

Barriers to Colorectal Cancer Screening in Latino and Vietnamese Americans

Compared with Non-Latino White Americans

Judith M. E. Walsh, MD, MPH, Celia P. Kaplan, PH, MA, Bang Nguyen, PH, Ginny Gildengorin, PhD, Stephen J. McPhee, MD, Eliseo J. Pérez-Stable, MD

OBJECTIVE: To identify current colorectal cancer (CRC) screening practices and barriers to screening in the Latino, Vietnamese, and non-Latino white populations.

METHODS: We conducted a telephone survey of Latino, non-Latino white, and Vietnamese individuals living in San Jose, California. We asked about demographics, CRC screening practices, intentions to be screened, and barriers and facilitators to screening.

RESULTS: Seven hundred and seventy-five individuals (40% white, 29.2% Latino, and 30.8% Vietnamese) completed the survey (Response Rate 50%). Overall, 23% of respondents reported receipt of fecal occult blood test (FOBT) in the past year, 28% reported sigmoidoscopy (SIG) in the past 5 years, and 27% reported colonoscopy (COL) in the past 10 years. Screening rates were generally lower in Latinos and Vietnamese. Vietnamese were less likely than whites to have had SIG in the past 5 years (odds ratio [OR], 0.26; 95% confidence interval [CI], 0.09 to 0.72), but ethnicity was not an independent predictor of FOBT or COL. Only 22% of Vietnamese would find endoscopic tests uncomfortable compared with 79% of whites ($P < .05$). While 21% of Latinos would find performing an FOBT embarrassing, only 8% of whites and 3% of Vietnamese felt this way ($P < .05$). Vietnamese were more likely than whites to plan to have SIG in the next 5 years (OR, 2.24; 95% CI, 1.15 to 4.38), but ethnicity was not associated with planning to have FOBT or COL.

CONCLUSIONS: Rates of CRC screening are lower in ethnic minority populations than in whites. Differences in attitudes and perceived barriers suggest that culturally tailored interventions to increase CRC screening will be useful in these populations

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Colorectal cancer is the third most common form of cancer in the U.S. and has the third highest mortality

Received from the Division of General Internal Medicine, Department of Medicine, University of California (JMEW, CPK, GG, SJMP, EJPS), San Francisco, Calif; Medical Effectiveness Research Center for Diverse Populations (JMEW, CPK, GG, EJPS), San Francisco, Calif; Center for Aging in Diverse Communities (JMEW, GG, EJPS), San Francisco, Calif; Northern California Cancer Center, Union City, Calif (BN).

Address correspondence and requests for reprints to Dr. Walsh: Women's Health Clinical Research Center, 1635 Divisadero Suite 600 BOX 1793, San Francisco, CA 94115 (e-mail: jwalsh@medicine.ucsf.edu).

rate, and screening clearly reduces mortality.¹⁻³ In a recent systematic assessment of the value of clinical preventive services, which are recommended for average risk individuals by the U.S. Preventive Services Task Force, preventive services were ranked based on burden of disease prevented by the service and cost effectiveness. Screening for colorectal cancer was one of the highest ranked services (score of 7+ on a scale of 2 to 10) with the lowest delivery rate (<50% nationally) and it was concluded that it should be a national priority to increase rates of colorectal cancer screening.⁴

The United States Preventive Services Task Force (USPSTF) recommends screening for colorectal cancer for all persons older than age 50 years but does not recommend a preferred screening strategy.⁵ Potential strategies include fecal occult blood testing (FOBT) annually with sigmoidoscopy every 5 years or colonoscopy every 10 years.^{6,7} Despite this recommendation, these screening guidelines have not been widely implemented by physicians. In 2001, only 23.5% of eligible patients had undergone FOBT within the preceding year, and only 38.7% of eligible patients had undergone sigmoidoscopy or colonoscopy in the preceding 5 years; these rates have not significantly improved since 1999.⁸

Rates of cancer screening often tend to be even lower among ethnic populations in the United States,⁹⁻¹¹ and the Latino and Vietnamese populations are no exception. The Latino population in the United States is the second largest population in the US.¹² The Vietnamese are one of the fastest growing Asian Pacific ethnic groups in the United States, and it is estimated that by 2030 the Vietnamese population will be the largest Asian Pacific ethnic group in the United States.¹³ Colorectal cancer screening rates have previously been shown to be lower in the Latino and Vietnamese populations than in non-Latino whites.^{14,15} Since the time of these studies, colorectal cancer screening has been widely endorsed, and therefore some changes in rates of screening might be expected. The aim of this study was to identify current colorectal cancer screening practices and barriers and facilitators to colorectal cancer screening in the Latino, Vietnamese, and non-Latino white populations.

METHODS

Setting

We conducted a telephone survey of Latino, Vietnamese, and non-Latino whites aged 50 to 79 years residing in San Jose (Santa Clara County), California. Data were

collected using a Computer Assisted Telephone Interviewing (CATI) system at the Public Research Institute at San Francisco State University. San Jose was chosen as the study site because it has one of the densest clusters of Vietnamese and Latinos in California; according to 2000 Census data, there were 269,989 Latinos and 78,842 Vietnamese living in San Jose (Census 2000 #1286)

Sampling

We used US Census data to identify 14 zip codes which contained at least 25% Latino or Vietnamese households. Whites were selected from the same zip codes in an attempt to find respondents in roughly equivalent income groups. Using a professional sampling company, 6,093 households with at least one age- and ethnicity-eligible member were selected from the 14 zip code study area.

