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**Permalink** https://escholarship.org/uc/item/4j83n9hn

**Journal** Health Promotion Practice, 22(4)

**ISSN** 1524-8399

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Publication Date

2021-07-01

## DOI

10.1177/1524839920912240

Peer reviewed



# **HHS Public Access**

Author manuscript *Health Promot Pract.* Author manuscript; available in PMC 2021 August 15.

Published in final edited form as:

Health Promot Pract. 2021 July ; 22(4): 491-501. doi:10.1177/1524839920912240.

# A *Promotor*-Led Pilot Study to Increase Colorectal Cancer Screening in Latinos: *The Juntos Contra El Cáncer* Program

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### Abstract

**Background:** Latinos have lower colorectal cancer (CRC) screening rates compared to other racial/ethnic groups in the United States, despite an overall increase in CRC screening over the past 10 years. To address this disparity, we implemented a *promotor*-led intervention to increase CRC screening test adherence in community-based set-tings, connecting community members with a partnering Federally Qualified Health Center (FQHC).

**Purpose:** To evaluate the *Juntos Contra el Cáncer*/Together Against Cancer (JUNTOS) intervention, by assessing pre–post changes in (1) CRC screening test adherence and (2) CRC knowledge and perceived barriers to CRC screening. We also assessed the feasibility and acceptability of program activities.

**Methods:** JUNTOS was a group-based intervention, delivered by *promotores* (community health workers), to promote CRC screening test adherence among Latino adults. The intervention consisted of a culturally tailored 2.5-hour interactive workshop followed by an appointment scheduling assistance from a *promotor*. Workshop participants were Latino adults (males and females) aged 50 to 75 years who were not up-to-date with CRC screening guidelines. We conducted interviews before and 6 to 9 months after the workshop to assess program outcomes.

**Results:** Of the 177 participants included, 118 reported completing the CRC screening test (66.7%) by 6 to 9 months post-intervention. We observed baseline to 6- to 9-month increase in CRC knowledge and lower perceived barriers to obtaining CRC screening. Furthermore, the intervention was found to be feasible and acceptable.

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**Conclusion:** Results suggest that JUNTOS can be feasibly implemented in partnership with a federally qualified health center. The current study supports group-based CRC interventions in community and clinic settings.

#### INTRODUCTION/BACKGROUND

Colorectal cancer (CRC) is the third leading cause of cancer deaths in Latinas and Latinos in the United States (Miller et al., 2018). Among adults aged 50 to 75 years, Latinos have the lowest CRC screening adherence rates (49.9%) compared to non-Hispanic Whites (65.4%) and African Americans (61.8%; Centers for Disease Control and Prevention, 2016). A number of factors account for the low screening rates, including lack of knowledge about the screening procedure, stigma associated with the procedure, and lack of access to regular health care (Beydoun & Beydoun, 2008; Guessous et al., 2010; Holden et al., 2010). Health programs that facilitate access to CRC preventive services have the potential to reduce CRC mortality by encouraging CRC screening and enabling more timely medical care.

A number of strategies, including the involvement of patient navigators and mailed fecal test outreach, have been shown to increase the CRC screening rates among underserved communities (Coronado et al., 2011; Meade et al., 2014). However, the majority of CRC screening interventions have been implemented in clinic settings. Among 27 studies (randomized controlled trials, nonrandomized controlled trials, cohort studies, and pre–post studies) included in a recent systematic review of CRC screening interventions, 74.1% were clinic based, while 18.5% were community based, and only 7.4% were conducted in both community and clinic settings (Davis et al., 2018). Using intervention strategies to promote CRC screening in health care systems has been shown to increase CRC screening rates but may target only individuals who have a medical home and/or regular access to health services and not reach those who are at highest risk for CRC (Hall et al., 2018). To reach individuals who are at highest risk for CRC, community-based strategies may be needed.

#### Community-based CRC Screening Interventions for Latinos

Interventions that provide CRC education, reduce structural barriers, and offer appointment reminders have been shown to increase CRC screening (Mojica et al., 2016; Mojica et al., 2019; Sabatino et al., 2012). Emerging research suggests that group-based CRC interventions led by *promotores* (community health workers) are a promising approach to increase CRC screening among Latinos. Recently, Mojica et al. (2019) found significant increases in CRC screening among participants who received an education-plus-patient navigation intervention implemented within a federally qualified health center (FQHC) compared to participants who did not receive the intervention. Group-based interventions in community settings have the potential to reach community members who may not have access to regular health care and those who are served by the local health clinics (DeGroff et al., 2017; Enard et al., 2015; Lairson et al., 2018; Larkey et al., 2012).

The purpose of this study was to examine the preliminary impact on CRC screening test adherence, CRC knowledge, and perceived barriers to CRC screening of a group-based, *promotor*-led intervention to increase CRC screening adherence among Latinos compared to their baseline screening frequency. We also investigated feasibility and acceptability of

the *promotor*-led CRC intervention. The current study augments published research by recruiting participants from clinics and community organizations where participants may not have regular access to health care services. Reaching community members who do not have access to health care services or do not have health insurance is important to address the low CRC screening rates evident in underserved communities. Our findings will help inform randomized community trials that can test the effectiveness of group-based interventions for CRC screening adherence among Latinos.

