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Kin KeeperSM: Design and Baseline Characteristics of a Community-Based Randomized Controlled Trial Promoting Cancer Screening in Black, Latina, and Arab Women

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Abstract

Background—Although breast and cervical cancer deaths have declined due to early screening, detection, and more effective treatment, racial and ethnic disparities persist. This paper describes the study design and baseline characteristics of a randomized controlled trial (RCT) evaluating the effectiveness of the Kin KeeperSM Cancer Prevention Intervention, a family-focused educational intervention for underserved women applied in a community-based setting to promote health literacy and screening adherence to address cancer disparities

Methods—Female public health community health workers (CHWs) were trained to administer the intervention. They recruited female clients from their public health program caseload and asked each to assemble two to four adult female family members for the breast and cervical cancer home-based education sessions the CHWs would deliver in English, Spanish or Arabic. We randomized the clients into the kin keeper group (treatment) or the participant client group (control)

Results—Complete data were obtained on 514 Black, Latina, and Arab women. Close to half were unemployed and had yearly family income below \$20,000. Thirty-four percent had no medical insurance, and 21% had diabetes. Almost 40% had no mammography in the last year.

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Treatment and control groups were similar on most sociodemographics but showed differences in breast and cervical screening history.

Conclusions—This innovative study demonstrates the implementation of an RCT using community-based participatory research, while delivering cancer prevention education across woman's life span with women not connected to the health care system.

Keywords

Randomized controlled trial; community-based participatory research

1. Introduction

Although breast and cervical cancer deaths have declined due to early screening, detection, and more effective treatment [1–3], racial and ethnic disparities persist, even after controlling for age and socioeconomic status [2]. Breast cancer incidences are similar among White and Black women (122.6 vs. 118 per 100,000 women), yet death rates are higher among Black women (22 vs. 31.2 per 100,000) [4]. Cervical cancer incidence and death rates are higher among Black women (10.3 and 4.2 per 100,000) compared to White women (7.3 and 2.2) [4]. Women with low socioeconomic status do not, in general, adhere to cancer screening guidelines; therefore, their cancers are often found at later stages. Appropriately timed screening to promote early diagnosis among these women is key to reducing cancer disparities. Further, as the Institute of Medicine's report on health literacy identified, low literacy is an impediment to getting appropriately timed breast and cervical cancer screening [5]. Although, community health workers (CHWs) have demonstrated success in reaching and engaging minority women in health services, well-designed trials testing the effectiveness of CHW interventions are scarce [6–9].

Community-based participatory research (CBPR) methods, through active involvement of community stakeholders throughout the research process, can be used to develop and test practical interventions for underserved minority populations. In addition, policy makers are encouraging public health agencies to demonstrate program effectiveness that meets stringent evidence-based criteria [3–4]. Combining a CBPR approach to guide the intervention design and a randomized controlled trial (RCT) to measure its effectiveness can answer the need for an intervention that is practical and translatable to the community's real life environment while implementing the gold standard for measuring intervention success.

The Kin KeeperSM Cancer Prevention Intervention randomized trial is a CBPR study that relies on the synergy and natural communication that exist among female family members and uses CHWs to increase cancer prevention education and screening behaviors and, thus, functional cancer literacy. Kin KeeperSM includes African American (hereafter referred to as Black), Latina, and Arab women, uses existing resources within the public health system, builds skill capacity among the CHWs and expands health services for hard-to-reach women [10–11].

This trial responds to the need for rigorously testing the effectiveness of female family-focused educational interventions for underserved women applied in real world settings using RCT designs. A community-university partnership developed the Kin KeeperSM trial to test the primary hypothesis that cancer education delivered by CHWs could increase breast and cervical cancer screening rates. The secondary hypothesis was that breast and cancer literacy will be higher in the kin keeper group compared to the control group. We will also assess intervention costs and health care utilization. The present paper describes the study design, recruitment, randomization, baseline characteristics, and analysis guidelines. We discuss the challenges of designing an RCT in a community-based setting, provide

insight into the solutions found in the initial implementation phase of the trial, and conclude with the future implications of the Kin KeeperSM trial study.

2. Research design and methods

We based our research design to test Kin KeeperSM on the following principles: 1) Maintain the community-based participatory structure of the Kin KeeperSM model; 2) Test the intervention with scientific rigor; 3) Recognize our longstanding community-university research collaboration [7, 12].

