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The “Empowering Latinas to Obtain Breast Cancer Screenings” Study: Rationale and Design

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Abstract

Background—Latinas suffer disproportionately from breast cancer (BC) in part due to lower guideline-concordant screening. Multiple intervention approaches have been developed to promote screening through direct patient education and empowerment approaches (i.e., training community members to share BC information). This study compares the relative effects of these approaches on: 1) women’s BC screening; and, 2) women’s dissemination of BC information within their social networks.

Design/Methods—Our quasi-experimental trial is being implemented in community venues in two predominantly Latino neighborhoods in South and West Chicago. Eligible participants: 1) are female; 2) are 52–74 years old; 3) have not obtained a mammogram in the past 2 years; and, 4) have not previously participated in health-related volunteerism. Based on their geographic location, participants are assigned to one of two group-based interventions. Both interventions consist of three two-hour sessions, which includes BC early detection education. The education intervention sessions also covers BC prevention (diet, physical activity), whereas the empowerment intervention covers sharing information with family/friends, and health volunteerism. Navigation is provided for all women who wish to obtain mammograms. Primary outcomes include: 1) receipt of BC screening; and, 2) participants’ dissemination of BC information. Secondary outcomes include positive changes in 1) participants’ self-reported psychosocial facilitators; and, 2) social network members’ BC behaviors.

Discussion—The design of our program allows for a preliminary comparison of the effectiveness of these two approaches. This work will inform larger comparative trials and offers a new approach to intervention evaluation via social network analysis.

Keywords

Breast Cancer; Health Disparities; Screening; Latinas

1. Introduction

Latinas suffer disproportionately from breast cancer (BC) relative to non-Latina Whites (NLWs), including later stage at diagnosis and worse quality of life [1–4]. While controversies about BC screening exist [5, 6], screening remains a major modifiable determinant of these disparities [7–9]. Multiple approaches have sought to improve screening among Latinas to reduce BC burden [10–17]. Some have focused on access/logistic barriers (e.g., costs, insurance status, transportation, childcare), including *patient navigation* to free/low-cost services [10,13–14, 18]. While implemented at the individual-level, these approaches have focused on the consequences of societal/distal determinants (e.g., economic hardship, fragmented/uncoordinated care). Others, generally implemented by community health workers [19], have focused on psychosocial/cultural barriers (e.g., lack of information, embarrassment) [10, 12, 17]. These approaches have focused on more proximal (e.g., fear) and intermediate determinants (e.g., shared cultural misconceptions with social networks). Two psychosocial/cultural approaches are *education*, wherein the target population of Latinas receive information (e.g., [20, 21]); and, *empowerment*, wherein community leaders and BC survivors have been trained to disseminate information to the target population of Latinas (e.g., [22–24]).

Are there differences in the effectiveness of interventions? Access/logistic-based approaches appear to be more effective more consistently [10]. This work parallels systematic reviews that have characterized screening promotion across populations [25, 26]. Less consistently effective are psychosocial/cultural approaches, which often reflect intrapersonal, interpersonal, as well as cultural forces (e.g., norms, values), although there are more studies that combine access/logistic and psychosocial/cultural-based approaches is optimal [27–30].

There is a question about *which* psychosocial/cultural-based approach should be used. Variation in effectiveness for psychosocial/cultural-based approaches has been found in the context of BC screening [10], but also in other reviews focused on Latino health at large [11, 17, 31] and across populations.[16] Reviews have largely compared efficacy in terms of the presence of a theoretical framework, interventionist characteristics, intervention duration, and intervention location (e.g.,[15, 16, 32, 33]). Assessing differential efficacy has been less studied, partly due to differences in participant populations (e.g., target populations versus community leaders/advocates) and goals (e.g., participants' behavior change versus dissemination of health information) [23, 34, 35]. However, a growing number of empowerment approaches, which generally include elements of education approaches *and* training on dissemination, have begun to measure the behaviors of the targeted community leaders/advocates in addition to the behaviors of the target populations reached by the leaders/advocates [34, 36–38]. Others have similarly advocated that measuring participant-driven health dissemination is needed for education approaches, as participants are likely sharing information they have learned and may be catalyzing behavior change for individuals in their own social networks [39–41]. There is altogether a growing ability and need to compare these approaches' effects on participants' behaviors *and* their dissemination of information/behavior change throughout networks.

