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# Pap Testing Adherence among Vietnamese American Women

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## Abstract

**Objectives—**Vietnamese American women are five times more likely to be diagnosed with cervical cancer than their White counterparts. Previous research has demonstrated low levels of Papanicolaou (Pap) testing among Vietnamese. Our study objective was to examine factors associated with interval Pap testing adherence.

**Methods—**A population-based, in-person survey of Vietnamese women aged 18–64 years was conducted. Questionnaire content was guided by the Health Behavior Framework (HBF). The study sample was randomly selected from 1639 south Seattle households. Statistical methods included $\chi^2$ tests and logistic regression.

**Results—**The response rate among eligible households was 82%, and the study included 352 women. Sixty-eight percent of the participants had been screened during the preceding 3 years. The following HBF factors were associated ($P < 0.05$) with interval Pap testing in bivariate comparisons: believing Pap tests decrease the risk of cervical cancer and believing cervical cancer is curable if detected early (perceived effectiveness); knowing testing is necessary for women who are asymptomatic, sexually inactive, or postmenopausal (knowledge); reporting concern about pain/discomfort as a barrier to screening (barriers); family member(s) and friend(s) had suggested testing (social support); doctor(s) had recommended testing; and had asked doctor(s) for testing (communication with provider). In a multivariate analysis, being married, knowing Pap testing is necessary for asymptomatic women, doctor(s) had recommended testing, and had asked doctor(s) for testing were independently associated ($P < 0.05$) with screening participation.

**Conclusion—**Our results confirm low levels of Pap testing among Vietnamese women and demonstrate the importance of physician-patient communication in increasing screening adherence. Health education efforts should target unmarried women and reinforce the importance of Pap testing for all Vietnamese women.

## Introduction

In 2000, the U.S. Census documented 1,123,000 Vietnamese Americans (1). Because of continued immigration and high fertility rates, there will be an estimated 4 million Vietnamese

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in the United States by 2030, and they will soon constitute the second largest Asian subgroup (2). Compared with the general Asian American population, Vietnamese are economically disadvantaged, linguistically isolated, and particularly unfamiliar with Western culture (3–5). While the effectiveness of Papanicolaou (Pap) testing has never been evaluated in a randomized controlled trial, observational studies have consistently shown dramatic reductions in cervical cancer mortality rates after the implementation of population-based screening programs. Case-control studies have also demonstrated a strong inverse relationship between screening and invasive disease (6).

Information from the Surveillance Epidemiology and End Results cancer registry shows that Vietnamese American women are over five times more likely to be diagnosed with invasive cervical cancer than their non-Latina White counterparts. Surveillance Epidemiology and End Results data also indicate that cervical cancer is the most commonly occurring invasive malignancy among Vietnamese American women (incidence rate of 43.0 of 100,000 compared with 37.5 for breast cancer; Ref. 7). Given the high cervical cancer incidence rate among Vietnamese women, it is not surprising that California studies have found that Vietnamese women report lower levels of Pap testing use than any other racial/ethnic group (8, 9). For example, the Pathways to Early Detection project surveyed five San Francisco Bay populations in 1994; nearly all the White (99%) and Black (98%) respondents reported at least one Pap smear compared with 76% of Latina, 67% of Chinese, and 43% of Vietnamese respondents (8).

There is a paucity of published information about the cervical cancer screening behavior of Vietnamese immigrants. Additionally, nearly all the previous population-based studies addressing Pap testing use among Vietnamese American women were conducted in California (9, 10). Our project, Cancer Control in a Vietnamese American Population, aims to collect qualitative and quantitative information about the cervical cancer prevention behavior of Vietnamese American women as well as to design and evaluate a culturally appropriate cervical cancer control outreach program. As part of this project, we conducted a population-based survey in Seattle, WA during 2002. The goal of this descriptive, hypothesis-generating study was to provide information about Pap testing barriers and facilitators that could be used to develop intervention strategies for Vietnamese American women. In this analysis, we used our survey data to examine variables associated with interval adherence to Pap testing guidelines.