#### METHODS

Juntos Contra el Cáncer/Together Against Cancer (JUNTOS) was a 3-year study (1 year of development, 2 years of implementation and evaluation) in collaboration with an FQHC serving a predominantly Latino neighborhood in San Diego, California. The partnering FQHC provides comprehensive health care in 36 sites throughout San Diego County, including 19 primary care clinics. The FQHC serves a diverse population at risk for cancer disparities: 56.6% are Latino, 92.2% live below the federal poverty level, 39% are uninsured, and 45% are insured by the state Medicaid program (MediCal). The goals of JUNTOS were to develop a community-based intervention to promote CRC screening test adherence among Latinos who were not adherent to CRC screening guidelines. The intervention consisted of a 2.5-hour *promotor*-led educational workshop with a 6- to 9-month followup phone call to assess completion of CRC screening. A description of the intervention can be found below. JUNTOS used a pre/post-intervention study design, and the primary outcome was participant self-report of CRC screening test adherence at 6 to 9 months after the intervention. In addition to the baseline and immediate post-intervention surveys, promotores called participants 2 weeks after participation to follow up on the status of CRC appointment scheduling and helped them schedule an appointment when needed. Last, research assistants called participants 6 to 9 months after participation to conduct a survey to collect information on CRC screening test completion. Participants received a \$15 gift card for completing the pre- and immediate post-workshop surveys assessing CRC knowledge and perceived barriers to CRC screening and an additional \$15 gift card after completing the 6- to 9-month survey. The study was approved by the San Diego State Institutional Review Board for involvement of human subjects.

#### Participant Recruitment and Eligibility Criteria:

Eligible participants included Latino men and women aged 50 to 75 years, not up-to-date with CRC screening (have not had a FIT [fecal immunochemical test]/FOBT [fecal occult blood test] in the past 12 months or a colonoscopy in the past 10 years), residing in a partnering FQHC's catchment area, and planning to remain in the San Diego area for the next 12 months.

Two types of strategies were used for recruitment: health care settings and community settings. Bilingual research assistants and *promotores* recruited study participants from the general community in non-health care settings within the catchment area (e.g., community centers, schools, senior centers, apartment complexes, markets, and health events) using convenience sampling from fliers, word of mouth, and announcements at community

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meetings. Screening status was unknown prior to recruitment for this group. Participants were also recruited from the partnering FQHC through lists of patients who were not up-todate with CRC screening. We recruited 1,479 individuals, with 1,024 from the community and 455 from the one of the clinics within the partnering FQHC (Figure 1). Six hundred twenty-six individuals (40%) were excluded because they either were unable to be contacted or declined screening for inclusion in the study. *Promotores* and research assistants screened the remaining 853 participants in person or by telephone to assess eligibility. Four hundred seventy-seven (384 from the community and 93 from the clinic) were excluded due to not meeting the inclusion criteria, with 276 (72%) of those from the community excluded because they reported being up-to-date with CRC screening. The remaining 376 screened individuals were eligible to participate, and 214 (57%) enrolled in the study.

#### **JUNTOS Intervention**

The JUNTOS intervention workshop was developed based on formative research using a needs assessment, literature review, focus groups with community members, and key informant interviews with FQHC staff. A community advisory board, which included members from community organizations, health organizations, the American Cancer Society, and the Office of Binational Border Health within the California Department of Public Health, provided feedback on the workshop materials.

Eligible participants were invited to attend a 2<sup>1</sup>/<sub>2</sub>-hour workshop led by the clinic-based promotores. Each workshop incorporated interactive group activities, didactic presentations, and discussions to further reinforce learning. The workshops provided information on CRC myths and misconceptions, CRC risk factors, and different screening methods. The workshops also used group activities to encourage participation, which included an interactive slide presentation on CRC myths and a modified Mexican lottery game called La Loteria (a "bingo"-style game with clues related to CRC screening; Elder et al., 2017). Participants were provided information on all options for CRC screening recommended by the U.S. Preventive Services Task Force, including screening for CRC starting at age 50 years and continuing until age 75 years. Participants also received handouts on CRC screening recommendations from the National Cancer Institute and the American Cancer Society. All workshop materials were culturally tailored for the target Latino population, with Spanish and English versions that used vocabulary appropriate for low literacy levels. At the end of the workshop and again 2 weeks after, promotores helped participants schedule CRC screening appointments with the partnering FQHC. For participants who had a medical home other than the partnering FQHC, community health workers encouraged them to make an appointment. The *promotores* offered to schedule an appointment with the partnering FQHC (whether they were already patients or if they did not have a home), and they referred them to the insurance enrollment specialists if they did not have insurance. The workshops were offered on different days of the week to accommodate different availabilities. The partnering FQHC and community-based organizations provided workshop spaces (classrooms and meeting rooms), and the partnering FQHC offered CRC screening at a sliding scale.

