



Using a Culturally Tailored Intervention to Increase Colorectal Cancer Knowledge and Screening among Hispanics in a Rural Community

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Abstract

Background: Disparities in colorectal cancer incidence and mortality rates exist among racial/ethnic minorities, especially those living in rural areas. There is an urgent need to implement interventions to improve colorectal cancer screening behaviors among such groups, particularly those living in rural areas in the United States.

Methods: From a rural community of Hispanics, we recruited participants to attend home-based *promotor(a)*-led "home health parties" in which participants were taught about colorectal cancer screening; participants ages 50 and older were given a free fecal occult blood test (FOBT) kit to complete on their own. A pre- and posttest design was used to assess changes in colorectal cancer awareness, knowledge, and screening at baseline and at 1-month follow-up after the intervention.

Results: We observed a statistically significant increase in colorectal cancer screening awareness and knowledge among

participants. Colorectal cancer screening rates with FOBT increased from 51.0% to 80%. There was also a statistically significant increase in social engagement, that is, the intent to speak to friends and relatives about colorectal cancer screening.

Conclusions: Findings indicate that culturally tailored colorectal cancer education facilitated by *promotores* in a rural environment, coupled with free stool-based test for colorectal cancer screening, is an effective way to increase colorectal cancer screening awareness, knowledge, and screening among Hispanics living in a rural area in Washington State.

Impact: Culturally tailored home health interventions have the potential to achieve Healthy People 2020 colorectal cancer screening goals in Hispanic rural communities. *Cancer Epidemiol Biomarkers Prev*; 27(11); 1283–8. ©2018 AACR.

Introduction

The American Cancer Society estimates that 135,430 adults in the United States will be diagnosed with colorectal cancer, and 50,260 will die from this disease in 2017 (1). Colorectal cancer is the third most common cancer among men and women in the United States (1); however, it is the second most commonly diagnosed cancer in both U.S. Hispanic men and women (2). Although colorectal cancer incidence and mortality rates have been declining since about the mid-1980s due to increases in screening rates, removal of polyps, and modification of behaviors to address potential risk factors (3), these declines have not been experienced by all adults in the United States. Disparities in colorectal cancer incidence and mortality rates exist among racial and ethnic minorities, as well as people living in rural areas (4–7), and cancer morbidity and mortality

may be worse for racial/ethnic minorities living in rural areas (5, 8). Research indicates that people living in rural areas, compared with those living in urban areas, are more likely to face increased colorectal cancer morbidity and mortality (9) due to higher poverty rates, lower levels of education, lack of health insurance, and lack of access to health care (10, 11).

Disparities are not only seen in colorectal cancer rates, but also seen in colorectal cancer screening rates. The Healthy People 2020 target for the percentage of adults ages 50 to 75 who have received a colorectal cancer screening based on current guidelines is 70.5%; National Health Interview Survey data from 2015 indicate the United States is at 62.4% overall (12). When overall data are viewed by race/ethnicity, however, disparities become apparent; Hispanics (48.7%) are less likely to be up-to-date with colorectal cancer screening compared with blacks/African Americans (60.6%) and non-Hispanic whites (NHWs; 63.6%; ref. 12). Colorectal cancer screening uptake is even lower (11%) among uninsured Hispanics and Spanish-speaking Hispanics (30.6%; refs. 2, 13). Further, people living in nonmetropolitan (rural) areas are less likely to be up-to-date with screening (58.2%) compared with those living in metropolitan areas (63.3%; refs. 4, 12, 14–16).

