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ORIGINAL PAPER

A Workplace-Based Intervention to Improve Awareness, Knowledge, and Utilization of Breast, Cervical, and Colorectal Cancer Screenings Among Latino Service and Manual Labor Employees in Utah

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Abstract

In the United States, Latinos are more likely to be uninsured and diagnosed with later stage cancer than non-Hispanic whites. Promotoras (lay health educators) help improve cancer knowledge and facilitate access to cancer screenings. We tested a promotora led workplace-based intervention to improve knowledge of and adherence to breast, cervical, and colorectal cancer screening among Latino employees in service or manual labor jobs. Latinos 18 and older from Salt Lake County, Utah were enrolled from January 2015 to February 2016. N = 265 completed pre- and post-intervention surveys that measured knowledge of and adherence to breast, cervical, and colorectal cancer screenings. Demographic, economic, and cancer factors of participants who completed the intervention were compared to those who were incomplete. Changes in knowledge and adherence were calculated using McNemar's tests. Logistic regression compared outcomes by select demographic, economic and cancer factors. More participants were older, spoke Non-English languages, were single/widow(er)s, worked part-time, and had an immediate family member with cancer compared to those who did not complete the study (all $p < 0.05$). Knowledge of the age to begin cancer screenings increased significantly from baseline to follow-up for cervical (65.1–77.7%), breast (67.2–81.7%), and colorectal cancer (49.8–80.7%), all $p \leq 0.001$. Knowledge of the frequency of cervical (34.0–46.5%) and colorectal (72.1–84.5%) screening increased from baseline to follow-up, both $p < 0.001$. Adherence to fecal immunochemical tests (FIT) for colorectal cancer increased from baseline to follow-up (13.8–56.9%, $p < 0.001$). Promotora led workplace-based interventions can strengthen community capacity for educating and supporting Latino employees in preventing breast, cervical, and colorectal cancer.

Keywords Health education · Intervention · Community-based participatory research · Cancer prevention · Latino

Introduction

In the United States (US), Latinos are more likely to be diagnosed with later stage cancers than non-Hispanic whites [1–3], which may be due to Latinos' lower cancer screening rates and lack of insurance compared to non-Hispanic whites [1–3]. Similar to other US regions, in Utah, Latinos often work in low-income service industry and manual labor jobs [4]. The lack of insurance offered by these positions may reduce access to healthcare including preventive cancer screenings [5].

Promotoras (lay health educators) are trusted members of Latino communities that are effective at improving cancer education and screening in the Latino community [6]. Promotoras are able to leverage existing relationships with communities, which makes them well poised to provide

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education in a culturally sensitive way to other Latinos who are employed in their same social networks [6]. Reaching Latino employees through promotoras in their workplaces may provide untapped opportunities to improve cancer screenings among low-income and uninsured Latino populations who otherwise may have limited access to health information and screening procedures.

We adapted the Prevention Care Management program from the National Cancer Institute Research-Tested Intervention Programs [7, 8], and created a work-place based intervention to improve awareness of cancer and cancer prevention behaviors among Latino workers employed in service and manual labor jobs in Utah. We partnered with promotoras at two community-based organizations and with local businesses to provide cancer prevention education and patient navigation for access to low cost cancer screening services during the study. We evaluated the efficacy of the intervention through pre- and post-test surveys to assess changes in participant's knowledge of recommended cancer screening age and frequency for breast, cervical, and colorectal cancer. Our hypothesis was that knowledge of and adherence to cancer screening tests for breast, cervical, and colorectal cancer would increase from baseline to follow-up. Additionally, we examined how sociodemographic factors influenced the effect of promotora-led health education on knowledge and adherence to recommended cancer screenings.

Methods

This community-based participatory study was centered on a partnership between researchers at Huntsman Cancer Institute and the University of Utah; managers of professional home cleaning, hotel cleaning, construction, transportation, and culinary/restaurant service businesses in Salt Lake County, Utah; and two community-based organizations that serve Latino communities in Salt Lake County, Utah. The community-based Latino organizations each included a team of promotoras who were actively involved in cancer prevention education, cancer survivorship support, Latino health advocacy, and improving access to cancer screening services among vulnerable and underserved Latino populations in Utah. Our goal was to identify whether patient navigation and health education programs targeted at service-related workplaces could improve Latino employees' knowledge and adherence to recommended breast, cervical, and colorectal cancer screenings.