Participant Eligibility

Eligible respondents were 50 to 79 years old (in the target age group for colorectal cancer screening) and self-identified as white, Latino, or Vietnamese. In addition, all respondents had to be able to communicate in either English, Spanish, or Vietnamese.

Procedures

The study investigators trained skilled bilingual interviewers. Interviewers made a maximum of 9 callback attempts to reach an eligible respondent. If more than one household member met the eligibility criteria, one was randomly selected for participation.

After interviewer training was completed, 54 pretest interviews were completed, and the survey was again revised.

Survey Development

Extensive formative work was conducted to develop the survey instrument. We conducted a total of 18 focus groups—6 for each ethnic group. Each group had an average of 6 participants. Groups were separated by gender. One group for each gender included individuals who had never undergone screening for colorectal cancer, one group included those who had previously had a FOBT, and one included those who had previously had sigmoidoscopy or colonoscopy.

Focus group participants were asked about their knowledge, intention, and behaviors regarding colorectal cancer and colorectal cancer screening. In the group whose members had had at least one colorectal cancer screening test, we discussed facilitators of screening, assessed satisfaction with the colorectal cancer screening procedure, and discussed factors that influenced the likelihood of undergoing screening for colorectal cancer. In the group whose members had never had a colorectal cancer screening test, we focused on barriers to tests. Each screening test was described to those individuals who had not had

the test and/or were not familiar with the test and they were asked how they would make their decision about having the test. All focus groups were audio-taped, transcribed, translated, and analyzed for important themes.

Survey questions were developed based on focus group themes. Written transcripts of all the focus groups were reviewed by 5 study investigators. Each reviewer identified important themes and all investigators then met to discuss their findings and develop consensus on those themes that were most important and pervasive. Differences of opinion were resolved by consensus. The final themes were agreed upon by all investigators. After careful analysis of these themes, we focused on those themes that were most pervasive. Several categories of themes emerged from the focus groups and were included in the survey. These included: 1) awareness of colon cancer and screening tests and perceived need for the test; 2) fear; 3) social influences; and 4) logistics of testing (e.g., preparation, discomfort, embarrassment). Additional questions (such as sociodemographics, acculturation) were developed or adopted from prior studies.¹⁶⁻¹⁹ We asked about knowledge, attitudes and beliefs about colorectal cancer screening, colorectal cancer screening behaviors, and barriers and facilitators to colorectal cancer screening. We first asked individuals whether or not they had had or had heard of each of the tests. For those who were not familiar with the test, the test was described in detail. After this explanation of the test, additional questions about the test were asked. Outcome variables included: 1) receipt of colorectal cancer screening tests; 2) maintenance (whether colorectal cancer screening was up to date); and 3) intentions to be screened. We defined up-to-date screening as: FOBT in the past one year, sigmoidoscopy in the past 5 years, or colonoscopy in the past 10 years.

The survey instrument was developed in English, translated into Spanish and Vietnamese and back-translated into English to ensure lexical equivalency, and pilot-tested and revised. This methodology ensures that the source language does not become the dominant language.²⁰ Respondents were offered the choice of answering in English, Spanish, or Vietnamese.

The survey was conducted between November, 2001 and June, 2002. Phone calls were typically made during the afternoons and evenings, which were the times found to be most convenient for participants.

Analyses

Data were analyzed using SAS (version 8.2, SAS Institute Inc., Cary, NC). The primary analyses were designed to examine the association of the outcome variables (ever having, being up to date with or planning to have one of the screening tests) with sociodemographics, knowledge, attitudes, and beliefs. Descriptive statistics were computed for all the demographic and dependent variables, including means and standard deviations for continuous data and frequency distributions for each of the categorical variables.

In general, the rate of missing data was low (0% to 2%); however, 26% of respondents declined to answer the question about annual income. In order to incorporate all cases in the analysis the missing data were imputed. We used all of the available information in our dataset to estimate missing income data, including education, gender, and ethnicity, factors that are known to be correlated with income.^{21,22} Based on the assumption that the data are missing at random, methods of multiple imputation producing 10 imputation sets were used to handle missing data.²³ Once the missing data were imputed the resultant completed datasets were analyzed. This method allowed for valid estimates of the variance of estimates using standard complete data procedures.

Initial univariate analyses were conducted based on frequency tables of the outcomes and potential covariates: χ^2 tests, Student's *t*-test and logistic regression models were used to gauge the degree of association. If an association with a significance level of .05 was found between the dependent variables and the potential predictor variables, the variable was used in a stepwise logistic regression model. While including the demographic measures of age, gender, ethnicity, acculturation, education, income, and insurance in the model, the estimates of the parameters of multivariate logistic regression models were computed in a stepwise manner by entering or removing variables one variable at a time from a list of potential predictors. The significance level of .10 was set for entering and removing variables in the stepwise models. Results of these exploratory analyses were used to make informed decisions about which variables to include in the final multivariate models. The hypotheses were evaluated by using multivariate logistic regression models while adjusting for age, gender, ethnicity, acculturation, education, income, and insurance. Multivariate analyses were performed to determine which predictors remained significant when correcting for other variables.

In all models, the variable most important in predicting past and future screening behavior was physician recommendation. For example, the biggest predictor of having had a sigmoidoscopy or colonoscopy was physician recommendation (odds ratio [OR], 6.50; 95% confidence interval [CI], 2.34 to 18.08). Because this was such a strong factor, and because MD recommendation is a prerequisite for obtaining colorectal cancer screening, we performed the analyses with and without this variable. Several additional important variables became significant after excluding this variable, and provided important information about barriers and facilitators to screening. Because it is not possible to obtain screening without physician recommendation, we present the results of the models without including this variable. The .05 level of significance was used for all statistical tests.