The current paper describes the rationale and design for the “Empowering Latinas to Obtain Breast Cancer Screenings” study. Our primary aim is to compare the effects of two multifaceted interventions, education/navigation and empowerment/navigation among Chicago-based Latinas who are non-adherent to US Preventive Services Task Force (USPSTF) guidelines [42].

2. Study design and methods

2.1 Overview

As described above, the “Empowering Latinas to Obtain Breast Cancer Screenings study” is an exploratory quasi-experimental study funded by the National Institutes of Health. The target sample is 150 Chicago-based Latinas who are non-adherent to USPSTF guidelines (75 education; 75 empowerment). The objectives are to compare the relative efficacy of two multifaceted interventions. The primary predictor is study arms - education/navigation and empowerment/navigation programs. Both programs were delivered by community health workers (CHWs). Primary outcomes are BC screening uptake; and, dissemination of BC information throughout their networks. Secondary outcomes are women’s psychosocial/cultural facilitators for BC screening uptake (cultural beliefs, self-efficacy, social norms, social support, knowledge); and, network members’ BC screening behaviors (screening, peer referrals to study). Figure 1 depicts a simplified overview of study processes described below, including sampling, area-level assignment, study arm-specific interactions, and surveys.

2.2 Conceptual framework and hypotheses

Figure 2 depicts our conceptual framework.

Several theories informed our conceptual model. First, we draw from existing multi-level models [27, 29, 43–45], which describe screening as influenced by distal (e.g., social conditions, policies), intermediate (e.g., neighborhoods, social networks), and proximal determinants (e.g., access/logistic, psychosocial/cultural, demographics). Existing intervention approaches focus on proximal determinants to promote Latinas’ BC screening. Navigation is tailored to address patients’ specific barriers, including access and logistic factors [13, 14]. Education approaches target psychosocial/cultural barriers [17]. Empowerment approaches focus on intermediate determinants of screening – specifically social networks [22, 23, 46, 47]. Thus, in navigation and education approaches, participants are the targeted population and behavior change in BC screening is targeted by addressing proximal determinants. Conversely, in empowerment approaches, participants are the interventionists to the targeted population, wherein proximal determinants of screening are addressed to encourage the dissemination of information throughout networks and, ultimately, to change the intermediate determinants of network members’ decisions to obtain screening. Given this, we predict that women receiving the empowerment intervention will be more likely to disseminate BC information more often and more widely throughout their networks relative to women receiving the education intervention.

Second, we draw from social psychology and volunteerism theories, which suggest that empowerment approaches may also have incidental health-protective effects for the participants themselves [37, 48, 49]. These models suggest that there may be more sustained changes in cultural beliefs, self-efficacy, social norms, social support, and knowledge for empowerment participants because of their greater perceived obligation to share information (thus the need to know it and model it first). This sustained change in psychosocial/cultural facilitators to screening may then result in greater adherence to guideline-concordant BC screening among empowerment participants relative to education participants. Additionally, hypocrisy reduction and cognitive dissonance theories suggest that participants trained to share recommendations with members of their networks may be more obligated to adhere to recommendations before they disseminate information throughout their communities [50, 51]. Given these consequences of engaging one's social networks, an intermediate determinant, we predict that women receiving the empowerment intervention will be more likely to obtain BC screening relative to women receiving the education intervention.

We have two primary hypotheses based on literature described above. First, we hypothesize that empowerment intervention participants will be more likely to obtain BC screening relative to education intervention participants. Second, we hypothesize that empowerment intervention participants will be more likely to share information with women in their social networks relative to education intervention participants.

We also have two secondary hypotheses, based on literature described above. First, we predict that empowerment intervention participants will have greater sustained changes in psychosocial facilitators to screening (cultural beliefs, self-efficacy, social norms, social support, and knowledge) relative to education intervention participants. Second, we hypothesize that women within empowerment participants' networks will be more likely to change their BC screening behaviors than those within education participants' networks. We will measure changes in the context of network members' interest in enrolling in the study (peer referrals) and attainment of BC screening.

2.3 Settings and rationale regarding area-level design

Trial implementation began in March 2017 and is expected to be complete by March 2020. The study arms are being implemented in 2 different community areas in Chicago, Illinois. We have selected an area-level design for this study because there is a high likelihood of substantial contamination. Chicago neighborhoods are tightly interconnected [52]. In addition, the empowerment study arm trains and promotes participant-driven dissemination. It may be highly likely that participants randomized to both conditions within the same neighborhood would interact, leading to contamination bias. These two areas are comparable in ethnic composition (65% Latino) and socioeconomic status (30% 100–199% federal poverty level) [53].

