

*Short Communication***A Multifaceted Intervention to Increase Cervical Cancer Screening among Underserved Korean Women**Carolyn Y. Fang,<sup>1</sup> Grace X. Ma,<sup>2</sup> Yin Tan,<sup>2</sup> and Nungja Chi<sup>3</sup><sup>1</sup>Division of Population Science, Fox Chase Cancer Center, <sup>2</sup>Department of Public Health, Center for Asian Health, College of Health Professions, Temple University, and <sup>3</sup>Jaisohn Medical Center, Philadelphia, Pennsylvania**Abstract**

**Objective:** Despite the proven survival benefits associated with cervical cancer screening, use of the Pap test continues to be suboptimal in some population subgroups, such as among Korean-American women who face considerable barriers to screening. Therefore, we evaluated a multifaceted intervention that combined psychoeducational counseling with patient navigation to address both psychosocial and access barriers to screening.

**Method:** Women ( $n = 102$ ) were recruited from Korean community centers and assigned to the intervention or control condition. The intervention group received cervical cancer education and patient navigation delivered by bilingual Korean health educators. The control group received general health education, including information about cervical cancer and screening. Assessments were obtained at baseline and postintervention. Screening behavior was assessed at 6 months postintervention.

**Results:** At baseline, 17% of participants reported having had a Pap test in the previous year. At 6 months post-intervention, 83% of women in the intervention group had obtained screening compared with 22% in the control group,  $\chi^2(1) = 41.22$ ,  $P < 0.001$ . Multivariate logistic regression analyses indicated that participation in the intervention was associated with screening ( $P < 0.001$ ). Fewer psychosocial barriers (e.g., discomfort at having a stranger perform Pap) and greater self-efficacy were also associated with screening ( $P < 0.05$ ).

**Conclusion:** A combined modality intervention that delivers education with patient navigation training and assistance resulted in increased screening rates. Multifaceted approaches may be effective in reducing the psychosocial, access, and language barriers that contribute to cancer health disparities in underserved populations. (Cancer Epidemiol Biomarkers Prev 2007;16(6):1298–302)

**Introduction**

Despite the survival benefits associated with cervical cancer screening, use of the Pap test among Asian-American women lags far behind that of the general U.S. population (1). Specifically, Asian-American women have the lowest rates of screening (68.2%) compared with Hispanic (77.9%), Native American (78.4%), African-American (85.5%), and non-Hispanic white women (83.9%; ref. 2). Furthermore, screening rates among Asian-American women fall well below the Healthy People 2010 national objectives, which calls for 97% of women aged 18 and older to be screened annually for cervical cancer (3).

Cervical cancer is a significant health concern for Korean women (4–6). The age-adjusted cervical cancer incidence rate for Korean-American women is 15.2/100,000 compared with 8.7/100,000 for all U.S. women (3). Failure to obtain regular Pap tests, which is a key factor contributing to women's vulnerability to cervical cancer (2), may be due to the considerable psychosocial and access barriers to screening experienced by this population subgroup (7–9). For example, Korean women have reported that they avoided obtaining Pap tests due to embarrassment associated with exposing one's genitalia, especially to a male physician (10). Other health beliefs that contribute to poor adherence to screening

recommendations include low perceived risk (11) and uncertainty about the benefits of screening (12). The belief that one only seeks healthcare for the treatment of illness or specific symptoms also contributes to low uptake of screening in the absence of symptoms (9, 13, 14).

Although interventions that target women's health beliefs can lead to increases in screening rates (12), the effectiveness of such interventions is likely to be attenuated if access barriers are not adequately addressed. Access barriers, including cost of screening, lack of insurance, and language difficulties, pose formidable challenges and are the most often cited factors influencing screening behavior (9, 11, 13). It is well established that women who do not have health insurance or lack a regular source of healthcare are less likely to receive a Pap test than women who have insurance or a primary care provider (9, 15). In addition, poor English language proficiency is a key barrier to obtaining screening (7). Studies have shown that women who are unable to speak or read English cannot successfully navigate the healthcare system to schedule their appointments and/or communicate with healthcare professionals (8). However, although Korean women face considerable barriers to screening, few programs have been designed specifically for this population subgroup (12, 16).

