

# Academic-Community Partnership to Develop a Patient-Centered Breast Cancer Risk Reduction Program for Latina Primary Care Patients

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Received: 24 November 2014 / Revised: 12 April 2015 / Accepted: 11 May 2015 / Published online: 28 May 2015  
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**Abstract** This collaborative study sought to address Latina breast cancer (BC) disparities by increasing health literacy (HL) in a community health center situated on the US-Mexico border region of San Diego County. An academic-community partnership conducted formative research to develop a culturally tailored *promotora*-based intervention with 109 individuals. The Spanish language program, entitled *Nuestra Cocina: Mesa Buena, Vida Sana* (Our Kitchen: Good Table, Healthy Life), included six sessions targeting HL, women's health, BC risk reduction, and patient-provider communication; sessions include cooking demonstrations of recipes with cancer-risk-reducing ingredients. A pilot study with 47 community health center Latina patients was conducted to examine the program's acceptability, feasibility, and ability to impact knowledge and skills. Pre- and post-analyses demonstrated that participants improved their self-reported cancer screening, BC knowledge, daily fruit and vegetable intake, and ability to read a nutrition label ( $p < 0.05$ ). Results of the pilot study demonstrate the importance of utilizing patient-centered culturally appropriate noninvasive means to educate and empower Latina patients.

**Keywords** Latinas · Breast cancer risk reduction · Formative research · Community health center · Patient-centered care · Women's health · Community-based participatory research

## Introduction

In 2009, cancer surpassed heart disease as the leading cause of death for Latinos, contrasting all other racial/ethnic groups [1]. Breast cancer (BC) is among the most commonly diagnosed cancers and among the top causes of mortality among Latinas in California and nationwide [1–5]. Cancer treatment is the second highest annual medical expenditure for US women (37.7 billion) [6], with estimated lifetime per-patient costs for BC treatment ranging from \$20,000 to \$100,000; costs increase with more advanced cancer stages [7, 8]. BC risks include age, behavioral (e.g., alcohol use, obesity, lack of physical activity), genetic and physiological factors (e.g., inherited risk and breast density), and environmental risks (e.g., radiation exposure, estrogen) [9]. Little to no community-based cancer control intervention research has been conducted on border Latino populations outside of Texas. Given the community composition (e.g., rural versus urban) and access to resource differences between Southern California and Southern Texas, there is a need to test and apply cancer control efforts in the California-Mexico border region.

Latinas are more likely to be diagnosed with late-stage cancers compared to non-Hispanic white women, resulting in more invasive treatments and lower survival rates in San Diego, California [3] and nationwide [10]. Regular use of BC screening is associated with early detection and decreased risk of developing invasive cancer [11] and a significantly increased rate of survival [12–16]. Evidence-based primary care screening guidelines for BC vary; those most aligned with health insurance programs stem from the National Cancer

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Institute (NCI) and the Agency for Healthcare Research and Quality (AHRQ). NCI recommends that women 50 years and older receive mammograms every year [17], and AHRQ recommends mammography every 1 to 2 years, with or without clinical breast exam (CBE) [18]. Screening differs by ethnicity, education, income, acculturation, and geographic region [19]. Latinas have lower screening rates than other ethnicities nationwide [1, 20, 21] and in San Diego, California [22].

### Health Literacy and Cancer Screening

Health literacy (HL) is one of the strongest predictors of BC screening among Latinas [23]. HL is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions [24, 25]. HL is evolving to include components beyond reading ability, such as patient empowerment, self-navigation, and self-care ability [26]. National 2003 data showed that almost 90 % of adults surveyed did not have proficient HL (e.g., the ability to read a prescription label) and Latinos had the lowest scores of all ethnic groups [27]. Individuals with lower HL have poorer health outcomes [28]. Latinas in the USA have the lowest level of educational attainment and are the least likely to obtain a high school or bachelor's degree [29, 30]. As such, HL is likely to be a major contributor of health disparities, particularly among Latinas of low educational attainment.

