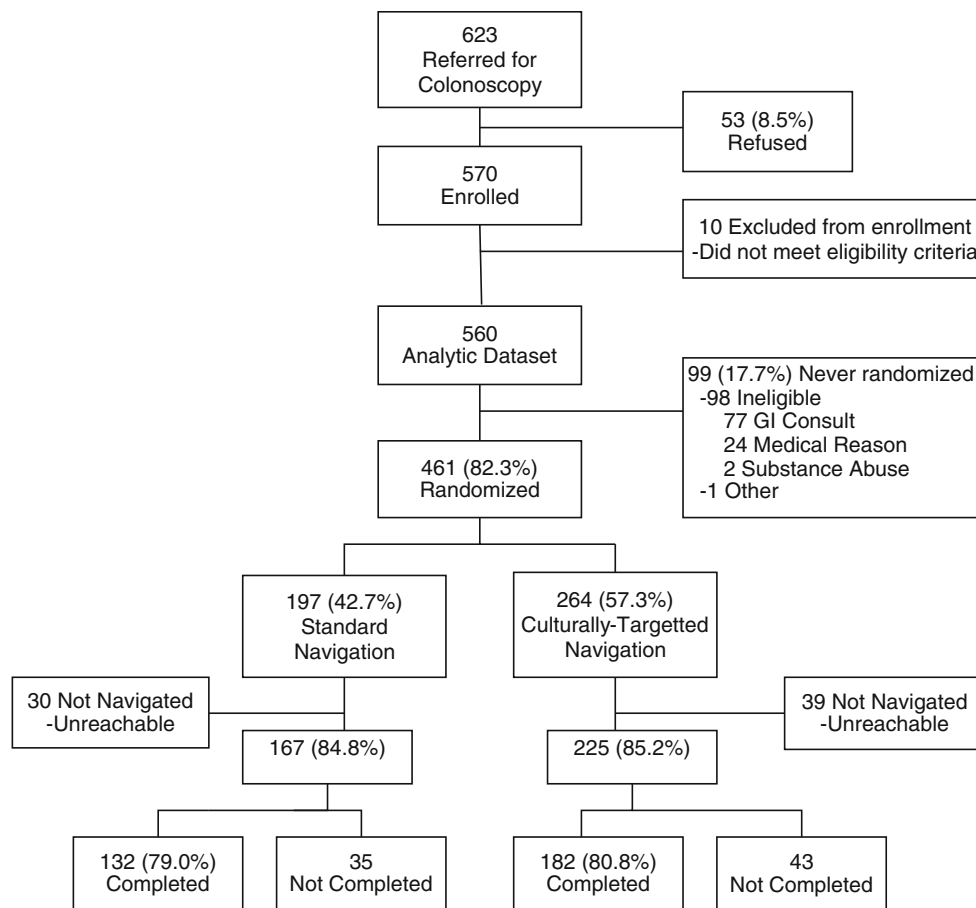


Fig. 1 CONSORT diagram

Non-navigated Participants

Upon review, 10 of the 570 enrolled patients should have not been included in enrollment as they did not meet eligibility requirements (e.g. no working phone) and thus were not randomized. During the medical clearance process by the GI staff, 99 (17.6 % of enrolled) patients were determined ineligible for direct referral based on medical condition (e.g. uncontrolled diabetes or hypertension, substance abuse, etc.) and were referred for further medical clearance and therefore were not included in randomization.

Thus, 461 enrolled patients were randomized to the two study arms: enhanced patient navigation (EPN) and standard navigation (STD). In the EPN group, a health professional assisted participants in negotiating the health care system and discussed barriers to completing their colonoscopy. In the STD group, participants received the standard of care, which included navigation from staff PNs. The script delivered to the EPN group included a culturally targeted message emphasizing importance of SC for Latinos and attended to patients' concerns. The second message was a standard script to only schedule the procedure and answer questions. Despite numerous attempts to contact

them, 69 (15.0 % of randomized patients) were never reached to schedule a SC appointment, and consequently were not navigated.

