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Multi-Site Implementation of Health Education Programs for Latinas

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Abstract US Latinas are more likely to be diagnosed with late stage breast cancer and have nearly double the incidence of cervical cancer. A culturally customized educational program (*Esperanza y Vida*) was established in three locations to increase cancer awareness and screening. Educational programs ($N = 159$) were conducted, with participants randomized to either a breast and cervical (intervention) or diabetes (control) program. Variations in key factors, including gender, program location sites, language utilized, time/day of programs, and data collection method were detected, uncovering unique distributions across locations. *Esperanza y Vida* was successful in recruiting participants to health programs in three locations, each with a unique Latino population. Program site differences demonstrated educational and screening interventions can be implemented in multiple locations, with program variations reflecting local characteristics. These findings can be applied to outreach efforts to effectively increase participation and enhance screening practices and benefits in other regions.

Keywords Cancer · Screening · Latinos · Educational programs

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Introduction

As of 2005, Latinas are still less likely to have undergone mammography, with 59.6% of Latina women aged 40 and older completing the exam within the past 2 years, compared to 68.1% of non-Latina whites [1]. Mexican (56.2%) and Puerto Rican women (57.8%) specifically utilized this screening test at low rates [1]. In the United States (US), breast cancer is the most frequently diagnosed cancer in Latinas, as in non-Latinas. Still, the incidence rate of breast cancer is 27% lower for Latinas (90.2/100,000) than for white non-Latina women (126.9/100,000) due to protective reproductive patterns (lower age at first birth and more children) or the possibility that many Latinas are not diagnosed at all due to low mammography utilization [1]. Latinas diagnosed with breast cancer are less likely to be diagnosed with the earliest stage compared to non-Latina white women even after age, socioeconomic status and method of detection are controlled. Latinas are more likely to have more advanced cancer with larger tumors and/or metastatic disease at the time of diagnosis, correlated with a poorer prognosis and lower chance of successful treatment. Low levels of mammography utilization and delayed follow-up of abnormal results might explain why Latina women are nearly 20% more likely to die of breast cancer than non-Latina white women diagnosed at similar age and stage [1].

Latina women continue to trail behind their non-Latina white counterparts for cervical cancer screening also with 74.6% of Latinas (aged 18 and older) having a Pap test within the past 3 years, compared with 81.4% of non-Latina white women [1]. Central and South American women were the least likely to have a recent Pap test, with only 71.3% reporting one in the last 3 years [1]. They were followed closely by Cubans (72.4%) and Mexicans

(73.3%). The death rate from cervical cancer is 50% higher among Latinas than among non-Latina white women, due to low screening rates [1, 2]. It has been estimated that over 80% of deaths from cervical cancer could be prevented by regular screening paired with adequate patient follow-up for treatment [3].

Latinas, reported as a single category although they include multiple subgroups from various countries and cultural backgrounds, experience many obstacles to health care services for cancer prevention and early detection. Many have a lower income and experience cultural and language barriers. Often they lack a regular provider, place of care, dependable transportation and/or access to satisfactory health insurance coverage (often due to lack of documentation/illegal residence in the US) [4–6]. For example, compared with 12% of whites, an overwhelming 33% of all Latinos are uninsured [7]. Across all races, low income and uninsured individuals are more likely to be diagnosed with cancer at later stages, receive substandard clinical care and die from the disease [7]. Because 22% of Latinos live below the poverty line, compared to 11% of whites, the Latina population has less access to screening exams and medical care which could help to either prevent the development of or late diagnosis of cancer [7].

Community-based health promotion supports the premise that individuals cannot be considered separately from their social environment and background and that programs incorporating multiple interventions, extending beyond the individual level, have the potential to be more successful in influencing and supporting individuals, as members of communities, to adopt and maintain healthy lifestyles [8, 9]. The determinants of health can be successfully addressed through social networks, neighborhoods and communities. It is important to tailor interventions to reflect community priorities and culture in order to reach different segments of the population. Thus, delivering culturally appropriate information and resources is an advantageous way to increase patients' knowledge for self care and decrease obstacles to health care faced by underserved populations, like Latina subgroups [10]. A literature review shows successful health education programs that have utilized churches [11], Latino role models [12], and lay health advisors (promotoras or consejeras) [13–15] to reach recent Latino immigrants in Texas and California and positively increase screening habits.