Before the study began, a 2-hour promotora training session was conducted by the University research team at each of the community-based Latino organizations in partnership with the community leaders. During the training sessions, promotoras received orientation and instruction on the research protocol, human subjects research ethics, and interpreting the results of fecal immunochemical tests (FIT) by a bilingual and bicultural health educator from our cancer center and the University of Utah research team. The promotoras and leaders of the community-based Latino organizations partnered with the research team to design the survey instruments and plan participant recruitment to ensure multi-cultural acceptability of the data collection approach that was strategically implemented. The University of Utah institutional review board approved this study.

Participant Eligibility, Recruitment, and Data Collection

Eligible employees spoke Spanish or English, were aged 18 years or older, and were employed in a service or manual labor job. Managers of professional home cleaning, hotel cleaning, construction, transportation, and culinary/restaurant service businesses in Salt Lake County were recruited using flyers, postcards, and sign-up sheets. Employees who were interested in participating provided their contact information to their managers. Workplace managers provided sign-up sheets to the research team, who provided the names and phone numbers of interested employees to the community-based Latino organizations. Promotoras also recruited eligible participants at community health fairs and from their social networks.

Promotoras contacted potential participants, assessed eligibility, administered the pre-test (116 open and close-ended items), conducted the intervention, distributed home-based FIT tests to eligible participants, and then administered the post-test (98 open and close-ended items) in-person or on the telephone. Pre- and post-tests measured attitudes, perceptions, and knowledge of cervical, breast, and colorectal cancer, previous diagnoses of cancer, and current knowledge of cancer prevention. Promotoras collected the results of FIT tests from eligible participants (i.e., aged 50 years or older and overdue for colorectal cancer screening) for whom they also administered a brief process evaluation survey (13 open and close-ended items). Data were collected January 2015–February 2016.

Intervention

The intervention consisted of two promotora-led educational sessions delivered over the telephone, in person at a location selected by the participant, or at one of the local businesses. Participants were assigned a promotora who provided tailored education about cancer prevention, detection, and treatment for cervical, breast, and colorectal cancer. Participants also received guidance on overall healthy lifestyle strategies for the prevention of cancer. The promotoras then provided support and navigation to eligible participants to

help them schedule and receive any cancer screening for which they were overdue, including FIT. Lastly, participants completed a post-test. Participants received gift card incentives at each step during the intervention: pre-test ($15), post-test ($20), and FIT evaluation survey ($25).

Outcomes

Outcomes included knowledge of and adherence to cervical, breast, and colorectal cancer screenings. Knowledge was assessed using two dichotomous outcomes for each cancer screening question (correct, incorrect, see Table 1): (1) age at which individuals should begin cervical, breast, and colorectal cancer screenings (2) frequency with which individuals should receive cervical, breast, and colorectal cancer (fecal occult blood test/FIT, sigmoidoscopy, colonoscopy) screenings. Aggregate variables were created to measure changes in knowledge of the recommended frequency for colorectal cancer screenings by screening type. Participants who marked a correct response for at least one colorectal cancer screening frequency (i.e., fecal occult blood test/FIT, sigmoidoscopy, colonoscopy) were marked as having a correct response in the aggregate colorectal cancer frequency variable. Knowledge was assessed for all participants with non-missing data on the pre- and post-intervention surveys (n = 265). Adherence to cancer screenings was assessed for subgroups of participants based on their gender and age: cervical cancer screening (females aged 21–65 years, n = 193), breast cancer screening (females aged 40–74 years, n = 149), and colorectal cancer screening (participants aged 50–75 years, n = 112).

Demographic, Economic, and Cancer Characteristics

All demographic, economic, and cancer characteristics were self-reported by participants. Demographic characteristics included age, sex, birthplace, primary language, education, and relationship status. Economic characteristics included

Table 1 Items used to assess knowledge of and adherence to cancer screenings among Latino manual labor and service workers in Salt Lake County, Utah from January 2015 to February 2016

