Effect of Language on Colorectal Cancer Screening Among Latinos and Non-Latinos

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Abstract

BACKGROUND—Language barriers among some Latinos may contribute to the lower rates of colorectal cancer (CRC) screening between Latinos and non-Latino Whites. The purpose of this study was to examine the relationship between language and receipt of colorectal cancer screening tests among Latinos and non-Latinos using a geographically diverse, population-based sample of adults.

METHODS—Cross-sectional analysis of the Behavioral Risk Factor Surveillance System (BRFSS) survey. Analysis included adults 50 years of age and older, who completed the 2006 BRFSS in a state that recorded data from English and Spanish-speaking participants.

RESULTS—The primary outcome measure was receipt of colorectal screening tests (fecal occult blood testing within prior 12 months and/or lower endoscopy within 10 years). Of the 99,895 respondents included in the study populations, 33% of Latinos responding-in-Spanish reported having had CRC testing, while 51% of Latinos responding-in-English and 62% of English-speaking non-Latinos reported test receipt. In multivariable analysis, compared to non-Latinos, Latinos responding-in-English were 16% less likely (OR,0.84, 95 % CI, 0.73-0.98), and Latinos responding-in-Spanish were 43% less likely to have received colorectal cancer testing (OR,0.57, 95% CI, 0.44-0.74). Additionally, compared to Latinos responding-in-English, Latinos responding-in-Spanish were 36% less likely to have received CRC testing (OR, 0.64; 95% CI, 0.48-0.84)

CONCLUSION—Latinos responding to the 2006 BRFSS survey in Spanish had a significantly lower likelihood of receiving CRC screening tests compared to non-Latinos and to Latinos responding-in-English. Based on this analysis, Spanish language use is negatively associated with CRC screening and may contribute to disparities in CRC screening.

Keywords

Colorectal cancer; Screening; Latino/Hispanic; Language; BRFSS

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Introduction

Colorectal cancer (CRC) remains the third most common cancer in both men and women and the second leading cause of cancer-related deaths in the U.S.(1) National guidelines, including those from the United States Preventive Services Task Force and the American Cancer Society, recommend CRC screening for all men and women 50 years of age and older. While there is no ideal screening method, recommended screening modalities include fecal occult blood testing, sigmoidoscopy, colonoscopy, double-contrast barium enema(2), as well as CT colonography and fecal DNA analysis.(3) While studies suggest that up to 60% of colorectal cancer deaths could be prevented with routine CRC screening(4), a major barrier to decreasing colorectal cancer morbidity and mortality is poor utilization of CRC screening procedures. (5)

Colorectal cancer is the second most commonly diagnosed cancer among Latinos yet previous studies demonstrate that even after accounting for socioeconomic factors, colorectal cancer screening rates are lower in Latinos compared to non-Latino Whites. (6,7) While previous studies suggest that some Latinos have misperceptions and erroneous understandings of cancer that may impact their preventive behavior,(8,9) language may also be an important potential barrier to screening as limited English proficiency has been implicated as a barrier to preventive care in general (10) and in breast and cervical cancer screening services.(11,12)

The purpose of this study was to examine the relationship between preferred language use (English versus Spanish) and self-reported receipt of CRC screening tests among Latinos and non-Latinos.

Materials and Methods

Data Source and Study Population

We conducted a cross-sectional study using data from the Centers for Disease Control's (CDC) 2006 Behavioral Risk Factor Surveillance System (13). Following guidelines for CRC screening, adults, the study population for this analysis included adults at least 50 years of age. (2,3) Although in 2006 the CDC provided states with English and Spanish versions of the survey, not all states administer the survey in Spanish. States that had data on fewer than 50 surveys completed in Spanish were excluded and given differences in healthcare delivery between the U.S. territories and the states, the territories were excluded.

Study Variables

Our dependent variable was the reported receipt of colorectal cancer (CRC) screening tests. We operationalized this variable by using BRFSS questions regarding fecal occult blood testing (FOBT) and lower endoscopic procedures and testing. Respondents were considered to have been tested for CRC if they reported completing FOBT testing within the past one year or lower endoscopy within the past 10 years.