## Methods

### Sampling Methods

Census data indicate that Seattle's Vietnamese community is concentrated in the southern part of the city (11). Therefore, our survey sample was drawn from seven contiguous south Seattle zip codes. McPhee *et al.* at the University of California have shown that over 95% of Vietnamese families share 23 last names (12). We applied this list of names to the 2001 telephone book for metropolitan Seattle. Specifically, we identified 1639 Vietnamese households that were in the target zip codes; 602 of these households were randomly selected for inclusion in the survey. Because nine addresses were subsequently found to be duplicates, the final study sample included 593 households.

### Household Recruitment

Our study procedures were approved by the University of Washington Institutional Review Board. To raise awareness of the study among households selected for participation, we publicized the survey by placing posters about the study in community settings such as Vietnamese grocery stores. Households received an introductory mailing from the Medical

Director of the International Medical Clinic at Seattle's county hospital (J. C. J.). Two weeks after each introductory mailing, bilingual, bicultural, female survey workers visited the participant's home to conduct an interview. Participation incentives included posters depicting Vietnamese artwork (participants chose one of four different posters) as well as a summary of Seattle organizations providing social and health services to Vietnamese families. Respondents were given the option of completing their survey in Vietnamese or English. Five door-to-door attempts were made to contact each household (including at least one daytime, one evening, and one weekend attempt). Each interview took ~45 min to complete.

## Participant Selection

We aimed to interview one woman aged 18–64 years in each household. Our project collaborates with a coalition of Vietnamese community members. The coalition believed that the survey response rate would be negatively impacted if we attempted to list household members and then randomly select a respondent in each household with two or more age-eligible women. Coalition members also advised us not to use the "nearest birthday" method of participant selection (*i.e.*, asking to speak to the woman with the most recent birthday; Ref. 13). Specifically, they reported that a meaningful proportion of older Vietnamese women do not know their exact date of birth and routinely use "January 1" for U.S. documentation purposes. However, to ensure our sample was representative of different age groups, we randomly assigned households to one of two groups: households where we initially asked to speak with a woman in the 18–39 age group (and then asked to speak with a woman aged 40–64 years if there were no women in the younger age group) and those where we initially asked to speak with a woman in the 40–64 age group (and then asked to speak with a woman aged 18–39 years if there were no women in the older age group).

## Survey Development and Content

The survey instrument was developed in English, translated into Vietnamese, back-translated to ensure lexical equivalence, reconciled, and pretested. Eyton and Neuwirth have suggested that qualitative methods should routinely be applied during the development of survey instruments for Vietnamese (14). The survey development was guided by an earlier qualitative study, our research group's previous experience conducting women's health surveys in Asian American communities, and the Health Behavior Framework (HBF; Refs. 10, 15–18). The qualitative study included unstructured interviews as well as focus groups with members of Seattle's Vietnamese community. Our study used the HBF to develop survey items within the context of the qualitative findings but did not aim to formally test the framework.

The HBF represents a synthesis of some of the major theoretical formulations in the area of compliance, including the Health Belief Model, the Theory of Reasoned Action/Planned Behavior, the Transtheoretical Model of Change, components of PRECEDE, and social influence theory (16, 19, 20). This framework has been successfully used to develop survey instruments and intervention programs for diverse racial/ethnic groups (including Asian Americans) and screening behaviors (15, 19, 21–23). It is a general heuristic framework and all of its elements are not applicable to every population or specific research question; we chose to use the HBF as our conceptual framework because, unlike most models, it does not specify that the same factors are determinants of behavior across population subgroups (15, 19). The relevant HBF constructs identified by the qualitative study and therefore included in the survey were as follows: fatalism, perceived susceptibility, perceived effectiveness, knowledge, barriers, social support, and communication with provider (Fig. 1).

Respondents were read the following statement: "A Pap test is when a doctor does a pelvic exam and also takes a scraping of tissue from the cervix inside the vagina and sends it to a

laboratory." Then, they were asked if they had ever received a Pap test and, if so, when they were last screened. Because routine Pap testing is not recommended for women without uteri, we also asked each woman if she had a history of hysterectomy (24). Survey participants were queried about their age, marital status, educational level, and household income. Respondents also specified how many years they had lived in the United States; provided information about their English language proficiency; and indicated whether they had health insurance, a regular source of care, and a regular provider.