#### **Guiding Framework**

The intervention used theory-driven, multilevel approaches to consider the context in which Latinos live. Accordingly, the social-ecological framework guided the JUNTOS program as it recognizes that multiple levels of influence affect behaviors. These include individual factors, family support, the health care team, the organization or practice setting, and the community environment. At the individual level, the intervention targeted CRC knowledge, attitudes, and CRC screening barriers. At the interpersonal level, *promotores* offered social support during the workshop and through the telephone calls to follow up on the participants' efforts to schedule a CRC appointment. At the organizational and community levels, the FQHC and community-based organizations provided workshop spaces and had a "warm handoff" to the clinic (*promotores* connecting participants to the clinic system to make an appointment). The *promotores* were hired through the partnering FQHC to help schedule appointments directly and be a direct link to the clinic. At the community level, *promotores* distributed American Cancer Society cancer education materials.

**Promotor Training.**—Two clinic-based *promotores* (one male and one female) fluent in English and Spanish were hired by the partnering clinic to deliver the 2½-hour educational JUNTOS workshops. *Promotores* were selected based on their community involvement in promoting health and bilingual abilities in English and Spanish. They completed an 80-hour training conducted by the research team's outreach coordinator who evaluated their performance and supervised the *promotores*. *Promotores* were trained on participant recruitment and screening, how to lead CRC screening workshops, knowledge of community cancer screening services, current cancer screening guidelines (U.S. Preventive Services Task Force), obtaining participant informed consent, administering preand post-intervention surveys, and assisting participants with scheduling CRC screening appointments with the partnering FQHC.

#### Evaluation

Participant evaluation was conducted prior to participating in the workshop (baseline or pre-workshop survey) and immediately following the workshop (post survey). Study staff administered the survey within 12 months following completion of the workshop to assess whether participants completed the CRC screening test within 6 to 9 months post participation in the workshop.

#### Measures

Primary Outcome: Self-Report of CRC Screening test Adherence (Baseline and 6- to 9-Month Assessment).—Two questions in the phone survey asked about CRC screening: "Did you complete a screening test for colorectal cancer?" If participants answered "Yes" the follow-up question was, "If yes, which one?" Response options were "FIT/FOBT or other stool test," "colonoscopy," and "Other."

**Documentation of CRC Screening Test Completion Among Patients Registered With Partnering FQHC (n = 151; 85% of Participants).**—Direct review of the partnering FQHC's electronic health records (EHRs) validated self-report of screening completion. For participants that sought CRC screening test at the partnering FQHC,

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documentation of a date of screening completion (FIT or colonoscopy) at 6 to 9 months following attendance of the workshop was considered a confirmation of reported CRC screening test completion. Self-report of CRC screening test but lack of EHR documentation of test completion was adjudicated as not having completed the screening. Discordant results between self-report and the EHRs were reconciled. Self-report of nonscreening but EHR documentation of test completion was adjudicated as having completed screening. EHRs of participants who were not part of the partnering clinic were not confirmed.

**Sociodemographic Factors (Baseline).**—We assessed participants' age, country of birth (recoded to "born in the United States" and "not born in the United States"), gender, marital status, employment status, household income, education level, and health insurance.

**Health Conditions (Baseline).**—The 2015 Behavioral Risk Factor Surveillance System questions regarding chronic health conditions (Centers for Disease Control and Prevention, 2015) were used to assess whether participants had been diagnosed with diabetes, cancer, high blood pressure, and high cholesterol. Responses to these items were computed into the variable "health conditions," which was coded as "none," "one condition," "two conditions," and "more than two conditions."

Health Behaviors (Baseline).—Self-report measures of sedentary behavior and physical activity were adapted from the 2015-2016 National Health and Nutrition Examination Survey questions. Sedentary behavior was assessed by asking the number of minutes spent sitting on a typical day. Physical activity was assessed in terms of the number of days with physical activity adding up to at least 60 minutes per day during the past 7 days, with response options of 0 to 7 days. The number of days in which participants completed at least 60 minutes of physical activity was recoded into the three categories "none." "1 to 3 days," and "4 to 7 days." Smoking and alcohol consumption were measured with questions from the 2015 Behavioral Risk Factor Surveillance System Questionnaire (Centers for Disease Control and Prevention, 2015). Smoking frequency was assessed with the question "Do you now smoke cigarettes every day, some days, or not at all?"; alcohol consumption frequency was assessed as number of drinks during the past 30 days and recoded as "none" and "more than 1 drink" for final analysis. Last, given the association between consumption of red and processed meat and CRC risk (Bouvard et al., 2015), the processed meat consumption question "In an average week, how often do you eat regular processed meats (like bologna, salami, corned beef, hotdogs, sausage, or bacon)?" was included from the Rapid Eating and Activity Assessment for Participants-Short Version (Segal-Isaacson et al., 2004). Response options for this question were recoded into "rarely/never" and "sometimes/often" for final analysis.

**CRC Knowledge (Pre- and Post-workshop).**—A set of nine questions was used to assess CRC knowledge. Six of these questions (four measuring general knowledge of CRC and two measuring knowledge of CRC risk factors) were adapted from the CRC Knowledge Assessment Survey (Sanchez et al., 2013). The sum total scores were then calculated for each of the two surveys.