The community-university partnership between Michigan State University, the Detroit Department of Health and Wellness Promotion (DDHWP), and the Arab Community Center for Economic and Social Services (ACCESS) was established to ultimately impact cancer disparities. This partnership has already enabled and accomplished Kin KeeperSM feasibility and pilot testing as foundational steps for the ongoing RCT this paper reports on. Specifically, we developed and validated breast and cervical cancer literacy measures and the evidence-based Kin KeeperSM CHW curriculum in English, Spanish, and Arabic [7, 12–13].

2.1. Recruitment

The ongoing Kin KeeperSM RCT is based in Detroit and Dearborn, Michigan, with the collaboration of our community partners—DDHWP, one of the largest health departments in the United States that serves primarily Black and Latino residents, and ACCESS, a health and human service agency that serves the largest Arab population in the United States. Women aged 21–70 from public health programs that utilize CHWs from DDHWP and ACCESS were the focus of this project. Recruitment strategies have been previously described [7]. We randomized a total of 242 Black, Latina, and Arab women residing in Southeast Michigan (Detroit and Dearborn) to intervention and control conditions. Eligible participants were women already receiving CHW services. Past screening history or cancer history were not exclusion criteria.

Enrollment for the study was completed over 11 months. Patient flow from screening for enrollment to intervention is shown in Figure 1. Of the individuals initially screened, 52% enrolled in the study, yielding a high screening-to-enrollment ratio compared to other published trials involving underserved racial and ethnic minorities [14]. Each family unit received a restaurant gift certificate for participation. In addition, each research participant received a gift bag with various breast cancer learning materials. The educational intervention was delivered, and we are now in the process of conducting the 12-month follow-up of the trial cohort. The kin keeper and the participant client received a stipend for recruiting their family into the study. Recruitment materials, consent documents, and the study protocol were approved by the Michigan State University Institutional Review Board.

2.2. Study Design

Originally 466 women were invited by the CHWs to participate in the study, of whom, 242 agreed to participate and were randomized into intervention and control conditions (Figure 1). We randomized at the level of clients served by an individual CHW. After each CHW recruited clients and each gave informed consent, we created pairs of clients based on proximity in age. We used age as a stratification variable in order to increase the equivalence of the treatment and comparison groups on a variable of potential relevance to the study outcomes. Within each pair, we randomly assigned one client to the treatment group and the other to the comparison group. Each woman underwent a baseline evaluation in a home visit or at the health center or another agreeable setting. During this encounter, CHWs administered a questionnaire to assess participants' sociodemographic

characteristics, family medical history including cancer, health co-morbidities, behavioral risk factors, access to health services, and exposure to cancer prevention information. At the conclusion of this baseline evaluation, each research participant agreed to recruit two to four women from her immediate family to the study (mother, grandmother, sister, daughter, aunt). Consistent with Community-Based Participatory Research (CBPR) principles, our community partners thought it important that the research participants understand that they could be in one of two groups: the kin keeper group (treatment) in which they would receive two face-to-face sessions of comprehensive cancer education or the participant client group (control) in which they would receive cancer information in printed materials only. Participants in both groups were informed that the CHWs would follow up with them every 6 months for 3 years.

Within one month, a second visit took place to conduct the baseline evaluation of the family members upon consent, apply the intervention, and perform a first assessment of the main study outcomes. Interviews were conducted in English, Spanish or Arabic. The CHWs for both intervention and control groups were of the same race/ethnicity and spoke the same language as the study participants. Future outcome assessments are scheduled at 6, 12, 18, 24, and 36 months after the initial outcomes assessment.

2.3. Kin KeeperSM Intervention

Kin KeeperSM is a family focused intervention that builds on the common ways women communicate health messages to other women in their families to influence women's engagement in cancer screening services. Kin KeeperSM was developed to attach to existing CHW delivery systems, that is, the intervention is delivered by CHWs who are already employed by an existing non-cancer public health program (e.g., prenatal home visiting programs, diabetes) and who have a caseload of underserved clients. The CHW engages her client, herein called the kin keeper, to bring other immediate female family members together for a cancer health intervention in the family setting.