Navigated Participants

The 392 participants in this study were randomized to a study arm and a PN based on randomization tables created by the study statistician. Participants were randomized to either the STD group ($N = 167$) or the EPN group ($N = 225$). Both intervention groups received three scripted navigation calls: a scheduling call, a call 2 weeks before their colonoscopy date, and a final call 3 days prior to the procedure. Written bowel preparation instructions were mailed after the scheduling call. The two reminder navigation calls included a review of preparation instructions, assessment of transportation needs, and the navigators provided education and support. Ten percent of recorded calls were monitored to ensure fidelity with each condition.

In addition to the scheduling calls, there was one 30 min assessment interview completed at the time of enrollment for which participants received \$20 in compensation.

Analyses

Descriptive analysis was used to evaluate the socio-demographic and psychosocial factors among Latino participants who completed a colonoscopy and participants who did not complete a scheduled colonoscopy. Missing data, which was minimal because of the face-to-face interview-format, was excluded from analysis. Univariate Chi square analyses were performed to determine which factors were associated with completion. Based on univariate analyses and known literature, variables were selected to be included in a logistic regression model (α level of 0.200 was established for inclusion in the model). Colonoscopy completion rates were modeled as a function of the factors that appeared to be related to colonoscopy completion among Latino participants in the logistic regression analysis.

Measures

There were two main categories of variables: (1) socio-demographic characteristics; and (2) intrapersonal factors that have been reported as potential barriers or facilitators for CRC screening.

Demographic Characteristics

Participants completed a general socio-demographic questionnaire regarding age, race/ethnicity, country of birth, years in the US (for immigrants), employment status, income, insurance status and education.

Intrapersonal Factors

Our study adapted a variety of published scales to measure intrapersonal factors that have been identified as possible barriers to SC. A detailed description of the measures for fear of colonoscopy, fatalistic attitudes, screening pros and cons, collective self-esteem, self-efficacy, social influence, cancer anxiety, cancer worry, and perceived risk for CRC have been published [26].

In addition, a 9-item measure of acculturation adapted from previous literature [27] asked participants to indicate the primary language they use in a variety of settings (e.g. “In which language(s) do you usually think?”) on a 5-point scale (1 = only Spanish, 5 = only English). An additional three items assessed social acculturation by asking participants to rate their number of interactions with other Latinos (e.g. “The persons who you visit or who visit you are:”) on a 5-point scale (1 = All Latinos/as, 5 = All non-Latinos/as) (Cronbach’s α = 0.946).

Results

Of the 623 patients recruited for this study, there were no significant differences in age or gender between those who consented ($N = 570$) and those who refused to participate ($N = 53$). There were also no statistically significant differences in age, gender, country of origin, years in the US, or preferred language between eligible, randomized participants who were navigated ($N = 392$) and those who were unable to be reached for navigation ($N = 69$).

Colonoscopy Completion Rates

There were no significant differences in SC completion rates between the EPN (80.9 %) and SPN (79.0 %) study arms. However, these rates exceed national averages of all Latinos [24] and the screening rate of physician-referred patients by approximately 30 % [20], suggesting that either form of PN is effective for increasing screening uptake. Thus, the focus of this report is on potential predictors of SC completion, regardless of navigation type.

Socio-Demographic Characteristics of Completers and Non-completers

Comparative analyses of socio-demographic features of SC completers versus non-completers are summarized in Table 1. Participants with annual incomes over \$10,000 were significantly more likely to get a SC than participants who earned under \$10,000 annually ($P = 0.003$). Participants who were navigated in English or combination of English and Spanish were significantly less likely to be screened than those who were navigated in only Spanish ($P = 0.001$). Foreign-born participants had a significantly higher rate of SC completion (85.2 %) than those born in Puerto Rico (80.6 %) and the US (70.7 %) ($P = 0.035$). Insurance status was also related to colonoscopy completion. Patients insured through Medicare or Medicaid were less likely to get a colonoscopy than patients with private or self-pay insurance ($P = 0.044$). Marital status showed a marginally statistically significant difference between the groups, suggesting those who were married tended to complete screening more than non-married participants ($P = 0.056$). Employment also showed a slight trend toward significance. Employed participants tended to be more likely to complete screening than those who were unemployed ($P = 0.076$). There were no statistically significant differences in age, gender, education level, or years in the US between completers and non-completers.