Item	Outcome measure	Correct response	Asked of
At what age should women be screened for cervical cancer with a Pap smear?	Cervical cancer age	21 years old	All participants
At what age should women begin screening for breast cancer with a mammogram?	Breast cancer age	40 years old or 50 years old	All participants
At what age should someone begin screening for colorectal cancer with either a fecal occult blood test (FOBT/FIT), sigmoidoscopy, or colonoscopy?	Colorectal cancer age	50 years old	All participants
How often should women be screened for cervical cancer with a Pap smear?	Cervical cancer frequency	Every 3 years	All participants
How often should women be screened for breast cancer with a mammogram?	Breast cancer frequency	Every 2 years	All participants
How often should someone be screened for colorectal cancer with a fecal occult blood test (FOBT/FIT)?	Colorectal cancer frequency aggregate variable	Once per year	All participants
How often should someone be screened for colorectal cancer with a sigmoidoscopy?	Colorectal cancer frequency aggregate variable	Every 5 years	All participants
How often should someone be screened for colorectal cancer with a colonoscopy?	Colorectal cancer frequency aggregate variable	Every 10 years	All participants
During the past 3 years, have you had a Pap smear?	Adherence cervical cancer	Yes	Females ages 21–65
During the past year, have you had a mammogram?	Adherence to breast cancer	Yes	Females ages 40–74
During the past year, have you had a fecal occult blood test done to screen for colon cancer?	Colorectal cancer adherence aggregate variable	Yes	Participants ages 50–75
During the past 5 years, have you had a sigmoidoscopy done to screen for colon cancer?	Colorectal cancer adherence aggregate variable	Yes	Participants ages 50–75
During the past 10 years, have you had a colonoscopy done to screen for colon cancer?	Colorectal cancer adherence aggregate variable	Yes	Participants ages 50–75

current occupation, work status, insurance status, and annual income. Family cancer history included personal history, immediate family member history, and other relative history.

Sample Size and Assignment Method

The target sample size was determined based on prior research and the results from the feasibility of the pilot study [9]. The goal was to recruit 300 participants, of which 75 were eligible for FIT testing. Participants were assigned to a promotora based on their language preference and gender, with approximately equal distribution of patients assigned to each Latino community organization.

Statistical Methods

The unit of analysis was each participant's change in knowledge and adherence from pre-test to post-test. We compared differences in demographic, economic, and cancer characteristics between those who completed the intervention and those with incomplete records using Chi square and Fisher's Exact tests. McNemar's tests were utilized to assess change in the proportion of participants with improved knowledge of and adherence to breast, cervical, and colorectal cancer screenings. There was some missing data in the outcome variables (range n = 0–36 missing). Univariate logistic regression analyses were used to estimate crude (OR) and adjusted odds ratios (aOR) and 95% confidence intervals (95% CI) for associations between demographic, economic, and cancer characteristics for knowledge of and adherence to cervical, breast, and colorectal cancer screening. All analyses were conducted using Stata 14.2 [10]; values were considered significant at $p \leq 0.05$.

Results

Demographic, Economic, and Cancer Characteristics

Of 318 participants, 265 completed the intervention and 53 did not (completion rate of 83.3%). Differences between those who completed the intervention and those who did not are shown in Table 2. Among those who completed the intervention, the majority were ages 31–49 (49.1%), female (79.6%), born in Mexico (64.5%), primarily spoke non-English languages (88.3%), high school educated (57.4%), and married/living with a partner (67.2%). In terms of employment, most participants held service/manual labor jobs (60.4%), were working part-time/temporary jobs (39.6%) and uninsured (69.1%). Most participants were making between $10,000 to less than $25,000 per year (43.4%). While the majority of participants did not have a personal history of cancer (92.4%), nearly a third (27.9%) had an immediate family member with a cancer history, and 37.7% had another relative with a cancer history.

Cancer Screening Knowledge

In Fig. 1, knowledge of the age at which to begin cancer screenings increased significantly from baseline to follow-up for cervical (65.1% baseline vs. 77.7% follow-up, $p < 0.001$), breast (67.2% baseline vs. 81.7% follow-up, $p < 0.001$), and colorectal cancer (49.8% baseline vs. 80.7% follow-up, $p = 0.001$) screenings. Knowledge of the frequency of cancer screenings increased from baseline to follow-up for cervical (34.0% baseline vs. 46.5% follow-up, $p < 0.001$) and colorectal cancer (72.1% baseline vs. 84.5% follow-up, $p < 0.001$) screenings. Knowledge of breast cancer screening frequency also increased, but was not significantly different at follow-up (14.2% baseline vs. 20.0% follow-up, $p = 0.07$).

