Published in final edited form as:
Prev Med. 2003 August ; 37(2): 102–109.

Results of a Randomized Trial to Increase Breast and Cervical Cancer Screening Among Filipino American women

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Abstract

Background.—This paper reports the first evaluation of an intervention to increase breast and cervical cancer screening among Filipino American women.

Methods.—Filipino women over 40 years of age were recruited through nine community-based organizations and six churches in Los Angeles County. After completion of a short baseline interview, all women were invited to attend a group session with some of their peers and a female Filipino health educator. Women within each organization were randomized to receive a cancer screening module (intervention) or a physical activity module (control). Telephone follow-up interviews 12 months after the group session assessed the impact of the intervention.

Results.—Of the 530 women invited, 444 (84%) attended a session. At baseline and follow-up, screening rates for breast and cervical cancer did not differ between study groups. Moderate increases in screening rates (9 to 12 percentage points) were observed in both arms of the study. Among relatively recent immigrants who had spent less than 10 years in the United States, mammography screening increased substantially more in the intervention arm than under the control condition (a 27 vs 6 percentage point increase, $P < 0.05$).

Conclusion.—Our intervention was only effective in increasing cancer screening among relatively recent immigrants who had very low baseline screening rates.

Keywords

Breast cancer screening; Cervical cancer screening; Filipino; Intervention

Introduction

In recent years, a number of surveys have been conducted to assess cancer risk and screening behaviors among Asian American women, including American Samoan [1], Chamorro [2], Korean [3-7], Filipino [7-10], Chinese [11,12], Cambodian [13], and Vietnamese [14-18]. These surveys show that Asian American women fall significantly short of NCI's Year 2010 goal of regularly screening 70% of age-eligible women for breast cancer and 90% of women for cervical cancer. Two of these studies have examined screening rates among Filipino American women: In an age-stratified random sample of 875 Filipino women age 20 and older in Northern California, women were classified as being in the "maintenance stage" if they had a Pap test within the last 2 years and if they had three or more Pap tests in the past 5 years. Only 63% of women 50-64 years of age and 53% of women 65+ were found to be in the maintenance stage [10]. In a convenience sample of pre-dominantly low-income Filipino

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women 50+ residing in Los Angeles County, 48% reported a Pap test in the past 2 years [9], and 54% reported receipt of a screening mammogram in the past 2 years [8]. These studies also found that screening rates were particularly low among recent immigrants and among women who communicated predominantly in a language other than English [9,10].

The two most populous Asian ethnic groups in Los Angeles County are Chinese and Filipino [19]. Among Filipinos, more than 70% are foreign born and more than 25% do not speak English very well [20]. Given that Filipinos are one of the fastest growing segments of the population due primarily to immigration [21], Filipino women constitute an important group that is underserved with respect to cancer screening.

Among Filipino women, breast cancer is the leading cause of cancer death. The incidence of breast cancer in Filipino women is 73.1 per 100,000, which is higher than that experienced by Hispanic women, but lower than in African American or White women. The incidence of cervical cancer in Filipino women is 9.6 per 100,000—higher than for White women but lower than for African Americans and Hispanics [22]. Although cervical cancer is not a leading cause of cancer death in Filipino women (it is the eighth most common cause of cancer death), it is one of the few cancers for which an effective screening test is available.

To date, few cancer control interventions have been conducted that have been specifically developed for Asian American women and that have been evaluated using randomized controlled trials [11,13,23-26]. This paper reports the first evaluation of an intervention to increase breast and cervical cancer screening among Filipino women.