Given the diverse factors influencing cervical cancer screening behavior in this community, there is a need to evaluate comprehensive and multifaceted approaches to increase screening in this underserved population (17). Guided by an overarching framework that combined elements from the Health Belief Model (18) and Social Cognitive Theory (19, 20), we developed an intervention program to target both individual- and system-level barriers to screening. The program not only addressed group-specific health beliefs and psychosocial barriers to screening, but also adapted the patient

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**Requests for reprints:** Carolyn Y. Fang, Fox Chase Cancer Center, 510 Township Line Road, Cheltenham, PA 19012. Phone: 215-728-4062; Fax: 215-214-2178. E-mail: carolyn.fang@fccc.edu  
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navigator concept for preventive care. The purpose of the present study was to evaluate the effects of this multifaceted intervention on cervical cancer screening rates among underserved Korean women.

## Materials and Methods

**Participants.** Korean women ( $n = 102$ ) were enrolled from two Korean community organizations. The organizations were non-faith-based, sociocultural centers that offer social services and senior programs, and they serve a predominantly low-income, uninsured, and recent immigrant population. Exclusion criteria included <18 years of age, current diagnosis of cervical cancer, and had a Pap test within the past 6 months. Informed consent was obtained from each participant.

**Study Design and Procedures.** The study used a two-group quasiexperimental design with pre- and posteducation assessments. The program was advertised using flyers and posted announcements. Program announcements were also published

in a local Korean newspaper. Participants were accrued between August 2004 and October 2004. A total of 145 women self-referred to the study, and 115 women were eligible to participate. Of the eligible women, 102 (88.7%) agreed to participate. To minimize potential contamination effects from the intervention, the first 50 women enrolled in the study were assigned to the control group. Women in the control group received one 2-h education session delivered by trained Korean community health educators. The education session, which was delivered in a small-group format to ~15 participants, covered topics on general health and cancer education, including tobacco, nutrition, regular medical checkups, and cancer screening (e.g., cervical, breast, and colon cancer screening). Participants received written materials on general health and cancer screening, including cervical cancer and the Pap test, as well as information about healthcare sites that provided free cervical cancer screening.

Intervention participants ( $n = 52$ ) also received one 2-h small-group education session. In the intervention condition, the education session focused on cervical cancer risk

**Table 1. Demographic and baseline psychosocial characteristics of Korean women aged 19 y and older who enrolled in the study between August and October 2004**

Variables	Intervention ( $n = 52$ )	Control ( $n = 50$ )
<i>Sociodemographic</i>		
Mean age (SD)	50.92 (11.70)	60.20 (11.41)
Marital status		
Married/living as married	88.5% (46)	56.0% (28)
Divorced/widowed/single	11.5% (6)	44.0% (22)
Education (y)		
<11	15.3% (8)	36.0% (18)
12 (high school)	46.2% (24)	18.0% (9)
12+ (college/postgraduate)	36.5% (19)	44.0% (22)
Years in the United States (SD, range)	15.63 (8.63, 1-32)	17.29 (9.12, 1-33)
English-speaking proficiency		
Speaks English very fluently	1.9% (1)	4.0% (2)
Speaks English fairly fluently	48.1% (25)	30.0% (15)
Speaks English poorly/not at all	50.0% (26)	64.0% (32)
English-reading proficiency		
Reads English very fluently	3.8% (2)	6.0% (3)
Reads English fairly fluently	53.8% (28)	38.0% (19)
Reads English poorly/not at all	42.3% (22)	54.0% (27)
Have regular doctor		
Yes	59.6% (31)	80.0% (40)
No	40.4% (21)	20.0% (10)
Have medical insurance		
Yes	44.2% (23)	76.0% (38)
No	55.8% (29)	24.0% (12)
Had Pap test in the past 12 months		
Yes	11.5% (6)	22.0% (11)
No	88.5% (46)	78.0% (39)
Had Pap test in the past 3 years		
Yes	38.5% (20)	40.0% (20)
No	61.5% (32)	60.0% (30)
<i>Perceived risk</i> (% high/very high)		
My chance of developing cervical cancer	7.7% (4)	10.0% (5)
<i>Perceived severity</i> (% agree/strongly agree)		
Cervical cancer is a treatable disease	76.9% (40)	74.0% (37)
Whole life would change if I had cervical cancer	46.2% (24)	56.0% (28)
<i>Benefits</i> (% agree/strongly agree)		
Treatment may not be as bad if detected early	84.6% (44)	86.0% (43)
Having a Pap test is the best way to detect cervical cancer	86.5% (45)	92.0% (46)
Pap test will decrease chances of dying from cervical cancer	90.4% (47)	94.0% (47)
Pap can detect cervical cancers that cannot be seen in an exam	90.4% (47)	90.0% (45)
Relief from worry about cervical cancer	59.6% (31)	54.0% (27)
<i>Barriers</i> (% agree/strongly agree)		
Having a Pap test will be painful and unpleasant	21.2% (11)	26.0% (13)
I do not know where to go to get a Pap test	36.5% (19)	34.0% (17)
Uncomfortable with having a stranger perform Pap test	30.8% (16)	32.0% (16)
Having a Pap test will take too much time	23.1% (12)	22.0% (11)
Having a Pap test will cost too much money	34.6% (18)	22.0% (11)
<i>Self-efficacy</i> (% agree/strongly agree)		
I feel capable of arranging to have a Pap test	59.6% (31)	52.0% (26)
I am confident about my abilities to get a Pap test	44.2% (23)	50.0% (25)
I know that I will do whatever it takes to get my Pap test	46.2% (24)	62.0% (31)