The literature demonstrates a need to offer culturally tailored interventions for Latino groups to increase screening. Therefore, a multisite intervention program, *Esperanza y Vida*, was developed in collaboration with diverse Latina women in three locations in order to account for geographic, ethnic and community diversity [16]. This intervention program, which will be explained in more detail below, seeks to: (1) collect demographic and screening data on the subpopulations we are reaching in each area; (2) educate about breast and cervical cancers (or diabetes) and the recommended screening tests: breast self exam (BSE), clinical breast exam (CBE), mammography, Pap test or blood glucose; (3) revise fears, concerns and perceptions that may negatively impact understanding of cancer/diabetes and may play a role in decisions to screen; (4) evaluate pre- and post-program knowledge; and (5) test the efficacy of attending a program to improve participant screening adherence. The goals of this paper are to describe differences found (1) between control and intervention programs in each geographic location, (2) among all programs in each respective location and (3) among all control and all intervention programs regardless of location. The country of origin variations will be addressed in another study manuscript [16]. Methodologic and program differences may affect the success with which different populations at multiple sites can be reached and guide us in further improvement of health education programs.

Methods

Intervention

In order to address the low rate of breast and cervical cancer screening in the Latina population, a peer-led education program called *Esperanza y Vida* was developed [17]. The program accommodates Latino perspectives on family, religion and gender roles and provides participants with navigation (e.g., assistance finding affordable screening locations) into screening. The educational material is presented in a group setting, at community- or faith-based locations or in women's homes. To test the effectiveness of the educational material, each approved site is randomly assigned to either the breast and cervical cancer education format (intervention) or the diabetes education format (control). During the program, demographic information and current participation in screening exams is collected, as is further explained below. Specific information about either diabetes or breast and cervical cancer (per randomization) is then presented. Emphasis is on the importance of screening to decrease morbidity and mortality. The necessary screening procedures are explained and affordable screening locations are provided. Suggested lifestyle modifications (e.g., diet and exercise) are also discussed. Program staff answers questions posed by participants and addresses false information or uncertainties which may prevent participants from undergoing screening.

Trained peer volunteers (breast and cervical cancer survivors or women living with diabetes) assist with most programs. The survivors share their personal stories (either

about their fight against cancer or living with diabetes). They testify to the capacity one has to survive a diagnosis of these diseases and the importance of early detection and regular screening. Men are also encouraged to attend programs, since earlier formative research has demonstrated the patriarchal family structure and impact of male partners on women's access to screening [18]. We recognize that, in Latino families, men often have more control over the resources and decision making [12]. Thus, when possible, a male advisor also attends to educate men at the program about their responsibilities in promoting the health of women family members.

As the program is based on the success of the faith-based Witness Project [19], the opportunity for an opening and/or closing prayer is included, albeit optional. Attendance for the participants at the educational programs is voluntary although consent is requested, from the women, in order to conduct follow up assessments.

Site Selection

Three different geographic locations, including Arkansas (AR), New York City (NYC) and Western New York (WNY), are the focus of the programs and were selected to incorporate a wide variation of Latino subpopulations, including country of origin and language preference, in both rural and urban settings. The Latino population in AR grew 48% between 2000 and 2005, faster than that of any other state [20]. In 2007, Latinos composed 5.3% of the AR population, up from 3.2% in 2000 [21]. Recent studies suggest that half of the Latino population in AR is foreign born, with the majority coming from Mexico [22]. In contrast, NYC has a population of over 8 million people, of which 27% are of Latino origin [23]. As of 2007, 12.4% of Latinos in NYC are Mexican, 33.3% are Puerto Rican, 25.8% are Dominican, 8.6% are Ecuadorian, 4.9% are Colombian and 15% are from other countries in Central and South America [24]. The region classified as "WNY" includes the following upstate NY counties: Erie, Niagara, Orleans, Genesee, Wyoming, Chautauqua, Cattaraugus and Allegany. The Latino population of WNY has grown steadily over the past 30 years and now comprises 2.8% of the population in the eight-county area [21]. Two-thirds of the Latino population is Puerto Rican, 9.9% is Mexican and the remaining 23.6% come from other countries in Central and South America.

