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## Sources of Information that Promote Breast and Cervical Cancer Knowledge and Screening Among Native Hawaiians in Southern California

**Jacqueline H. Tran,**

Orange County Asian and Pacific Islander Community Alliance, 12900 Garden Grove Blvd., Suite 214A, Garden Grove, CA 92843, USA

**Michele Mouttapa,**

Department of Health Science, California State University Fullerton, Fullerton, CA, USA

**Travers Y. Ichinose,**

Health Promotion Division, Orange County Healthcare Agency, Santa Ana, CA, USA

**Jane Ka'ala Pang,**

Pacific Islander Health Partnership, Garden Grove, CA, USA

**Dawn Ueda,** and

Keck School of Medicine, University of Southern California, Los Angeles, CA, USA

**Sora Park Tanjasiri**

Department of Health Science, California State University Fullerton, Fullerton, CA, USA

Jacqueline H. Tran: [jtran@ocapica.org](mailto:jtran@ocapica.org)

### Abstract

Breast and cervical cancers are the second and fourth leading causes of cancer death among Asian and Pacific Islander women. Despite screening exams that can detect these cancers early and increase survival, racial and ethnic populations continue to be disproportionately affected. This study examined the sources of information and their impacts on cancer screening compliance among native Hawaiians in Orange County, California. A community-based participatory research approach was used to conceive, design, implement, and analyze data. A relatively small proportion of the study's native Hawaiian women were compliant with recommended breast and cervical cancer screenings, and their screening rates were below the national Healthy People 2010 standards. Knowledge of screening procedures, seeking advice from a doctor, and obtaining information from internet medical sites were associated with higher rates of compliance with cancer-screening procedures.

### Keywords

Native Hawaiian; Breast cancer screening; Cervical cancer screening; Sources of information; Community-based participatory research

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Correspondence to: Jacqueline H. Tran, [jtran@ocapica.org](mailto:jtran@ocapica.org).

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## Introduction

Breast and cervical cancers continue to affect racial/ethnic minority populations in disproportionate numbers, despite the existence of screening exams that can prevent or detect such cancers early. Breast and cervical cancers are the second and fourth leading causes of cancer death among Asian and Pacific Islander (API) women [1, 2], Native Hawaiians experience enormous and disproportionate burdens from both diseases, both nationally [3, 4], and in Orange County, California [5]. Late-stage cancer diagnoses for Pacific Islanders account for much of their survival disparity [6]. For instance, according to Marshall et al. [5], Orange County native Hawaiians and other Pacific Islanders were over 2.4 times more likely to have late-stage breast cancer at the time of diagnosis. Unfortunately, API subgroups have some of the lowest cancer screening rates among all ethnic groups in the nation [4, 7, 8]. Multiple barriers to cancer screening have been reported, including cost, lack of knowledge about screening exams, and lack of perceived susceptibility to cancer [8]. Effective health communication and empowerment can help address the latter two barriers [9]; however, little is known about the health information-seeking behavior of native Hawaiian women, in California, regarding breast and cervical cancer, limiting the development of tailored messages and interventions. The purpose of our study was to further explore sources of health information and their potential impacts on breast and cervical cancer screening compliance among native Hawaiians in Orange County using a community-based participatory research (CBPR) approach.

## Materials and Methods

### Community-Based Partnership

This cross-sectional survey of native Hawaiian women was conceived, planned, implemented and evaluated by members of the Orange County Cancer Detection Partnership's Asian Pacific Islander Task Force using a CBPR approach. The task force was composed of members from eight community-based social and health services agencies. In early 2004, task force members discussed the lack of disaggregated data on breast and cervical cancer screening and education among Orange County APIs and embarked upon a voluntary effort to collect such data from various subgroups, including native Hawaiians. Pacific Islander Health Partnership (PIHP), established in 2003 and well respected in the native Hawaiian community, served as the lead agency in the native Hawaiian screening study partnership to ensure the involvement and engagement of that community and to facilitate a “ground up” process wherein the study goals and objectives were defined by community members. Based on CBPR successes described elsewhere [7, 10], a collaborative partnership was then developed between the task force and researchers from California State University, Fullerton (CSUF), resulting in regular meetings to develop all aspects of the project, particularly on data collection and analytical capacity.