2.4 Intervention sites/staff qualifications and training

Table 1 provides the qualifications by which we chose the 1 community-based organizations in each community area, the 2 field community health workers (CHWs), 1 office coordinator/ navigator, and 3–5 field and office assistants throughout the project as well as

the extensive training each position underwent. Briefly, all staff undergo overall research training (e.g., human subjects) as well as training tailored to their roles (e.g., role-playing phone calls). Subsequently, the PI and senior staff regularly review performance during the first year and routinely give booster training after each session/weekly set of calls. After the first year, 25% of group sessions/phone calls are randomly selected to be attended by the PI and senior staff and booster trainings are subsequently given.

Ethics committee approval

All study materials and processes are in accordance with the Code of Ethics of the World Medical Association and have been approved by the University of Illinois at Chicago Institutional Review Board. Approved materials and procedures include: informed consent, intervention activities, surveys, and HIPAA forms for medical record abstraction. More information pertaining to informed consent and patient details is described in the context of study processes (Sections 2.6–2.14).

2.5 Recruitment

Field CHWs recruit primarily by posting flyers in their offices, other community venues (e.g., community centers, schools) and community events (e.g., health fairs). They also recruit through short oral presentations (e.g., public radio, during church masses) and provide regular clientele with the relevant information. Interested women contact office staff to be screened and scheduled.

Participants are also able to recruit, if interested. Willing participants obtain numbered flyers that provide a study overview and contact information. Participants receive \$10 for each peer that contacts study staff to be screened and scheduled. During screening, peers note the number on flyers to identify the seed participant.

2.6 Eligibility Criteria and Participant Incentives

Eligibility criteria are: 1) identification as Latina, Hispanic, Chicana; 2) residence in one of the targeted community areas; 3) no personal history of BC; 4) non-adherence to current USPSTF guidelines (i.e., 52–74 years old; no mammogram in past 2 years)[42]; and, 5) no history of health volunteerism. Participants receive \$80 across their six months of participation in the trial (\$10 for Session 1, \$20 for Session 2, \$25 for Session 3, \$25 for 6-month follow-up survey).

2.7 Intervention Group Sessions

The education and empowerment interventions include three consecutive, weekly sessions with groups of 3–10 women in a community-based site. The topics, learning targets, and activities for each session are outlined in Table 2.

2.8.1. First Session for Education and Empowerment Interventions—Both interventions provide the same information during the first session, including that BC is the most common type of cancer for Latinas [3]; various modifiable and non-modifiable BC risk factors [54]; Latinas' worse stage diagnosis and quality of life relative to NLWs [1, 2, 4, 55]; 3 types of BC screenings, including procedures, USPSTF recommendations, and the average

tumor size; economic, psychosocial/cultural, and access/logistic barriers they may have; and, potential solutions to address these barriers.

2.8.2 Education intervention-specific sessions—After the first session, the education intervention focuses on two modifiable BC risk factors – diet and physical activity. These sessions draw from the Diabetes Empowerment Education Program [56, 57]. For the diet session, given literature on dietary factors and BC risk is complex [58], CHWs discuss how dietary behaviors can reduce BC risk through reducing the risk of overweight/obese status [54]. Next, women learn about food groups and the recommended portion sizes for these groups. For the physical activity session, women review information BC prevention-based information, with a focus on how physical activity is associated with BC risk directly as well as through overweight/obese status[54, 59]. Next, women learn about the three types of movement and recommended physical activity guidelines. For both sections, visual tools are used (e.g., pictures of food, movement) to describe women’s current behaviors as well as planned behavior change post-intervention.

2.8.3 Empowerment intervention-specific sessions—After the first session, the empowerment intervention focuses on contextualizing breast health via women’s informal social networks (interpersonal advocacy) and larger communities (community advocacy). With regard to interpersonal advocacy, women discuss the importance of interpersonal advocacy; identify barriers and solutions to interpersonal advocacy; and, review information about BC (risk factors, 3 screenings) in the context of three specific women they identify in their networks; develop action plans to discuss breast health with these 3 specific women; and, engage in a role-playing activity to practice their plans. With regard to community advocacy, women discuss the importance of community advocacy; identify barriers and solutions to community advocacy; and, develop a plan regarding how, when, and where women can serve as volunteers for existing Latino health-based community efforts. Finally, women are provided with a list of local opportunities to volunteer.