Our main independent variable was preferred language of survey respondent, English versus Spanish. We classified participants as "responding-in-English" if the corresponding survey was coded in the BRFSS dataset as being conducted in English or "responding-in-Spanish" if the survey was coded as being conducted in Spanish. The BRFSS provides no information about the level of English proficiency, so this variable remained dichotomous. Respondent language was further stratified based on Hispanic/Latino race/ethnicity. The main independent variable was thus divided into three categories of exposure: non-Latinos responding-in-English (non-Latinos), Latinos-responding-in-English, and Latinos responding-in-Spanish. There were insufficient data from non-Latinos responding-in-Spanish to create a fourth exposure category.

Entries that were missing a language identifier or Hispanic/Latino status were excluded from the analysis.

Demographic characteristics for the study population included age, gender, marital status, health insurance status, and geographic region. Race and ethnicity were incorporated into the exposure variable. Education and income were combined to define an indicator variable for low socio-economic status (SES). Low SES was defined as less than a 12th grade education and/or annual income less than $15,000. (14) In addition to these factors, we included as potential confounders presence of an identified healthcare provider, smoking status, and respondent's perceived general health.

Statistical Analysis

Respondent characteristics were calculated using standard means for continuous variables and proportions/frequencies for categorical variables. Chi-square tests were used to examine the relationships between the outcome of interest, receipt of colorectal cancer screening tests, and ethnicity/language category as well as each potential confounder. Logistic regression was used to estimate crude odds ratios between the three ethnicity/language categories and the receipt of colorectal cancer screening tests and to calculate crude odds ratios between potential confounder variables and receipt of colorectal cancer screening tests. Variables were considered to be confounders, and hence included in a final multivariable logistic model, if the odds ratio for the ethnicity/language variable adjusted for each potential confounder resulted in at least a 10 percent difference from the crude unadjusted odds ratio. Additional variables were retained in the multivariable model if their inclusion was supported by prior research. (6,15,16) The data were analyzed using SUDAAN version 9 (Research Triangle Institute). Sampling weights were included in all analysis. These sampling weights take into account the disproportionate stratified sampling design of the BRFSS. Additionally, the weights are adjusted post-stratification to accommodate non-response and non-coverage within the sample. (13)

Results

The final study population of 99,895 represented individuals age $\geq$ 50 years old in 23 states. The majority, N=94,346, (94.4%) of the study population was comprised of non-Latinos who completed the survey in English. The remainder of the population consisted of Latinos who responded in English, N=3660, (3.7%) and Latinos who responded in Spanish, N=1889 (1.9%). A greater percentage of non-Latinos had health insurance, a healthcare provider, and higher education and income levels compared to Latinos responding-in-English, who in turn had greater percentages of these characteristics compared to Latinos responding-in-Spanish. (Table 1.)

Colorectal Cancer Screening Tests Use by Hispanic/Latino Ethnicity

Of the total study population, 59.5% reported having received FOBT within the last year and/ or lower endoscopy within 10 years. There were no significant differences in reported test receipt among groups of non-Hispanic/Latino race/ethnicity sub-groups so these groups, White non-Hispanic, Black non-Hispanic, other non-Hispanic, mixed non-Hispanic, were collapsed and categorized as non-Latino. Overall, 61.6% of non-Latinos versus 43.6% of Latinos reported having received at least one screening test. In the adjusted model, compared to non-Latinos, Latinos as a group were less likely to report having received CRC screening tests, either FOBT and/or lower endoscopy [adjusted odds ratio (OR), 0.74; CI 95%, 0.65-0.85].

Colorectal Cancer Screening Tests Use by Language

When divided into the three exposure categories to account for language and Hispanic/Latino ethnicity, 33.4% of Latinos responding-in-Spanish reported having CRC screening tests, compared to 51.0% of Latinos responding-in-English, and 61.6% of non-Latinos. In the adjusted model, both Latinos responding-in-English [OR, 0.84; 95% CI, 0.73-0.98] and Latinos responding-in-Spanish [OR, 0.57; 95% CI, 0.44-0.74] were less likely to report receiving CRC screening tests compared to non-Latinos. Latinos responding-in-Spanish were 36% less likely than Latinos responding-in-English to report having been screened (OR=0.64, 95% CI, 0.48-0.84).