Methods

Overview of research design—A total of 530 Filipino women over 40 years of age were recruited through nine community-based organizations and six churches in Los Angeles County. After completion of a short interviewer-administered face-to-face baseline interview by the female Filipino project director or by one of several female Filipino project liaisons, all women were invited to attend a group session with some of their peers and a female Filipino health educator. Group sessions were held at the community-based organizations, churches, or a private home. Women within each organization were randomized to receive a cancer screening module (intervention activity) or a physical activity module (control activity) [27]. Because women who were recruited together (e.g., after a short presentation by a project staff member) also wanted to attend the same group session, 5-10 women were randomized to one study condition, and the next group of 5-10 women to the other. Intervention sessions were conducted by two physicians and three nurses, and control sessions were conducted by three nurses and one physical therapist. All educators were born and raised in the Philippines and fluent in both English and Tagalog. All educators completed one training session on the study background and the intervention/control curriculum and another practical training session, in which each educator conducted a group session with feedback from the Principal Investigator (A.E.M.) and the Study Coordinator (P.V.). The group sessions lasted 60-90 min and were typically conducted in “Taglish,” which is a mix of English and Tagalog. We also provided information packages in English and Tagalog for women to take home which included a list of local facilities where free mammograms and Pap smears are available under the Breast and Cervical Cancer Control Program (BCCCP) and the Breast Cancer Early Detection Program (BCEDP) and the telephone number of the Cancer Information Service (CIS). At the time of the study, CIS did not have the capacity to respond to telephone inquiries in Tagalog. Telephone follow-up interviews were conducted in English or Tagalog 3 and 12 months after the group session to assess breast and cervical cancer screening and related knowledge and attitudes. We had to exclude 2 women from the study who did not speak either of these languages. The study protocol was approved by the UCLA Committee for the Protection of Human Subjects. This

article describes the intervention and its effectiveness in increasing breast and cervical cancer screening at 12-month follow-up.

Theoretical framework—The content of the cancer screening module was developed based on national screening guidelines and findings from our previous survey among Filipino women [8], with input from several Filipino community advisors. The Adherence Model [28,29] provided the theoretical framework for the content of the intervention. This model combines elements from the Health Belief Model [30], the Theory of Reasoned Action/Planned Behavior [31,32], and the Precede Model [33] to allow a better understanding of adherence to health recommendations. The educator informed women about the screening guidelines for breast and cervical cancer screening and stressed age and length of stay in the United States as risk factors for developing cancer, thus raising *knowledge* and *perceived susceptibility*. The screening procedures were described (either by the educator or by participating women), emphasizing that early detection is crucial for successful treatment (*efficacy of early detection*). Women who had undergone cancer screening were encouraged to share their experience to provide *peer support* and *peer norms* advocating cancer screening. Individual *barriers to screening*, such as cost, fear of radiation, concern about finding cancer, pain, inconvenience, lack of physician recommendation, embarrassment, lack of symptoms, and ways to overcome them were discussed, drawing again on the experience of participants who had already undergone screening. If it was needed, the health educator educated the group members in how to deal with each of these barriers, using an established format for response to these barriers (see Fig. 1 for examples). A concept that was discussed in all groups was the importance of staying healthy to be able to enjoy a long life and to take care of family members and friends. This concept drew on *cultural values* of collectivism, interdependence, and community that are common among many Asian groups [34]. The session ended with practical advice on how to get ready for a mammogram and a Pap test, how to remember to get tested on a yearly basis, and a *strong recommendation from the health professional to get screened*.

Cultural tailoring—Interventions targeted toward Asian and other non-White populations are often based on indigenous models [35] in which the underserved group must be reached on its own communication and cultural terms by peers with whom it identifies (e.g., [23, 36-42].) These peers, usually described as “trained lay health educators,” are culturally, linguistically, and socially similar to the targeted population [36]. We modified this intervention strategy slightly because our prior work showed that a female Filipino health professional was more credible to our target group than a lay health educator [8].

Several components of the study were designed based on recommendations of our Filipino community partners, in an effort to further tailor the study for older Filipino women. For example, a study logo was developed *Kulusugan ay Kayamanan* (Health is Wealth) that was printed on all study materials, including tote bags that were given to women at enrollment. All participants received and signed an attractive, personalized certificate of completion during a short graduation ceremony at the end of each session, which included a pledge to get screened each year on the participants' birthday or to exercise on a regular basis. Additionally, in each session, women had the opportunity to socialize with each other and the health professional while refreshments and traditional Filipino snacks (empanadas or noodles) were served. Finally, women received a small cash payment of $15 at the end of the session and an informational package in English and Tagalog which summarized the information on breast and cervical cancer screening or physical activity.