2.8 Post-intervention six-month engagement

After women complete the three group sessions, office staff call them monthly for the subsequent six months. This continued contact is partially designed to reduce the risk of loss to follow-up. Staff make up to a maximum of three attempts across one week. For successful contacts, staff ask a series of open-ended questions related to BC screening, diet, physical activity, and volunteerism.

2.9 Navigation

Throughout intervention sessions and monthly calls, CHWs and office staff offer navigation services for women who are interested in obtaining a BC screening within a BICOE-accredited facility. For women who are interested, the study team coordinates their enrollment in hospital-based and/or community-based navigation services [60, 61] for low cost/free mammography. These navigation services are largely funded through the local affiliate of the National Breast and Cervical Cancer Early Detection Program [62, 63], hospital charity care, and service grants via the city public health department. Throughout the BC care uptake process, the study team keeps in close contact with the participant. The

study team's goals are to ensure that participants: 1) obtain screening within 30 days of initial interest; 2) receive diagnostic resolution within 60 days of an abnormal screening result; and, 3) initiate treatment within 30 days of a definitive diagnosis.

2.10 Study management

The Principal Investigator (Dr. Molina) and community leaders (e.g., Lucio, Coronado) are responsible for protocol development, implementation, and dissemination of study findings in manuscripts and conference presentations. To oversee processes, they meet with field and office staff on a weekly basis as a group and one-on-one as needed. Leadership from hospital/ community navigation services provide feedback on intervention implementation throughout the study via weekly or monthly meetings as is needed. Regarding database management, Dr. Molina and office assistants with epidemiological training develop and manage a complete study database that leverages diverse data sources (medical records; study records; data sources; Table 3).

2.11 Measures

Table 2 depicts the measures used, the data sources for the measures, variable type (outcome, predictor, covariate), and when the particular measure was collected/abstracted during the course of the study. All survey instruments have been previously validated among Latina/Spanish-speaking populations.

2.12 Planned statistical analyses

We will use multiple imputation techniques to handle missing data [74, 75], including using hot-deck pattern matching techniques, wherein respondents with missing data will be matched to respondents with existing data based on baseline/demographic data. Measures will be assessed and included if they have adequate reliability (Cronbach's alphas ≥ 0.70). Subsequently, we will conduct descriptive statistics. For social network covariates, we will conduct network visualization and subsequently estimate network composition [76, 77]. We will next examine how potential covariates described in Table 3 differ by study arms and relate to outcomes of interest through bivariate analyses.

We will proceed to conduct models to examine study arm differences in primary and secondary outcomes, after adjusting for relevant covariates. For receipt of screening, we will use logistic regression. For BC dissemination throughout participants' networks, we will first examine the distribution of the variable. If the variable is normally distributed, we will use linear regression, adjusted by covariates. Otherwise, we will dichotomize the variable (0 = No dissemination; 1 = Any dissemination) and will use logistic models. For psychosocial/ cultural facilitators, we will use mixed modeling with level 2 being participants and level 1 being time points. We will assess within-participant change over time for each facilitator to identify whether it would be best modeled as linear versus non-linear (quadratic). Once determined, we will expand models to examine study arm and study arm*time interaction effects across time, after being adjusted by covariates. If this type of modeling is not possible, due to computational complexity, we will use Generalized Estimating Equations modeling. For peer referrals, we will first examine its distribution and clustering. If the variable is normally distributed, we will use linear regression, adjusted by covariates.

Otherwise, we will dichotomize the variable (0 = No peer referrals; 1 = Any peer referrals) and will use logistic regressions, adjusted by covariates. We will use mixed modeling, if adjustment for clustering is needed.

2.13 Power analyses

For this trial, we estimate the minimal detectable effect size (MDES), assuming a sample size of 150 (75 per arm), power = .80, two-tailed tests, and $p < .05$. We note that MDES is preferred over sample size requirements, when resources are limited for expensive data collection. Under these circumstances, we describe the smallest true impact interventions could have, given our programmatic requirements. All analyses use G*Power 3.1.9.2 [78, 79]. The MDES for primary outcomes, assuming screening and BC dissemination are both dichotomous (yes/no, any/no dissemination), we would be able to detect study arm differences that are medium to large in magnitude (OR= 2.8). For psychosocial characteristics, assuming 450 level-1 units (time points) and 150 level-2 units (participants), we would be able to detect changes of small/medium magnitude for study arm*time interactions (ICC=0.0–0.5). For peer referral, assuming dichotomization would be necessary, we would also be able to detect study arm differences that were medium to large in magnitude.