**Table 2. Screening behavior at 6 mo posteducation among Korean women aged 19 y and older who enrolled in the study between August and October 2004**

Variables	Intervention	Control	$\chi^2$
Among all women			
% who had had a Pap test in the previous year	11.5% (6/52)	22.0% (11/50)	5.38
% who had Pap test in the 6 months following intervention	82.7% (43/52)	22.0% (11/50)	41.22*
% increase in screening rate following the intervention	71.2%	0%	
Among the subgroup of women who had not had a Pap test in the previous year			
% who had Pap test in the interval following intervention	84.8% (39/46)	12.8% (5/39)	42.80*

\* $P < 0.001$ .

factors, prevalence rates, and the benefits of screening and early detection, particularly in relation to the life roles of Asian women (e.g., social norms, family responsibilities). Cues to action and strategies for overcoming barriers were provided in combination with training on how to navigate the medical system. Finally, to increase self-efficacy, we used intervention activities such as helping participants with goal setting and using culturally and linguistically appropriate videos to model and reinforce positive attitudes and behaviors. Role-play and behavioral rehearsal of skills were used. Intervention participants also received information about healthcare sites that provided free cervical cancer screening, and navigation assistance (e.g., arranging appointments, language translation) was provided upon request by the bilingual health educators. In the present study, 39 participants (75%) requested navigation services, primarily in the form of assistance with language translation and with completing paperwork associated with their medical appointments (e.g., registration). In both the control and intervention conditions, study assessments were obtained at baseline and posteducation using self-administered surveys completed in person. Six-month follow-up assessments were obtained by telephone interview. All participants completed the follow-up assessments.

**Measures.** Study assessments were developed in English, translated into Korean, and backtranslated to English to ensure equivalence. The Korean language version was then pretested for ease of usage and comprehension, and any necessary modifications were made.

**Demographic Items.** Age, marital status, education, country of birth, and English language fluency were obtained at baseline.

**Healthcare Access.** Participants reported whether they had health insurance, a regular healthcare provider, and obtained prior Pap tests.

**Health Beliefs.** Perceived susceptibility of developing cervical cancer was assessed with the item "Compared to the average woman your age, how likely do you think it is that you will develop cervical cancer in the future?" Participants rated their chances of getting cervical cancer from "Very low" to "Very high" (21). Responses to items on perceived severity, benefits of screening, barriers to screening, and self-efficacy (see Table 1) were adapted from previous research (19, 21, 22) and scored on a five-point Likert-type scale ranging from 1, "Strongly disagree" to 5, "Strongly agree."

**Outcome Measure: Pap Testing Behavior.** Self-reported screening behavior was obtained at 6 months posteducation. Screening behavior was verified among those intervention participants who indicated that they had undergone screening, each of whom signed and returned a medical release consent form. Health providers were identified by participants, and the signed medical release consent forms were faxed to the respective facility where screening was done. Verification of screening was then obtained from the medical staff.