Inadequate HL is also linked to health risk behaviors [28, 31, 32], increased hospitalization rates and emergency care usage [33], and lower rates of preventive care use [33, 34]. Studies show that low HL relates to low preventive care knowledge [35] and causes barriers to accessing and using health information [36, 37]. Thus, HL has been recognized as a key factor in revitalizing the health-care system and promotion of the patient-centered medical home (PCMH). PCMH and HL overlap includes a deeper focus on the following: (1) improved patient-provider communication, (2) navigation and improved access, (3) multiple methods of communication, (4) shared decision making, and (5) self-care and patient empowerment [38]. HL interventions in clinical settings can increase comprehension, knowledge, and self-care abilities [39] and are effective at improving dietary behavior and knowledge [36, 40], although HL interventions focusing on BC risk reduction among Latinas are limited. BC screening is a modifiable behavior and, therefore, one of the most important intervention targets for BC risk reduction.

### Promoting Screening Adherence Among Latinas

Facilitators of screening adherence among Latinas include individual (e.g., knowledge and insurance), system-level (e.g., proactive care coordination, electronic reminders, and case management), and provider-level factors (e.g., primary care

physician referral) [10, 14, 19, 23, 41–57]. Research shows that community- and clinic-based interventions are effective at increasing screening rates among Latinas [58]. Such strategies include group or individual education and clinician and system interventions, e.g., reminders, decision aides, increased access to services, physician recommendations, and patient navigation and case management [12, 15, 58–61]. Such evidence-based strategies have been shown to improve screening rates from 10 to 20 % [58]. However, acculturation levels among Latinas may play a significant role in the relevance and effectiveness of these strategies. Latinas with low acculturation and limited English proficiency have greater difficulties communicating with and understanding providers [62, 63] and are less likely to use preventive services, such as cancer screening, or have health insurance [51, 53, 64–69]. Studies show several Latina cultural perceptions, beliefs, and behaviors impede screening use, including fatalistic beliefs [70–76] and misconceptions about cancer [21, 63, 70–78], seeking health care only when sick, fear [53, 70, 73–75, 77, 79, 80], denial that cancer can occur, other needs more pressing than preventive care, use other remedies rather than biomedical care [81, 82], low perceived cancer susceptibility [79], putting the health needs of the family before one's own needs, lack of information [63], disbelief in the efficacy of early detection, unawareness of cancer risk [83], and embarrassment of exposing private body parts [63]. As such, there is a need for culturally appropriate interventions aimed to reduce Latina cancer disparities [84, 85], and studies show that educational programs that are personally relevant and tailored to cultural belief systems are more effective than those that are not [86–88].

To improve the use of BC screening outcomes among Latinas, there is growing evidence for *promotora*-based interventions [89–91]. *Promotores/as* are lay health advisors that provide community health education and generally are culturally and linguistically aligned with the target population, of the same age, and have had personal or close experience with the disease (e.g., cancer) for which s/he is providing education. *Promotores/as* are formally trained to provide group or one-on-one education to build knowledge using local resources and services, aid with patient navigation, and increase health-care service access and utilization [92–94]. Recent research shows that the integration of community health workers (i.e., *promotoras*) as part of the patient-care team can assist primary care settings to become more patient-centered [95].

### Collaborative Study Development

This study was conceptually guided by community-based participatory research (CBPR) [96] and cultural tailoring approaches to health communication [86–88]. Although research shows evidence that group education can motivate, inform, and empower women for positive behavioral change and to obtain screening [58], it is unclear whether these

strategies can be generalized to Spanish-speaking Latinas. In order to develop and test the effectiveness of these strategies, an academic-community partnership was formed in which cancer coalition members were integral in informing study design and implementation. Development of these strategies followed CBPR principles to ensure relevance to the patient population. The primary purpose of this academic-community partnership study was to develop and test a health educational program delivered through a culturally tailored Spanish cooking class series delivered by a *promotora*, entitled the *Nuestra Cocina: Mesa Buena, Vida Sana* (Our Kitchen: Good Table, Healthy Life) program. Specifically, this study aimed to improve HL- and BC-related knowledge (e.g., cancer myths and understanding of risk), behavior (e.g., deprioritizing self and not making time for preventive care), and cultural beliefs (e.g., fatalistic cancer beliefs) that influence screening intention.