Cancer Screening Adherence

In Fig. 2, adherence to cancer screening among eligible females was relatively high at baseline for cervical (Papanicolaou, 77.7% ages 21–65 years) and breast (mammogram, 66.4% ages 40–74 years) cancer screenings. While the proportion of adherent participants did increase at follow-up (Papanicolaou: 79.9%, mammogram: 68.5%), these increases were not statistically significant. For colorectal cancer screening, adherence to screening recommendations for sigmoidoscopy (baseline = 0.9%, follow-up = 1.8%) and colonoscopy (baseline and follow-up = 30.8%) among eligible participants, ages 50–75 years, were relatively unchanged from baseline to follow-up. However, for FIT testing there was an increase in adherence among eligible individuals from 13.8% at baseline to 56.9% at follow-up, $p < 0.001$.

Improvement in Cancer Screening Knowledge

Among those with incorrect knowledge of breast cancer screening at baseline, having health insurance was associated with a fivefold increase in knowing the correct age at which to receive breast cancer screening (OR 5.28, 95% CI 1.39–20.04, $p = 0.015$) compared to those without health insurance (data not shown). Older participants who answered incorrectly about the frequency of breast cancer screening at baseline had lower odds of answering correctly at follow-up (31–49 years: OR 0.19, 95% CI 0.06–0.61, $p = 0.006$ ages 50 and older: OR 0.20, 95% CI 0.06–0.64, $p = 0.007$) compared to participants ages 18–30 years. Those with higher incomes were also less likely to improve in their knowledge about the frequency of breast-cancer screening at follow-up ($10,000–$24,999 OR 0.40, 95% CI 0.16–1.00, $p = 0.05$) compared to the lowest income participants, earning annual incomes of $5000–$9999.

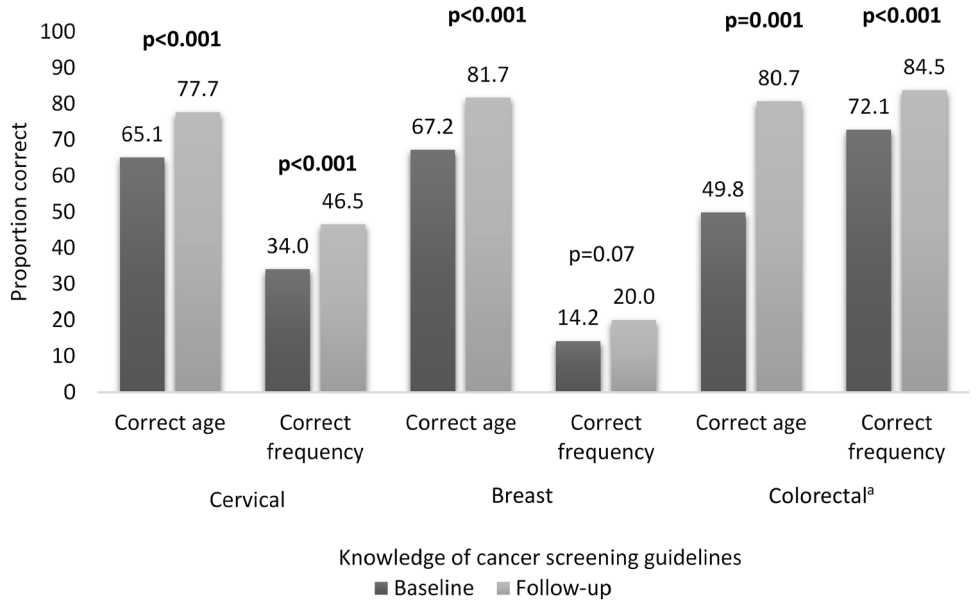

Fig. 1 *Cancer screening knowledge at baseline and follow-up for service industry and manual labor employees in Salt Lake County, Utah from January 2015 to February 2016 (N = 265)*[b]. Superscript "a" represents participants were asked about three types of colorectal cancer screenings: fecal occult blood test (FOBT) or fecal immunochemical (FIT), sigmoidoscopy, and colonoscopy. Participants were indicated as having correct responses if they selected the correct response for at least one of the three colorectal cancer screening questions. Superscript "b" represents missing for, variable (n): cervical correct age (n = 36), cervical correct frequency (n = 33), breast correct age (n = 24), breast correct frequency (n = 25), colorectal correct age (n = 32). All participants selected at least one colorectal frequency response, thus there were no missing in the aggregate colorectal correct frequency variable. The proportions (shown in this figure) are based on non-missing data