**Statistical Analyses.** Data were analyzed using SPSS Version 14.0. Descriptive statistics were used to characterize

the sample with respect to demographic, psychosocial, and behavioral variables. Potential differences in baseline variables between the intervention and control condition were examined using one-way ANOVAs and  $\chi^2$  analyses. To compare health beliefs of women who did and did not obtain a Pap test in the 6-month interval following the educational workshops, we dichotomized items with response options ranging from "Strongly disagree" to "Strongly agree" into agree/strongly agree versus other.  $\chi^2$  analyses were used to assess statistical significance of bivariate associations between agreement with health beliefs and screening behavior. All variables significant at  $P < 0.05$  in the bivariate analysis were included in subsequent multivariate analyses. Finally, a hierarchical logistic regression analysis was conducted to examine factors associated with screening behavior. In the regression analysis, relevant demographic covariates were entered on step 1, followed by study condition (i.e., intervention versus control) on step 2, and posteducation health beliefs on step 3. Health beliefs were entered in step 3 to evaluate whether these factors could explain any additional variance in screening behavior over and above that accounted for by study condition.

## Results

**Study Sample.** Table 1 presents baseline characteristics by study condition. All participants were foreign born. Women in the control group were older,  $F(1, 101) = 16.43$ ,  $P < 0.01$ , and were less likely to be married or living with a partner,  $\chi^2(1) = 13.49$ ,  $P < 0.01$ . Although a similar proportion of women had obtained a college or postgraduate degree, fewer women in the control group had completed a high school education,  $\chi^2(2) = 10.85$ ,  $P < 0.01$ . On the other hand, a greater proportion of women in the control group had a regular healthcare provider,  $\chi^2(1) = 5.01$ ,  $P < 0.05$ , and health insurance,  $\chi^2(1) = 10.70$ ,  $P < 0.01$ . No differences in English language fluency, prior screening behavior, or baseline health beliefs were observed between the two groups.

To evaluate whether demographic variables were associated with prior screening behavior, bivariate comparisons were conducted. Marital status was associated with prior screening behavior, with a greater proportion of married women (85.0%) having obtained a Pap test in the past 3 years compared with nonmarried women (63.9%),  $\chi^2(1) = 5.35$ ,  $P < 0.05$ . Furthermore, women who had undergone prior screening were more likely to have a regular healthcare provider (80.0%) compared with women who were not screened (62.3%), although this association did not reach statistical significance,  $\chi^2(1) = 3.56$ ,  $P = 0.059$ . Age and education level were not significantly associated with prior screening behavior.

**Postintervention Screening Behavior.** At baseline, only 17% of women reported obtaining a Pap test in the past 12 months. At 6 months postintervention, screening rates increased from 12% to 83% in the intervention group (see Table 2). No increase in screening rate was observed in the control group, which remained stable at 22%. Screening rates were significantly higher in the intervention group (83%) compared with the



control group (22%),  $\chi^2(1) = 41.22$ ,  $P < 0.001$ . When screening behavior was examined among the subgroup of women who had not had a Pap test in the previous 12 months (i.e., 46 women in the intervention group and 39 women in the control group), a similar pattern was observed with significantly higher screening rates in the intervention group (84.8%) compared with the control group (13.2%),  $\chi^2(1) = 42.80$ ,  $P < 0.001$ .

**Postintervention Health Beliefs and Barriers.** At post-intervention, women in the intervention condition were more likely to agree that getting a Pap test would reduce one's worry about cervical cancer (80.8%) compared with women in the control condition (58.0%),  $\chi^2(1) = 6.25$ ,  $P < 0.05$ . In addition, women in the intervention condition also perceived fewer financial barriers to screening (9.6%) compared with the control condition (24.0%),  $\chi^2(1) = 3.80$ ,  $P < 0.05$ . Finally, women in the intervention condition reported feeling more capable of arranging to have a Pap test (69.2%) compared with women in the control group (50.0%),  $\chi^2(1) = 3.92$ ,  $P < 0.05$ .

Bivariate analyses were conducted to examine whether health beliefs and barriers were associated with screening behavior. Agreement with the belief that getting a Pap test would reduce one's worry about cervical cancer was positively associated with screening,  $\chi^2(1) = 4.23$ ,  $P < 0.05$ . Two barriers, being uncomfortable with having a stranger perform a Pap test and not knowing where to obtain a Pap test, were negatively associated with screening (both  $P < 0.05$ ). All self-efficacy items were positively associated with screening ( $P < 0.01$ ). Health beliefs that were significantly associated with screening were included in the subsequent multivariate model.

**Predictors of Screening Behavior.** A hierarchical logistic regression analysis was conducted with screening behavior as the dichotomous outcome variable (see Table 3). The intervention was significantly associated with screening uptake. In addition, higher self-efficacy was positively associated with screening, whereas being uncomfortable with having a stranger perform the exam remained negatively associated with screening.