## Methods

### Participants

This study focuses on a patient population of Mexican-heritage Latina women attending San Ysidro Health Center, Inc. (SYHC), a federally qualified community health center in the Southern border region of San Diego, California, adjacent to Tijuana, Baja California Norte, Mexico. SYHC has over 10 clinic sites and over 90,000 registered patients, most of whom are Spanish-speaking Latinos. According to the 2010 US census, Latinos—the majority of whom are of Mexican heritage—comprise the second largest ethnic group in the USA, consisting of 37 % of Californians and about 30 % of San Diegans; yet more than 70 % of the South San Diego communities of San Ysidro, Chula Vista, and Imperial Beach are Latino [97]. Participants in this study included enrolled SYHC patients who were Spanish-speaking Mexican-born women. Participants ( $n=42$ ) reported an average age of 51.9 (SD=7.5) and 46.4 % had less than a high school education. Most (73.2 %) reported having a household income of less than \$20,000 per year and 19.5 % were currently employed. Several women (95.2 %) had a mammogram ever, yet 19 % had a colorectal cancer exam ever. Few (10 %) reported ever smoking cigarettes in the past, and 21.4 % reported currently having diabetes. Finally, many participants reported that a doctor had recommended a diet reduced in sodium (76.2 %) or reduced in fat and cholesterol (88.1 %) in the past (Table 1).

### Data Collection

Recruitment was carried out in-person by trained research assistants in the SYHC clinic waiting rooms through verbal announcements, flyers, and informational booths in high

**Table 1** Participant characteristics at baseline ( $n=42$ )

Characteristics	Percent ( $n$ )
Age ( $M$ , $SD$ ) (range 40–70)	51.9 (7.5)
Country of birth	
Mexico	97.6 (41)
Nicaragua	2.4 (1)
Annual income	
$\leq$ \$20,000	73.2 (30)
$>$ \$20,000	26.8 (11)
Health insurance	
Yes	51.2 (21)
No	48.8 (20)
Highest level of education	
Elementary/primary	22.0 (9)
Middle school/secondary	24.4 (10)
High school	34.1 (14)
Vocational/GED/college	19.5 (8)
Employment status	
Employed currently	19.5 (8)
Unemployed	12.2 (5)
Housewife ( <i>ama de casa</i> )	61.0 (25)
Retired/unable to work	7.3 (3)
Personal history of cancer	
Yes	0.0 (0)
No	100.0 (42)
Mammogram ever	
Yes	95.2 (40)
No	4.8 (2)
Colorectal exam ever	
Yes	19.0 (8)
No	81.0 (34)
History of cigarette smoking	
Yes	10.0 (4)
No	90.0 (36)
Currently has diabetes	
Yes	21.4 (9)
No	78.6 (33)
Doctor recommended you to reduce sodium intake in the past	
Yes	76.2 (32)
No	23.8 (10)
Doctor recommended you to reduce fat or cholesterol intake in the past	
Yes	88.1 (37)
No	11.9 (5)

traffic areas. Potential participants were invited to participate in a 6-week group cooking class education program that focused on women's health. Eligibility criteria included SYHC Spanish-speaking Latina patients over the age of 40 years with some form of BC screening coverage (e.g., health insurance or Every Woman Counts), no personal history of BC, and no

mammogram in the last year. A total of 81 women that stated interest in participating in the study were screened for eligibility, of which 73 were eligible, and 3 refused to participate due to the study intervention time requirements. All 73 eligible women received a follow-up phone call to further describe the study and participation requirements. Among the eligible women, 47 agreed to participate in one of three cohorts. Reasons for not participating included time conflicts, lack of available childcare, and lack of transportation to the class location. The total retention rate was 96 % ( $n=45$ ), where 44 participants attended at least five of six classes to graduate the program, and 72 % ( $n=34$ ) attended all six classes and received the full dose of the intervention. Two-month postintervention follow-up data is available on 42 women (89 %). During session 1, the *promotora* and research assistant consented participants and collected the baseline survey. Detailed field notes were documented by an RA trained in ethnography and a background in qualitative method data collection and analysis. Refreshments or light snacks were offered at each session and each participant was given a total of \$50.00 to participate in the intervention and complete the baseline, immediate follow-up, and 2-month postintervention follow-up survey.