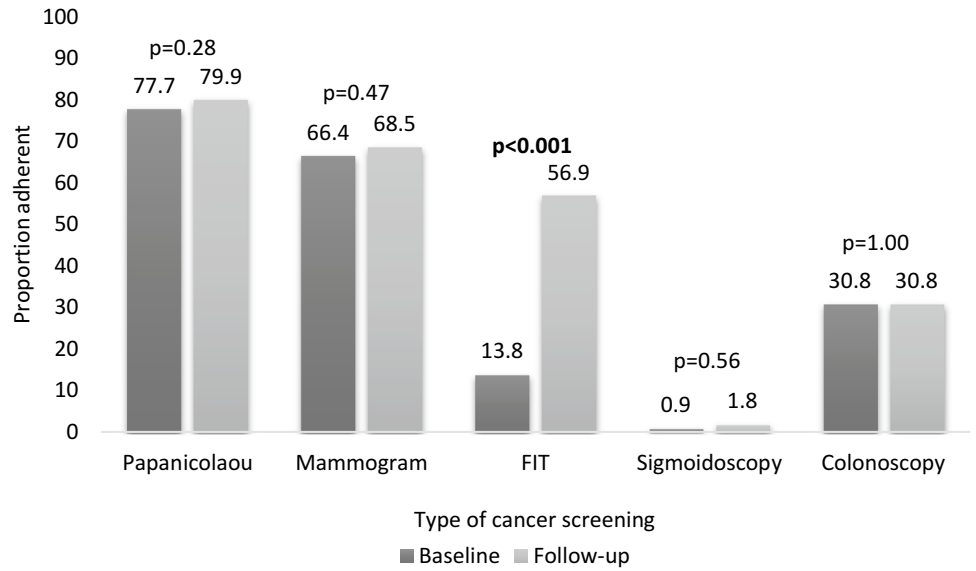

Fig. 2 *Cancer screening adherence at baseline and follow-up for service industry and manual labor employees in Salt Lake County, Utah from January 2015 to February 2016*[a,b]. Superscript "a" represents sample sizes were limited to participants who were eligible for screenings based on age and sex: Papanicolaou (n = 193 females ages 21–65 years), mammogram (n = 149 females ages 40–74 years), fecal immunochemical test (FIT) (n = 112 participants ages 50–75 years), sigmoidoscopy (n = 112 participants ages 50–75 years), colonoscopy (n = 112 participants ages 50–75 years). Superscript "b" represents missing for, variable (n): Papanicolaou (n = 9), mammogram (n = 6), FIT (n = 3), sigmoidoscopy (n = 4), colonoscopy (n = 5). The proportions (shown in this figure) are based on non-missing data

Table 2 Baseline demographic, economic, and cancer characteristics of service industry and manual labor employees compared to those who did not complete the intervention in Salt Lake County, Utah from January 2015 to February 2016 (N = 318)

Item	Completed[a] N = 265		Incomplete[b] N = 53		p-value
	N	%	N	%	
Demographics					
Age					
18–30	19	7.2	5	9.4	**0.01**[c]
31–49	130	49.1	37	69.8	
50 and older	113	42.6	11	20.8	
Sex					
Female	211	79.6	39	73.6	0.33[c]
Male	54	20.4	14	26.4	
Birthplace					
USA	16	6.0	2	3.8	0.16[d]
Mexico	171	64.5	41	77.4	
Other (e.g., Mexico, Argentina, Peru, Brazil)	72	27.2	8	15.1	
Primary language					
Non English (e.g., Spanish, Portuguese)	234	88.3	40	75.5	**0.03**[c]
English multilingual (e.g., English and Spanish)	24	9.1	10	18.9	
Education					
< High school	104	39.2	26	49.1	0.21[c]
≥ High school	152	57.4	26	49.1	
Relationship status					
Married/partner	178	67.2	45	84.9	**0.02**[c]
Single/widow(er)	74	27.9	7	13.2	
Economic characteristics					
Current occupation					
Managerial/office worker	10	3.8	3	5.7	0.39[d]
Service/manual worker	160	60.4	36	67.9	
Not working/other	88	33.2	13	24.5	
Work status					
Full-time	101	38.1	29	54.7	**0.01**[c]
Part-time, temporary work	105	39.6	10	18.9	
Unemployed, retired	46	17.4	7	13.2	
Insurance status					
Insured	71	26.8	15	28.3	0.83[c]
Uninsured	183	69.1	36	67.9	
Annual income					
$5000 to less than $10,000	52	19.6	11	20.8	0.37[c]
$10,000 to less than $25,000	115	43.4	23	43.4	
$25,000 to $55,000 or more	84	31.7	10	18.9	
Family cancer history					
Personal history					
No	245	92.4	51	96.2	0.75[d]
Yes	17	6.4	2	3.8	
Immediate family member history					
No/don't know	181	68.3	28	52.8	**0.02**[c]
Yes	74	27.9	23	43.4	
Other relative history					
No/don't know	148	55.8	32	60.4	0.68[c]
Yes	100	37.7	19	35.8	