## Discussion

This study presents the results of a multifaceted cervical cancer screening intervention designed to address psychosocial and access barriers faced by Korean women. This combined modality approach merged cervical cancer education delivered in a culturally and linguistically appropriate format with the provision of navigation training and assistance, resulting in dramatically higher rates of screening in the intervention

compared with the control condition. Patient navigation has been recognized as a key element in facilitating access to cancer care and treatment; however, navigation in the prevention setting has not been extensively studied. Because obtaining preventive care can be a formidable challenge for Korean women who face not only psychosocial, but also access and language barriers, adapting the navigator concept for cancer prevention may be an extremely important addition to future programs designed for this community.

Our findings suggest that particular health beliefs were associated with subsequent screening behavior as well. Specifically, self-efficacy was positively associated with screening, whereas modesty and discomfort at being examined by a stranger was negatively associated with screening. Studies of other Asian-American subgroups, notably Vietnamese women, have noted that concerns about pain, but not modesty, were barriers to screening (22). These differences highlight the importance of tailoring prevention programs to address subgroup-specific health beliefs and needs.

Surprisingly, the groups did not differ on perceived susceptibility of developing cervical cancer or perceived severity of cervical cancer following the workshops. This may be attributed to the fact that both groups received general factual information about cervical cancer and risk factors. However, differences in beliefs pertaining to the benefits and barriers to screening and self-efficacy were observed, suggesting that the intervention content was successful in addressing key health beliefs associated with screening behavior.

There were several limitations to the present study. First, verification of self-reported screening was done only in the intervention group and not in the control group. However, screening rates in the control group remained stable at 22%, and thus, it is unlikely that women in the control condition were misreporting their screening status. Second, the two groups differed on several demographic variables. However, with the exception of marital status, these variables were not associated with prior screening behavior, suggesting that these demographic differences did not account for the differences in posteducation screening observed between the groups. Furthermore, women in the control group were more likely to have health insurance, a factor that has been positively associated with screening in previous studies (9, 15) and in our present study. Given that the control group had fewer women who faced access obstacles, these baseline differences may have actually attenuated the intervention effect. Third, the 6-month follow-up may not have been a long enough interval to capture screening among some women. Although the majority of women in the present study had not undergone screening in several years, it is possible that the 6-month follow-up period was not congruent for screening among the small subgroup of women who had been screened in the past year. It is acknowledged that longer screening intervals (e.g., once every 2 to 3 years) may exist for a subset of women ages 30 and older, but this option is only appropriate for women who have had three consecutive negative results on annual tests (23). In this sample of predominantly non-English-speaking immigrants, it is highly unlikely that a substantial proportion of women would have received recommendations for the longer screening interval. Finally, the present study does not allow us to determine the independent effects of education versus patient navigation in improving screening rates. Larger studies that are designed to tease apart specific effects associated with each intervention component will be needed to address that question. However, our findings show that when these specific elements are presented together to target multiple, diverse factors within one cohesive curriculum, such an approach can contribute to significant improvements in screening rates.

In sum, these findings have implications for the development and implementation of future cancer prevention

**Table 3. Multivariate logistic regression model for screening behavior at 6 mo posteducation among Korean women aged 19 y and older who enrolled in the study between August and October 2004**

Variable	OR (95% CI)	P
Step 1		
Marital status	0.78 (0.17-3.49)	0.74
Have regular provider	1.43 (0.19-10.64)	0.73
Have health insurance	9.53 (1.30-69.66)	0.03
Step 2		
Intervention group	38.47 (7.04-210.26)	<0.001
Step 3		
Relief from worry about cervical cancer	0.92 (0.45-1.89)	0.82
Not know where to go to get a Pap test	0.87 (0.38-1.98)	0.74
Uncomfortable with having a stranger perform Pap	0.24 (0.07-0.79)	0.02
Am capable of arranging to have a Pap test	1.47 (0.64-3.38)	0.36
Am confident about my ability to get a Pap test	2.49 (1.01-6.09)	0.05
Will do whatever it takes to get a Pap test	1.67 (0.64-4.32)	0.29

programs. Because health disparities result from the complex interplay of numerous social, environmental, and institutional factors (24, 25), a multifaceted approach is needed to overcome the considerable challenges faced by individuals in underserved communities. Community-accessible programs that use a combination of health-promoting strategies can be highly effective in reducing the barriers that contribute to cancer health disparities among underserved Korean women.

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