We also explored the effect of language and Latino/Hispanic ethnicity on colorectal cancer tests use by examining the relationship among respondents who reported having medical insurance and an identified healthcare provider. Among those with a healthcare provider and medical insurance, Latinos responding-in-English [OR, 0.83; 95% CI, 0.71-0.98] and Latinos responding-in-Spanish [OR, 0.56; 95% CI, 0.41-0.75] were less likely to report test use compared to non-Latinos. These odds ratio results are very similar to the previously stated full model analysis. We further examined the effect of education and income on screening by stratifying on socioeconomic status (SES). In the low SES strata, compared to non-Latinos, Latinos responding-in-English [OR,0.70; 95% CI, 0.54-0.91] and Latinos responding-in-Spanish [OR,0.50; 95% CI, 0.39-0.65] were again less likely to report CRC test use. In the higher SES strata, although no longer statistically significant among Latinos responding-in-English [OR, 0.84; 95% CI, 0.70-1.0], Latinos responding-in-Spanish remained less likely to report screening compared to non-Latinos [OR,0.39; 95% CI, 0.24-0.64].

Discussion

Despite recent increases in colorectal cancer screening nationally,(15,17) screening rates remain low, particularly among Latinos. Understanding disparities in colorectal cancer screening are especially important given that Latinos and other ethnic minority groups are more likely than Whites to be diagnosed with colorectal cancer in more advanced stages and have higher mortality rates.(18) In this population-based study of American households, not only were Latinos significantly less likely to report having colorectal cancer screening tests than non-Latinos, but when language was considered Latinos who responded to the BRFSS survey in Spanish were significantly less likely to report colorectal cancer screening test use than Latinos who responded In English.

In an analysis of the 2001 California Health Interview Survey, Etzioni found that among adults age less than 65, Hispanics were the only ethnic group less likely than Whites to have received recent colorectal cancer testing. However, in a multivariate model, those with limited English proficiency did not have lower rates of self-reported testing.(16) A potential for reason for the discordant results between this study and the present study is that Etzioni et al, included an assessment of acculturation based on English proficiency and the percent of years lived in the U.S. which may which may partially explain the impact of language on CRC screening.(19)

Several limitations of this study are noteworthy. First, we categorized Latinos as responding-in-English versus responding-in-Spanish based on respondents' language in the BRFSS. While this may represent respondents' language preference, respondents who answered in Spanish may also be proficient in English and vice versa. More formal measures of English-proficiency were not used in the 2006 BRFSS. The definition of the screening outcome variable is also a potential limitation. We relied upon self-report and considered those who had reported FOBT within the past year or lower endoscopy within the past ten years as having been screened for colorectal cancer. While current screening guidelines suggest intervals of every five years for sigmoidoscopy and every ten years for colonoscopy, the BRFSS assesses the use of

sigmoidoscopy and colonoscopy together in the same questions. We therefore included both sigmoidoscopy and colonoscopy testing done within the previous ten years as part of the screening outcome variable. While this measurement error may overestimate the true screening rates, they are likely to affect all three exposure groups equally and therefore would bias our results towards the null. Finally, as a telephone survey of non-institutionalized adults, the survey may not be representative of those of lower socioeconomic status who may not have telephones and of those who primarily use cellular telephones. Of particular concern with the BRFSS is the finding described by Link et al. who used race, ethnicity, and language variables from the 2000 U.S. Census data with 2003 BRFSS data and estimated that counties with larger percentages of Spanish-only speakers had lower BRFSS participation rates compared to counties in which all respondents spoke English.(20) The BRFSS dataset does not provide response rate by race/ethnicity or language so we could not assess the impact of potential differential response rates based on these variables.