The study adheres to CONSORT [25] guidelines to perform randomization with each site's programs (AR, NYC, and WNY) for either control or intervention educational programs. Recruitment of program sites is done locally, with the program coordinators working with our Community Advisory Boards, volunteers and local community- and faith-based organizations. Outreach includes providing potential sites with detailed information about the program content as well as the time and space needed to conduct the educational programs. In order to prevent sites from pre-selecting the type of educational program, Program Coordinators and host sites are blinded to the assignment (intervention or control) until the site has agreed to host the educational program and has a confirmed date. Thus, every site agrees to host, regardless of the program assignment, a culturally appropriate health education presentation for Latino men and women. Each site is responsible for recruiting participants to attend its program.

Data Collection

All participants complete demographic questions (age, country of birth, marital status, number of years in the US, language preference) and indicate their current participation in screening exams (BSE, CBE, mammogram, Pap and blood glucose test). A pre-intervention knowledge survey is given to evaluate participant baseline knowledge and attitudes about breast and cervical cancer and diabetes. A post-intervention survey (with the same questions) is administered at the end of the session to measure attitude and knowledge changes after attendance at the program. Survey questions are displayed on PowerPoint slides and read aloud with responses recorded anonymously using wireless keypads. This technology, called an audience response system (ARS), has been shown to be an excellent research and education tool, especially for rural, low literacy, and English as a second language populations [17, 26, 27]. At the beginning of the program, participants are given a hand held remote which they use to electronically record their answers to questions posed throughout the program (67.9% of programs were conducted using only the ARS). At times, paper surveys are used, either fully or in combination with the ARS (e.g., when participants arrive after the program has already started, when participants are not comfortable using the remotes or if the setting is not suited for electronic tools). In 15.1% of programs, paper surveys were used exclusively and 17.0% of programs were conducted using a combination of ARS and paper surveys.

At each program, staff records program specific factors, including site (AR, NYC or WNY), setting (urban or rural/suburban), type of site (community-based, faith-based or private home), language in which the program was conducted (Spanish or English), and type of educational program delivered (control or intervention). Programs were held from August 1, 2007 to September 17, 2009. Data analysis was performed using SPSS 16.0 software in September and October 2009. All data recorded by program coordinators for each session were analyzed to define the distribution of various variables: (1) within each location,

(2) within each program type in each location or (3) within each program type (regardless of location).

Results

As stated above, we found methodologic and program differences (1) between control and intervention programs in each geographic location, (2) among all programs in each respective location and (3) among all control and all intervention programs regardless of location. These differences may affect the success of reaching different populations; awareness of these differences can help to improve health education programs. In total, 159 educational programs were delivered between our three sites, reaching 474 men and 1,701 women.

Program Differences by Type

Analysis was performed looking for any significant differences between the two different programs (intervention and control) without differentiating between the three locations (see Table 1). In total, 89 programs were interventional and 70 were control. There was a significant finding between the mean number of male participants in each type of program, with 4.21 in control programs [SD = 5.9] and only 2.01 in intervention programs [SD = 2.9] ($P = 0.00$). The mean number of female participants was 9.50 [SD = 7.3] in control programs and 11.64 [SD = 6.7] in intervention programs ($P = 0.06$). There were no differences noted in the distribution of program types within each site (AR, NYC and WNY), in location type (community-based, faith-based and private home) or in area (urban versus rural).

Program Differences by Location

Table 2 displays differences between the three locations (AR, NYC and WNY). Fifty-three programs were conducted in AR, 67 in NYC and 39 in WNY. The highest mean number of male participants per program was in AR (4.11 [SD = 6.2]), followed by WNY (3.38 [SD = 3.8]) and then NYC (1.85 [SD = 3.0]) ($P = 0.02$). The mean number of total participants, female participants and the distribution in the type of programs was not significantly different between sites. Within each location, program sites were assigned as faith-based, community-based or private home. In AR, only 11.5% of programs were offered in community locations, 53.8% were at faith-based sites and 34.6% were in private homes. In NYC, 77.6% of programs were community-based, 9.0% were faith-based and 13.4% were in private homes. WNY had the most equal