Underutilization of screening can play a role in the stage of diagnosis of colorectal cancer, with the unscreened more likely to be diagnosed at an advanced stage. Similar to inequities in colorectal cancer rates, disparities in colorectal cancer screening rates and adherence to screening guidelines can be attributed to

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doi: 10.1158/1055-9965.EPI-17-1092

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factors such as socioeconomic status, race/ethnicity, and geography. For people living in rural areas, there are additional barriers, such as traveling longer distances for care, and lack of access to primary care providers and specialists in Health Professional Shortage Areas (17). People who are uninsured, have lower income brackets, and/or have lower levels of education and face these additional barriers are less likely to be up-to-date with colorectal cancer screening (12, 18). For example, compared with NHWs, Hispanics are more likely to be diagnosed with advanced stage colorectal cancer, when treatment is less likely to be effective (2, 19, 20). In rural areas, higher colorectal cancer mortality rates may be indicative of lack of access to primary care or to referrals for colonoscopy screening or lack of follow-up on abnormal screenings (7, 19, 21). For rural dwelling racial/ethnic minorities, the barriers faced by being a minority as well as those of living in a rural area present a pronounced burden.

Increased colorectal cancer awareness, knowledge, and colorectal cancer screening opportunity are associated with intention to receive colorectal cancer screening. Further, social engagement, that is, being advised to partake in colorectal cancer screening by one's family and friends, is thought to motivate changed colorectal cancer behaviors among Hispanics living in rural settings (22–25). Previous interventions aimed at increasing colorectal cancer screening among Hispanic populations have focused on providing culturally targeted education to promote colorectal cancer awareness and knowledge (26). *Promotor(a)*-led interventions have been demonstrated to be effective in improving colorectal cancer screening in this population; however, most have been implemented in primary care clinical settings, potentially missing a large portion of the underserved Hispanic population who lack health insurance and access to primary care (26, 27). *Promotores* (community health workers) are members of the community they serve and are able to direct and motivate individuals through the use of culturally appropriate educational tools (28). They are trusted and respected by their community and thus provide culturally sensitive support (26, 28).

Given the distances in rural communities, it is not feasible to offer hospital-based programs to encourage colorectal cancer screening. An alternative approach includes "Home Health Parties" (HHPs), in which 1- to 2-hour small-group education sessions are taught by a *promotor(a)* in a community member's home. This approach appears ideal in rural settings where they have been used to effectively educate Hispanic women about cancer and mammography screening (27, 29). One previous study used *promotor(a)*-led HHPs to effectively increase breast cancer knowledge, social engagement, and intent to receive mammography; however, this study did not assess change in screening behaviors (29). Although intent to screen is an important factor for improved screening behaviors, intention does not always translate to actual screening behavior. Other studies utilizing the HHP strategy focused on increasing cancer knowledge and self-reported cancer screening with fecal occult blood test (FOBT), an outcome that could be subject to recall or social desirability bias (27). Overall, the combination of the *promotor(a)* in a familiar setting provides a learning environment that is conducive to increasing colorectal cancer awareness, knowledge, and promoting colorectal cancer screening (26). This study expands on previous research by coupling a *promotor(a)*-led home-based intervention with no-cost colorectal cancer screening for Hispanics living in a rural geographical area.

There is a growing need to implement interventions to increase awareness of colorectal cancer and colorectal cancer screening behaviors among racial/ethnic groups living in rural areas in the United States, particularly Hispanics, who comprise the largest minority group in the United States. The aim of this study was to assess changes in colorectal cancer awareness, knowledge, and colorectal cancer screening-related behaviors among Hispanic men and women residing in a rural geographic area in Washington State, following the implementation of home-based *promotor(a)*-led colorectal cancer HHP intervention.

Materials and Methods

Setting

Fred Hutchinson Cancer Research Center (FHCRC)'s Center for Community Health Promotion (CCHP) has been using community-based participatory research methods for more than 20 years to address health disparities experienced by the Hispanic population in the Lower Yakima Valley of Washington State (the Valley). The Valley is a rural agricultural area in eastern Washington. Many communities in the Valley are Hispanic-majority towns; and overall, 67% of the Valley's residents are of Hispanic ethnicity, Spanish-speaking, and primarily of Mexican origin. The population in the Valley also is underserved in terms of poverty rates, educational status, and health insurance status (30).