[a]Percentages may not add to 100% due to missing. Missing for age (n = 3), birthplace (n = 6), primary language (n = 7), education (n = 9), relationship status (n = 13), current occupation (n = 7), work status (n = 13), insurance status (n = 11), annual income (n = 14), personal history (n = 3), immediate family member history (n = 10), other relative history (n = 17)

[b]Percentages may not add to 100% due to missing. Missing for birthplace (n = 2), primary language (n = 3), education (n = 1), relationship status (n = 1), current occupation (n = 1), work status (n = 7), insurance status

Table 2 (continued)

(n = 2), annual income (n = 9), immediate family member history (n = 2), other relative history (n = 2)

[c]Chi-square test, bold indicates significance at $p < 0.05$

[d]Fisher's Exact test, bold indicates significance at $p < 0.05$

Improvement in Cancer Screening Adherence

Males who were not adherent at baseline had higher odds of improving in FIT testing for colorectal cancer screening compared to females (OR 2.95, 95% CI 1.08–8.05, p = 0.035) (data not shown). Participants who were working part-time/temporary work (OR 0.30, 95% CI 0.11–0.80, p = 0.017) had lower odds of improving in FIT testing for colorectal cancer screening at follow-up compared to full-time employees. Those with the highest earnings, of $25,000 or more per year, had higher odds of improving in FIT testing for colorectal cancer screening (OR 10.2, 95% CI 2.74–37.94, p = 0.001) compared to those earning $5000–$9999 per year. When adjusted for age, these findings were slightly attenuated, with males showing 2.93 higher odds (95% CI 1.07–8.01, p = 0.036) of improving in FIT testing from baseline to follow-up compared to females; and highest income participants showing 9.12 higher odds of improvement (95% CI 2.23–37.22, p = 0.002) compared to lowest income participants when adjusted for age and sex.

In secondary analyses, we examined whether participants who demonstrated no improvement in adherence from baseline to follow-up currently had an appointment scheduled for cervical (n = 10, 5.7%), breast (n = 28, 21.0%), and colorectal (n = 2, 1.8%) cancer screening at follow-up, which may have diminished improvements in adherence if participants completed their scheduled screenings after the study timeframe.

Discussion

Our promotora-led workplace-based educational intervention demonstrated that by collaborating with community partners, businesses can successfully implement a cancer education/screening intervention to improve cancer screening knowledge and adherence among Latinos working in service and manual labor industry jobs. This intervention improved knowledge of screening guidelines for cervical, breast, and colorectal cancer and adherence for colorectal cancer screening among Latinos who may not be getting information about cancer screenings from providers, given that only 26.8% of our sample had health insurance.

The most notable strength of this study was the meaningful contribution of promotoras. Promotoras are trusted community members that are typically culturally and linguistically similar to participants, making them a trusted source of information for Latinos [11]. Participants may have been more receptive to cancer screening information delivered from promotoras than a formal healthcare provider, who may not necessarily be a cultural and linguistic match for them, potentially making participants more comfortable asking follow-up questions for clarification and alleviating cultural barriers [11, 12]. Patient navigation and health education provided through promotoras significantly improved participant knowledge regarding cervical, breast, and colorectal cancer screening guidelines from pre- to post-intervention (all were significant except for knowledge regarding breast cancer frequency). This study demonstrates that a workplace-based promotora health education model may be successful when disseminated on a broader scale, but more research is necessary to test the feasibility of scaling up such an intervention.