### **Nuestra Cocina: Cancer Risk Reduction Intervention Description**

The program was developed using a CBPR approach with Latinas in Southern San Diego, California. Content was designed by using data from key informant interviews with 15 key cancer stakeholders with knowledge of the needs of the target community and by hosting focus groups with 45 Latina patients [70–73, 98–102]. This was coupled with information from evidence-based sources (e.g., the NCI, the American Cancer Society (ACS), and the American Institute for Cancer Research (AICR) [85, 103–105]). The curriculum materials were then pretested with 46 women who were recruited using the same methods and eligibility criteria as the current feasibility study to assess the cultural and linguistic appropriateness, readability, and usability of materials for consumers with limited prior medical knowledge and low literacy [106, 107]. Suggested changes were incorporated in the final curriculum [108, 109].

The finalized 6-week Spanish language program, entitled “*Nuestra Cocina: Mesa Buena, Vida Sana* (Our Kitchen: Good Table, Healthy Life),” integrates SYHC’s cooking class education format with educational sessions. The program was culturally tailored to reflect cultural elements discovered in our formative research mentioned above, including deep structure elements such as Latino cultural values (e.g., *personalismo*, *respeto*, *familismo*, *marianismo*) and cultural beliefs (e.g., *coraje* and *nervios*) related to BC risk reduction strategies. In addition, surface structure included familiar pictures, group cooking, and traditional recipes delivered by a

*promotora* [110]. The sessions consist of (1) women’s health and cancer basics, (2) HL and navigation of screening services, (3) dispelling BC myths, (4) communicating with providers, (5) risk reduction strategies, and (6) graduation and review. The curriculum is a mix of *promotora*-based group instruction; low literacy health education handouts; cooking demonstrations using healthy recipe and ingredients to reduce cancer risk stemming from the NCI, ACS, and AICR; role modeling; the *Personal Health Journal* to track preventive service visits; homework; take-home recipes; and follow-up calls. The curriculum was designed for delivery by *promotoras* (Table 2).

### **Measures**

A series of Spanish language self-administered pencil and paper surveys was administered to participants. Surveys were translated to Spanish by several members of the research team whose primary language was Spanish using standard back translation techniques [111]. Surveys took 15–20 min to complete and were tested during our pilot study for readability and comprehensibility. To assess the study impact on screening intentions and related factors, the following measures were included: demographics, health history, cultural and psychosocial factors with BC relevance, HL, screening intentions, and BC/CRC screening.

**Demographics and Health History** Participants completed standard items to assess their age, socioeconomic status (SES) (e.g., education, household income, occupation), marital status, nativity, ethnicity, time spent in the USA, and generation. In addition, participants completed measures of access to care, history of cancer, and smoking history.

**BC Screening and Screening Intentions** Two questions related to ever having had a mammogram or colon cancer screening (yes/no) were derived from the CDC’s Behavioral Risk Factor Surveillance Survey (BRFSS) (<http://www.cdc.gov/brfss/>). BC screening intention “How often do you plan in getting a mammogram in the future?” (annually, every 2 years, every 5 years) was assessed by modifying an existing question from the 2003 NCI Health Information National Trends Survey (HINTS) (<http://hints.cancer.gov>).

**Health Literacy Screeners** Three items from the Chew Health Literacy Screener were included to assess confidence in filling out medical forms, asking for help in reading clinic materials, and interpreting written medications [112, 113]. The 3-item scale was summed and a mean score was used for analysis with higher scores indicating greater health literacy; this 3-item scale had a moderate reliability in Spanish ( $\alpha=0.40$ ). In addition, the Newest Vital Sign (NVS) developed by Weiss and colleagues was used. The NVS utilizes a