RESULTS

Call attempts were made to 6,093 households to reach potentially eligible participants. Of these, 903 (14.8%)

reached nonworking or fax numbers and 118 (1.9%) reached businesses. An additional 1,699 reached families who were not eligible for interview for reasons such as not having an age eligible family member (18.2%), not being of Latino, Vietnamese, or non-Latino white ethnicity (9.4%), or having already completed the interview (0.2%). An additional 1,235 (20.2%) individuals of unknown eligibility were not available until after the study was completed and 579 (9.5%) refused interview before eligibility could be determined. The remaining call attempts reached 1,559 respondents of whom 775 (50%) agreed to complete the survey. Forty percent of survey respondents were white, 29.2% were Latino, and 30.8% were Vietnamese. The average length of the telephone survey was 19.6 minutes.

Characteristics of participants are described in Table 1. The average age was 61 years and approximately half were female. The majority of Latinos were either from Mexico or US born, which is reflective of the Latino population in California. Forty-seven percent were employed, and only 7% of respondents were uninsured. The majority (87%) had a regular physician and 38% saw their physician in a private office.

More Vietnamese were married (85%) than were whites (62%) or Latinos (65%) ($P < .05$). Forty-two percent of respondents had a high school education or less. (Employment status was relatively similar among ethnic groups (53% white vs 41% Latino vs 46% Vietnamese). Median income was higher in whites (\$70,000) than in Latinos (\$35,000) or Vietnamese (\$50,000) ($P < .05$). Many more white respondents rated their health as very good or excellent (57%) than did Latinos (35%) or Vietnamese (9%; $P < .05$). Acculturation was assessed for Latinos and Vietnamese using a previously validated acculturation scale.²⁴ Although 43% of Latinos were more acculturated, the vast majority of Vietnamese (99%) were less acculturated ($P < .05$).

Screening Rates

Overall, 23% of respondents reported receipt of FOBT in the past one year, 28% reported sigmoidoscopy in the past 5 years, 27% reported colonoscopy in the past 10 years, and 41% reported receipt of any of these tests in the recommended time interval (Table 2). Screening rates varied by ethnicity, and were generally lower in the Latino and Vietnamese respondents than in the non-Latino whites. For example, 36% of whites reported sigmoidoscopy in the past 5 years, whereas only 29% of Latinos and 18% of Vietnamese had undergone sigmoidoscopy ($P < .05$). Thirty-one percent of whites had received colonoscopy in the past 10 years, in contrast to 27% of Latinos and 22% of Vietnamese, which was of borderline statistical significance ($P = .07$). Interestingly, significantly more Vietnamese (31%) than whites (19%) or Latinos (18%) reported FOBT in the past year ($P < .05$).

For the outcome of any colon cancer screening (FOBT in the past year or sigmoidoscopy in the last 5 years or colonoscopy in the last 10 years), there was no significant

Table 1. Characteristics of 775 White, Latino, and Vietnamese Individuals Completing the Survey, %

	White (N = 310)	Latino (N = 226)	Vietnamese (N = 239)	Total (N = 775)
Mean age, y \pm SD	62 \pm 8	62 \pm 8	60 \pm 7	61 \pm 8
Gender, %				
Male	49.4	39.8	59	49.5
Female	50.6	60.2	41	50.5
Marital status,* %				
Married/live with partner	61.9	65	84.9	69.9
Other (separated/widowed/never married/refused)	38.1	35	15.1	30.1
Educational level,* %				
High school or less	21.2	61.0	52.7	42.4
Some college	31.9	23.9	20.9	26.2
College graduate or advanced degree	45.5	10.2	26	29.2
Other/do not know/refused	1.3	5.3	0.4	2.2
Insurance,* %				
Medicare	27.4	21.2	20.1	23.4
HMO or PPO	66.5	56.3	53.1	59.3
None	2.3	8.8	10.5	6.7
Other (MediCal, unknown, refused)	3.8	13.7	16.3	10.6
Employment status,* %				
Employed	52.6	40.7	46	47.1
Retired	35.2	31.9	25.1	31.1
Homemaker/unemployed/other	12.2	27.4	28.9	21.8
Income (median),* %	\$70,000	\$35,000	\$50,000	\$50,000
Church attendance,* %				
Less than once a month or never	57.4	28.8	59.9	49.8
2-3 times/month	10	14.6	5.4	9.9
Once or more a week	28.4	47.8	34.3	35.9
Do not know/refused	4.2	8.8	0.4	4.4
Site of MD visit,* %				
Community clinic	3.9	12.4	1.3	5.6
Public hospital	2.6	7.5	8.4	5.8
Private hospital or HMO	57	51.8	34.3	48.4
Private doctor's office	35.6	22.6	54.4	37.5
Other	0.9	5.8	1.6	2.7
Have a regular doctor,* %	87.4	81.9	91.6	87.1
Been to the doctor in past 12 months,* %				
1-2 times	34.2	27.4	31.8	31.5
3 or more times	55.8	58.4	63.6	59
None/do not know/not sure/refused	10	14.2	4.6	9.5
Self-rated health,* %				
Excellent or very good	56.5	34.5	8.8	35.3
Good	26.8	30.1	38.5	31.4
Fair or poor	16.1	35.4	52.3	32.9
Other	0.6	0	0.4	0.4
Acculturation, [†] %				
High	n/a	42.6	0.4	52
Low	n/a	57.4	99.6	48
Language spoken with MD,** %				
English	99.2	75.1	15.5	65.5
Spanish	0	21.1	1.4	6.2
Vietnamese	0.4	0	81.3	26.5
Other	0.4	3.8	1.8	1.8
MD ethnicity, [‡] %				
White	49.4	34.6	11.4	33
Latino	1.5	13.5	0.5	4.4
Vietnamese	7.4	5.9	83.1	31.6
Other (nonwhite)	41.7	45.9	5	31

* Differences between ethnic groups are statistically significant at the $P < .05$ level.