The Kin KeeperSM intervention relied on CHWs to deliver cancer educational sessions in order to improve cancer literacy at the individual and family level, and to increase appropriate cancer screening rates. The current study paid 14 CHWs to recruit, administer the cancer education, and retain the participants. These CHWs each had more than eight years of experience, including recruiting clients for university-based research projects. They all completed 24 hours of Kin KeeperSM Cancer Prevention Intervention training on topics including breast and cervical cancer prevention and early detection and how to implement the Kin KeeperSM model and the research protocol [15]

All participants received printed materials about breast and cervical cancer, and all participants were provided the same stipends for participation. The primary difference between the groups was that the participants in the kin keeper group received two educational sessions in the home within one to three weeks from the CHW for the kin keeper and her family members. One visit focused on breast cancer education and the other on cervical cancer education. Kin keepers and their families learned: 1) how to connect their individual and familial risks for getting breast cancer and cervical cancer; 2) how to conduct a self breast examination with the use of breast models, 3) what to expect when getting various breast screenings and a Pap test; 4) how to find and engage a health care provider; 5) the appropriate timing guidelines for screening; and 6) the facts to dispel various cancer myths. The CHWs reviewed all of the material in the preferred language of the family (English, Spanish or Arabic) and guided discussion among family members. All family members followed along with the CHW as they answered the pre- and post-intervention surveys independently. Additionally, the CHW assisted the participants in setting personal screening goals using a personal action plan, which is a check off list that is reflective of the

clinical breast examination, mammography and pap screening guidelines of the American Cancer Society.

2.4. Control condition

The control group received one home visit in which they independently read health promotional material on breast and cervical cancer in the presence of the CHW. The participants completed the cancer literacy assessments and an action plan without the guidance of the CHW.

2.5. Outcome assessment

The primary outcomes were clinical breast exams, mammography, and Pap tests. The secondary outcomes were breast and cervical cancer literacy. Another outcome measured was the costs of implementing the Kin KeeperSM intervention. The outcomes listed in Table 1 were assessed at baseline and will be assessed again after 6, 12, 18, 24, and 36 months. CHWs will follow up with all participants. A Breast Cancer Literacy Assessment Tool (Breast CLAT) was used at the home visit focusing on breast cancer education for the participants in the intervention group. The CHW first applied the tool before the intervention, then applied the educational intervention, and finally re-applied the tool after the intervention. Similarly, a Cervical Cancer Literacy Assessment Tool (C-CLAT) was applied pre- and post-intervention at the second home visit, which focused on cervical cancer.

The same pre-and post-intervention outcome assessment tools and instruments were administered to both intervention and control groups. The difference for the control group was that the pre- and post-intervention instruments for both breast and cancer screening were applied during the only home visit they received at baseline.

To aid in the cost analyses, we are carefully tracking the amount of time the CHWs spend in their activities. Costs incurred in deploying the intervention are collected from a programmatic perspective. This includes time for personnel involved in training and executing the intervention, time and material costs for recruitment and retention of participants, and cost of educational materials. Separately, we will be monitoring health care utilization and costs including cancer screening, Pap tests, and physician visits. We will obtain participant travel and time costs from CHWs or estimate them.

2.6. Statistical analysis plan

We randomized at the level of clients being served by an individual CHW. At the conclusion of the ongoing 36-month trial, in order to mitigate differences that might have existed among participants in these groups at baseline, we will pursue a balancing strategy based on propensity scores to obtain an unbiased estimate of the treatment effect on the trial's outcomes of interest. We will borrow heavily from the extensive literature on estimating an *average treatment effect* (ATE) in non-randomized studies of program or treatment evaluation including our own experiences in applying propensity score methods [16]. The *propensity score* for a participant will be the probability (p) of participating in Kin KeeperSM. To estimate the intervention effects, we will utilize an elaborated logistic model for p with covariates (and functions thereof, e.g., squares, cross-products) that includes patient sociodemographic characteristics, family medical history, and comorbidity.

As the Kin KeeperSM trial progresses, the following binary outcomes will be assessed: 1) receipt of a mammogram; 2) receipt of a clinical breast exam; and 3) receipt of a Pap test. We will also assess participants' functional literacy scores at follow-up times in addition to baseline. For this outcome, we plan to assess the effect of treatment on improvement in

literacy scores, and how past scores might influence the subsequent appropriately timed binary responses. Although for some responses a single time-appropriate evaluation will be made (e.g., Pap test at 36 months), a repeated measures analysis will be performed for other responses. For example, receipt of mammograms and functional cancer literacy will be determined at multiple time points. With respect to functional cancer literacy, we will test whether superior scores are seen at 12 months in the kin keeper group (relative to the control group) and whether these scores will be sustained over time.