**Barriers to CRC Screening (Pre- and Post-workshop).**—Barriers to CRC screening were measured using an eight-item scale from the Barriers to FIT Survey and a 10-item scale from the Barriers to Colonoscopy Survey (Rawl et al., 2001). Barriers to screening questions were on a 5-point Likert-type scale from 1 = strongly agree to 5 = strongly *disagree* (Cronbach's  $\alpha$ : FIT scale = .59, colonoscopy scale = .76; Rawl et al., 2001).

**Clinic-Related Factors (Baseline).**—We assessed whether the partnering FQHC clinic was the participants' preferred clinic and whether cost was a barrier to health care. Participants were also asked about their last checkup.

**Feasibility.**—We evaluated intervention *implementation* and *acceptability* based on the guidelines proposed by Bowen et al. (2009). *Implementation* focuses on the extent to which an intervention can be fully implemented as planned, whereas *acceptability* focuses on the reaction of the target individuals to the intervention (Bowen et al., 2009). We evaluated *implementation* using number of workshops offered and attended and retention rate for the intervention. Two aspects of *acceptability* of intervention content were measured with questions in the post-workshop survey: satisfaction, with the open-ended question "What suggestion do you have for us to improve the workshop?" and appropriateness of workshop information, with the item "The information presented during the workshop was …" with response options "easy to understand" and "too difficult to understand."

#### **Data Analysis**

We performed descriptive statistics, chi-square analysis, and paired-sample *t* tests. Descriptive statistics were used to examine the frequencies of sociodemographic variables for the study sample: recruitment site (community, clinic), age, marital status, gender, education, household income, employment status, health insurance, chronic health conditions, and health behaviors. Chi-square analyses examined differences in sociodemographic between those who completed CRC screening test and those who did not. Paired-sample *t* tests were carried out to assess the differences in CRC knowledge and perceived barriers to FIT and colonoscopy at baseline and immediately after workshop attendance (pre- and post-workshop). Alpha levels were set at .05 for all significance tests. Additional analyses included manual coding of an open-ended question to assess participant satisfaction with the intervention and the sum scores of the Barriers to FIT Survey and Barriers to Colonoscopy Survey. A total of 182 participants completed the survey within a year. To be consistent with our 6- to 9-month criteria, we excluded five participants who were reached outside of the 9-month (but within 12 months) window. Thus, our final sample consisted of 177 participants.

#### RESULTS

Overall, 177 participants completed the intervention and were included in the final analyses. At the 6- to 9-month follow-up, 118 participants (66.7%) reported obtaining a CRC screening test. Direct review of the partnering FQHC's EHRs for registered patients resulted in a rate of self-report of documented CRC screening completion of 57%. Out of the 118 participants who reported obtaining CRC screening test, 90.5% (n = 105) received an FIT/

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FOBT or other stool test, 9.5% (n = 11) received a colonoscopy, and 1.7% (n = 2) reported receiving a CRC screening test but did not report details.

Table 1 presents the sociodemographic characteristics of the study population included in the final analyses. The population included was 98.3% Hispanic/Latino. Overall participants were primarily female (78.4%), with an average age of 58 years (Mdn = 57, SD = 6.1), and living in the United States for an average of 26 years (Mdn = 27, SD = 10.4). Most participants had a low education level, had low household incomes, were recruited mostly from the larger community (59.9%) versus the clinic (40.1%), and were uninsured (57.2%). The only variable that showed significant group differences for CRC screening versus no CRC screening at 6 months was health insurance status: 77.0% of those with health insurance reported having completed CRC screening compared to 59.6% of those who were uninsured (p = .02). Participants who were recruited from the clinic were significantly less likely to have health insurance compared to participants recruited from the community.

#### Differences in CRC Knowledge and Perceived Barriers to Obtaining CRC Screening

There were significant increases in CRC knowledge, t(169) = -20.8, p < .05, and changes in the expected direction when considering perceived barriers to FIT, t(171) = <2.2, p<.05, and colonoscopy, t(172) = -8.2, p < .01, from baseline to post-workshop assessments.

#### **Feasibility Metrics**

Implementation and Retention Rate.—The study offered 70 workshops, at spaces provided by six community organizations. Retention included those who completed the follow-up survey (83%). Acceptability. Analysis of the post-workshop survey open-ended question "What suggestion do you have for us to improve the workshop?" identified two main themes: (1) satisfaction with the workshop (with codes such as excellent, liked it, perfect, interesting, among others) and (2) suggestions for improvement (with codes such as more advertising, invite more people, offer the test for free, among others) with 143 participants (81%) reporting being satisfied with the workshops and seeing no need to improve it or make changes. At the same time, 40 (22%) participants made some suggestions for improvement, although none had negative comments. In addition, 97.7% of participants found the information presented during the workshop to be easy to understand, showing it was appropriate for the target population. Furthermore, results from the 6 to 9-month follow-up survey showed that the majority of participants (71.9%) who reported completing the CRC screening test used the information that they learned in the workshop to inform their decision to engage in that behavior, indicating the acceptability of this information.