[†] Asked of Latinos and Vietnamese only.

[‡] Question only asked of those who stated they had a regular doctor.

HMO, health maintenance organization; PPO, preferred provider organization.

Table 2. Colon Cancer Screening Rates Among 775 White, Latino, and Vietnamese Individuals, %

	White (N = 310)	Latino (N = 226)	Vietnamese (N = 239)	Total (N = 775)
FOBT				
Ever had FOBT*	59.7	49.1	66.9	58.8
FOBT in past year*	19	18.1	31.4	22.6
Sigmoidoscopy				
Ever had sigmoidoscopy*	50	38.1	24.7	38.7
Sigmoidoscopy in the past 5 years*	35.5	29.2	18.4	28.4
Colonoscopy				
Ever had colonoscopy*	33.9	29.2	23	29.2
Colonoscopy in the past 10 years	30.6	27	21.8	26.8
Any colon cancer screening				
Ever had FOBT or sigmoidoscopy or colonoscopy*	78.4	63.7	73.6	72.7
FOBT in past year or sigmoidoscopy in past 5 years or colonoscopy in past 10 years	41.9	37.2	45.2	41.2

* Differences between ethnic groups are statistically significant at the $P < .05$ level.
FOBT, fecal occult blood test.

difference in screening rates among ethnic groups (white 41.9% vs Latino 37.2% vs Vietnamese 45.2%; $P = .21$).

Knowledge, Attitudes, and Beliefs

Knowledge of colorectal cancer and colorectal cancer screening tests differed significantly among ethnic groups as well (Table 3). Whereas 90% of whites had heard of a colorectal polyp, only 50% of Latinos and 29% of Vietnamese had heard of one ($P < .05$). The majority of whites (84%) had heard of colonoscopy, whereas only 57% of Latinos and 70% of Vietnamese reported that they had heard of colonoscopy ($P < .05$). Interestingly, recognition of FOBT was more common in the Vietnamese (79%) than in the whites (73%) or Latinos (58%) ($P < .05$).

Attitudes about the various colorectal cancer screening tests also varied among ethnic groups. For example, many more of the Latinos (21%) than whites (8%) or Vietnamese (3%) would find performing FOBT embarrassing ($P < .05$). A similar pattern was observed for finding sigmoidoscopy or colonoscopy embarrassing ($P < .05$). The Vietnamese and Latinos were more concerned that FOBT would find cancer than were the Latinos or whites (Vietnamese 13% vs Latinos 11% vs whites 4%; $P < .05$). The Latinos (42%) were more likely to think the preparation for sigmoidoscopy or colonoscopy was unpleasant than were the whites (29%) or Vietnamese (17%). The Vietnamese were much more likely to think they needed sigmoidoscopy or colonoscopy (87%) than were the whites (63%) or Latinos (53%). Finally, the Latinos were less likely to think they needed any type of colorectal cancer screening if they felt healthy than were the whites or Vietnamese (for FOBT, Latinos 59.7% vs whites 65.8% vs Vietnamese 91%; $P < .05$).

Multivariate Analyses

The multivariate models focus on being up to date with screening (FOBT in the one past year or sigmoidoscopy in the past 5 years or colonoscopy in the past 10 years or receipt of any of the tests in the recommended time interval)

(Table 4) and on intention to be screened (plan to have FOBT in next 1 year or sigmoidoscopy in the next 5 years or colonoscopy in the next 10 years) (Table 5).

Increasing age was associated with all four measures of being up to date with screening: FOBT in the past year (OR, 1.22; 95% CI, 1.04 to 1.44), sigmoidoscopy in the past 5 years (OR, 1.22; 95% CI, 1.05 to 1.43), colonoscopy in the past 10 years (OR, 1.19; 95% CI, 1.02 to 1.39), or receipt of any of the tests in the recommended time interval (OR, 1.24; 95% CI, 1.03 to 1.50). Vietnamese ethnicity was associated with a lower likelihood of having sigmoidoscopy in the past 5 years (OR, 0.26; 95% CI, 0.09 to 0.72), but ethnicity was not associated with having FOBT in the past year or colonoscopy in the past 10 years. Having a Latino physician was associated with a decreased likelihood of having FOBT in the past year (OR, 0.23; 95% CI, 0.06 to 0.95). Other factors associated with being up to date with screening included number of visits to the doctor in the past year (FOBT, sigmoidoscopy, colonoscopy, and any test), thinking that the test was needed (FOBT, colonoscopy, and any test), and family member recommendation (sigmoidoscopy, colonoscopy, and any test). Individuals who were uninsured were less likely to have received colonoscopy than those who had Medicare insurance (OR, 0.31; 95% CI, 0.10 to 0.94).