The improvement in FIT adherence in our study may have been driven by the low baseline adherence at only 13.8%, compared to cervical and breast baseline adherence which were both substantially higher (Papanicolau 77.7% adherent, mammogram 66.4% adherent). All of the colorectal cancer screening methods (FIT, sigmoidoscopy, and colonoscopy) had the lowest adherence at baseline, however our data for colorectal cancer screening mirrors national data for both Latinos and Non-Hispanic Whites [1]. Other factors that may have bolstered colorectal cancer adherence included the personal interaction between overdue participants and their promotora, who physically handed them a FIT test at the time of the intervention. As compared to other cancer screening tests, the FIT does not require a doctor's visit and can be read and interpreted at home, potentially making it easier for individuals who lack health insurance and/or a primary care provider to complete the test. This immediate delivery of a screening test may have made it less burdensome to complete the FIT and the personal connection with a promotora may have encouraged participants to complete the test.

While our results demonstrated a significant increase in adherence to colorectal cancer screening using a home-based FIT, the increases in adherence for cervical and breast cancer screenings were not significantly different from baseline to follow-up. Although patient navigation was provided by the promotoras to participants who were overdue for cervical and breast cancer screening, there were only modest increases in the proportion of participants who were adherent at follow-up (2.2% increase for Papanicolaou and 2.1% increase for mammogram). Aside from having relatively high adherence at baseline, the promotoras experienced systematic issues in scheduling an appointment for overdue participants. Specifically, scheduling was hampered by

long wait times for appointments, decreasing the impact may have been observed over a longer intervention period. Lastly, although breast and cervical cancer screenings were offered free or low cost, some out of pocket costs may have still prohibited completion of Papanicolaou tests and mammograms [13].

Health insurance coverage is the strongest predictor of whether or not someone receives a cancer screening [14, 15], yet a high proportion of our participants (72%) were uninsured. Uninsured participants may have had limited interactions with a healthcare provider, potentially leading to low cancer screenings at baseline and low cancer knowledge [16]. Furthermore, while the expansion of Medicaid and in introduction of the Affordable Care Act has been shown to increase earlier stage cancer diagnosis among the working population [17], Utah only recently implemented a partial Medicaid expansion in March 2018. Thus low-income working Latino Utahans may not be experiencing improvements in the receipt of breast and cervical cancer screenings due to the Medicaid expansion. This is an important area for future consideration in workplace-based interventions.

From an implementation standpoint, inconsistent participation from partnering businesses was a challenge that should be considered in future workplace-based interventions. While business managers were overall enthusiastic about facilitating access and supportive of the goals of the project, they had to balance their support with the demands of operating a business. Our partnerships with businesses necessitated ongoing negotiation to meet competing demands and address logistical challenges getting information to their employees. For example, some businesses were able to accommodate a promotora to complete the intervention training on-site, meaning that their employees were able to complete the study at a dedicated time during the work day. Others, by nature of the work performed, required that the intervention was conducted during break time and/or outside of work hours. We found it was vital to have regular in-person meetings with business managers prior to the implementation of the study, and recommend future workplace-based interventions are founded on established relationships with business partners.

These findings are subject to at least three limitations. First, this study only had participants from Utah, limiting overall generalizability of the results. Second, there was a moderate amount of missing data in the knowledge outcomes, and missing responses may not have been at random. Nondifferential completion and dropout over the course of the study may have also biased our results toward more engaged and knowledgeable participants.

Strong family and community values are cornerstones of Latino culture [11, 12]. Therefore, cancer screening interventions that value family and community in the workplace, by engaging promotoras who bring information and/or services directly to Latinos, may help improve cancer awareness and utilization of screenings among the Latino community [18–21]. Using a promotora model to introduce low-income, uninsured Latinos to cancer screening services that are available to them could significantly reduce the number of later-stage cancer diagnoses among Latinos. To further the impact of this work, a randomized trial is needed that determines the best techniques for implementing a workplace-based promotora led intervention to improve cancer screening education and adherence among Latinos in service and manual labor employment. This could include developing alternative strategies to improve reach, such as a phone based intervention, or working with one larger business that has multiple locations throughout a wide region. Additionally, to explore the sustainability of FIT testing as a viable alternative to other more invasive colorectal screenings, future studies should determine the impact of encouraging participant to obtain a FIT through a healthcare provider or health department as opposed to providing participants with a FIT at the time of the intervention. This study adds a valuable contribution to the literature because it established the feasibility of working with and training promotoras to conduct community based research in service and manual labor workplaces, which may inform future studies with low income Latinos.

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Compliance with Ethical Standards

Conflict of interest Dr. Kirchhoff has an immediate family member who has stock or other ownership in Medtronic. The authors declare that they have no other conflicts of interest.

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