Table 1 Program differences by type

Variables	Intervention	Control	*P*-value
Total no. of programs	89	70	
No. of participants mean (SD)	13.71 (7.6)	13.70 (11.7)	1.00
No. of male participants mean (SD)	2.01 (2.9)	4.21 (5.9)	0.00
No. of female participants mean (SD)	11.64 (6.7)	9.50 (7.3)	0.06
Site (as % of total)			0.87
AR	33.7	32.9	
NYC	40.4	44.3	
WNY	25.8	22.9	
Location type (as % of total)			0.97
Community-based	44.9	43.5	
Faith-based	29.2	29.0	
Private home	25.8	27.5	
Area (as % of total)			0.51
Urban	89.9	92.9	
Rural/suburban	10.1	7.1	
Language (as % of total)			0.42
Spanish	89.9	85.7	
English	10.1	14.3	
Participant range (as % of total)			0.49
1–20	83.1	87.1	
21 or more	16.9	12.9	
Opening prayer (as % of total)			0.60
Yes	58.4	54.3	
Closing prayer (as % of total)			0.68
Yes	56.2	52.9	
Survivor (as % of total)			0.95
Yes	85.4	85.7	
Male advisor (as % of total)			0.80
Yes	11.2	10.0	
System used (as % of total)			0.33
Paper	18.0	11.6	
ARS	62.9	73.9	
Both	19.1	14.5	
Day of the week (as % of total)			0.86
Weekday	37.1	35.7	
Weekend	62.9	64.3	
Program time (as % of total)			0.48
Morning	33.7	27.1	
Afternoon	40.4	50.0	
Evening	25.8	22.9	
Length of program in mins (SD)	146.40 (56.0)	132.25 (56.7)	0.12

Table 1 continued

Variables	Intervention	Control	*P*-value
Mean no. of volunteers (SD)	1.04 (0.7)	1.01 (0.6)	0.77
Country of origin (as % of total)			0.22
Mexico	35.2	32.3	
Dominican Republic	6.9	7.6	
Puerto Rico	26.5	25.4	
United States	11.3	12.6	
Central America	9.5	11.8	
South America	4.8	6.0	
Other	5.8	4.3	

distribution, with 30.8% community-based, 30.7% faith-based and 38.5% in private homes ($P < 0.00$).

Language had a different distribution between sites, with Spanish used in 100% of AR programs, 88.1% of NYC programs and 71.8% of WNY programs ($P < 0.00$). Opening prayers were given at some programs, including 75.5% in AR, 58.2% in NYC and 28.2% in WNY ($P < 0.00$). A survivor was present at 71.7% of AR programs, 94.0% of NYC programs and 89.7% of WNY programs ($P < 0.00$). A male advisor was present in only 3.0% of programs in NYC, 11.3% in AR and 23.1% in WNY ($P = 0.01$). Distribution differences were noted in programs that offered a closing prayer with 75.5% doing so in AR, 55.2% in NYC and 25.6% in WNY ($P < 0.00$).

Utilization of the ARS System was different between sites, with 47.2% in AR, 85.1% in NYC and 65.8% in WNY using ARS ($P < 0.00$). The time of the program was also different between sites, with weekend programs composing 52.8% in AR, 48.7% in WNY and only 16.4% in NYC ($P < 0.00$). Also, evening programs were given 32.1 and 43.6% of the time in AR and WNY respectively, but only 7.5% in NYC. Alternately, 53.7% of NYC programs, 20.5% of WNY programs and only 9.4% of AR programs were in the morning ($P < 0.00$). While all programs of a certain type (e.g., cancer versus diabetes) contained the same information and number of slides, the time it took to conduct and complete the program differed across sites. In AR, programs were longest (average 188.68 min [SD = 52.5]) compared with 94.33 min [SD = 17.6] in NYC and 153.73 min [SD = 41.9] in WNY ($P < 0.00$). Mean number of volunteers varied between sites, with 1.06 (SD = 0.5) in AR, 0.90 (SD = 0.6) in NYC and 1.24 (0.9) in WNY ($P = 0.03$).

Distribution by country of origin followed the census pattern for each area resulting in distinct ethnic variations by location, with 69.1% in AR, 22.5% in NYC and 0.8% in WNY from Mexico. Those from the Dominican Republic comprised 3.3% in AR, 15.1% in NYC and 2.3% in WNY. Puerto Ricans were only 0.1% of participants in AR, but 24.9% in NYC and 62.5% in WNY. Those born in the US made up 2.6% in AR, 11.9% in NYC and 24.5% in WNY. Participants from Central America were 21.5% in AR, 5.7% in NYC and 1.9% in WNY ($P < 0.00$).

Program Differences by Location and Type

Next, analysis was performed looking within each location (AR, NYC or WNY) at differences between the two types of programs (control versus intervention). Data is displayed in Table 3.