Intention to be screened was assessed by planning to have FOBT in the next year, sigmoidoscopy in the next 5 years, or colonoscopy in the next 10 years or planning to have any of the tests in the recommended time interval. The Vietnamese respondents were more likely to plan to have a colonoscopy in the next 10 years than were the whites (OR, 2.04; 95% CI, 1.07 to 3.88), but there was no association between ethnicity and intentions to have FOBT, sigmoidoscopy, or any colon cancer screening. Type of insurance was not associated with intention to be screened. Individuals who were worried about getting colorectal cancer were more likely to plan sigmoidoscopy (OR, 1.71; 95% CI, 1.16 to 2.51). Thinking that one needed a colorectal cancer screening test if one felt healthy was associated with

Table 3. Colon Cancer Knowledge and Attitudes Among 775 White, Latino, and Vietnamese Individuals, %

	White (N = 310)	Latino (N = 226)	Vietnamese (N = 239)
Knowledge			
Believe colon cancer cured if found early*	91.7	96.3	98
Heard of colon polyp*	90.3	50.4	28.9
Heard of FOBT ¹ *	72.6	58	78.7
Heard of SIG ² *	70.3	40.7	70.7
Heard of COL ³ *	83.5	56.6	69.9
Have seen SIG or COL recommended in the media?*	45.2	32.7	39.3
Attitudes: (FOBT)			
Awareness/perceived need			
Thought about getting FOBT*	35.2	32.7	80.8
Think you need FOBT if you feel healthy*	65.8	59.7	90.8
Fear			
Afraid of having FOBT because it might find cancer*	3.5	10.6	13
Social influences			
Would have FOBT if family member wanted you to*	59.4	60.6	38.1
Would have FOBT if doctor recommended it	96.5	94.7	98.3
Would delay FOBT if doctor gave it to you*	0	16.8	7.9
Logistics of test			
Would change your diet to do FOBT*	96.1	94.7	99.2
Would stop some medicines to do FOBT*	93.5	90.7	99.2
Think FOBT would be embarrassing*	7.7	20.8	2.9
Think FOBT would be messy or dirty*	26.1	21.7	2.5
Attitudes: (sigmoidoscopy or colonoscopy)			
Awareness/perceived need			
Thought about getting a SIG or COL*	50.6	35.8	75.7
Think you need SIG or COL if you feel healthy*	62.9	52.7	87
Fear			
Afraid of SIG or COL because it might find cancer*	6.5	12.8	14.6
Social influence			
Would get SIG or COL if family member wanted you to*	52.3	50.4	28.9
Would get SIG or COL if doctor recommended it*	95.8	89.8	95.8
Would delay SIG or COL if doctor referred you*	8.7	19.5	11.7
Would want SIG or COL with interpreter present?*	n/a	18.1	31
Logistics of test			
Think SIG or COL embarrassing*	16.8	24.8	10.9
Think SIG or COL uncomfortable*	79	73.5	22.2
Think preparation is too complicated or unpleasant*	29.4	41.6	16.7
Intentions			
Plan FOBT in next year*	30.6	36.7	66.5
Plan SIG in next 5 years*	36.5	39.8	58.2
Plan COL in next 10 years*	40	46	61.9

* Differences between ethnic groups are statistically significant at the $P < .05$ level.

[†] Asked only of Latinos and Vietnamese.

FOBT, fecal occult blood test; SIG, sigmoidoscopy; COL, colonoscopy.

an increased likelihood of planning FOBT, sigmoidoscopy, colonoscopy, or any colon cancer screening test.

DISCUSSION

Although colon cancer screening is now widely recommended, rates of colon cancer screening remain low. Only 53% of men and women aged 50 years and older have had FOBT in the past 12 months or lower endoscopy in the past 5 years.⁸ In contrast, 80% of eligible women have had a Pap smear in the past 3 years and 78% of eligible women have had a mammogram in the past 2 years.²⁵ This is the first community-based study to systematically address barriers to colorectal cancer screening in ethnic minority

populations. Screening rates were generally lower in Latinos and Vietnamese than in whites, although more Vietnamese reported receiving FOBT in the past 1 year than did whites or Latinos. Knowledge, attitudes, and beliefs varied among ethnic groups as well. In general, Vietnamese and Latinos were less knowledgeable about colorectal cancer and colorectal cancer screening tests than were whites, although more Vietnamese knew about FOBT than did members of other ethnic groups.

Prior studies have shown low rates of colorectal cancer screening among Latinos and Vietnamese. In the 1997 Behavioral Risk Factor Surveillance Survey, only 13% of eligible Latino individuals had had FOBT during the preceding year and only 20% had had sigmoidoscopy or

Table 4. Multivariate Predictors of Being Up to Date with Colon Cancer Screening Among 775 White, Latino, and Vietnamese Individuals[†] (Odds Ratios with 95% Confidence Intervals)