We will use random (mixed) effects models for a repeated binary or a repeated continuous response with additional structure to model effects of time. For example, a hierarchical model [17–19] with multiple random intercepts would include effects for: 1) CHW; 2) kin keeper within CHW; 3) participant in kin keeper; and 4) time within participant. For functional cancer literacy we expect a growth curve analysis to show a significant positive time slope and a small negative, but insignificant quadratic time effect. The approach will follow from our previous experience with the analysis of other CHW interventions for underserved and diverse populations [20,21].

3. Findings/Baseline characteristics

Tables 2 and 3 show that randomization was, overall, successful. There were no significant differences in sociodemographic and baseline measures between intervention and control groups except a slightly higher share of married and Black women in the intervention group. Black women were approximately 40% of the sample and Arab women were approximately 43%. Two-thirds of the women were aged 40 and over. Over half were married.

Approximately half of the women had at least some college education; however, close to half were unemployed, and half had yearly household income under \$20,000. A third had no medical insurance, and another third had Medicaid, Medicare or regular insurance.

As shown in Table 3, there were no treatment-control differences for the history of diabetes, heart disease, or high blood pressure. Finally, there were no differences in the baseline self-reported cancer screening history (Table 4). However, there were significant screening variations by race and ethnicity (Table 4). Latinas were significantly less likely to ever have had an age-appropriate mammogram compared to Black and Arab women. In addition, Latina and Arab women had significantly lower rates of Pap screening, ever or in the last 3 years, compared to Black women.

4. Discussion

Both RCT and CBPR aim to effect positive change. The challenges of effecting change in cancer disparities among medically underserved Black, Latina and Arab women that are related to breast and cervical cancer screening and health literacy, make public health partnerships necessities, not luxuries. Finally, to effect positive change in health programs and cancer disparities, public health agencies need tested interventions to adopt, interventions that are based on evidenced and have undergone the rigors of an RCT

The sustainability of community-based, preventive, public health interventions that utilize CHWs is dependent on evidence that CHW programs reach women at risk, improve health care and health outcomes, and are cost effective [10–11]. As a result, we chose to conduct an RCT, considered to be the gold standard. While RCT studies in which an intervention is empirically evaluated are more common now, such studies are novel in the use of CHWs in community-based cancer research [10]. The trial was built on our well-established, long term relationship with DDHWP and ACCESS. We implemented CBPR with our community partners to: 1) design our feasibility studies; 2) test and validate our Cancer Literacy

Assessments that measure pre- and post-intervention; and 3) design the implementation of the RCT with CHWs.

The community's general perception of the RCT is that it "withholds" something of value from some individuals (i.e., the control group). That is, the thought that some people would get "educated" about a devastating disease and others would not can foster mistrust of the research community and be equally unsettling for the researchers as well. Thus, we worked closely with our community partners to design an appropriate control group that mirrored the Kin KeeperSM model, with home visitation and addition of family members. We decided collaboratively that the control group would have the benefit of practice that meets the "standard of care," meaning that they would receive educational materials that were normally distributed in the partners' clinics and at public health fairs. Since Kin KeeperSM is a multilevel intervention [22], the RCT presented challenges to the community-university research team. For example, at what level (with whom) should randomization take place? After much deliberation, we decided to randomize at the client level, within each CHW's group of clients. This also allowed the CHWs to build their own skills and capacities by expanding their research experience. (Prior to this study only the university team researchers had experience with an RCT.) Since many of the CHWs work in the same public health program, the level at which to randomize also minimized possible confusion or a perception of favoritism.

To assure that the CHWs followed the RCT protocol, we included an additional eight hours of training above the normal 16-hour Kin KeeperSM training. This was important because CHWs are skilled in enrolling people into public health programs where the goal is to service as many eligible people as possible—compared to an RCT, where eligibility is very strict and the protocol has to be followed. Our community partners were paramount in designing the treatment fidelity in this study. They were able to make changes in treatment integrity and treatment differentiation based on our prior experiences in our feasibility studies. In addition to the regularly scheduled meetings with the CHW supervisors, we included CHW retreats every six months that coincided with the six-month data collection follow ups. Further, we have included a cost analysis that will inform public health policy and programming. Although this is not directly related to the RCT, it is important for sustainability. Likewise, our community-university research team observed that it was not good enough to conduct research just to generate knowledge solely for the academic community.