Arkansas

Of 53 programs in AR, 30 were intervention and 23 were control. There was a difference in mean number of female participants between programs, with 12.83 (SD = 7.5) in intervention and 8.39 (SD = 9.9) in control. The mean number of male participants in control programs was high (6.09 [SD = 8.3]) compared to intervention programs (2.60 [SD = 3.4]), which was statistically significant ($P = 0.042$). Comparison of location types revealed the following distribution between programs: 13.3% (intervention) versus 9.1% (control) for community-based programs, 56.7% (intervention) versus 50.0% (control) for faith-based programs and 30.0% (intervention) versus 40.9% (control) for programs based in private homes. Urban locations comprised 86.7% of intervention and 95.7% of control programs.

Both programs were offered exclusively in Spanish. The control programs had smaller groups of participants, with only 8.7% having 21 or more participants. Alternately, 23.3% of intervention groups had this many participants. Eighty percent of intervention programs included an opening and closing prayer, however only 69.6% of control did the same. For control programs, a survivor spoke in 78.3%, compared to only 66.7% at intervention programs. A male advisor was present in 13.3% of intervention and 8.7% of control programs.

The ARS system was utilized more in control (56.5%) than in intervention programs (40.0%). The two types of programs showed a difference in time of day they were offered, with 43.3% of intervention programs held in the evening, compared to only 17.4% of control. Fifty percent of intervention and 69.6% of control programs were held in the afternoon. Intervention programs lasted longer (194.67 min [SD = 47.0]) than control (180.87 min [SD = 59.1]).

One important difference in country of origin was that 7.1% of participants in control programs were born in the Dominican Republic, but only 0.3% of participants in intervention programs were born there. All other countries

Table 2 Program differences by location

Variables	AR	NYC	WNY	*P*-value
Total no. of programs	53	67	39	
No. of participants mean (SD)	15.02 (12.3)	12.48 (7.2)	14.05 (9.0)	0.34
No. of male participants mean (SD)	4.11 (6.2)	1.85 (3.0)	3.38 (3.8)	0.02
No. of female participants mean (SD)	10.91 (8.8)	10.55 (5.8)	10.67 (6.4)	0.96
Program type (as % of total)				0.87
Intervention	56.6	53.7	59.0	
Control	43.4	46.3	41.0	
Location type (as % of total)				0.00
Community-based	11.5	77.6	30.8	
Faith-based	53.8	9.0	30.7	
Private home	34.6	13.4	38.5	
Area (as % of total)				0.64
Urban	90.6	89.6	94.9	
Rural/suburban	9.4	10.4	5.1	
Language (as % of total)				0.00
Spanish	100.0	88.1	71.8	
English	0.0	11.9	28.2	
Participant range (as % of total)				0.34
1–20	83.0	89.6	79.5	
21 or more	17.0	10.4	20.5	
Opening prayer (as % of total)				0.00
Yes	75.5	58.2	28.2	
Survivor (as % of total)				0.00
Yes	71.7	94.0	89.7	
Male advisor (as % of total)				0.01
Yes	11.3	3.0	23.1	
Closing prayer (as % of total)				0.00
Yes	75.5	55.2	25.6	
System used (as % of total)				0.00
Paper	39.6	4.5	0.0	
ARS	47.2	85.1	65.8	
Both	13.2	10.4	34.2	
Day of the week (as % of total)				0.00
Weekday	47.2	83.6	51.3	
Weekend	52.8	16.4	48.7	
Program time (as % of total)				0.00
Morning	9.4	53.7	20.5	
Afternoon	58.5	38.8	35.9	
Evening	32.1	7.5	43.6	
Length of program in mins (SD)	188.68 (52.5)	94.33 (17.6)	153.73 (41.9)	0.00
Mean no. of volunteers (SD)	1.06 (0.5)	0.90 (0.6)	1.24 (0.9)	0.03
Country of origin (as % of total)				0.00
Mexico	69.1	22.5	0.8	
Dominican Republic	3.3	15.1	2.3	
Puerto Rico	0.1	24.9	62.5	
United States	2.6	11.9	24.5	
Central America	21.5	5.7	1.9	
South America	2.4	11.0	1.9	
Other	1.0	8.8	6.0	