3.0 Discussion

Disparities in BC screening may contribute to Latina BC patients' later stage at diagnosis and worse quality of life [1–4, 55, 80]. Multiple intervention approaches have been developed to promote BC screening to address this public health problem [10–17]. Relatively little research has however compared their effects on individual-level outcomes, including screening and related psychosocial/cultural facilitators. Another gap in the literature concerns potential multi-level effects of individual-level approaches, including dissemination of intervention information throughout networks and consequent behavior change by non-participant women within these networks. Such information is needed for future translational and Implementation Science efforts to mitigate population-level disparities.

4.0 Limitations

This study has several limitations. The study uses non-probability based community sampling from two geographic areas in Chicago, IL. We are thus limited in generalizability. Similar to any longitudinal intervention study, some amount of attrition is expected (e.g., voluntary drop out, loss of contact). Relatedly, another limitation concerns a lack of individual-level randomization. While our area-level design assists with contamination bias and neighborhoods are relatively comparable in terms of ethnic composition, certain threats to internal validity may exist. We also have a relatively short follow-up period (6 months). Over- and under-reporting of primary outcomes is likely to be a problem, due to recall and reactive measurement biases. We are using current USPSTF guidelines, but they may change, and new information may suggest different screening patterns are optimal for early detection of true, invasive breast cancer cases. Finally, this pilot study begins to compare different interventions targeting determinants at different levels of society, with a focus on

proximal and intermediate levels. Larger future studies are however warranted that can simultaneously compare approaches targeting all of the levels of society (proximal, intermediate, distal) as well as to examine the relative effects of truly multilevel interventions.

5.0 Conclusions

In conclusion, results from the “Empowering Latinas to Obtain Breast Cancer Screenings” will provide crucial information about comparative effectiveness of education/navigation and empowerment/navigation approaches in terms of participants’ BC screenings and diffusion of information throughout social networks. We also will provide preliminary data regarding differences in sustained changes in psychosocial facilitators of BC screening and changes in non-participants’ BC care behaviors.

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Fig 1.
Overview of Empowering Latinas to Obtain Breast Cancer Screenings study processes.

Fig 2.
Conceptual Framework.

Table 1

Staff qualifications and training

	Community-Based Organiz	Community Health Worker	Office Coordinator/ Navigator	Office/Field assistantsts
Qualifications	<p>1 had been serving Latinos in the targeted community for >20 years</p> <p>2 had a history of >10 years of providing BC health promotion services to Latinas in the targeted area</p> <p>3 had been navigating women to Breast Imaging Centers of Excellence (BICOE)-accredited facilities that provide free/low cost BC screening services.</p>	<p>1 identify as Latina, Chicana, or Hispanic</p> <p>2 be a woman</p> <p>3 be between 52–74 years old</p> <p>4 have given at least 2 BC workshops within the past year</p> <p>5 have undergone formal training to be a CHW (e.g., university-based, public health department-based)</p> <p>6 be fluent in Spanish</p> <p>7 have personal experience with BC (e.g., survivor, first-degree relative).</p>	<p>1 be bilingual in English and Spanish</p> <p>2 have formal training in hospital-specific referral processes and navigation overall (e.g., American Cancer Society).</p>	<p>1 identify as Latina, Chicana, or Hispanic</p> <p>2 be bilingual</p> <p>3 have formal training in public health</p>
Training		<p>1 Human subjects and HIPAA training</p> <p>2 Initial 4 week training on administrative research duties and intervention content/procedures for in-person sessions</p> <p>3 Booster trainings pre-intervention delivery during Year 1, based on senior staff notes on intervention fidelity on senior staff notes on script and participant</p>	<p>1 Human subjects and HIPAA training</p> <p>2 Initial 3 week session on administrative research duties and procedures for phone-based contact and navigation services</p> <p>3 Booster trainings, based fidelity and success</p>	<p>1 Human subjects and HIPAA training</p> <p>2 Initial 3–4 week training on administrative research duties, intervention content/procedures for in-person sessions and phone-based contact</p>

	Community-Based Organiz	Community Health Worker	Office Coordinator/ Navigator	Office/Field assistantsts
		non-verbal behaviors		

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Table 2

Intervention session components.