It was noted that research rarely made its way back to the community as policy or programming. In order to achieve sustainability and impact on people's lives, the results must be integrated into the systems of care that address the needs of underserved women. Thus, we wanted to foster adoption and integration by conducting our intervention outcomes research under "real world" conditions, partnering with community-based agencies, and assessing the intervention's costs. This will enable our partners to adopt the Kin KeeperSM model into their systems of care, as well as to demonstrate the model to other public health departments and federally qualified health centers, thereby expanding its utility for reducing cancer disparities.

Engaging a family member who is currently enrolled in a health program to serve as her family's kin keeper is a unique and novel approach intended to expand the reach of individually focused interventions. Further, using family members to recruit other female family members was a successful strategy and resulted in a heterogeneous sample with variation in age and education. Providing a common understanding of cancer prevention screening among family members may encourage women to support each other in achieving appropriate health screening [23,24]. This approach incorporates cancer prevention

education across a woman's life span. For example, women of child-bearing age are taught about primary prevention and are encouraged to practice it [25]. Equally as important, this approach reaches women who are not being connected to the health care system. For instance, in our study, only one-quarter of women were employed full-time with employer health insurance.

Conducting an RCT with CHWs in an underserved and diverse community of women can be challenging. In a prior feasibility study [7], we had approximately the same number of women per racial/ethnic group. However, in the current study the timing of immigration enforcement efforts resulted in recruiting fewer Latinas, than expected. Reassuring potential participants that their participation would not draw additional attention to their status can be a delicate matter, particularly when the women in the study would be going to a local clinic if they sought the cancer screening we hoped they would. The effect on recruitment was disheartening because 37% of Latinas in our current study had never had a mammogram and about half had a mammogram in the past 12 months [26]. Although this study includes a unique racial and ethnic sample, the use of CBPR limits generalization to Black, Latina, and Arab women in other communities. Rather data and experiences in this study provide a guide on how to implement an RCT using CBPR.

At its conclusion, the Kin KeeperSM trial will bring critical, real-world knowledge regarding the implementation and testing of a CHW intervention to increase cancer prevention education and improve screening behaviors among Black, Latina, and Arab women. Testing the Kin KeeperSM effectiveness will add to the cancer screening literature by: 1) using a family approach to a health behavior and utilization intervention; and 2) layering a moderate intensity CHW intervention onto existing public health programs. In addition, the Kin KeeperSM study design adds to the CBPR literature by providing a framework on how to design and conduct an RCT and how to plan for sustainability by adding a side-by-side cost analysis of the intervention. Implementing rigorously designed studies that engage medically underserved, minority populations holds hope for addressing health disparities.

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Figure 1.
Randomization for Kin Keeper Cancer Prevention Intervention Program

Table 1

Outcome Variables and Measures

Outcome Variable	Measures
Aim: First-time and <i>appropriately timed</i> clinical breast exam screening rate	Yes or No self-report of whether woman received clinical breast exam ever and <i>in the last 12 months</i>
Aim 1: First-time and <i>appropriately timed</i> mammography screening rate	Yes or No self-report of whether woman received Mammogram ever and <i>in the last 12 months</i>
Aim 2: First-time and <i>appropriately timed</i> Cervical cancer screening (Pap smear test) rate	Yes or No self-report of whether woman received Pap smear ever and <i>in the last 12 months</i>
Aim 3: Breast cancer literacy level	Sum of test score from 34-item breast cancer literacy assessment tool
Aim 3: Cervical cancer literacy level	Sum of test score from 21-item cervical cancer literacy assessment tool
Aim 4: Labor costs	Wage rate
Aim 4: Transport costs	Gasoline expenditures and/or public transport fares
Aim 4: Time value (Opportunity cost) for participants	<ul style="list-style-type: none"> Time spent during the intervention 1st best alternative activity that participants would have engaged in and their expected wage in that time
Aim 4: Medical screening costs	Unit cost for receiving clinical breast exam, mammogram and Pap smear test
Aim 4: Material and administrative transaction costs	Expenditures on easels, stationery, telephone calls, postcards, etc.

* All outcome variables were measured at baseline and will be measured again at, 6, 12, 18, 24, 30, and 36-month follow-ups.