**Table 2** *Nuestra Cocina*—overview

Group health education sessions (consecutive weeks: 1–6)	
Topics per week	Health education <i>session components</i>
1: Breast cancer basics (overview)	Breast cancer basics—overview Risk factors that could increase the risk of developing cancer Clinical exams for women’s health Recommendations to reduce the risk of developing breast cancer
2: How to schedule a breast health exam	First steps to make a breast health clinical exam Referral process to receive a mammogram Making your appointment for your routine mammogram Receiving and understanding your mammogram results
3: Dispelling BC myths: cultural beliefs about cancer	The importance of being informed to make the best health choices Myths about cancer and breast cancer causes Establishing good communication with your doctor—know the facts
4: Effective communication with your health-care providers	Addressing barriers to effective communication with providers Modeling effective communication with your health-care provider Questions to ask your doctor during your health visit Patients’ rights to request a different doctor
5: How to reduce your risk of developing breast cancer	Healthy diet and reducing the risk of developing breast cancer Physical activity and reducing the risk of developing breast cancer Food portions and the importance of a balanced diet The importance of going to routine health exams to reduce the risk of developing breast cancer
6: Graduation—let’s review	Review of <i>Nuestra Cocina—Buena Mesa, Vida Sana</i> curriculum Goal setting and feedback
1–6: Cooking demonstrations Follow-up phone contact	Modeling new and healthy recipes/discussion of key ingredients Challenges and accomplishments to reaching goals

standard nutritional label to assess numeracy and basic computational skills necessary for health [114]. One item from the NVS was used for analysis purposes, which read, “if you were to eat the whole amount of ice cream, how many calories would you consume?” Answers were recoded as “correct (1000 cal)=1 and incorrect (any other answer)=0.”

**BC Knowledge** Questions assessing knowledge of BC screening, prevention, and risk reduction were derived from two items from the Bird and colleagues’ 5-item BC Knowledge Scale [115] and three questions assessing knowledge of risks were added. Sample items include “A woman can have BC without symptoms or without feeling ill [115]” and “If a woman has a breast tumor, it is always malignant.” These items were summed and sum score that ranged from 0 to 5 was created, with higher scores indicating greater BC knowledge; this 5-item scale had a good reliability in Spanish ( $\alpha=0.70$ ).

**BC Cultural Beliefs** Items were developed based on cultural-based BC beliefs that emerged in formative research. The three items assessed beliefs related to the cause of spread of BC, including “when a woman has strong anger (*coraje*), it causes cancer”; “BC can spread to other parts of the body

during a biopsy or surgery”; and “having a lot of stress or anxiety causes cancer.” The three items were summed to create a mean score that ranged from 0 to 3, with higher scores indicating greater endorsement of BC cultural beliefs; this 5-item scale had a moderate reliability in Spanish ( $\alpha=0.47$ ).

**Diet** Two questions related to daily fruit and vegetable intake that stem from the CDC BRFSS were included to assess dietary behavioral change as a result of the program. Participants were asked how often they ate more than one fruit and how often they ate more than one vegetable per day, with a response format that ranged from “never” to “always.”

**Process Evaluation Measures** Following the RE-AIM framework [116–118], a quasi-experimental process evaluation of the program was conducted using materials adapted from an evidence-based *promotora*-delivered curriculum (e.g., Project DULCE) at SYHC [119]. Measures included intervention fidelity, tracking of recruitment and retention, dosage delivered and received through independent observations of the degree to which scripted content was covered, participant satisfaction, structured observations, and *promotora* perceptions on areas for improvement [120–122].

## Data Analysis

To assess the impact of the intervention on HL and related knowledge, behavior, and cultural beliefs, outcomes were analyzed from preintervention to 2-month postintervention using *t* tests and chi-square tests [123, 124] in SPSS version 22.0. Where appropriate, overall continuous sum scores were created for scales for each of the measurement time points (i.e., baseline and 2-month postintervention follow-up). In reality, 47 Latina adults participated at baseline, and 42 (89 %) at 2-month follow-up. Data presented here are on the 42 participants with complete data at both measurement time points.

To assess the quality of the intervention, all process evaluation data (including the *promotora*, participant, and observer rating sheets) was summarized to determine attendance, dosage, and fidelity. These open-ended questions were administered at the end of each session and assessed perceived relevance, self-efficacy, acceptability, and overall satisfaction for each session topic and related nutritional recipe. In addition, the *promotora* and assistants completed session assessments and evaluation forms upon the completion of each session. Open-ended responses and satisfaction data were analyzed to determine salient themes within and across cohorts. Themes that reflect the most common feedback are reported here.