Intrapersonal Characteristics

Table 2 shows the comparative results of the potential intrapersonal factors for colonoscopy completion. Overall, only

acculturation was significantly related to colonoscopy completion rates. Participants who did not get screened had significantly higher levels of acculturation ($P = 0.002$). Language and media acculturation were included in the overall acculturation score, but were scored separately as well. High language and high media acculturation were associated with low completion rates ($P = 0.001$ and $P = 0.019$, respectively). Participants with higher self-efficacy tended to get screened more often than participants with lower self-efficacy ($P = 0.054$).

Table 1 Socio-demographic factors of completers versus non-completers of screening colonoscopy

N = 392	Completers		Non-completers		Total N	P	%
	N	%	N	%			
Age							
49–64	235	79.4	61	20.6	75.5	77.0	0.536
65+	79	82.3	17	17.7	96	24.5	
Gender							
Male	87	76.3	27	23.7	114	29.1	0.229
Female	227	81.7	51	18.3	278	70.9	
Marital status							
Married	81	87.1	12	12.9	93	23.9	0.056
Not married	231	78.0	65	22.0	296	76.1	
Employment status							
Employed	88	86.3	14	13.7	102	26.2	0.076
Unemployed	225	78.1	63	21.9	288	73.8	
Education level							
≥Grade 13	60	82.2	13	17.8	73	18.7	0.645
≤Grade 12	253	79.8	64	20.2	317	81.3	
Income							
≤10,000	132	73.3	48	26.7	180	51.3	0.003
>10,000	147	86.0	24	14.0	171	48.7	
Language of navigation							
English	112	71.3	45	28.7	157	40.1	0.002
Spanish	192	86.1	31	13.9	223	56.9	
Both	10	83.3	2	16.7	12	3.1	
Language of navigation							
English/both	122	72.2	47	27.8	169	43.1	0.001
Spanish	192	86.1	31	13.9	223	56.9	
Origin							
US	58	70.7	24	29.3	82	20.9	0.035
Puerto Rico	141	80.6	34	19.4	175	44.6	
Other	115	85.2	20	14.8	135	34.4	
Insurance							
Medicare/Medicaid	270	78.7	73	21.3	343	88.2	0.044
Private/self-pay	42	91.3	4	8.7	46	11.8	
Study arm							
Enhanced	182	80.9	43	19.1	225	57.4	0.651
Standard	132	79.0	35	21.0	167	42.6	

Multivariate Regression

A 3-variable model was created to predict colonoscopy completion (Table 3). The language acculturation subscale was the strongest unique predictor of colonoscopy completion ($P \leq 0.000$, OR = 2.223, CI = 1.470, 3.361). For each single unit increase in language acculturation, participants were more than two times less likely to get a colonoscopy. This suggests that a preference for the Spanish language was a positive predictor of completion. Participants with annual incomes of over \$10,000 were nearly twice as likely to get a colonoscopy as those who made less than \$10,000 annually ($P = 0.026$, OR = 1.965, CI = 1.086, 3.557). Private or self-pay insurance status was marginally significant in contributing to the prediction of colonoscopy completion ($P = 0.107$).

Discussion

Overall, the results of this study indicate lower acculturation and an income over \$10,000 were the strongest predictors of completion among Latinos in this sample. Specifically, participants with lower language acculturation (i.e. prefer to communicate in Spanish rather than English) were twice as likely to complete a SC. A few studies have shown that Latinos who are less integrated into American culture may have greater positive health outcomes compared to more acculturated Latinos [18, 28, 29]. However, the majority of research has associated lower acculturation with lower rates of cancer screening [10, 30–33]. All the subjects in our study had some form of health insurance regardless of their immigration status, suggesting that less acculturated participants had already overcome the hurdles of gaining access to health care coverage and were a population interested in preventative care. This could explain our surprising results, as previous studies sampled from a broader population of immigrants, including Hispanics who had no or little access to care. Our findings may be evidence that PN is effective in increasing SC in less acculturated populations. In prior research finding different trends, PN was not used as an intervention to facilitate the screening process.