Table 3 Program differences by location and type

Variables	AR			NYC			WNY		
	Intervention	Control	*P*-value	Intervention	Control	*P*-value	Intervention	Control	*P*-value
Total no. of programs	30	23		36	31		23	16	
No. of participants mean (SD)	15.43 (7.9)	14.48 (16.6)	0.783	12.50 (7.5)	12.42 (7.0)	0.876	13.61 (7.3)	14.69 (11.2)	0.717
No. of female participants mean (SD)	12.83 (7.5)	8.39 (9.9)	0.042	11.33 (6.6)	9.65 (4.6)	0.012	10.78 (5.7)	10.50 (7.4)	0.282
No. of male participants mean (SD)	2.60 (3.4)	6.09 (8.3)	0.069	1.03 (1.6)	2.81 (3.9)	0.332	2.83 (3.3)	4.19 (4.5)	0.893
Location type			0.691			0.805			0.681
Community-based	13.3%	9.1%		80.6%	74.2%		30.4%	31.2%	
Faith-based	56.7%	50.0%		8.3%	9.7%		26.1%	37.5%	
Private Home	30.0%	40.9%		11.1%	16.1%		43.5%	31.2%	
Area			0.267			0.848			0.791
Urban	86.7%	95.7%		88.9%	90.3%		95.7%	93.8%	
Rural/suburban	13.3%	4.3%		11.1%	9.7%		4.3%	6.2%	
Language			–			0.822			0.282
Spanish	100.0%	100.0%		88.9%	90.3%		95.7%	93.8%	
English	0.0%	0.0%		11.1%	9.7%		4.3%	6.2%	
Participant range			0.160			0.848			0.563
1–20	76.7%	91.3%		88.9%	90.3%		82.6%	75.0%	
21 or more	23.3%	8.7%		11.1%	9.7%		17.4%	25.0%	
Opening prayer			0.382			0.604			0.725
Yes	80.0%	69.6%		61.1%	54.8%		26.1%	31.2%	
Closing prayer			0.382			0.581			0.503
Yes	80.0%	69.6%		58.3%	51.6%		21.7%	31.2%	
Survivor			0.353			0.877			0.145
Yes	66.7%	78.3%		94.4%	93.5%		95.7%	81.2%	
Male advisor			0.597			0.183			0.312
Yes	13.3%	8.7%		5.6%	0.0%		17.4%	31.2%	
System used			0.445			0.168			0.544
ARS	40.0%	56.5%		77.8%	93.5%		69.6%	60.0%	
Paper	46.7%	30.4%		5.6%	3.2%		0.0%	0.0%	
Both	13.3%	13.0%		16.7%	3.2%		30.4%	40.0%	
Day of the week			0.933			0.547			0.605
Weekday	46.7%	47.8%		86.1%	80.6%		47.8%	56.2%	
Weekend	53.3%	52.2%		13.9%	19.4%		52.2%	43.8%	
Program time			0.126			0.200			0.570
Morning	6.7%	13.0%		61.1%	45.2%		26.1%	12.5%	
Afternoon	50.0%	69.6%		36.1%	41.9%		34.8%	37.5%	
Evening	43.3%	17.4%		2.8%	12.9%		39.1%	50.0%	
Length of program in mins (SD)	194.67 (47.0)	180.87 (59.1)	0.348	97.50 (16.4)	90.65 (18.5)	0.244	161.95 (40.0)	141.67 (43.1)	0.151
Mean no. of volunteers (SD)	1.00 (0.5)	1.13 (0.3)	0.307	0.94 (0.5)	0.84 (0.6)	0.739	1.30 (1.0)	1.14 (0.8)	0.601
Country of origin			0.000			0.001			0.003
Mexico	71.1%	66.7%		24.3%	20.5%		0.3%	1.3%	
Dominican Republic	0.3%	7.1%		17.5%	12.3%		2.8%	1.8%	
Puerto Rico	0.0%	0.3%		22.0%	28.2%		67.6%	55.9%	
United States	3.6%	1.3%		14.4%	9.1%		17.8%	33.0%	

Table 3 continued

Variables	AR			NYC			WNY		
	Intervention	Control	*P*-value	Intervention	Control	*P*-value	Intervention	Control	*P*-value
Central America	20.2%	23.1%		4.2%	7.5%		1.7%	2.2%	
South America	3.4%	1.3%		8.8%	13.6%		1.7%	2.2%	
Other	1.6%	0.3%		8.8%	8.8%		8.0%	3.5%	

of origin had a similar distribution between the two programs in AR.