## Results

### Impact Evaluation Results

Study outcomes evaluating the interventions' impact on participant knowledge, attitudes, and behavior to promote screening intention were assessed. Results demonstrated that women increased their cancer knowledge, nutrition-related behavior and skills, and self-reported cancer screening from pre- to postintervention assessment. Participant BC knowledge increased from baseline ( $M_{pre}=2.64$ ) to postintervention assessment ( $M_{post}=3.02$ ) ( $p\leq 0.05$ ). Participants were more likely to have a mammogram or colorectal cancer exam ever at postintervention assessment ( $p\leq 0.05$ ). Women reported eating more fruits and vegetables and were more likely to be able to correctly read a nutrition label, a computational health literacy skill, at posttest ( $p\leq 0.05$ ). Participants had no significant change in measures of BC cultural beliefs, health literacy, and screening intentions (Table 3).

### Process Evaluation Results

First, results from participants show that the program was well-received, with *Session 4: improving communication with healthcare providers and patient rights* rated as the most popular session. Overall, participants reported that the cooking classes and recipe components of the series were the most

appealing (Table 4). Participants also highlighted that the sessions provided an “open and safe place just for women” which encouraged the discussion of culturally sensitive topics related to women’s health, including demystifying cultural beliefs related to breast health. Second, the *promotora* completed a form following each session to evaluate the session the participants’ general interest and other relevant feedback. She recommended introducing more new “unfamiliar” vegetables into the recipes since the women were open to “try new ingredients.” The *promotora* underscored anecdotal feedback from women who stated that they “felt more empowered” to prioritize and take control of their health and “more confident” to discuss and clarify health topics with their health providers. In addition, women also reported that the program made them “feel special” and included a discussion of the cultural and normative issues that frequently influenced their self-care. Finally, each session was observed for fidelity of intervention delivery. Dosage ratings for the sessions ranged between 90 and 98 % demonstrating that the majority of the scripted content was covered. The observer did not identify any concerns. The feasibility, relevance, and overall acceptability of this culturally tailored intervention study demonstrate its suitability for a clinic setting. Furthermore, the study carefully considered factors such as the location, session times, and session duration to best suit the needs of the women in the study. In this way, frequently reported barriers to attendance such as work and family responsibilities were minimized, resulting in high attendance and successful program completion.

## Discussion

This academic-community partnership study was built upon several years of prior collaborative efforts, was mutually beneficial, and had a balance of scientific and community-oriented contributions. This research study supports previous research [125] and the importance of academic-community partnerships in the successful delivery of community-based cancer control programs that reach and impact Latina women. Results demonstrated that recruitment, intervention, and assessment methods were feasible and accepted by the target community. High attendance and participation in the sessions, as well as high retention rates, support the feasibility and acceptability of the *promotora*-led intervention in this community.

Results showed that there were improvements in cancer knowledge and nutrition-related behaviors and no change in HL, which has implications for HL research. Measures of HL in previous studies vary and can include various components such as health-related reading level, numeracy, and health-related knowledge. The current study conceptualized HL as specific to BC risk reduction and utilized brief measures that

**Table 3** Change in cancer-related knowledge and behaviors

	Baseline, % yes ( <i>n</i> )	2-Month postintervention follow-up, % yes ( <i>n</i> )	Sig.
<b>Cancer screening</b>			
How often do you plan on getting a mammogram in the future?			
Annually	82.9 (34)	82.9 (34)	<i>p</i> =0.982
Every 2 years	14.6 (6)	14.6 (6)	
Every 5 years	2.4 (1)	2.4 (1)	
Mammogram ever	95.2 (40)	97.6 (41)	<i>p</i> =0.000
Colorectal exam ever	19.0 (8)	21.4 (9)	<i>p</i> =0.000
<b>Nutrition-related behaviors and skills</b>			
% that were able to correctly compute total calorie amount per container	40.5 (17)	71.4 (30)	<i>p</i> =0.007
Do you eat more than one kind of fruit a day?			
Never	4.8 (2)	0 (0)	<i>p</i> =0.000
Yes, sometimes	47.6 (20)	30.2 (13)	
Yes, often	21.4 (9)	30.2 (13)	
Yes, always	26.2 (11)	21.4 (9)	
Do you eat more than one kind of vegetable a day?			
Never	4.8 (2)	0.0 (0)	<i>p</i> =0.000
Yes, sometimes	40.5 (17)	38.1 (16)	
Yes, often	28.6 (12)	28.6 (12)	
Yes, always	26.2 (11)	33.3 (14)	
<b>Cancer knowledge</b>			
Breast cancer cultural beliefs, <i>M</i> (SD) <sup>a</sup>	0.53 (0.84)	0.61 (0.93)	<i>p</i> =0.646
Breast cancer knowledge, <i>M</i> (SD)	2.64 (1.01)	3.02 (0.84)	<i>p</i> =0.034
Health literacy, <i>M</i> (SD)	2.45 (0.77)	2.29 (0.94)	<i>p</i> =0.787