Preference for Spanish language suggests that some Latinos prefer to speak their native language, perhaps because they are better able to communicate and understand others in this language. This was especially true in the current study as a greater proportion of participants who were navigated in their preferred language (Spanish) completed a SC compared to those who were navigated in English or both Spanish and English (86.1 vs. 71.3 vs. 83.3 %, respectively). These high rates of completion among Spanish-speaking participants are in contrast to many study findings [15–17] that have shown that

Table 2 Intrapersonal factors of completers versus non-completers of screening colonoscopy

	Completers Mean (σ)	Non-Completers Mean (σ)	<i>P</i>	<i>N</i>
Fear	1.9913 (0.92571)	2.0082 (0.85456)	0.884	390
Fatalism	0.2610 (0.33215)	0.2408 (0.30494)	0.630	384
Pros and Cons	2.5592 (0.50928)	2.5707 (0.46635)	0.857	390
Self-efficacy	4.3202 (0.54234)	4.1779 (0.56485)	0.054	365
Perceived risk for CRC	1.8130 (0.66488)	1.7294 (0.61240)	0.316	389
Acculturation_Overall	1.6920 (0.53551)	1.9044 (0.56131)	0.002	387
Acculturation_Language	1.7096 (0.63272)	1.9924 (0.68571)	0.001	387
Acculturation_EthnicSocial	1.5999 (0.39195)	1.6778 (0.39047)	0.123	386
Acculturation_Media	1.7685 (0.81066)	2.0156 (0.83656)	0.019	386

Table 3 Logistic regression predicting odds of colonoscopy completion

	<i>P</i>	Odds ratio	95 % CI for odds ratio	
			Lower	Upper
Language acculturation	0.000	2.223	1.470	3.361
Income				
<\$10,000		1.000	1.000	1.000
\$10,000+	0.026	1.965	1.086	3.557
Insurance type				
Medicare/Medicaid		1.000	1.000	1.000
Private/self-pay	0.107	2.543	0.816	3.676

English-speaking Latinos are more likely to complete CRC screening. The current findings might be explained by the fact that most of the PNs were bilingual and thus were better able to communicate with Spanish-speaking participants, and those participants may have better understood their PN and thus the details required for a SC. This finding additionally suggests that English-speaking Latinos may have wanted to assimilate into mainstream culture (by speaking the dominant language), but may not have been completely bilingual (i.e. not able to comprehend some of the complex medical terminology associated with SC), which could lead to diminished participation in screening. Further, the fact that Latinos with an English language preference were less likely to get screened suggests that acculturation to mainstream beliefs, values, customs and behavior may be related to lack of resources and support necessary to complete a SC, which future refinements and adaptations of PN still need to address. This reasoning is underscored by the current study’s finding that a greater proportion of Latinos with extremely low incomes (under \$10,000, which is well below the current federal poverty line \$23,050 for a family of four), public insurance (Medicaid/Medicare), who were unmarried/unpartnered and who were currently unemployed did not complete a colonoscopy.

Our study has some important limitations that should be noted. All participants had health care coverage and physician referral; therefore, the increased rate of SC completion may be higher than the rate of completion in a broader population with ranging health care insurance and access. We used a five-year interval for previous CRC screening, although current guidelines recommend SC every 10 years. Although offering FOBT as an alternative method of CRC screening may have influenced completion rates, FOBT is not a part of the standard of clinical care at our institution, and was therefore not offered as an alternative in this study. Latinos make up a wide variety of communities that may have distinct cultures, values and behaviors that could affect their rates of screening uptake in a navigation setting. Our study is limited by a lack of distinction between these subgroups of Hispanic populations.

The study results have implications for the future implementation of PN in Latino populations as well as future research. The lack of significant differences between STD and EPN study groups suggest that cultural targeting is not necessary for PN to successfully increase SC adherence in some Latino populations. In fact, our findings suggest that any form of PN may be useful for reducing barriers associated with low acculturation. Care should be taken to ensure that English-speaking Latinos have a full understanding of the necessary procedural information even if English is their preferred language.

The results of this study demonstrate the role of PN in increasing CRC screening adherence for insured Latinos, regardless of the use of cultural targeting. A focus on addressing barriers specific to low-income, more acculturated, and uninsured Latinos is still needed to continue to reduce disparities in SC uptake and CRC mortality in the Latino population.

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