Women were asked whether they thought illness is a matter of karma or fate (fatalism); whether they thought Vietnamese are more likely to get cervical cancer than Whites (perceived susceptibility); whether they believed getting regular Pap tests decreases the risk of cervical cancer and whether they believed cervical cancer is curable if detected early (perceived effectiveness); and whether they knew Pap testing is necessary for women who are asymptomatic, sexually inactive, or postmenopausal (knowledge). We also asked respondents if the following prevented them from getting Pap smears: modesty, concern about pain/discomfort, and fear of cancer being discovered (barriers). Finally, women were asked whether a family member had ever suggested Pap testing, whether a friend had ever suggested Pap testing, whether a doctor had ever recommended Pap testing, and whether they had ever asked a doctor for Pap testing (social support and communication with provider).

Our previous experience working with Asian communities has shown that less educated individuals have difficulty answering questions with more than three response options. Because some Vietnamese immigrants have little formal education, we made the response options for our HBF items as simple as possible. Specifically, the response options were yes, no, and not sure/do not know.

### Data Analysis

The American Cancer Society and the U.S. Preventive Services Task Force recommend regular Pap tests at intervals of 1–3 years depending on a woman's risk for disease and previous screening history (24, 25). We compared the characteristics of women who did and did not report a Pap test within the previous 3 years. Answers to items with response options of yes, no, and not sure/do not know were dichotomized into yes versus other. Proportion of life in the United States was calculated from responses to questions about current age and years in the United States (26). The $\chi^2$ test was used to assess statistical significance in bivariate comparisons (27). We used unconditional logistic regression models to summarize the independent effect of individual items on cervical cancer screening adherence (28). All variables with a $P < 0.10$ in the bivariate analysis were included in our multivariate analyses. We chose a $P < 0.10$, rather than a $P < 0.05$, for selecting variables for our regression models because a variable may be at the borderline significance level ($0.05 < P < 0.10$) in a bivariate analysis but become significant ($P < 0.05$) in multivariate analyses (29).

## Results

### Study Sample

The questionnaire was completed by 370 women. The disposition of the remaining 223 addresses in the original sample is given in Table 1. The overall estimated response rate was 82% (assuming the proportion of eligible households was the same among those that were and were not contactable) and the cooperation rate (*i.e.*, response among reachable and eligible households) was 85%; 360 (97%) of the respondents completed the survey in Vietnamese. Five women were excluded because they did not provide sufficient information about their Pap

testing history and a further 13 were excluded because they were without uteri. Therefore, the analysis included 352 respondents.

### Study Group Characteristics

The study group characteristics are given in Table 2. About one-third of the respondents were in each of the following age groups: 35 years or younger (32%), 35–49 years (33%), and 50 years or older (35%). Thirteen percent had never been married, 48% had less than a high school education, and 34% reported an annual household income of under $20,000. Over one-half (52%) of the study group had spent less than 25% of their life in the United States and only 15% spoke English fluently or well. The majority had health insurance (89%), a regular source of health care (89%), and a regular provider (79%).

### Pap Testing Behavior

Two hundred and fifty one (71%) of the survey participants reported having received a Pap test on at least one occasion. Self-reports with respect to interval cervical cancer screening were as follows: 157 (45%) had been screened in the last year, 219 (62%) had been screened in the last 2 years, and 240 (68%) had been screened in the last 3 years.

Table 2 presents bivariate comparisons of the 240 women who had been screened in the preceding 3 years and the 112 women who had not been screened in the preceding 3 years. The following variables were associated ($P < 0.05$) with cervical cancer screening in the previous 3 years: being married; having a regular source of care and a regular provider; believing regular Pap tests decrease the risk of cervical cancer and believing cervical cancer is curable if detected early; knowing that Pap tests are necessary for women who are asymptomatic, sexually inactive, or postmenopausal; reporting concern about pain/discomfort was a barrier to cervical cancer screening; family member(s) and friend(s) had suggested Pap testing; and doctor(s) had recommended Pap testing as well as had asked doctor(s) for Pap testing.