Chi-square and *t* test analyses were used to compare pre- and postintervention data

<sup>a</sup>Higher scores indicate higher endorsement of breast cancer cultural beliefs, higher breast cancer knowledge, and higher health literacy

could be administered in a clinic setting. Future studies are needed to validate such multidimensional measures of HL.

**Table 4** Key process evaluation results

What I liked the best was that I learned how to cook healthfully.
[I learned about] the recipes and how to be more aware and take care of our health and do our health exams.
I learned more about cancer.
[I liked] that they gave us instructions about our health and the importance of a healthy diet.
[I liked] the way that every topic was explained.
I really enjoyed all of the talks. Healthy because I learned a lot.
Everything was delicious and a million thanks for the recipes, especially the eggplant.
[I] learned how to cook with less oil, salt, and sugar.
They covered more than I knew, very important topics.
Well, the topic was very complete, well advised. Thank you to all those involved and bless you.
Everything was covered. Everything was complete.
You covered important topics for women.
I loved the class, informative, and the food was nutritious and delicious.

This pilot intervention study had several limitations. Selection bias may have influenced recruitment because patients who were in obvious distress or pain were not approached. The relatively low sample size may have limited the power to detect other or more notable statistically significant differences. This study was based at a community health center serving a patient population of predominantly low-income Spanish-speaking Mexican origin individuals, limiting the generalizability of findings to other Latino and non-Latino cultural groups. In addition, since all participants were active patients within a primary care setting and had some form of BC screening coverage (i.e., health insurance or the California Every Women Counts program for the uninsured), results may vary in comparison to populations that lack access to these services. The Spanish breast cancer risk knowledge and cultural belief scales that were derived from focus groups and the researchers' previous experience had low reliability and, thus, have not yet been validated, limiting their widespread utilization. In addition, at the time of study recruitment and implementation, the clinic had not fully implemented its electronic health record (EHR) system; thus, this study relied on self-report cancer screening behaviors. However, *Nuestra Cocina*

findings have the potential to be applied to other national federally qualified CHC settings (that serve over 20 million patients annually) but limited validity to organizations that target middle and upper class populations.

## Conclusion

This academic-community partnership developed and tested the *Nuestra Cocina* program, an innovative group health education cancer literacy intervention that aimed to be appropriate for the population and community setting. *Nuestra Cocina* addresses features of the Affordable Care Act as it relates to primary care settings and the patient-centered medical home, including promotion of meeting clinical preventive service guidelines, patient empowerment, improving patient-provider communication, promoting Healthcare Effectiveness Data and Information Set (HEDIS) indicators, and meaningful use of EHR. Results demonstrate the importance of utilizing patient-centered culturally appropriate noninvasive means, such as cooking classes, to educate and empower Latina patients for behavioral change.

**Acknowledgments** This research was made possible by the California Breast Cancer Research Program (18AB-1100), the National Cancer Institute's Center to Reduce Cancer Health Disparities (U01 CA114657-05 and U54 CA153511), and the National Institute for Minority Health and Health Disparities (R25MD006853-01). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIH or CBCRP. The authors thank the San Diego Cancer Care Access Partnership (C-CAP) Coalition. Special thanks go to patients at San Ysidro Health Center, Inc. who made this research possible.

**Conflict of Interest** All authors declare that they have no conflicts of interest.

**Ethical Standards Statement** This research study involved human subjects and was approved by the San Diego State University and San Ysidro Health Center, Inc. institutional review boards. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all participants for being included in the study.

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