An instrument with which to conduct the personal structured interviews was developed using established questionnaire development methods and some initial technical assistance from researchers at the University of California, Irvine. Items were taken from the National Health Interview Survey, Cancer Control Supplement, the California Health Interview Survey, and previous surveys used in past community–university efforts of selected partners [11–13]. The survey was reviewed and approved by the CSUF Institutional Review Board (IRB) for adherence to human subject standards and contained an introductory script that obtained verbal consent from the women to participate in the study.

University researchers estimated that a sample size of 200 would be needed based upon the planned statistical analyses (including univariate and multivariate logistic regression) that required ten cases for every independent variable. Next, a non-probability community

sampling plan was developed to maximize the range of the native Hawaiian women likely to complete the survey. Study members identified eight types of community events or sites to recruit survey participants, including the Pacific Islander Festival, Hawaiian Music Series, Aloha Expo, Ho'olaule'a, E Hula Mau, 'Ohana "intergeneration family" gathering, canoe/surfing event, and choral practices. The number of eligible women likely to be encountered and successfully recruited at each site was then estimated, and a plan to approach every fifth woman at each site was developed.

Once the community sampling plan was developed, the CSUF researchers trained five volunteers working with the native Hawaiian women community on how to implement the sampling plan, navigate and consistently administer the instrument, provide consistent terminology and definitions, ask non-leading questions, code answers, address participants' questions and concerns, and comply with IRB human subject protections. All survey administrators received a stipend for completing a defined number of face-to-face interviews. These volunteers spent approximately 18 months implementing the face-to-face survey protocol at each of the planned sites. Sampled women were deemed eligible for interview if they were 18 years or older, identified themselves as a native Hawaiian, had never had cancer, and resided in Orange County. All women were informed that the survey was anonymous and that compensation consisted of a \$10 gift certificate.

## Measures

The study's primary dependent variable was compliance. Compliance was defined as having received the recommended breast and cervical cancer screening tests within the past year, given the participant's age, which potentially included a clinical breast exam (CBE), a Pap test, and a mammogram [14]. Other variables for consideration were knowledge of screening procedures for breast and cervical cancers, usual source of health information, usual source of advice, and demographic and psychosocial variables. Knowledge and usual source questions were a series of open-ended and close-ended response categories. Demographic and psychosocial variables, based on their association with cancer screening utilization in previous research [15], age, health insurance status, marital status (married/living with a partner vs. not married/not living with a partner), household income, and educational attainment were considered potential covariates in the study. Furthermore, because acculturation is associated with higher rates of routine breast and cervical cancer screenings among APIs [16], we also considered years of living in the continental United States, a proxy for acculturation, as a potential demographic covariate. Previous research among APIs also suggests that individuals with fatalistic attitudes towards cancer are less likely to obtain certain types of routine cancer screenings [17, 18]. Therefore select items from a key domain of the Powe Fatalism Inventory, a validated measure of fatalism [19], were also included as potential covariates.

## Statistical Analyses

All survey data were entered at CSUF and analyzed using SPSS version 16.0. Descriptive analysis was done using frequencies and percentages for categorical variables, and means and standard deviations for continuous variables. Chi-square and ANOVA tests were used to assess univariate associations between and multicollinearity amongst independent variables, demographic and psychosocial variables, and compliance status. Independent and demographic variables that were significantly associated with compliance status at the  $p < 0.05$  level during screening were included in a multiple logistic regression model to detect and describe the adjusted associations of such variables with compliance status.

## Results

### Characteristics of the Sample

Interviewers approached women at a total of 25 community locations. Of over 4,000 women estimated to be age-eligible at these sites, 228 met the inclusion criteria, and 213 agreed to be interviewed, for a response rate of 93.4%. After data cleaning and quality control procedures, there were 157 respondents with valid compliance status data. Table 1 provides detailed information on the demographic characteristics of the study participants.