Intervention

FHCRC used a community health worker program model, more specifically the *promotor(a)* model, for this intervention. FHCRC's Community Health Educator trained five (four females and one male) bilingual/bicultural *promotores*, representative of the population being served, to conduct colorectal cancer HHPs. Using a flipchart to lead and guide discussion around the topic of colorectal cancer, the *promotor(a)* also answered participant questions about colorectal cancer. In an HHP, a host (community member) invites friends and family to come to his/her home to hear a *promotor(a)* present information about a health topic. The small size of the group (usually 6 to 10 individuals) and the characteristics of the *promotor(a)* lead to the group being very interactive, and lengthy discussions are frequently generated. This strategy has been used successfully in the Valley in the past (27, 29, 31–33). The educational content in the colorectal cancer flipchart used by the *promotores* was adopted from the *Cancer 101* curriculum (34), but tailored to address colorectal cancer screening; in addition, the content was translated into Spanish so that HHPs could be offered in either English or Spanish.

Males and females ages 50 years of age or older were recruited to be HHP hosts at various outreach activities such as health fairs, community meetings, church services, and other community events. Hosts received a small gift, such as a water bottle or lunch bag, as well as a modest amount of money to purchase refreshments. Participants completed questionnaires in their preferred language (Spanish or English). Participants who completed a pre- and postassessment received a small gift such as a lunch tote.

The goal of the HHPs was to increase awareness and knowledge about colorectal cancer as well as to encourage screening behavior. HHPs were conducted between March and October 2012 over two 1-to-2-hour visits in the participants' preferred language (English or Spanish). At the first visit, the *promotor(a)* began by obtaining informed written consent and asking participants to complete a

baseline questionnaire (colorectal cancer knowledge and screening practices, health care access, social engagement, and demographic questions). After completing the questionnaire, the *promotor(a)* used the flip chart to guide a discussion of how cancer begins and spreads, what colorectal cancer is, risk factors (including family history), and ways to modify lifestyle to lower risk. During the second visit, the *promotor(a)* continued the discussion with symptoms of colorectal cancer and screening tests available. A general overview of treatment options also was discussed, and the HHPs concluded with a discussion around survivorship if colorectal cancer is detected early, when a cure is more likely. Participants were encouraged to ask questions and engage in open discussion at both sessions. One to 3 months after the second HHP, participants were contacted via telephone to complete the follow-up questionnaire (colorectal cancer knowledge and screening since first HHP, health care access, and satisfaction with HHPs).

Participants who were 50 years of age or older and were not up-to-date with colorectal cancer screening were given a free FOBT kit at the end of the first HHP. The FOBT kit (Hemoccult ICT) was designed for a 3-day screening, and participants were instructed to collect two samples per stool. The instructions that accompany general FOBT kits use a relatively high level of language; in addition, the instructions were all in English. To accommodate our population, we revised the instructions to be of simpler language, to be more visual, and to be in Spanish as well as English. Envelopes accompanying the kits were self-addressed to the hospital where they were to be analyzed and stamped for ease of return. Completed kits were assessed by a laboratory at the local community hospital. Participants who took a kit and completed it were followed up with a phone call from the CCHP *promotores* who let the participant know their FOBT results. We partnered with the Yakima Health District's Breast, Cervical and Colon Health Program to let participants know about resources available for low-cost or free follow-up colorectal cancer screening.

Study design and measures

Changes in colorectal cancer screening-related awareness, knowledge, and behaviors from baseline to follow-up were assessed using a pre- and posttest intervention study design. A baseline questionnaire included items on demographics, including age, education, and race/ethnicity, as well as access to health care. Both pre- and posttest contained items on colorectal cancer screening awareness, knowledge, intent to be screened, and social engagement. For awareness, participants were asked questions such as, "Have you ever heard of a test to check for blood in your stool or feces, called a Fecal Occult Blood Test? [You smear a little of your stool or feces on a card and take it in to your doctor or clinic.]" For knowledge, the participants were asked to respond to prompts such as, "The goal of finding cancer early is stop a tumor before it grows and spreads" and "Colorectal cancer is a disease that only affects men." For intent to be screened, we asked whether the participant intended to be screened with FOBT or colonoscopy in the next 6 months. For social engagement, we asked, "Have you ever talked to any of your family members about colorectal cancer screening tests?" and "Have you ever talked to any of your friends about colorectal cancer screening tests?" Colorectal cancer screening awareness and knowledge measures consisted of "true" and "false" responses. Intent-to-screen and social engagement measures consisted of "yes" and "no" responses. As mentioned in the intervention section, screening behavior was assessed among

participants 50 years of age or older who were not up-to-date with colorectal cancer screening through completed FOBT kits that were analyzed at the local community hospital.