Questionnaires—All questionnaires were developed based on the theoretical framework of the Adherence Model, focus group input, and extensive pilot testing. In order to keep the baseline survey as brief as possible (so as not to deter women from attending the group session),

data collection was limited to breast and cervical cancer screening history (ever had mammogram/Pap test, recency of last test) and demographic characteristics. The 3-month telephone follow-up survey assessed breast and cervical cancer screening history (recency of last test), questions related to the control activity (exercise, reported in [27]), and questions regarding recruitment procedures and participation in health research studies, which will be described in a future publication. The 12-month telephone follow-up survey included the final outcome measures: receipt of screening mammogram and Pap test within 12 months after the group session.

Women were given the choice of completing the baseline and follow-up surveys in English or Tagalog. Interviewers who conducted the follow-up surveys were blind to the women's intervention group status. After completion of the 12-month follow-up interview, women were mailed a thank you letter with a $10 payment. As an additional incentive, women who completed the 12-month follow-up interview were entered into a lottery for a chance to win $300.

Analysis

We conducted an intent-to-treat analysis for all women who completed baseline and 3- and 12-month follow-ups. About 17% of the women had a hysterectomy which could have affected their need to obtain Pap tests. Excluding those women from analysis on cervical cancer screening did not substantially change the result (data not shown).

For the outcome analysis, we first computed a McNemar statistic for each before-after comparison to test whether screening behavior changed over time. Next, we computed 95% confidence intervals for both intervention and control groups separately for the difference in paired proportion receiving a mammogram at baseline versus receiving a mammogram at followup. Finally, using methodology from Newcombe [43], we computed a confidence interval for the difference of differences between the two populations to test if the extent of the change was different in the two arms of the study. Because women were randomized in groups of 5-10, we computed the intraclass correlation coefficient (ICC) to assess the extent of clustering that might have occurred. We found a small ICC of 0.02, which did not change our findings when taken into account (data not shown).

Results

Between February 1998 and February 2000, a total of 48 group sessions were conducted, 24 on screening and 24 on exercise. Of the 530 women invited, 444 attended a session, for an overall attendance rate of 84%. Attendance was higher for exercise sessions (239/267 = 90%) than for cancer screening sessions (205/263 = 78%, $P < 0.001$). On average, screening sessions were attended by 9 women. Attendance of most sessions ranged from 5 to 15 women. A total of 447 women (84%) completed both the 3-month *and* 12-month follow-up interviews. Retention was higher for women who attended a group session (90%) than for non-attendees (74%), and this was similar in the intervention and control groups.

Subjects—As shown in Table 1, women who were randomized to attend the intervention arm of the study were not significantly different from those randomized to attend the control arm with respect to any demographic characteristics. All but one of the subjects were foreign born. About half of the women were married and 60% reported a family income of less than $25,000 per year. About 75% completed the surveys in Tagalog. Women who completed the 12-month follow-up did not differ from dropouts with respect to age, education, and baseline screening behavior (data not shown).

Cancer screening rates—At baseline, 81% of women had ever had a mammogram and 48% had had one during the past year (Table 2) with no differences between groups. At 3-month follow-up, women in the intervention group were significantly more likely to report a screening mammogram within the past 12 months than women in the control group (55% versus 42%, $P < 0.02$, χ^2 test). This was confirmed by a logistic regression analysis in which group emerged as a significant predictor of mammography screening at 3-month follow-up ($P < 0.02$). However, at 12-month follow-up, no differences in mammography screening rates were found between the two groups: A total of 58% of all women reported a screening mammogram in the past 12 months, a 10 percentage point increase from baseline ($P < 0.0001$, McNemar Test).

With regard to cervical cancer screening, no differences were detected between the two arms of the study at any time point: At baseline, 84% of all women had ever had a Pap smear and 42% reported one during the past year. At 3-month followup, 42% of all women reported a Pap test in the past 12 months, and at 12-month follow-up, 54% of the women had had a Pap test in the past 12 months, a 12 percentage point increase from baseline ($P < 0.0001$, McNemar Test). We also compared the change over time between the two groups (Table 3, last column) and found no difference in proportion differences for breast and cervical cancer screening.