#### DISCUSSION

JUNTOS was a pilot study that examined the feasibility, acceptability, and preliminary impact of the CRC *promotor*-led workshop plus "light warm handoff" by the *promotores* through the scheduling of appointments to promote the CRC screening test in Latinos. Our findings show that 66.7% of participants who were not adherent to CRC screening guidelines prior to participating in the intervention became adherent by the 6- to 9-month

follow-up. Findings from JUNTOS and other research (Community Prevention Services Task Force, 2019; Moralez et al., 2012; Rao et al., 2013; Shokar et al., 2016) suggest that involving *promotores* is an effective way to increase CRC screening test adherence among Latinos. Factors that may have contributed to the increase in adherence to CRC screening rates observed in JUNTOS include the systematic development of the intervention that involved the input of community partners and members of the target community. Another key aspect that helped explain success is the involvement of *promotores* who were hired as employees of the FQHC, thereby familiar with the FQHC system which in itself helped with the scheduling of appointment. The "warm hand-off" by the *promotores* through the facilitation of appointments likely increased the CRC screening test adherence. Furthermore, the clinic's ability to offer low-cost CRC screening to uninsured patients also reduced a common barrier to CRC screening among low-income communities (Muthukrishnan et al., 2019; Perisetti et al., 2018).

Participants who did not have health insurance were significantly less likely to seek the CRC screening test. Consistent with prior research, having health insurance is a strong predictor for seeking CRC screening (Beydoun & Beydoun, 2008), and Latinos are less likely to be insured compared to non-Hispanic Whites (Klabunde et al., 2012). These findings underscore the value of programs such as the Affordable Care Act and the Removing Barriers to Colorectal Cancer Screening Act of 2015 as they reduce cost barriers for CRC screening by mandating that private insurances and Medicare cover the complete cost of CRC screening tests for those above the age of 50 (National Colorectal Cancer Roundtable, 2012). The clinic partner in JUNTOS reduced financial screening barriers for uninsured participants, which may be a reason why the program was successful for uninsured clinic patients.

#### Limitations and Strengths

The JUNTOS study had limitations worth noting. This study was a single-group, pretest– posttest design with no randomized control group and causation cannot be established. Furthermore, 15% of our sample did not seek health services at the partner FQHC; therefore, we were unable to confirm CRC screening test adherence through EHRs for these participants. Also, the hiring of *promotores* to conduct community outreach as a strategy to engage individuals who do not adhere to regular CRC screening or do not have access to regular health care requires more resources (i.e., paid position) compared to less resource-intensive strategies (e.g., mailed out-reach, reminders). However, intensive community outreach strategies may be needed to increase the suboptimal CRC screening rates in some high-risk communities. Given that our program showed higher preliminary effectiveness than most evaluations of less intensive strategies, future research might compare the cost-effectiveness of these and other intervention strategies.

The current study has several strengths. JUNTOS engaged participants who were patients of the partnering clinic (85%) and included community members who did not have a medical home (15%). JUNTOS can be used as a model for linking community members to clinical care for screening that may be replicable by others. Because the majority of CRC interventions have been implemented in clinics (Davis et al., 2018), JUNTOS may have

extended services to those who do not respond to traditional clinic-based outreach strategies (e.g., clinic reminders) and/or experience additional barriers to CRC screening. JUNTOS could complement existing clinic services like mailed FOBT and other similar services. Although not a randomized controlled trial, the current study provides further support on the potential impact of group-level interventions for increasing CRC screening test adherence (Community Prevention Services Task Force, 2019).

#### Implications for Practice and Further Research

JUNTOS builds on the limited research that has evaluated the influence of interventions to promote adherence to the CRC screening test among Latinos. The JUNTOS study achieved a comparatively high CRC screening rate among male and female Latinos, a population particularly at risk for low screening and negative CRC cancer outcomes. Findings from the study suggest that a promotor-led, culturally tailored, group-based education intervention implemented in community settings can be a feasible and effective way to promote the CRC screening test among high-risk communities. Furthermore, the success of the program can be attributed, in large, to the fact that promotores targeted the different levels of the social-ecological framework: individual (e.g., participants' knowledge of CRC prevention), interpersonal (e.g., social support for attaining the CRC screening test), organizational (e.g., linking participants to the health center), and community (e.g., holding community educational workshops). These findings are consistent with the growing scientific consensus that to reduce CRC-related mortality, multilevel interventions are required that target activities across different levels. Our findings also under-score the importance of having access to health insurance as this was found to be associated with CRC screening test among our study participants.

#### Acknowledgments

The authors thank Carolina Lopez de la Torre for leading the development of the JUNTOS curriculum, supporting the implementation of the program, and outlining the methodology section. Authors also thank Sheila Kealey for editorial support of the manuscript. This work was supported by grants from the National Cancer Institute (U54CA132384 and U54CA132379).