*Compliance Status* The majority of women were compliant with the breast and cervical cancer screening procedures, having the appropriate screening with the last year, recommended for their age. Across the sample, 93 women (59.2%) were categorized as compliant; among women under age 40, under two thirds of them (63.2%) reported having a CBE in the past year, and 67.1% reported having a Pap test in the past year. Among women who were 40 years or older, 77.8% reported having a CBE, 71.4% reported having a Pap test, and 67.9% reported having a mammogram in the past year. The two age groups did not differ from each other on compliance status.

*The Independent Variables* Although nearly three in four respondents (73.9%) knew the recommended screening frequency for breast and cervical cancer for women their age, slightly under one half (46.5%) correctly described these breast and cervical screening procedures. Participants reported obtaining health information from a variety of sources. Nearly two thirds (65.6%) used the internet, 64.3% obtained information from television, newspapers, magazines, signs, and/or radio announcements, and 52.9% obtained information from fairs, brochures, and/or workshops. Nearly all of the participants (93.6%) reported that they go to a doctor for health advice, while relatively few (18.5%) reported going to a nurse. Approximately one in seven (15.3%) reported going to traditional practitioners or religious leaders for health advice, nearly one in three (31.2%) reported going to friends or co-workers, and slightly over one half (53.5%) reported going to family members. Chi-square tests performed between all possible pairs of the independent variables indicated that there was no multicollinearity.

### Characteristics of the Sample by Compliance Status

Table 1 displays chi-square and *t* test statistics for univariate differences in independent variables and demographic variables between compliant participants and non-compliant participants. Knowledge of age-appropriate screening procedure definitions was positively associated with screening compliance, with over one half (55.9%) of compliant participants demonstrating knowledge compared to only 32.8% of those who were non-compliant ( $p=0.004$ ). Similarly, knowledge of the recommended frequency of screening procedures was associated with higher rates of compliance status; 84.9% of compliant participants answered these questions correctly, compared to 57.8% of non-compliant participants. Those who were screening compliant also reported higher rates of internet medical site utilization (80.7%) and were more likely to go to a doctor for advice (98.9%) compared to those who were non-compliant (60.0%,  $p=0.006$  and 85.9%,  $p=0.001$ , respectively). Other independent variables were not significantly associated with compliance status.

Among demographic variables, health insurance status ( $p<0.001$ ) and educational attainment ( $p=0.002$ ) were both positively associated with compliance status. Surprisingly, endorsement of the belief that cancer was meant to be (if one does have cancer;  $p=0.032$ ) was associated with higher rates of compliance status. These variables were utilized as covariates in subsequent multivariate analyses.

## Logistic Regression of Compliance Status

Table 2 displays the associations of independent variables with compliance status. These associations are presented as odds ratios, both unadjusted and adjusted for health insurance status, educational attainment, and the other significant predictors in the model. Knowledge of screening procedures ( $p<0.05$ ), seeking advice from a doctor ( $p<0.05$ ), and obtaining information from internet medical sites ( $p<0.05$ ) were all associated with higher rates of cancer screening compliance. Although seeking health advice from family members was not associated with compliance status in univariate analyses (Table 1), we included this variable in the multivariate analyses as a central factor in the study. Interestingly, in the multivariate analysis, this variable was negatively associated with compliance status ( $p<0.05$ ). In other words, those who sought advice from family members were less likely to be compliant, after adjusting for the other predictors (including seeking advice from a doctor) and demographic covariates in the model. Although knowledge of recommended frequencies for cancer screening procedures was associated with higher rates of compliance in the univariate analyses, the association was not significant in the multivariate analyses.

## Discussion

In the current study, only 59% of native Hawaiian women were compliant with age-specific breast and cervical cancer screening recommendations. Though the current study was not designed to estimate screening prevalence, and there exists no definitive stable disaggregated national prevalence estimate for recent mammography utilization among native Hawaiian women, approximately 68% of respondents 40 years and older reported having a mammogram in the past year. This was slightly higher than mammography compliance observed in other studies [8]. Approximately 59% of respondents reported having a Pap test within the past year, which was slightly lower than that observed in other studies [4]. However, both screening rates were below the Healthy People 2010 standards of mammography screening (70%) and Pap testing (90%) for women.