New York City

In NYC, 36 of the programs were intervention and 31 were control. The mean number of female participants at intervention programs was higher (11.33 [SD = 6.6]) than that of control programs (9.65 [SD = 4.6]). There was a mean of 2.81 men per control (SD = 3.9) and 1.03 men per intervention program (SD = 1.6), which was statistically significant ($P = 0.012$). Location types revealed the following distribution: 80.6% (intervention) versus 74.2% (control) for community-based programs, 8.3% (intervention) versus 9.7% (control) for faith-based programs and 11.1% (intervention) versus 16.1% (control) for programs in private homes.

Opening prayers were offered at 61.1% of intervention and 54.8% of control programs. A similar difference was noted with closing prayers (58.3 and 51.6% respectively). A male advisor was present at 5.6% of intervention and 0.0% at control programs. The ARS system was used almost exclusively (93.5%) in control programs, but only 77.8% at intervention programs. More intervention programs were on weekdays (86.1%) than control (80.6%). Evening intervention programs were much less frequent (2.8%) than evening control programs (12.9%) and 61.1% of intervention programs were offered in the morning, compared to 45.2% of control.

In the intervention programs, 24.3% of participants were born in Mexico, compared with only 20.5% of participants in control programs. Participants from the Dominican Republic comprised 17.5% of intervention and 12.3% of control participants. Participants born in Puerto Rico represented 22.0% of participants at intervention programs compared with 28.2% of control participants. Other reported countries of origin had a similar distribution between program types.

Western New York

In WNY, 23 of the programs were intervention and 16 were control. The mean number of men at control programs was 4.19 (SD = 4.5), compared to 2.83 (SD = 3.3) in intervention programs. The location types followed the subsequent distribution: 30.4% (intervention) versus 31.2% (control) for community-based, 26.1% (intervention) versus 37.5% (control) for faith-based and 43.5% (intervention) versus 31.2% (control) for programs in private homes.

Spanish was used in 78.3% of intervention but only 62.5% of control programs. Control programs, on average, had larger groups, with 25.0% having 21 or more participants and only 17.4% of intervention groups having this number. An opening prayer was given in more control (31.2%) than intervention programs (26.1%), as was a closing prayer (31.2 and 21.7% respectively). In 81.2% of control programs, a survivor spoke, compared to 95.7% in intervention. A male advisor was present at 31.2% of control, but only 17.4% of intervention programs.

The ARS system was utilized in 69.6% of intervention and 60.0% of control programs. Weekday programs were more widely offered in control (56.2%) than in intervention programs (47.8%), and evening programs were most common in control (50.0% compared to only 39.1% in intervention). Morning programs consisted of 12.5% of control and 26.1% of intervention programs. Intervention programs were longer than control programs (161.95 min [SD = 40.0] compared to 141.67 min [SD = 43.1] respectively).

Participants born in Puerto Rico comprised 67.6% of intervention participants, but only 55.9% of control. Likewise, participants born in the US comprised only 17.8% in intervention, but 33.0% in control programs. All other identified countries of origin had a similar distribution between program types in WNY.

Discussion

Implementation of the *Esperanza y Vida* program in three diverse locations with unique geographic and ethnic variations and methodological considerations is instructive for future outreach and replication of this program in other locations throughout the US. Fidelity to the program messages (cancer and diabetes) was maintained through the use of the same PowerPoint presentation and questions within the ARS process. All tailored variations were implemented through program delivery and accommodations to regional

and cultural site differences. The strength of this research lies in the adaptation of the same intervention for use in different geographic sites and diverse sample populations, characterized by varied country of origin, degree of assimilation and customs in local sites. This analysis offers insight into multi-site intervention research, randomization outcomes for real-world community-based interventions, and concerns that address how to reproduce and improve this program to reach more of the underserved Latina subgroups. The cultural competence of our program has the potential to reduce health disparities evident in breast and cervical cancer mortality rates of Latinas in the US.

In each location, there were a significantly higher number of male participants in control programs, which is possibly because diabetes is a disease that is widely known to also afflict men. Although sites were selected and recruited before being randomized by health topic, the individual hosts could have influenced participant recruitment when they were told the nature of the program. It is also possible that men who arrived at an intervention program may have decided not to stay once they learned of the topic. In addition, as some participants may have been informed about which program would be given in advance of their attendance, there is the possibility that participants self-selected based on this information. It is also possible that people knew more about or had more interest in learning about one topic versus the other. However, since literature has acknowledged Latino families as patriarchal, with men having more resources to make health decisions for their families, the program should further emphasize the need for male awareness to promote the health of female family members [12]. Further outcome analysis will determine the impact of these male partners' presence at each of the programs.