As shown in Table 3, four variables were independently associated with recent cervical cancer screening participation in our multivariate analysis: current marriage, knowing that Pap tests are necessary for women who are asymptomatic, doctor(s) had recommended Pap testing, and had asked doctor(s) for Pap testing. Because women with positive beliefs about cervical cancer screening are more likely to request Pap tests, we repeated our multivariate analysis without the variable “had asked doctor(s) for Pap testing.” In this model, five variables were significantly associated ($P < 0.05$) with recent cervical cancer screening: marital status, regular source of care, knowing Pap testing is necessary for asymptomatic women, reporting concern about pain/discomfort as a barrier to screening, and doctor(s) had recommended Pap testing.

## Discussion

The Healthy People 2010 objectives specify that 97% of women aged 18 years and older should have received at least one Pap test and 90% of women should have been screened within the preceding 3 years (30). We found that current levels of cervical cancer screening adherence among Vietnamese American women do not even approach these national goals. Specifically, less than three-quarters (71%) of our Seattle sample reported ever having received Pap testing and only 68% reported a Pap smear within the last 3 years. These findings are consistent with a recent study by Nguyen *et al.* that found 78% of Vietnamese women in Santa Clara County, California and 74% of Vietnamese women in Harris County, Texas had ever been screened for cervical cancer (10).

Earlier studies have consistently reported an association between marital status and cervical cancer screening adherence (9, 10, 31). We also found that married women were more likely to have been screened in the preceding 3 years than those who were single, divorced, or widowed. Married women are more likely to be receiving family planning or obstetric services, which provide an opportunity for cervical cancer screening (9). Additionally, the stigma associated with extramarital sexual activity in Vietnamese culture may deter unmarried women from getting Pap smears (10). The majority (over 70%) of our survey respondents knew that Pap testing is necessary in the absence of symptoms, for women who are not sexually active, and after menopause. Although knowledge about the necessity of Pap testing for each of these subgroups of women was relatively high among the study participants, these knowledge variables were associated ($P < 0.001$) with recent Pap testing in our bivariate comparisons.

In their review of cervical cancer screening in relation to public education, Coyne *et al.* reported lack of knowledge and fear of embarrassment are important barriers to Pap testing among the female population as a whole, low-income African Americans, low-income Hispanics, and women aged 50 years and older. They also reported that barriers vary by population subgroup. For example, concern about becoming a family burden is an important barrier among Hispanics but not other groups and African American women are particularly concerned about discomfort in association with Pap smears (32). We found that knowledge and concern about pain/discomfort, but not modesty, were barriers to cervical cancer screening among the Vietnamese American women who participated in our study. These findings suggest that the content of health education programs to improve Pap testing levels should be tailored to each population subgroup (33).

Our research group has previously reported a strong association between physician recommendation and Pap testing receipt among Cambodian and Chinese women in Washington as well as Vietnamese women in California and Texas (10, 17, 18). In addition, Nguyen *et al.* showed that Vietnamese women who request a Pap smear are more likely to receive the test than those who do not request a Pap smear (10). Finally, Maxwell *et al.* found that Filipino women who felt comfortable asking their physician for a mammogram were more likely to have one (21). It is important to note that, in our study, women who reported a physician recommendation for Pap testing had a nearly 7.0 higher odds of having been screened for cervical cancer within the preceding 3 years. Similarly, women who had asked a doctor for Pap testing had 8.0 higher odds of recent testing.

The reported study has several limitations that warrant discussion. First, we recruited households in areas of Seattle with a relatively high proportion of Vietnamese residents. Our findings may not be generalizable to other geographic areas or Vietnamese who live in communities with small Asian American populations. Second, only households with listed telephone numbers associated with complete address information were eligible for the survey; it is unclear to what extent such households are representative of Seattle's Vietnamese community (34). Third, survey respondents may have had different preventive behavior patterns than those who were unreachable or refused participation (35). Last, self-reports may be faulty due to inaccurate recall or desirability bias (36, 37). Because ethnic minority women tend to overreport screening test receipt when compared with non-Latina White women, our study likely overestimated levels of Pap testing use among Vietnamese American women (36).