	FOBT in Past Year	SIG in Past 5 Years	COL in Past 10 Years	Any Colon Cancer Screening [‡]
Age (per 5 years)	1.22 (1.04 to 1.44)*	1.22 (1.05 to 1.43)*	1.19 (1.02 to 1.39)*	1.24 (1.03 to 1.50)*
Gender, [§] male	0.89 (0.60 to 1.31)	1.44 (0.96 to 2.16)	1.36 (0.91 to 2.03)	1.50 (1.00 to 2.25)
Ethnicity [¶]				
Latino	1.01 (0.52 to 1.94)	0.90 (0.52 to 1.56)	1.27 (0.73 to 2.22)	0.55 (0.30 to 1.02)
Vietnamese	1.37 (0.49 to 3.86)	0.26 (0.09 to 0.72)*	0.65 (0.30 to 1.44)	0.37 (0.12 to 1.08)
Acculturation ^{**}				
Low	0.87 (0.38 to 1.99)	1.71 (0.84 to 3.48)	0.96 (0.49 to 1.88)	2.10 (0.84 to 5.26)
Education	0.89 (0.73 to 1.09)	1.51 (0.86 to 1.27)	1.01 (0.83 to 1.23)	1.04 (0.84 to 1.28)
Income	1.05 (0.90 to 1.23)	0.99 (0.87 to 1.14)	1.02 (0.90 to 1.17)	1.01 (0.89 to 1.15)
Insurance ^{††}				
HMO/Kaiser/PPO	0.90 (0.51 to 1.59)	1.09 (0.62 to 1.89)	0.70 (0.40 to 1.21)	0.50 (0.23 to 1.06)
None	0.97 (0.38 to 2.50)	0.44 (0.15 to 1.34)	0.31 (0.10 to 0.94)*	0.57 (0.22 to 1.50)
Other	0.65 (0.30 to 1.40)	0.32 (0.13 to 0.81)*	0.56 (0.26 to 1.21)	0.31 (0.13 to 0.75)*
Know someone with colon cancer	0.58 (0.38 to 0.88)*	not in model	1.43 (0.98 to 2.10)	not in model
Heard of colon cancer	not in model	not in model	2.69 (0.98 to 7.44)	1.76 (1.14 to 2.70)*
# times gone to see MD	1.96 (1.37 to 2.81)*	1.77(1.30,2.42)*	1.59 (1.17,2.16)*	1.70 (1.26 to 2.28)*
MD ethnicity ^{¶¶}				
Latino	0.23 (0.06 to 0.95)*	not in model	not in model	not in model
Vietnamese	1.04 (0.46 to 2.34)	not in model	not in model	not in model
Other (nonwhite)	0.50 (0.31 to 0.82)*	not in model	not in model	not in model
MD language ^{†††}				
Spanish	1.57 (0.66 to 3.74)	1.08 (0.45 to 2.58)	not in model	0.76 (0.30 to 1.90)
Vietnamese	0.69 (0.25 to 1.90)	0.76 (0.31 to 1.87)	not in model	1.18 (0.50 to 2.77)
Other	2.46 (0.57 to 10.55)	3.72 (0.85 to 16.27)	not in model	4.44 (0.25 to 79.84)
MD gender: female	not in model	1.32 (0.84 to 2.08)	not in model	not in model
Get test if family recommended	1.84 (0.99 to 3.43)	2.00 (1.20 to 3.34)*	2.12 (1.28 to 3.52)*	2.24 (1.10 to 4.57)*
FOBT/SIG/COL				
Thought about getting FOBT/SIG/COL	not in model	2.54 (1.71,3.77)*	1.86 (1.20 to 2.86)*	not in model
Want interpreter present when getting a SIG/COL	n/a	0.52 (0.27 to 1.03)	not in model	not in model
Thinks FOBT is messy	0.55 (0.30 to 1.02)	n/a	n/a	0.42 (0.26 to 0.72)*
Think preparation for SIG/COL is complicated	n/a	not in model	1.78 (1.22 to 2.62)*	1.60 (1.01 to 2.52)*
Think need FOBT/SIG/COL if healthy	1.71 (1.03 to 2.82)*	not in model	1.75 (1.11 to 2.78)*	1.98 (1.27 to 3.10)*
Would delay getting FOBT	0.50 (0.25 to 1.02)	n/a	n/a	0.37 (0.20 to 0.67)*
Think need FOBT	1.88 (1.26 to 2.81)*	n/a	n/a	2.71 (1.67 to 4.39)*
MD gender preference ^{§§}				
Male	not in model	0.98 (0.47 to 2.05)	1.64 (0.80 to 3.40)	not in model
No preference	not in model	1.88 (1.08 to 3.26)*	2.08 (1.16 to 3.74)*	not in model

* Statistically significant at the $P < .05$ level.

[†] For each model, age, gender, ethnicity, acculturation, education, income and insurance were included. For each outcome, additional items were included if they were significant in univariate analyses. Therefore, not all items were included in each model. MD recommendation was not included in the models, as this was the biggest factor influencing outcomes, and because MD recommendation is a prerequisite for getting the proposed tests. Multiple imputations were used to account for missing data.

[‡] Any colon cancer: FOBT in past year, or sigmoidoscopy in the past 5 years, or colonoscopy in the past 10 years.

[§] Compared with female as a referent group.

[¶] Compared with white as referent group.

^{**} Compared with highly acculturated as referent group.

^{††} Compared with Medicare as a referent group.

^{†††} Compared with English as a referent group.

FOBT, fecal occult blood test; SIG, sigmoidoscopy; COL, colonoscopy; HMO, health maintenance organization; PPO, preferred provider organization.

proctoscopy during the preceding 5 years. These rates were significantly lower than those of non-Latino whites (20% and 31%, respectively).^{14,15} Latinos were also significantly less likely to have a digital rectal examination, FOBT or sigmoidoscopy even when direct financial barriers were removed.⁹

In an earlier survey, using a Vietnamese-language version of the CDC's Behavioral Risk Factor Surveillance System (BRFSS), 35% of eligible men and 38% of eligible women had had a fecal occult blood test.¹⁵ In another study, for each of 5 cancer screening tests (including FOBT and rectal examination), Vietnamese were less likely than

Table 5. Multivariate Predictors of Planning to Undergo Colorectal Cancer Screening Among 775 White, Latino, and Vietnamese Individuals[†] (Odds Ratios with 95% Confidence Intervals)