Exploratory subgroup analyses were conducted to determine groups that might have changed their screening behavior in response to the intervention. For these analyses, we compared changes in screening behavior by age group, educational level, years spent in the United States (a proxy for acculturation), marital status, health insurance, and baseline screening history. Each of these variables was dichotomized and a total of 12 comparisons were made. Therefore, a P value of <0.004 (0.05/12) was considered significant for interpreting the McNemar tests in the subgroup analyses. As indicated in Table 3, among relatively recent immigrants who had spent less than 10 years in the United States, screening increased substantially more in the intervention arm than in the control condition (27 percentage point increase, $P < 0.0004$ versus 6 percentage point increase, NS). A direct comparison of the change scores also showed a significantly higher increase in the intervention group than in the control group (a 21 percentage point difference, 95% confidence interval does not contain 0). With regard to cervical cancer screening, the intervention appeared to be somewhat effective among relatively recent immigrants. Among women who had spent less than 10 years in the United States, screening rates increased more in the intervention arm than under the control condition (19 percentage point increase, $P < .007$, versus 11 percentage point increase, NS). However, a direct comparison of the change scores showed no statistically significant differences. No intervention effects were detected in any of the other subgroup analyses.

Discussion

Although the small group discussion intervention with a female Filipino health professional was based on extensive pilot work and developed with substantial input from the Filipino community, our randomized trial did not show an effect on breast and cervical cancer screening in an intent-to-treat analysis. A weak intervention effect with regard to mammography screening was found at 3-month follow-up, which was due to the receipt of screening by a few women in the intervention group who, at baseline, had their last mammogram 3 or more years ago. Thus, the intervention may have served as a cue to action for these women who were overdue for screening. However, at 12-month followup, screening rates for breast and cervical cancer did not differ between study groups. A moderate increase in screening rates (9 to 12 percentage points) was observed in both arms of the study. This finding demonstrates the importance of conducting long-term follow-up to assess the effectiveness of interventions. Without the 12-month follow-up results, we would have derived the opposite conclusion,

namely, that our intervention was effective in increasing mammography screening based on rates reported at 3-month follow-up.

There are several possible explanations for the general lack of effect observed in this study. First, given the close-knit Filipino community, and given that intervention and control sessions were conducted with women from the same community-based organizations, there is the possibility that contamination occurred between the two groups. Women who had attended a screening session may have discussed the content with friends who had been randomized to an exercise session. We found some evidence for contamination when we asked “What did you learn?” at 3-month follow-up: Several women under the control condition mentioned the importance of cancer screening, which was not mentioned in their session. On the other hand, one could argue that a conversation about cancer screening among friends may not be sufficient to change screening behavior.

Second, the increase in breast and cervical cancer screening between baseline and 12-month follow-up may reflect a secular increase in screening that is occurring in Filipino women at this time. For example, in our 1995/96 study [8,9] that recruited a sample of Filipino women at similar locations, 43% reported a mammogram in the last 12 months (compared to 48% at baseline and 58% at follow-up in the current study). If this increase in screening rates in these two convenience samples of low-income Filipino women residing in Los Angeles County really is indicative of a secular trend, this would be good news, indeed. However, our intervention may not have been strong enough to show an effect over and above this secular trend that occurred in women in both arms of the study.

Finally, our intervention was designed to inform women about the need for cancer screening, to address barriers to screening, and to encourage screening through peers and health professionals. However, we did not offer more concrete assistance, such as providing transportation, help in appointment making, or having screening facilities available in conjunction with the group session. These and similar access-enhancing strategies have been found to increase mammography screening among old, poor and racial-ethnic minority women [44], including Asian American women [45]. Our cognitively based intervention was successful in substantially raising very low screening levels among recent immigrants but was not sufficient to further increase screening levels that were already moderately high. The addition of access-enhancing strategies may be required to change the behavior of more resistant women, who in the past did not get screened despite moderately high screening levels among their peers.