Our study has several major strengths. We used population-based sampling methods, administered the survey face-to-face, and had a high response rate. Further, we used a culturally appropriate conceptual framework to examine factors associated with cervical cancer screening use. Specifically, the HBF was used as a conceptual framework for developing survey items

within the context of our earlier qualitative findings. Our bivariate results indicated that perceived effectiveness, knowledge, barriers, social support, and communication with provider are relevant to Vietnamese women's Pap testing behavior. The earlier qualitative work indicated that fatalism and perceived susceptibility might impact cervical cancer screening use among Vietnamese women; however, this quantitative analysis failed to confirm these qualitative findings.

In conclusion, we found that low levels of cervical cancer screening participation in Vietnamese American communities remain a significant public health problem (particularly as our results probably overestimate Pap testing levels; Ref. 36). Our findings confirm the importance of physician-patient contact in increasing cervical cancer screening use among Vietnamese women (10). Intervention programs should target physicians who serve Vietnamese patients as well as women themselves. Educational interventions for Vietnamese women should specifically target women who are single, divorced, or widowed; emphasize the importance of Pap testing for all Vietnamese women with uteri; and empower women to request Pap tests from their physician.

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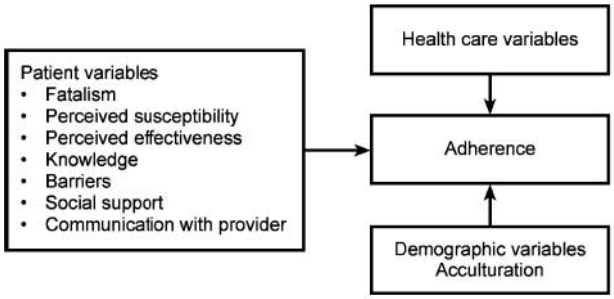


**Fig 1.**
Application of the health belief framework.

**Table 1**

Summary of survey response

| Response variable | *n* | % |
|---|---|---|
| Addresses attempted | | |
| A. Not a residential address (vacant dwelling or business) | 25 | |
| B. Eligibility not established (no contact after five attempts) | 16 | |
| C. Verified to be ineligible (household not Vietnamese or no women aged 18–64 yr) | 116 | |
| D. Eligible but refused | 66 | |
| E. Completed | 370 | |
| Estimates[a] | | |
| F. Estimated proportion of eligibles among households where eligibility was not established | | 79 |
| G. Estimated number of eligibles among households where eligibility was not established | 13 | |
| Response rates[b] | | |
| H. Estimated total response rate | | 82 |
| I. Cooperation rate | | 85 |

[a] F = (D + E) / (C + D + E); G = F × B.

[b] E / (D + E + G); I = E / (D + E).

**Table 2**

Factors associated with Pap testing adherence ($n$ = 352)

| Variable | *n* (%) | Pap testing within the last 3 yr (%) | *P* |
|---|---|---|---|
| Sociodemographics | | | |
| Age (yr) | | | |
| <35 | 113 (32) | 64 | 0.22 |
| 35–49 | 116 (33) | 74 | |
| ≥50 | 121 (35) | 67 | |
| Marital status | | | |
| Currently married | 283 (80) | 73 | <0.001 |
| Previously married | 22 (6) | 59 | |
| Never married | 47 (13) | 43 | |
| Education (yr) | | | |
| <6 | 65 (19) | 66 | 0.44 |
| 6–11 | 102 (29) | 74 | |
| ≥12 | 180 (52) | 67 | |
| Household income ($) | | | |
| <20,000 | 119 (34) | 63 | 0.27 |
| ≥20,000 | 188 (53) | 72 | |
| Unknown | 45 (13) | 67 | |
| Acculturation | | | |
| Proportion of life in the United States (%) | | | |
| <25 | 183 (52) | 68 | 0.94 |
| 25–49 | 135 (39) | 68 | |
| ≥50 | 31 (9) | 71 | |
| English proficiency | | | |
| Speaks fluently or well | 52 (15) | 65 | 0.85 |
| Speaks quite well | 74 (21) | 70 | |
| Does not speak well or at all | 226 (64) | 68 | |
| Health care | | | |
| Health insurance | | | |
| Yes | 313 (89) | 70 | 0.09 |
| No | 39 (11) | 56 | |
| Regular source of care | | | |
| Yes | 313 (89) | 72 | <0.001 |
| No | 39 (11) | 38 | |
| Regular provider | | | |
| Yes | 279 (79) | 73 | <0.001 |
| No | 73 (21) | 51 | |
| Fatalism | | | |
| Thought illness is a matter of karma or fate | | | |
| Yes | 122 (35) | 66 | 0.44 |
| No | 230 (65) | 70 | |
| Perceived susceptibility | | | |
| Thought Vietnamese are more likely to get cervical cancer than Whites | | | |
| Yes | 82 (23) | 67 | 0.81 |
| No | 270 (77) | 69 | |
| Perceived effectiveness | | | |
| Believed regular Pap tests decrease the risk of cervical cancer | | | |
| Yes | 219 (62) | 79 | <0.001 |
| No | 133 (38) | 51 | |
| Believed cervical cancer is curable if detected early | | | |
| Yes | 214 (61) | 73 | 0.02 |
| No | 138 (39) | 61 | |
| Knowledge | | | |
| Knew Pap testing is necessary if asymptomatic | | | |
| Yes | 290 (83) | 77 | <0.001 |