#### REFERENCES

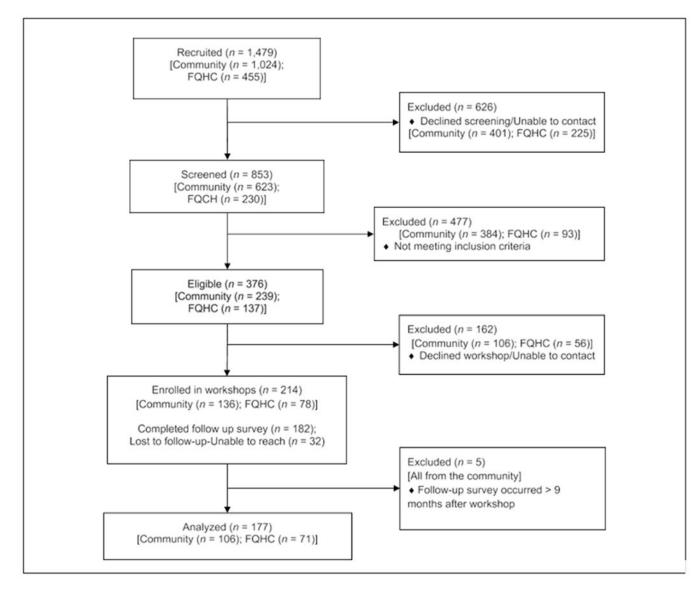
- Beydoun HA, & Beydoun MA (2008). Predictors of colorectal cancer screening behaviors among average-risk older adults in the United States. Cancer Causes & Control, 19(4), 339–359. 10.1007/ s10552-007-9100-y [PubMed: 18085415]
- Bouvard V, Loomis D, Guyton KZ, Grosse Y, Ghissassi FE, Benbrahim-Tallaa L, Guyton KZ, Grosse Y, El Ghissassi F, Bouvard V, Hall A, Jaillet C, Mattock H, & Straif K (2015). Carcinogenicity of consumption of red and processed meat. Lancet Oncology, 16(16), 1599–1600. 10.1016/ s1470-2045(15)00444-1 [PubMed: 26514947]
- Bowen DJ, Kreuter M, Spring B, Cofta-Woerpel L, Linnan L, Weiner D, Bakken S, Kaplan CP, Squiers L, Fabrizio C, & Fernandez M (2009). How we design feasibility studies. American Journal of Preventive Medicine, 36(5), 452–457. 10.1016/j.amepre.2009.02.002 [PubMed: 19362699]
- Centers for Disease Control and Prevention. (2015). Behavioral Risk Factor Surveillance System questionnaire. https://www.cdc.gov/brfss/questionnaires/pdf-ques/2015-brfssquestionnaire-12-29-14.pdf
- Centers for Disease Control and Prevention. (2016). National Health Interview Survey, Public-use data file and documentation. https://www.cdc.gov/nchs/data\_access/ftp\_data.htm