Participant responses were collected and managed using Research Electronic Data Capture (REDCap) tools hosted at University of Washington (35). REDCap is a secure web-based software designed to support and facilitate data capture for research studies, providing (1) an intuitive interface for validated data entry; (2) audit trails for tracking data manipulation and export procedures; (3) automated export procedures for seamless data downloads to common statistical packages; and (4) procedures for importing data from external sources.

This project was approved by the Fred Hutchinson Cancer Research Center's Institutional Review Board (File #7293) and was conducted in accordance with the Belmont Report and the U.S. Common Rule. All participants gave written informed consent to study staff prior to their inclusion in the study.

Analysis

Analyses were performed using STATA: Data analysis and Statistical Software 14.0 (STATA Corp, 2014). We examined descriptive statistics in individual-level demographics using proportions of participants.

Composite scores were developed for colorectal cancer screening awareness (sum of two items, range scores 0 to 2), colorectal cancer screening knowledge (sum of seven items, range of scores 0 to 7), intent to obtain screening (sum of four items, range of scores 0 to 4), and social engagement (sum of two items, range of scores 0 to 2). Two items assessed colorectal cancer screening-related patient-provider communication: (1) "Has a doctor ever talked to you about colorectal cancer screening?" and (2) "Has a doctor ever told you that you should receive a colorectal cancer screening test?" Paired-sample *t* tests were used to test for significant differences in colorectal cancer screening awareness, knowledge, intent to screen, and social engagement from baseline to follow-up. Two-sided significance tests with *P* values less than 0.05 were considered statistically significant. We also examined whether the participants were colorectal cancer screening adherent. The response variable for adherence was if the participant was compliant with FOBT screening in the last year or colonoscopy in the last 10 years.

Results

Participant characteristics

A total of 101 adults over 50 years of age participated in the colorectal cancer HHP intervention. At follow-up, there was a 96% response rate. The majority of the participants were female (70%), self-reported as being Hispanic (99%), and had less than a high school education (88%; Table 1). About half (47.5%) had no health insurance; of those who did have insurance, most were covered by Medicare or by the state-financed Medicaid insurance system (Apple Care). Despite the lack of insurance, 76% of the participants reported having a regular doctor and 95% reported having a regular health care clinic.

Colorectal cancer screening knowledge and behaviors

At baseline, 30.9% of participants were not up-to-date with colorectal cancer screening (via FOBT, sigmoidoscopy, or colonoscopy). Of these screening nonadherent participants, 86.7% (*n* = 26) received an FOBT kit at the first HHP and

Table 1. Participant demographics (*n* = 101)

Characteristics	Total (%)
Race	
Hispanic	100 (99.0)
White	1 (1.0)
Education	
<HS/GED	88 (87.1)
HS/GED or greater	13 (12.9)
Gender	
Female	70 (69.3)
Male	30 (29.7)
Access to health care	
Health insurance	
Medicare/medicaid	24 (23.8)
Private	19 (18.8)
Basic health plan/other	10 (9.9)
None	48 (47.5)
Regular physician	76 (75.3)
Regular clinic	95 (94.1)

returned it for analysis. One of the kits returned was abnormal; the participant was encouraged by the *promotora* to talk with their provider and was given referrals to providers offering low-cost/sliding scale fees for follow-up screening. As seen in Table 2, there was a statistically significant increase in colorectal cancer screening awareness and knowledge among participants (*P* values < 0.0001). Further, there was a nonstatistically significant decrease in behavioral intentions to obtain colorectal cancer screening (*P* = 0.076, see Table 2). Overall, there was a statistically significant increase in colorectal cancer screening with FOBT among men (40% to 72%) and women (57.1% to 82.5%). Only 3 participants were nonadherent at time of follow-up.