The results of the present study suggest a negative association between Spanish language respondents and English language respondents implying that non- or limited-English speaking Latinos are at greater risk of not being screened for colorectal cancer. Limited English proficiency has been implicated as a barrier to medical comprehension (19) which may be particularly important given the multiple colorectal cancer screening options, the relatively complicated required preparation, and the invasiveness of lower endoscopy compared to other commonly-performed cancer screening tests. The mechanism by which Spanish language use for survey responses is associated with less screening indicates that it may be a proxy measure for acculturation and/or may simply represent a communication barrier. While the BRFSS does not include further analysis of respondents' level of acculturation, language itself is a major component of most acculturation scales.(19) On the other hand, using data from the Hispanic Health and Nutrition Examination Survey, Solis et al suggest that the effect of language on screening practices should be considered as a factor related to access to care as opposed to a cultural factor.(21) Regardless of the mechanism, cultural and language differences between patients and providers contribute to poorer health communications.(22) When counseling patients about CRC screening and other complex medical decisions, providers should recognize that limited-English proficiency may be a marker for lower acculturation, lower health literacy, and lower access to healthcare. Barriers to effective health communication may be overcome with relatively simple interventions such as culturally and linguistically appropriate telephone counseling targeting non-English speaking populations which have been shown to improve colorectal cancer screening rates.(23) In addition, adoption of the Department of Health and Human Services' National Standards for Culturally and Linguistically Appropriate Services in Health Care would help minimize cultural and linguistic barriers to health care and colorectal cancer screening.(19,24)

Acknowledgement

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Table 1

Demographic Characteristics of 2006 BRFSS Sample: Participants 50 years and older - estimates weighted for sample design

		Non-Latino Responding-in-English	Latino Responding-in-English	Latino Responding-in-Spanish
Weighted N		45,422,579	3,413,576	2,468,406
Age	*mean*	64.2	61.61	61.29
	se	0.07	0.32	0.53
Region (%)	*Northeast*	22.96	14.18	17.28
	Midwest	14.34	5.45	5.07
	Southern	31.34	28.71	33.18
	Western	31.36	51.66	44.5
Gender (%)	*Male*	45.92	44.36	45.91
	Female	54.08	55.64	54.09
Education (%)	*< High School*	8.18	24.13	67.55
	High School/GED	28.13	27.37	15.17
	> High School	63.69	48.49	17.28
Marital (%)	*Partnered*	65.77	64.3	66.02
	Not Partnered	34.23	35.7	33.98
Income (%)	*< $20,000*	13.86	27.15	44.7
	$20,000 - $34,999	18.56	19.34	22.8
	$35,000 - $74,999	28.14	25.47	10.04
	$75,000+	25.11	15.89	0.96
	Refused	14.32	12.14	21.51
Medical Insurance (%)		93.57	86.25	68.23
Identified Health Care Provider (%)		91.56	85.44	70.28
Smoking (%)	*Current*	14.27	13.76	12.94
Good Health (%)		79.02	69.93	40.21
CRC Screening (%)	*FOBT*	17.07	14.19	6.36
	Endoscopy	57.29	46.75	30.37
	Combined	61.61	51.04	33.4

BRFSS, Behavioral Risk Factor Surveillance System;

GED, General Education Degree; CRC, Colorectal Cancer

Table 2

Screening Rates and Odds Ratios for Colorectal Cancer Screening

		Non-Latino Responding-in-English		Latino Responding-in-English		Latino Responding-in-Spanish	
Crude	OR (95% CI)	1.00	(n/a)	0.65	(0.56-0.75)	0.31	(0.25-0.38)
	Screening Rates	0.62		0.51		0.33	
Adjusted[*]	OR (95% CI)	1.00	(n/a)	0.84	(0.72-0.98)	0.57	(0.44-0.74)
	Screening Rates	0.61		0.55		0.46	
Stratified Models							
Low SES Adj[**]	OR (95% CI)	1.00	(n/a)	0.70	(0.54-0.91)	0.50	(0.39-0.65)
	Screening Rates	0.52		0.44		0.37	
High SES Adj[**]	OR (95% CI)	1.00	(n/a)	0.84	(0.70-1.01)	0.39	(0.24-0.64)
	Screening Rates	0.63		0.59		0.44	

SES, Socioeconomic Status

[*] OR's and screening rates adjusted for age, regular medical care, marital status, insurance, gender, current smoking status, self-perceived health status, geographic region, and SES status

[**] OR's and screening rates adjusted for age, regular medical care, marital status, insurance, gender, current smoking status, self-perceived health status, and geographic region