- Community Prevention Services Task Force. (2019). Cancer screening: Interventions engaging community health workers– Colorectal cancer, https://www.healthypeople.gov/2020/tools-resources/evidence-based-resource/cancerscreening-interventions-engaging-community-health-workers-%E2%80%93-colorectal-cancer
- Coronado GD, Golovaty I, Longton G, Levy L, & Jimenez R (2011). Effectiveness of a clinic-based colorectal cancer screening promotion program for underserved Hispanics. Cancer, 117(8), 1745–1754. 10.1002/cncr.25730 [PubMed: 21472722]
- Davis MM, Freeman M, Shannon J, Coronado GD, Stange KC, Guise JM, Wheeler SB, & Buckley DI (2018). A systematic review of clinic and community intervention to increase fecal testing for colorectal cancer in rural and low-income populations in the United States-How, what and when? BMC Cancer, 18(1), 40. 10.1186/s12885-017-3813-4 [PubMed: 29304835]
- DeGroff A, Schroy PC 3rd, Morrissey KG, Slotman B, Rohan EA, Bethel J, Murillo J, Ren W, Niwa S, Leadbetter S, & Joseph D (2017). Patient navigation for colonoscopy completion: Results of an RCT. American Journal of Preventive Medicine, 53(3), 363–372. 10.1016/j.amepre.2017.05.010 [PubMed: 28676254]
- Elder JP, Haughton J, Perez LG, Martinez ME, De la Torre CL, Slymen DJ, & Arredondo EM (2017). Promoting cancer screening among churchgoing Latinas: Fe en Accion/faith in action. Health Education Research, 32(2), 163–173. 10.1093/her/cyx033 [PubMed: 28380627]
- Enard KR, Nevarez L, Hernandez M, Hovick SR, Moguel MR, Hajek RA, Blinka CE, Jones LA, & Torres-Vigil I (2015). Patient navigation to increase colorectal cancer screening among Latino Medicare enrollees: A randomized controlled trial. Cancer Causes & Control, 26(9), 1351–1359. 10.1007/s10552-015-0620-6 [PubMed: 26109462]
- Guessous I, Dash C, Lapin P, Doroshenk M, Smith RA, & Klabunde CN (2010). Colorectal cancer screening barriers and facilitators in older persons. Preventive Medicine, 50(1-2), 3–10. 10.1016/ j.ypmed.2009.12.005 [PubMed: 20006644]
- Hall IJ, Tangka FKL, Sabatino SA, Thompson TD, Graubard BI, & Breen N (2018). Patterns and trends in cancer screening in the United States. Preventing Chronic Diseases, 15, E97. 10.5888/ pcd15.170465
- Holden DJ, Jonas DE, Porterfield DS, Reuland D, & Harris R (2010). Systematic review: Enhancing the use and quality of colorectal cancer screening. Annals of Internal Medicine, 152(10), 668–676. 10.7326/0003-4819-152-10-201005180-00239 [PubMed: 20388703]
- Klabunde C, Brown M, Ballard-Barbash R, White M, Thompson T, Plescia M, & King S (2012). Cancer screening: United States, 2010. MMWR Morbidity and Mortality Weekly Report, 61(3), 41–45. [PubMed: 22278157]
- Lairson DR, Kim J, Byrd T, Salaiz R, & Shokar NK (2018). Cost-effectiveness of community interventions for colorectal cancer screening: Low-income Hispanic population. Health Promotion Practice, 19(6), 863–872. 10.1177/1524839917750815 [PubMed: 29290126]
- Larkey LK, Herman PM, Roe DJ, Garcia F, Lopez AM, Gonzalez J, Perera PN, & Saboda K (2012). A cancer screening intervention for underserved Latina women by lay educators. Journal of Women's Health, 21(5), 557–566. 10.1089/jwh.2011.3087
- Meade CD, Wells KJ, Arevalo M, Calcano ER, Rivera M, Sarmiento Y, Freeman HP, & Roetzheim RG (2014). Lay navigator model for impacting cancer health disparities. Journal of Cancer Education, 29(3), 449–457. 10.1007/s13187-014-0640-z [PubMed: 24683043]
- Miller KD, Goding Sauer A, Ortiz AP, Fedewa SA, Pinheiro PS, Tortolero-Luna G, Martinez-Tyson D, Jemal A, & Siegel RL (2018). Cancer statistics for Hispanics/Latinos, 2018. CA Cancer Journal of Clinicians, 68(6), 425–445. 10.3322/caac.21494
- Mojica CM, Almatkyzy G, & Morales-Campos D (2019). A cancer education-plus-navigation intervention implemented within a federally qualified health center and community-based settings. Journal of Cancer Education. Advance online publication. 10.1007/s13187-019-01611-5
- Mojica CM, Morales-Campos DY, Carmona CM, Ouyang Y, & Liang Y (2016). Breast, cervical, and colorectal cancer education and navigation: Results of a community health worker intervention. Health Promotion Practice, 17(3), 353–363. 10.1177/1524839915603362 [PubMed: 26384925]
- Moralez EA, Rao SP, Livaudais JC, & Thompson B (2012). Improving knowledge and screening for colorectal cancer among Hispanics: Overcoming barriers through a PROMOTORA-led

home-based educational intervention. Journal of Cancer Education, 27(3), 533–539. 10.1007/ s13187-012-0357-9 [PubMed: 22488199]

- Muthukrishnan M, Arnold LD, & James AS (2019). Patients' self-reported barriers to colon cancer screening in federally qualified health center settings. Preventive Medicine Reports, 15, Article 100896. 10.1016/j.pmedr.2019.100896
- National Colorectal Cancer Roundtable. (2012). Coverage of colonoscopies under the Affordable Care Act's prevention benefit. http://nccrt.org/wp-content/uploads/NCCRT.KFF-report.pdf
- Perisetti A, Khan H, George NE, Yendala R, Rafiq A, Blakely S, Rasmussen D, Villalpando N, & Goyal H (2018). Colorectal cancer screening use among insured adults: Is out-of-pocket cost a barrier to routine screening? World Journal of Gastrointestinal Pharmacology and Therapeutics, 9(4), 31–38. 10.4292/wjgpt.v9.i4.31 [PubMed: 30191078]
- Rao S, Moralez E, Livaudais-Toman J, Lozano V, & Thompson B (2013). Evaluation of a Promotoraled Intervention on Colorectal Cancer among Hispanics: Findings Related to Perceptions and Communications. California Journal of Health Promotion, 11(2), 21–31.
- Rawl S, Champion V, Menon U, Loehrer PJ, Vance GH, & Skinner CS (2001). Validation of scales to measure benefits of and barriers to colorectal cancer screening. Journal of Psychosocial Oncology, 19(3-4), 47–63. 10.1300/J077v19n03\_05
- Sabatino SA, Lawrence B, Elder R, Mercer SL, Wilson KM, DeVinney B, Melillo S, Carvalho M, Taplin S, Bastani R, Rimer BK, Vernon SW, Melvin CL, Taylor V, Fernandez M, & Glanz K (2012). Effectiveness of interventions to increase screening for breast, cervical, and colorectal cancers: Nine updated systematic reviews for the guide to community preventive services. American Journal of Preventive Medicine, 43(1), 97–118. 10.1016/j.amepre.2012.04.009 [PubMed: 22704754]
- Sanchez JI, Palacios R, Thompson B, Martinez V, & O'Connell MA (2013). Assessing colorectal cancer screening behaviors and knowledge among at-risk Hispanics in Southern New Mexico. Journal of Cancer Therapy, 4(6B), 15–25. 10.4236/jct.2013.46A2003 [PubMed: 25621179]
- Segal-Isaacson CJ, Wylie-Rosett J, & Gans KM (2004). Validation of a Short Dietary Assessment Questionnaire: The Rapid Eating and Activity Assessment for Participants–Short Version (REAP-S). The Diabetes Educator, 30(5), 774–781. 10.1177/014572170403000512 [PubMed: 15510530]
- Shokar NK, Byrd T, Salaiz R, Flores S, Chaparro M, Calderon-Mora J, Reininger B, & Dwivedi A (2016). Against Colorectal Cancer in Our Neighborhoods (ACCION): A comprehensive community-wide colorectal cancer screening intervention for the uninsured in a predominantly Hispanic community. Preventive Medicine, 91, 273–280. 10.1016/j.ypmed.2016.08.039 [PubMed: 27575314]