In our study, knowledge of cancer screening among native Hawaiian women appeared low, with less than half (46.5%) of the participants appropriately describing breast and cervical cancer screening procedures. Even among compliant respondents, only 56% could correctly provide such descriptions. Though knowledge of the screening procedures was positively associated with compliance before and after adjustment, the magnitude of association was substantially smaller than those with current health insurance coverage, among those who seek advice from doctors, or use internet medical sites. The lack of association between knowledge of screening frequency and screening compliance may be due to the fact that both knowledge domains were strongly associated with each other ( $p=0.003$ ) and that the “correct description” variable explained a higher proportion of unique (unshared) variance in screening compliance. Generally, these findings reinforce the notion that although knowledge is important, whether it is knowledge of the screening itself or screening frequency, it is not the most important predictor of screening and does not inherently lead to health-related behavior. Therefore, interventions should not only improve knowledge, but should assess and strengthen women's social support systems and relationships with providers. These complex interactions among native Hawaiian women are important and worthy of further exploration.

Clinical access appeared to be a substantial predictor of cancer screening compliance among native Hawaiian women in the current study. Having current health insurance was the biggest predictor of breast and cervical cancer screening compliance status among native Hawaiian respondents and the magnitude of this association increased after adjustment for other factors, including measures of socioeconomic status such as educational attainment. Despite such strong associations, it is important to note that the majority (81.7%) of non-

compliant respondents also had health insurance, suggesting that coverage alone is insufficient to ensure screening compliance. Indeed, having *and* utilizing an authoritative clinical source of health advice appeared to be an important predictor of screening compliance. Aside from health insurance status, doctor's advice was, by far, the largest predictor of compliance status, reinforcing the importance of providers in ensuring that accurate information about cancer prevention is transmitted to native Hawaiian women. Though native Hawaiian women in the current study heavily utilized health advice from mainstream providers, it should be noted that many in the native Hawaiian community lack trust in and feel alienated by "the system" [20]. Mainstream providers may not consider or may undervalue important cultural concepts that drive cancer screening behavior among native Hawaiians, such as the importance of harmony, extended family, and an emphasis on collective rather than individual needs [20]. The potential negative impacts of such cultural dissonance on healthcare provision may be assuaged through provider cultural competency education and through the use of trusted community health workers to develop an understanding and trust of the mainstream healthcare system among native Hawaiian women, which not only facilitates initial contact with physicians but also promotes the continuity of care vital to maintaining cancer screening and healthy behaviors throughout life.

Interestingly, native Hawaiian women who utilized the internet to procure health information were more likely to comply with cancer screening recommendations. The magnitude of this statistically significant association remained after and, indeed, was strengthened by adjustment for other factors. It is possible that native Hawaiian respondents used the internet to more effectively communicate with their doctor, make and be reminded of cancer screening appointments, and/or otherwise navigate the healthcare system. The observed effects of internet utilization on screening compliance could also be a byproduct of a generally robust and proactive information-seeking behavior among a subset of women born of a sense of empowerment and an internal locus of control. Regardless, findings suggest that the internet could be mobilized as an asset to promote screening among native Hawaiian women.

In summary, the current study found health insurance status, advice from doctors, use of the internet to obtain medical information, and educational attainment were all independently related to the timely receipt of recommended breast and cervical cancer screening tests among native Hawaiian women. Receipt of health information from family members was negatively associated with cancer screening compliance after adjustment. As has been observed among other racial/ethnic groups, the chances of native Hawaiian women complying with cancer screening recommendations was affected by a multifaceted combination of individual, social, and institutional healthcare factors, all of which must be addressed through comprehensive public health interventions.

The current study has several important limitations to consider when interpreting findings. Firstly, the study was conducted in a cross-sectional manner, which precludes any causal inference being attributed to associations between knowledge, information source, and cancer screening compliance. Additionally, the current study employed a non-probability sample with potentially limited external validity. No generalizations regarding native Hawaiian cancer screening practices in the United States, California, or Orange County should be inferred from this study. Potential recall bias was likely minimized by the relatively short period of recollection required to determine compliance status (i.e. past year). Future studies would benefit from a population-based sampling methodology that follows a larger pool of subjects longitudinally to assess ongoing changes in knowledge, attitudes, information inputs, social support, and cancer screening compliance.