Both amongst the different locations and within each location, between both program types, there are different distributions of program location sites (community-based, faith-based and private home). These differences reflect access to various local agencies, community structure variations by site, participant preferences and access to local venues as well as recruiting preferences and options of project coordinators and could have lead to an unexpected selection of certain types of participants [28]. It is somewhat unclear from these data if there is an ethnic preference for specific venues. However, prior qualitative findings [18, 28, 29] predicted some of these variations as Puerto Rican and Dominican Latinas in NYC suggested that secular community venues would be better program sites for health education programs over Catholic Church sites, while Mexican Latinas in AR suggested that they would prefer local faith-based settings (Catholic or Protestant) for health education programs. It is understood that recent Latina immigrants from different countries, arriving in different locations, have different levels of integration into their new community. Formative research [18, 28, 29] indicated that Latino-friendly community centers may not be available in locations like Arkansas, while geographic locations like NYC and WNY with more established immigrant populations have alternative social networks and program venues within their neighborhoods and boroughs that provide user-friendly venues for Latinos. Likewise, undocumented Latinos may be more likely to attend programs in venues that are perceived as "safe" such as trusted faith-based organizations or at their friends' homes. Thus, large differences in program location, as seen in NYC (with 77.6% of programs in community-based locations and only 9.0% in faith-based locations) could influence access to certain populations which need these educational programs. For instance, in AR, intervention programs offered in faith-based locations and in private homes were more popular with the Mexican Latinos and less likely to be attended by Latinas from the Dominican Republic (0.3% compared to 7.1% from Dominican Republic in control).

The program length variations between sites are notable. The longer program times with the primarily Mexican, more recent immigrant communities in AR, may indicate the lower knowledge and experience level [30] of these groups, reflecting more program questions during presentations. This program variation also reflects that groups attending on weekends and evenings may have more time available to interact with program staff and volunteers and may not be as rushed to leave a program as attendees on weekdays. There may also be participant and location cultural variations as NYC residents may expect business to be conducted at a much faster pace than AR or WNY.

The language in which programs were offered were directly responsive to the hosts' and participants' requests and reflect the general language preferences and skills of the Latinos in the specific geographic region as well as the level of acculturation. In both AR and WNY, there were also significant differences between the control and intervention programs in attendance of a survivor and male advisor. Given that both are important features of the program's cultural sensitivity and offer participants an opportunity to interact with someone who can address their negative beliefs about health screening and prognosis after diagnosis, the implication of this will need to be examined with the follow up screening rates. ARS utilization was also very different within each location between the types of programs, which could be indicative of the participants recruited at each type (i.e., familiarity with technology, literacy). Differences in ARS utilization between AR, NYC and WNY could reflect a low level of comfort with the system in certain locations and the challenge of controlling when participants arrive and programs begin. This dissimilarity should be further explored to discover its

implications and to rule out any specific reason that one would be preferred over another by each program's participants.

One potential limitation of this research is the different methods of program site recruitment, including the choice of faith- or community-based locations. While this might have led to differences in participants across sites, it may also have led to our success in reaching large numbers of Latinos, as we were responsive to the needs of our communities. Our findings may not be completely extrapolated to Latinas in other regions of the US, such as border areas with Mexico, locations where Latinos are employed mostly as migrant workers [31] and regions with predominantly Central or South American Latino populations, since these groups were not strongly represented in our sample population. Investigators in community-based research must anticipate variation within this very diverse population.

These results demonstrate the ability of *Esperanza y Vida* to recruit a large number of diverse Latinos in various geographic locations to a health education program. These findings demonstrate an ability to recruit and educate diverse subgroups of the Latino population, the successful enhancement of knowledge about the topics, and that the program is malleable to different community needs. The next step will be to examine the potential impact the program may have on increasing screening habits in Latinas at diverse geographic locations. These findings provide an excellent foundation for subsequent expansion of the *Esperanza y Vida* program to educate Latino communities throughout the US in breast and cervical cancer awareness and screening as well as other health topics.

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