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**FIGURE 1: Consort Flow Diagram Noting Recruitment Source** NOTE: FQHC = Federally Qualified Health Center

#### Table 1.

Socio-Demographic Characteristics between Participants Adherent and Not Adherent to CRC Screening After Participation in Intervention

Variable	Total N = 177, N(%)	CRC Screened N = 118, 66.7%	Not CRC Screened N = 59, 33.3%	P-valu
Recruitment				
Community	106 (59.9)	65 (55.1)	41 (69.5)	0.07
Clinic	71 (40.1)	53 (44.9)	18 (30.5)	
Age (Mean = 58 years)				
50 - 60	127 (71.8)	83 (70.3)	44 (74.6)	0.57
61 - 70	43 (24.3)	31 (26.3)	12 (20.3)	
71+	7 (4.0)	4 (3.4)	3 (5.1)	
Gender				
Female	138 (78.4)	94 (79.7)	44 (75.9)	0.57
Male	38 (21.6)	24 (20.3)	14 (24.1)	
	Missing $n = 1$			
Marital Status				
Coupled	101 (57.1)	65 (55.1)	36 (61.0)	0.45
Not Coupled	76 (42.9)	53 (44.9)	23 (39.0)	
Employment Status				
Employed	101 (57.1)	68 (57.6)	33 (55.9)	0.83
Unemployed	76 (42.9)	50 (42.4)	26 (44.1)	
Household Income				
\$0 - \$2,000	121 (82.3)	78 (84.8)	43 (78.2)	0.31
\$2,001+	26 (14.7)	14 (15.2)	12 (21.8)	
	Missing $n = 30$			
Education Level				
Some high school or less	138 (78.0)	95 (80.5)	43 (72.9)	0.25
High school graduate or more	39 (22.0)	23 (19.5)	16 (27.1)	
Health Insurance				
Uninsured	99 (57.2)	59 (50.9)	40 (70.2)	0.02
Insured	74 (42.8)	57 (49.1)	17 (29.8)	
	Missing $n = 4$			
Health Conditions				
None	25 (15.4)	13 (11.8)	12 (23.1)	0.30
One	37 (22.8)	26 (23.6)	11 (21.2)	
Two	41 (25.3)	28 (25.5)	13 (25.0)	
More than two	59 (33.3)	43 (39.1)	16 (30.8)	
	Missing $n = 15$			
Health Behaviors				
Sedentarism				
0 to 120	59 (33.7)	43 (37.1)	16 (27.1)	0.42
121 to 240	62 (35.4)	39 (33.6)	23 (39.0)	

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Variable	Total N = 177, N(%)	CRC Screened N = 118, 66.7%	Not CRC Screened N = 59, 33.3%	P-value
More than 240	54 (30.9)	34 (29.3)	20 (33.9)	
	Missing $n = 2$			
Physical Activity				
None	65 (39.4)	46 (41.8)	19 (34.5)	0.48
1 to 3	47 (28.5)	32 (29.1)	15 (27.3)	
4 to 7	53 (32.1)	32 (29.1)	21 (38.2)	
	Missing $n = 12$			
Alcohol Consumption				
None	131 (74.4)	90 (76.9)	41 (69.5)	0.30
More than 1 drink	45 (25.6)	27 (23.1)	18 (30.5)	
	Missing $n = 1$			
Processed Meat Cons.				
Rarely/Never	86 (48.9)	52 (44.4)	34 (57.6)	0.10
Sometimes/Often	90 (51.1)	65 (55.6)	25 (42.4)	
	Missing $n = 1$			
Smoking				
Not at all	166 (93.8)	110 (93.2)	56 (94.9)	0.75
Some Days/Every Day	11 (6.2)	8 (6.8)	3 (5.1)	

*Note:* Screening outcomes based on M2 survey at six months post-intervention; *CRC Screened* = completion of FIT/colonoscopy; *Not CRC Screened* = no completion of FIT/colonoscopy