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Table 1

Characteristics of the sample by compliance status

	Non-compliant <sup>d</sup> (n=64)		Compliant <sup>d</sup> (n=93)		$\chi^2$	p
	f	%	f	%		
<b>Independent variables</b>						
Knowledge of screening procedures <sup>a</sup>						
Correct description	21	32.8	52	55.9	8.13	0.004
Recommended frequency	37	57.8	79	84.9	14.47	0.000
Usual source of health information						
Internet medical sites	36	60.0	67	80.7	7.42	0.006
Other media <sup>b</sup>	46	76.7	55	66.3	1.82	0.178
Community resources <sup>c</sup>	32	53.3	51	61.4	0.94	0.332
Usual source of advice						
Doctor	55	85.9	92	98.9	10.72	0.001
Nurse	9	14.1	20	21.5	1.40	0.238
Family members (husband, parents, children, and siblings)	37	57.8	47	50.5	0.81	0.369
Friends and co-workers	23	35.9	26	28.0	1.13	0.289
Traditional practitioner/religious leader	10	15.6	14	15.2	0.05	0.945
<b>Demographic variables</b>						
Age category (less than age 40)	32	50.0	44	47.3	0.11	0.740
Has current health insurance	49	81.7	81	97.6	10.69	0.001
Married/living with partner	34	53.1	51	54.8	0.05	0.832
Household income						
Less than \$20,000	9	20.5	7	8.9		
\$20,000–\$39,000	9	20.5	8	10.1		
\$40,000–\$59,000	8	18.2	24	30.4		
\$60,000–\$79,000	6	13.6	12	15.2		
\$80,000–\$99,000	2	4.5	9	11.4		
\$100,000+	10	22.7	19	24.1		
High school graduate or less	34	53.1	27	29.0	9.26	0.002

	Non-compliant <sup>d</sup> (n=64)		Compliant <sup>d</sup> (n=93)		$\chi^2$	P
	f	%	f	%		
Fatalistic attitudes toward cancer						
Meant to be	5	7.9	19	20.7	4.62	0.032
Get it no matter what you do	23	37.1	25	27.2	1.70	0.192
Will get it if it is meant to be	9	14.1	22	24.2	2.40	0.121
Does not matter what doctor tells you to do	12	19.0	18	20.2	0.032	0.857
Age in years, M (SD)	38.31 (11.96)		39.53 (10.78)		<i>t=0.66</i>	0.508
Years in U.S. (immigrants only), M (SD)	24.75 (16.28)		25.95 (13.73)		<i>t=0.49</i>	0.626

Frequencies for each variable do not add up to the total sample size because of missing responses

<sup>a</sup> Knowledge of screening procedures entailed a correct description of a mammogram, CBE, and Pap test for women 40+ years old, and a CBE and Pap test only for women younger than age 40

<sup>b</sup> Other media included TV, radio, magazines, newspapers, and billboards

<sup>c</sup> Community resources include health fairs, brochures/pamphlets, workshops, and conferences

<sup>d</sup> Compliance was defined as having a mammogram, a clinical breast examination (CBE) and a Pap test in the past year for women 40 years or older, and a CBE and Pap test only for women younger than age 40

Table 2

## Multiple logistic regression of compliance status

Independent variables	OR	95% CI	AOR	95% CI	p
Knowledge—correct description	2.88	1.43–5.78	2.43	1.01–5.87	0.049
Knowledge—recommended frequency	4.12	1.94–8.76	2.10	0.79–5.63	0.139
Source of advice—doctor	15.06	1.86–122.06	12.12	1.23–119.68	0.033
Source of advice—family members <sup>a</sup>	0.75	0.39–1.42	0.31	0.12–0.80	0.035
Info from internet medical sites	2.79	1.32–5.92	5.39	1.96–14.83	0.001
Demographic covariates					
Has current health insurance	9.09	1.93–42.74	48.07	6.48–356.65	0.000
More than high school education	2.77	1.43–5.38	2.59	1.16–6.67	0.036
Cancer—meant to be	3.02	1.06–8.57	6.20	1.38–27.87	0.017

<sup>a</sup>Family members included husband, parents, children, and siblings