Education			Empowerment		
Topic	Learning Targets	Activities	Topic	Learning Targets	Activities
Breast Health Education	<ul style="list-style-type: none"> Breast cancer incidence, stage at diagnosis, and quality of life among US-based Latinas 	<ul style="list-style-type: none"> CHW testimonial as a survivors and family members/caregivers of survivors Group discussions related to breast health Individual activities 	Breast Health Education	<ul style="list-style-type: none"> Same as Education 	<ul style="list-style-type: none"> Same as Education
	<ul style="list-style-type: none"> Breast cancer risk factors 	<ul style="list-style-type: none"> – Identification of risk factors 			
	<ul style="list-style-type: none"> Types of breast cancer screenings 	<ul style="list-style-type: none"> – Economic, psychosocial, logistic barriers 			
	<ul style="list-style-type: none"> Barriers and solutions to obtain screenings 	<ul style="list-style-type: none"> – Preferred solutions/ plans for screening 			
Diet	<ul style="list-style-type: none"> Diet and breast cancer risk 	<ul style="list-style-type: none"> CHW testimonial for using diet to reduce breast cancer risk Group discussions related to current diet (e.g., examples of unprocessed foods, benefits) Individual activities 	Interpersonal Advocacy	<ul style="list-style-type: none"> The importance of breast cancer burden among Latinas in the context of women in participants' networks The importance of women sharing information, due to peer status, existing relationships, as well as gender, ethnicity, language, and experiential concordance Barriers and solutions to 	<ul style="list-style-type: none"> CHW testimonial as individuals who support their family and friends Group discussions Individual activities – Identification of barriers to interpersonal advocacy ♦ Identification of solutions to engage in interpersonal advocacy ♦ Action plan to engage 3 women (whom,
	<ul style="list-style-type: none"> Food groups 	<ul style="list-style-type: none"> – Current consumption of food groups 			
	<ul style="list-style-type: none"> Portion sizes 	<ul style="list-style-type: none"> – Current portion sizes 			

Education			Empowerment		
Topic	Learning Targets	Activities	Topic	Learning Targets	Activities
		<ul style="list-style-type: none"> Planned dietary-based changes 		<ul style="list-style-type: none"> sharing information with other individuals Planning to share information 	when, where, how)
Physical Activity		<ul style="list-style-type: none"> CHW testimonial for using physical activity to reduce breast cancer risk 	Community advocacy	<ul style="list-style-type: none"> The importance of breast cancer burden among Latinas in the context of participants' communities 	<ul style="list-style-type: none"> CHW testimonial as individuals who support their communities
	<ul style="list-style-type: none"> Physical activity and breast cancer risk 	<ul style="list-style-type: none"> Individual activities 		<ul style="list-style-type: none"> The importance of women volunteering for their communities, due to their status, experiences, and knowledge as a community member 	<ul style="list-style-type: none"> Group discussions Individual activities
	<ul style="list-style-type: none"> 3 types of movement 	<ul style="list-style-type: none"> Current types of movement (with/without full ability) 			<ul style="list-style-type: none"> Identification of barriers to community advocacy
	<ul style="list-style-type: none"> Frequency, intensity, and time 	<ul style="list-style-type: none"> Current frequency, intensity, and time 		<ul style="list-style-type: none"> Barriers and solutions to volunteerism 	<ul style="list-style-type: none"> Identification of solutions to engage in community advocacy
		<ul style="list-style-type: none"> Planned physical activity-based changes 		<ul style="list-style-type: none"> Planning to volunteer with local community organizations 	<ul style="list-style-type: none"> Action plan to engage in local volunteer opportunity

Table 3

Study constructs, variable type, and timing of assessment.

Construct	Variable Type	Baseline	Post-Intervention	6-month follow-up
BC screening [64]				
Lifetime	Covariate			
BC screening within 6 months of Intervention	Primary Outcome			
Social network factors				
Social network size/characteristics [65]	Covariate			
Breast cancer-specific social connectedness[66, 67, 68,69]	Covariate			
Breast cancer dissemination[36, 37]	Primary Outcome			
Network members' BC screening due to participant (modified [64])				
Peer referrals to study	Secondary Outcomes			
Psychosocial facilitators				
Breast cancer knowledge[70]	Secondary Outcomes			
Cultural beliefs[71]	Secondary Outcomes			
BC-specific social norms[72]	Secondary Outcomes			
BC-specific social support [72]				
BC screening self-efficacy ref[73]	Secondary Outcomes			
Demographic/healthcare factors (e.g., age, education, income, insurance status, regular provider) [64]	Covariates			

* BC = breast cancer.