	Plan FOBT Next Year	Plan SIG in Next 5 Years	Plan COL in Next 10 Years	Plan Any Colon Cancer Screening [‡]
Age (per 5 years)	1.12 (0.95 to 1.32)	0.97 (0.84 to 1.14)	0.92 (0.78 to 1.08)	1.28 (1.07 to 1.52)*
Gender, male [§]	1.09 (0.76 to 1.56)	1.29 (0.91 to 1.83)	1.05 (0.71 to 1.54)	1.20 (0.79 to 1.84)
Ethnicity [¶]				
Latino	1.18 (0.66 to 2.12)	1.41 (0.79 to 2.52)	2.04 (1.07 to 3.88)*	1.31 (0.70 to 2.44)
Vietnamese	1.70 (0.71 to 4.05)	1.52 (0.70 to 3.29)	1.19 (0.50 to 2.84)	0.73 (0.31 to 1.74)
Acculturation**				
Low	1.81 (0.91 to 3.58)	2.19 (1.12 to 4.28)*	1.86 (0.90 to 3.83)	2.07 (1.00 to 4.30)
Education	0.96 (0.79 to 1.16)	1.07 (0.89 to 1.29)	1.06 (0.87 to 1.29)	0.98 (0.78 to 1.22)
Income	0.96 (0.84 to 1.08)	1.03 (0.87 to 1.23)	1.01 (0.88 to 1.16)	1.06 (0.88 to 1.27)
Insurance ^{††}				
Kaiser/HMO/PPO	1.07 (0.60 to 1.91)	0.74 (0.42 to 1.31)	1.22 (0.66 to 2.26)	1.64 (0.85 to 3.13)
None	0.56 (0.23 to 1.34)	0.43 (0.18 to 1.01)	0.95 (0.38 to 2.37)	1.18 (0.44 to 3.14)
Other	1.04 (0.50 to 2.19)	0.59 (0.28 to 1.23)	0.96 (0.43 to 2.11)	0.79 (0.35 to 1.81)
Employment ^{‡‡}				
Retired	1.64 (0.95 to 2.83)	not in model	not in model	not in model
Other/homemaker/unemployed	0.85 (0.52 to 1.41)	not in model	not in model	not in model
# times gone to see MD	not in model	not in model	1.36 (1.01 to 1.84)*	1.40 (1.03 to 1.91)*
Worry about getting colon cancer	1.46 (0.99 to 2.14)	1.71 (1.16 to 2.51)*	not in model	not in model
MD ethnicity [¶]				
Latino	0.71 (0.26 to 1.92)	not in model	not in model	not in model
Vietnamese	1.10 (0.61 to 1.99)	not in model	not in model	not in model
Other (nonwhite)	0.59 (0.8 to 0.90)*	not in model	not in model	not in model
Get test if family recommend FOBT/SIG/COL	1.65 (1.14 to 2.39)*	2.25 (1.54 to 3.28)*	1.97 (1.33 to 2.92)*	2.10 (1.36 to 3.24)*
Change medication for FOBT	2.77 (1.13 to 6.79)*	n/a	n/a	n/a
Think need FOBT if healthy	5.86 (3.63 to 9.45)*	n/a	n/a	3.06 (1.95 to 4.79)*
Think need FOBT	2.67 (1.83 to 3.90)*	n/a	n/a	n/a
Think need SIG/COL	n/a	not in model	not in model	3.74 (2.04 to 6.86)*
Thought about getting SIG/COL	n/a	3.28 (2.22 to 4.84)*	5.70 (3.76 to 8.65)*	3.49 (2.23 to 5.47)*
Had SIG/COL	n/a	2.07 (1.42 to 3.03)*	5.10 (3.25 to 8.02)*	not in model
Have seen SIG/COL recommended in the media	n/a	not in model	1.43 (0.98 to 2.10)	not in model
Delay SIG/COL if MD referred you	n/a	not in model	not in model	0.61 (0.33 to 1.12)
Think need SIG/COL if healthy	n/a	2.86 (1.86 to 4.40)*	2.95 (1.86 to 4.68)*	1.75 (1.26 to 2.76)*
MD Gender, female	not in model	not in model	1.67 (1.10 to 2.56)*	1.54 (0.94 to 2.52)
Think SIG/COL uncomfortable	n/a	not in model	0.65 (0.40 to 1.04)	not in model
Want to know if something is wrong with FOBT	not in model	n/a	n/a	2.75 (1.18 to 6.41)*

* Statistically significant at the $P < .05$ level.

[†] For each model, age, gender, ethnicity, acculturation, education, income, and insurance were included. For each outcome, additional items were included if they were significant in univariate analyses. Therefore, not all items were included in each model. MD recommendation was not included in the model, as this was the biggest factor influencing outcomes, and because MD recommendation is a prerequisite for getting the proposed tests. Multiple imputations were used to account for missing data.

[‡] Plan FOBT next year, sigmoidoscopy in next 5 years, or colonoscopy in next 10 years.

[§] Compared with female as a referent group.

[¶] Compared with white as a referent group.

** Compared with highly acculturated as referent group.

^{††} Compared with Medicare as a referent group.

^{‡‡} Compared with employed as a referent group.

FOBT, fecal occult blood test; SIG, sigmoidoscopy; COL, colonoscopy; HMO, health maintenance organization; PPO, preferred provider organization.

the general US population to report that they had had the procedure.²⁶ These prior studies did not assess predictors of screening, and also were performed at a time when colorectal screening was not as widely endorsed.

Vietnamese respondents seemed to have generally positive attitudes about colorectal cancer screening, although, with the exception of FOBT, screening rates were

lower than those of whites. They were much less likely to describe the screening tests as embarrassing or uncomfortable. They were much more likely to think they needed sigmoidoscopy or colonoscopy, although they were less likely to have had them. Low rates of screening in the Vietnamese in the face of generally more positive attitudes about screening suggest that other factors may be important.