Provider recommendation

As seen in Table 3, there was a nonsignificant decline in overall doctor recommendations from baseline to follow-up. In fact, fewer providers discussed colorectal cancer screening or recommended it at follow-up, which may have been a function of the timing of the follow-up questions.

Social engagement

There was a statistically significant increase in social engagement from baseline to follow-up with significantly more participants stating they would discuss colorectal cancer screening with family members and friends at follow-up.

Discussion

This study focused on assessing the effects of a culturally tailored, language-concordant home-based colorectal cancer educational intervention on colorectal cancer screening-related

outcomes among Hispanics living in rural Yakima Valley of Washington State. Our findings indicate that when coupled with no-cost screening, HHP educational interventions have the potential to improve colorectal cancer screening awareness, knowledge, screening behaviors, and social engagement among rural Hispanic populations. This is particularly important because adults residing in rural settings face significant and persistent disparities in colorectal cancer screening compared with their urban counterparts, potentially leading to an advanced colorectal cancer stage diagnosis (4, 12, 14–16).

Improving access to accurate and culturally appropriate colorectal cancer awareness and knowledge is imperative because these factors are significant barriers that hinder colorectal cancer screening adherence, especially among minority and rural population (36–39). In this study, the mean scores for colorectal cancer screening awareness and knowledge were considered relatively high at baseline; however, the scores significantly increased at time of follow-up indicating a significant intervention effect. Substantial improvements were also observed in colorectal cancer screening with FOBT. We observed significant increases in FOBT utilization among participants, surpassing the Healthy People 2020 colorectal cancer screening goals. Although this intervention was implemented prior to 2016, when the U.S. Preventive Services Task Force updated colorectal cancer screening strategies to include high-sensitivity guaiac-based FOBT or fecal immunochemical tests over the FOBT used in this intervention, this work still has merit. Stool-based tests are a practical low-risk colorectal cancer screening tool that can be administered by *promotores* in non-clinical settings. This tool can be a gateway to improve overall colorectal cancer awareness and knowledge, which offers the opportunity to discuss other screening options such as colonoscopy with their providers in the future (26).

Previous studies suggest that even after reducing financial barriers associated with colorectal cancer screening, disparities continue to persist among Spanish-speaking Hispanics (13). Thus, emphasizing a need for coupling culturally tailored colorectal cancer educational interventions with no-cost screening for people in rural communities who typically face several health care challenges, such as lack of access to primary care, is a positive step toward colorectal cancer screening. The effects on FOBT screening in this study are higher than previously reported by a study that utilized the HHP-only in the intervention. That study achieved a 10.9% increase in self-reported FOBT utilization among rural Hispanics, with 41.0% of the participants reporting receiving FOBT screening (27). Our study achieved an overall 28% increase in colorectal cancer screening with FOBT, and almost all participants partook of the FOBT screening test; only three participants in the current study reported being nonadherent with colorectal cancer

Table 2. Effect of the colorectal cancer HHP intervention on awareness and knowledge

	Mean		Change	<i>P</i> value ^b
	Baseline (<i>n</i> = 101) ^a	Follow-up (<i>n</i> = 97) ^a		
Colorectal cancer screening awareness	1.21	1.84	0.63	<0.001
Colorectal cancer screening knowledge	5.90	6.63	0.73	<0.001
Intent to screen	2.17	1.67	–0.5	0.076
Screening behaviours				
FOBT	0.52	0.80	0.28	<0.001
Endoscopy	0.35	0.13	–0.22	<0.001

^aMeans based on nonmissing values.

^bSignificance level α = 0.05.