Table 2

Baseline demographic characteristics

N (%)	All	Intervention	Control	p-value
	N=514	N=305	N = 209	
Age				
<=39	168(33.27)	104(34.67)	64(31.22)	0.27
40 to 49	173(34.26)	108(36.00)	65(31.71)	
50 to 64	138(27.33)	75(25.00)	63(30.73)	
65 and over	26(5.15)	13(4.33)	13(6.34)	
Race/Ethnicity				
Black	216(42.02)	147(48.20)	69(33.01)	<0.01
Latina	65(12.65)	33(10.82)	32(15.31)	
Arab	233(45.33)	125(40.98)	108(51.67)	
Marital status				
Married	262(52.61)	153(51.52)	109(54.23)	0.01
Single / Never married	140(28.11)	96(32.32)	44(21.89)	
Other	96(19.28)	48(16.16)	48(23.88)	
Education				
Graduate Degree	27(5.39)	17(5.69)	10(4.95)	0.77
College degree	69(13.77)	36(12.04)	33(16.34)	
Some College	104(20.76)	67(22.41)	37(18.32)	
High School Diploma	112(22.36)	69(23.08)	43(21.29)	
GED	38(7.58)	23(7.69)	15(7.43)	
Above 9th grade	59(11.78)	35(11.71)	24(11.88)	
Below 9th grade	92(18.36)	52(17.39)	40(19.8)	
Employment status				
Full time employee	123(24.70)	75(25.42)	48(23.65)	0.39
Part time employee	79(15.86)	45(15.25)	34(16.75)	
Unemployed	227(45.58)	130(44.07)	97(47.78)	
Retired	20(4.02)	10(3.39)	10(4.93)	
Not working due to disability	30(6.02)	20(6.78)	10(4.93)	
Self employed	19(3.82)	15(5.08)	4(1.97)	
Household income				
Below \$9,999	125(24.32)	79(25.90)	46(22.01)	0.54
\$10,000–\$19,999	127(24.71)	72(23.61)	55(26.32)	
\$20,000–\$39,999	105(20.43)	60(19.67)	45(21.53)	
\$40,000–\$74,999	36(7.00)	26(8.52)	10(4.78)	
\$75,000–\$119,999	13(2.53)	9(2.95)	4(1.91)	
\$120,000 or above	4(0.77)	2(0.66)	2(0.96)	
Prefer not to answer	104(20.23)	57(18.69)	47(22.49)	

N (%)	All	Intervention	Control	p-value
	N=514	N=305	N = 209	
Insurance				
No health insurance coverage	173(34.26)	99(32.89)	74(36.27)	0.44
Health insurance plan from an employer	118(23.37)	78(25.91)	40(19.61)	
Health insurance plan purchased directly	21(4.16)	11(3.65)	10(4.9)	
Medicaid/Medicare	173(34.26)	103(34.22)	70(34.31)	
Military health care	1(0.2)	0(0.00)	1(0.49)	
Other	19(3.76)	10(3.32)	9(4.41)	

Note: all percentages are calculated based on the valid responses, excluding missing values

Table 3

Baseline clinical characteristics

N (%)	All N=514	Intervention N=305	Control N = 209	p-Value
Chronic disease				
Diabetes	109 (21.21)	63 (20.66)	46 (22.01)	0.71
Heart disease	10 (1.95)	5(1.64)	5(2.39)	0.54
High blood pressure	124 (24.12)	78 (25.57)	46 (22.01)	0.35
I currently smoke	123 (24.60)	78 (26.44)	45 (21.95)	0.25

Note: all percentages are calculated based on the valid responses, excluding missing values

Table 4

Cancer screening by race/ethnicity

N (%)	All N=514	Intervention N=305	Comparison N=209	Black N=216	Latina N=65	Arab N=233
Ever had a clinical breast exam	406 (79.45)	242(79.61)	164 (79.23)	177 (82.71)	49(75.38)	180(77.59)
Had a clinical breast exam past 12 months	308(60.87)	180(59.80)	128(62.44)	131(61.21)	31(47.69)	146(64.32)
Ever had a mammogram (age<=40)	279 (82.79)	159(81.12)	120 (85.11)	112 (84.85)*	24(63.16)*	143 (85.63)*
Had a mammogram past 12 months (age<=40)	211(62.99)	122(62.89)	89(63.12)	82(62.60)	19(50.00)	110(66.27)
Ever had a Pap smear	451 (88.09)	268(88.16)	183 (87.98)	211(98.14)*	53 (81.54)*	187(80.60)*
Had a Pap smear in the last 3 years	382(75.79)	219(73.24)	163(79.51)	176(83.41)*	44(67.69)*	162(71.05)*

Note:

- all percentages are calculated based on the valid responses, excluding missing values
- *identifies statistically significant differences between intervention-control groups or between racial/ethnic groups p<0.01