Subgroup analyses indicate that our intervention was successful in substantially increasing breast cancer screening among recent immigrants who had spent less than 10 years in the United States and who had very low screening rates at baseline. We also found a moderate increase in cervical cancer screening in this subgroup, but lacked the statistical power to demonstrate that this increase was higher in the intervention than in the control arm. Although our method of comparing the differences between baseline and follow-up between the two study groups adjusts for possible baseline differences, this finding should be interpreted with caution since a ceiling effect may have limited the increase in the control group. Still, these findings are encouraging from the public health perspective of reaching out to the underserved. Our intervention was accepted by these relatively recent immigrants and facilitated a statistically significant (mammogram only) and clinically important change of screening behavior in this group. Educators who attempt to improve adherence to cancer screening in other immigrant populations should consider our intervention strategy in planning culturally specific outreach methods. Many immigrant populations are accessible through community-based organizations or churches and may respond to similar interventions that facilitate an information exchange

and discussion of health issues with peers and health professionals from their own cultural background.

A limitation of the study was the use of self-reported data to assess screening. A recent study validating recall of breast and cervical cancer screening by ethnically diverse women reported substantial overreporting [46]. It is possible that women felt compelled to give socially desirable responses, thereby inflating screening rates. Moreover, although interviewers who conducted follow-up interviews were not involved in intervention activities and had never met respondents, overreporting may have occurred to a greater extent among women who attended a screening session than among women randomized to the control condition. Future studies should further investigate the validity of self-reported cancer screening in Asian populations.

In planning our study, we postulated that good attendance at the study sessions and high retention would be prerequisites to show the effectiveness of the intervention activity. Therefore, based on the advice of our community partners and on our own research experience, we decided against a comprehensive baseline assessment of knowledge and attitudes related to cancer screening to limit respondent burden. We feel that this decision contributed to the excellent attendance we achieved. Limiting assessment instruments to key concepts may be one of the strategies necessary to expand research activities to underserved populations. However, because we made this compromise, we do not know to what extent knowledge and attitudinal changes occurred that can be attributed to the intervention activity.

Our sampling strategy also limits generalizability of our findings. Sampling through credible community organizations has been shown to be very effective for reaching underserved communities, which do not respond well to more representative sampling methods, such as random digit dialing [34,47]. We believe that our sample is representative of low-income, foreign-born Filipino women who are served by many religious and community-based organizations similar to those which participated in our study. The fact that women were paid for attending a group session raises questions of generalizability as well. However, because this study was designed to assess the effectiveness of the intervention (internal validity), we were more concerned about our ability to accrue enough women than about external validity. Finally, we acknowledge that based on current recommendations, women who are not at increased risk for developing cervical cancer can be screened less frequently than once a year, at the discretion of their physician. Thus, some women who may have been motivated to obtain the test may not have received one, based on this recommendation.

In conclusion, we successfully implemented a randomized trial to test the impact of a single session small group intervention with a Filipino health professional on breast and cervical cancer screening in the subsequent 12 months. Participation and retention in the study was excellent, probably due to the involvement of community partners in all phases of the study. We also found that randomization of small groups of women rather than individuals, which was preferred by the Filipino subjects, yielded very similar intervention and control groups. While the intervention was not able to increase screening rates overall, a substantial intervention effect was observed among more recent immigrants, who had very low screening rates at baseline. Given that the intervention can easily be implemented in community-based organizations with the help of volunteer health professionals, it may be worthwhile to explore similar strategies in other immigrant groups.

Acknowledgments

We gratefully acknowledge the leaders of all the community-based organizations and churches who participated in the study, the health educators who conducted the group sessions, and the Filipino women who participated in this research. This work was supported by National Cancer Institute Grant R01 CA74576 to the first author.

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Barrier	Response
Cost	There are clinics that are low-cost or you may qualify for a free mammogram and Pap test. We have compiled information on low cost and free facilities for you. (Distribute and explain provider directory; provide information on BCCCP and BCEDP; explain reimbursement by Medicare and Medicaid)
Fear of radiation	There's nothing to fear, it is only half of what you get from dental x-rays and only a fraction of what you get from the environment naturally over one year.
Concern about finding cancer	Nowadays there are many drugs and therapies to fight cancer. The important thing is early detection while the cancer is confined to a small area in the breast or in the cervix. You may be nervous when you go for your screening test, but finding it early before you have any symptoms will guaranty the best chance for treatment and survival. That's why it is important to get screened yearly, even if you feel that you are healthy.
Pain	In order to get a good picture, the breast has to be compressed, which can be uncomfortable or even painful. However, this will take only a few seconds, but you can be saving your life and your family grief.
Embarrassment	You can request a female practitioner. We must conquer the embarrassment if we care about our bodies and ourselves. Our health is very important - more than anything.