Table 3. Effect of the HHP intervention on provider communication and social engagement

	Mean			P value
	Baseline (101)	Follow-up (93)	Change	
Provider communication				
Discussed colorectal cancer screening	0.37	0.27	−0.1	0.118
Recommended colorectal cancer screening	0.38	0.20	−0.18	0.005
Social engagement				
Will talk to others about colorectal cancer	0.80	1.61	0.81	<0.0001

recommended guidelines using FOBT or colonoscopy at time of follow-up.

There was a nonstatistically significant decrease in intent to screen for colorectal cancer. It is noteworthy that among 22 nonadherent participants at baseline and who reported not thinking about going to their doctor or clinic to obtain colorectal cancer screening, 86.4% received colorectal cancer screening with FOBT. Similarly, out of 27 nonadherent participants who stated not asking their doctor about colorectal cancer screening at baseline, 88.9% reported having obtained colorectal cancer screening with FOBT at time of follow-up.

The lack of provider communication to patients in this study may have been the result of the relatively short time between baseline and follow-up. It may be that participants did not have an opportunity to see their provider within the short time period (1 to 3 months). Regardless, only about a third of providers at baseline had discussed colorectal cancer screening with or recommended screening to the participants. This suggests that interventions need to target providers as well.

In terms of social engagement, the intervention was successful in increasing participants' intention to speak with friends and relatives about colorectal cancer screening. This suggests that the intervention may have longer-term effects if participants continue to talk to community members about the importance of colorectal cancer screening.

Limitations

This study has some limitations. We did not have a control arm, and follow-up occurred at 1 to 3 months following implementation of the intervention. In addition, the sample size was small and was carried out with a Hispanic population of Mexican origin, and may therefore not be generalizable to all Hispanics residing in rural areas. With regard to the screening provided, we did not ask participants about colorectal cancer risk, and they may have been at increased risk for colorectal cancer where a stool-based test is not the preferred test. Nevertheless, this HHP intervention coupled with distribution of a stool-based test is relatively easy to implement and seems particularly suitable for a rural population; others are encouraged to utilize it.

Conclusion

Although colorectal cancer screening rates may be slowly increasing in the United States, this is not the case for Hispanics living in rural areas. This could be a primary reason why disparities in colorectal cancer incidence and mortality rates exist among these underserved groups. The findings of this study support evidence that evidence-based culturally tailored colorectal cancer education facilitated by *promotores* and coupling the intervention with no-cost stool-based test for screening is an effective way to increase colorectal cancer screening awareness, colorectal cancer knowledge, and colorectal cancer screening behavior among Hispanics living in a rural

area in Washington State. Our results show that coupling the *promotor(a)*-led home-based education with no-cost screening for a medically underserved population led to a screening rate above the Healthy People 2020 goal of 70.5%. This work can be used to inform future research that explores culturally tailored colorectal cancer education for other rural minority populations who may experience similar cancer burden and barriers for colorectal cancer screening disparities. Future research could explore effectiveness of the *promotor(a)* based on gender and their own personal experience with colorectal cancer screening, as this may influence their activity and/or performance. Future research could also investigate the best ways to address barriers to screening and follow-up, and explore the most effective colorectal cancer screening test for rural minority populations, including those who are at high risk for colorectal cancer and may benefit from other colorectal cancer screening tests.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

Disclaimer

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Cancer Institute (NCI), National Center for Research Resources (NCRR), or the National Institutes of Health (NIH).

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Acknowledgments

This project was supported by grant numbers U54 CA153502 and P30 CA015704-37S5 from the NCI and the Institute of Translational Health Science grant (UL1 RR025014) from the NCRR at the NIH.

We would like to thank all the participants who agreed to participate in this study. We would also like to thank the *promotores* who led the HHPs. Finally, none of this could have been done without the strong participation of the Community Advisory Board, which supported this intervention and its implementation.

The costs of publication of this article were defrayed in part by the payment of page charges. This article must therefore be hereby marked *advertisement* in accordance with 18 U.S.C. Section 1734 solely to indicate this fact.

Received November 24, 2017; revised February 3, 2018; accepted May 30, 2018; published first June 5, 2018.

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