For example, Vietnamese were more concerned that a screening test would find cancer than were Latinos or whites, which may have led to test avoidance and thus the low rates found. Another possibility for the more positive responses from the Vietnamese participants is that their responses reflected “acquiescence bias,” a phenomenon where individuals of some ethnicities may have a greater tendency than whites to provide socially desirable responses.^{27,28} Although this phenomenon has also been described in the Latino population, we did not find evidence of it in this study.

The results of our study have some similarities to and some differences from those of prior studies of cancer screening in the Vietnamese. Prior studies of knowledge of cancer and causes of cancer in the Vietnamese population have revealed that there are many misconceptions about cancer and its causes.²⁶ In our study, although most Vietnamese had heard of colorectal cancer, many had not heard of a colorectal polyp and were unfamiliar with sigmoidoscopy and colonoscopy. Studies of barriers to breast and cervical cancer screening have shown that being of recent immigrant status, having less education, not having insurance, not having a regular physician, and having a Vietnamese physician were all associated with lower rates of cancer screening.²⁹ Low income has been found to be a predictor of recognition of, intention to receive, and receipt of cancer screening tests among Vietnamese American women.³⁰ In our study, having a Vietnamese physician was not associated with having had colorectal cancer screening, but was associated with an increased likelihood of planning to undergo colonoscopy. We were interested in whether acculturation affected being up to date with colorectal cancer screening or planning to be screened, but the majority (99%) of respondents in our study were of low acculturation, limiting our ability to assess this association.

Attitudes about colorectal cancer screening were generally more negative in Latinos than in whites or Vietnamese. For example, many more Latinos did not feel that they needed colorectal cancer screening if they felt healthy. In addition, Latinos were more likely than whites or Vietnamese to describe FOBT or sigmoidoscopy/colonoscopy as embarrassing and to feel that the preparation for sigmoidoscopy/colonoscopy was unpleasant.

Studies in the Latino population suggest that fatalistic attitudes and fear of cancer are barriers to cancer screening,³¹ and that there are misperceptions about the causes of cancer.³²⁻³⁶ The results of our survey suggest that perceived discomfort and embarrassment may be barriers as well. Understanding and overcoming these barriers will be important in improving rates of colorectal cancer screening in the Latino population.

In our study, physician recommendation was by far the most important factor influencing previous colorectal cancer screening and intention to be screened. Other important predictors of being up to date with screening included increasing age, having insurance, going to the doctor more frequently, family recommending it, and thinking that

testing was necessary. Vietnamese were less likely to have had sigmoidoscopy in the past 5 years, but were more likely to plan to have sigmoidoscopy in the next 5 years than were Latinos or whites. Several factors predicted planning to be screened. Vietnamese were more likely to plan to have sigmoidoscopy than were Latinos and whites. Those who knew someone with colorectal cancer or who worried about developing colorectal cancer were more likely to be screened. Family recommendation and thinking the test was necessary even if one felt healthy also predicted future screening.

Our study had several limitations. All participants lived in a single geographic area, and therefore may not be representative of individuals living in other parts of the US. However, our survey was community-based, which suggests a broader spectrum of individuals than would be the case if the survey had been clinic-based. As with any telephone survey, respondents without a telephone would not be included.

Prior receipt of colorectal cancer screening tests was reported by self-report. Although review of medical records might provide more accurate information, it is not feasible for a telephone survey. In addition, prior study has shown that although under-reporting of sigmoidoscopy and FOBT may occur, it tended to be less for endoscopic procedures than for FOBT and, importantly, there was no differential bias by ethnicity in the level of under-reporting.³⁷ Thus, even if under-reporting occurs, any differences seen between ethnic groups should remain significant.

In addition, our response rate was only 50%, which is somewhat lower than we had anticipated. Part of the reason for this may be related to the listed sample we obtained. Although the sample was chosen to have at least one eligible member per household, a larger number of households than expected did not have an eligible household member. Another potential factor might be the survey content—individuals may be less comfortable talking about colorectal cancer than other health topics.

Despite our efforts to ensure optimal translation, the possibility of translation difficulties remains. The average survey length in the Vietnamese respondents was 28 minutes compared with 16 minutes for whites and Latinos. Since there are no Vietnamese words for “sigmoidoscopy” and “colonoscopy,” explaining these tests was more complicated and took longer to explain in Vietnamese than in Spanish or English. However, because each procedure was described, there was no difference between ethnic groups in the way the study was administered.

It is interesting that more Vietnamese reported having had FOBT and knowing about FOBT than did members of other ethnic minority groups. In the focus groups conducted during the survey development phase, we found that many Vietnamese confused stool testing for ova and parasites with FOBT. Many Vietnamese reported being tested for ova and parasites at the time of immigration to the US. Although we took this into account in designing the survey question, and tried to clearly define FOBT, it is possible that this confusion remained, resulting in

falsely high reports of FOBT testing and familiarity in the Vietnamese population. Alternatively, it is possible that FOBT, as the least expensive and most available screening test, actually is being performed more in the Vietnamese population.

Despite these limitations, this is the first community-based survey to address this important topic for Vietnamese and Latinos in their own language and in comparison with non-Latino whites in the same geographic area.

Current rates of colorectal cancer screening and barriers and facilitators to colorectal cancer screening differ among racial/ethnic groups, although for all groups physician recommendation was the most important factor influencing being up to date with screening and intending to be screened. Further understanding of these similarities and differences will be important if we are to develop culturally and linguistically appropriate interventions to increase rates of colorectal cancer screening in ethnic minority populations.

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