Fig 1.
Examples of scripts responding to barriers to screening.

Table 1

Demographic characteristics of Filipino women who completed 3- and 12-month follow-ups

	Intervention (*N* = 213)	**Control (*N* = 234)**
Age (mean ± standard deviation)	63.6 ± 9.4	63.4 ± 10.3
Percentage of lifetime in the U.S. (mean ± standard deviation)	28.3 ± 17.3	25.4 ± 16.3
Number of comorbidities (mean ± standard deviation)	0.89 ± 0.94	0.92 ± 0.94
	%	%
Has any comorbidity	58.2	61.1
Education		
<High school	18.8	17.5
High school	16.0	20.5
At least some college	65.2	62.0
History of		
Heart problems	19.7	18.8
Stroke	3.7	3.0
Hypertension	44.6	49.6
Diabetes	16.4	15.4
Cancer	4.2	5.6
Marital status		
Married	48.8	52.8
Widowed	31.0	30.0
Divorced/separated	10.3	8.2
Single	9.9	9.0
Has health insurance	86.4	82.9
Annual family income		
<$10,000	29.5	34.1
$10,000–25,000	26.3	29.8
$25,000–40,000	19.5	15.9
$40,000–55,000	11.0	8.7
>$55,000	13.7	11.5
Had a hysterectomy	17.1	17.2

Note. No significant differences were detected between women in the intervention and the control groups, *t* test for continuous variables, χ^2 test for categorical variables.

Table 2

Breast and cervical cancer screening at baseline and 3- and 12-month follow-up

Variable	Intervention (*N* = 213)		Control (*N* = 234)		*P* (χ^2 test)
	N	%	*N*	%	
Baseline					
Had last mammogram					0.4
Within the last 12 months	101	47	113	48	
1–2 years ago	40	19	55	23	
3 or more years ago	32	15	22	10	
Never had a mammogram	40	19	44	19	
Had last Pap test					0.7
Within the last 12 months	93	44	94	40	
1–3 years ago	49	23	64	27	
Over 3 years ago	34	16	40	17	
Never had a Pap test	37	17	36	15	
3-Month follow-up					
Had last screening mammogram					0.02
Within the last 12 months	107	55	92	42	
1–2 years ago	41	21	59	27	
3 or more years ago	12	6	29	13	
Never had a mammogram	36	18	41	19	
Had last Pap test					0.2
Within the last 12 months	98	46	91	39	
1–3 years ago	40	19	61	26	
Over 3 years ago	43	20	52	22	
Never had a Pap test	32	15	30	13	
12-Month follow-up					
Had a screening mammogram in past 12 months	126	59	134	57	0.7
Had a Pap test in the past 12 months	120	56	122	52	0.4

Table 3

Receipt of screening mammogram/Pap smear within the past 12 months at baseline and 12-month follow-up: subgroup analyses

	Intervention (I)					Control (C)					Difference in proportion differences (I - C)[b]	
	N	BS (%)	FU (%)	D (%)	*P*[a]	*N*	BS %	FU %	D %	*P*[a]	Point estimate (%)	95% CI
Mammogram												
Total sample	213	47	59	12	0.002	234	48	57	9	0.03	3	-8 to 13
By years spent in U.S.												
<10 years	58	28	55	27	0.0004	73	42	48	6	NS	21	2 to 41
≥10 years	155	55	61	6	NS	161	51	61	10	0.03	-4	-17 to 7
Pap smear												
Total sample	213	44	56	12	0.0009	234	40	52	12	0.002	0	-9 to 11
By years spent in U.S.												
<10 years	58	28	47	19	0.007	73	34	45	11	NS	8	-10 to 25
≥10 years	155	50	60	10	0.03	161	43	55	12	0.01	-2	-14 to 10

Abbreviations used: BS, baseline; FU, follow-up; D, difference (follow-up - baseline); CI, confidence interval.

[a] McNemar's exact test for change over time.

[b] Computed based on methodology by Newcombe [43].