| Variable | *n* (%) | Pap testing within the last 3 yr (%) | *P* |
|---|---|---|---|
| No | 60 (17) | 25 | |
| Knew Pap testing is necessary if sexually inactive | | | |
| Yes | 254 (72) | 78 | <0.001 |
| No | 98 (28) | 42 | |
| Knew Pap testing is necessary after menopause | | | |
| Yes | 276 (78) | 76 | <0.001 |
| No | 76 (22) | 38 | |
| Barriers | | | |
| Modesty was a barrier to Pap testing | | | |
| Yes | 124 (35) | 64 | 0.18 |
| No | 228 (65) | 71 | |
| Concern about pain or discomfort was a barrier to Pap testing | | | |
| Yes | 109 (31) | 55 | <0.001 |
| No | 243 (69) | 74 | |
| Fear of cancer being discovered was a barrier to Pap testing | | | |
| Yes | 92 (26) | 62 | 0.14 |
| No | 260 (74) | 70 | |
| Social support | | | |
| Family member(s) had suggested Pap testing | | | |
| Yes | 149 (42) | 85 | <0.001 |
| No | 203 (58) | 56 | |
| Friend(s) had suggested Pap testing | | | |
| Yes | 117 (33) | 86 | <0.001 |
| No | 235 (67) | 59 | |
| Communication with provider | | | |
| Doctor(s) had recommended Pap testing | | | |
| Yes | 209 (59) | 87 | <0.001 |
| No | 143 (41) | 41 | |
| Had asked doctor(s) for Pap testing | | | |
| Yes | 201 (57) | 91 | <0.001 |
| No | 151 (43) | 38 | |

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**Table 3**

Logistic regression results ($n$ = 350)

| Variable | OR | 95% CI |
|---|---|---|
| Marital status | | |
| Currently married | 2.7 | 1.1–6.5 |
| Previously married | 1.1 | 0.3–4.7 |
| Never married | 1.0 | |
| Health insurance | 0.8 | 0.3–2.2 |
| Regular source of care | 2.2 | 0.6–7.8 |
| Regular provider | 1.2 | 0.4–3.5 |
| Believed regular Pap tests decrease the risk of cervical cancer | 1.4 | 0.7–2.9 |
| Believed cervical cancer is curable if detected early | 0.9 | 0.5–1.7 |
| Knew Pap testing is necessary if asymptomatic | 3.5 | 1.2–10.5 |
| Knew Pap testing is necessary if sexually inactive | 1.4 | 0.6–3.2 |
| Knew Pap testing is necessary after menopause | 1.2 | 0.4–3.1 |
| Concern about pain or discomfort was a barrier to Pap testing | 0.5 | 0.3–1.1 |
| Family members had suggested Pap testing | 0.4 | 0.2–1.1 |
| Friends had suggested Pap testing | 0.8 | 0.3–2.2 |
| Doctor(s) had recommended Pap testing | 6.8 | 3.2–14.4 |
| Had asked doctor(s) for Pap testing | 8.0 | 3.9–16.5 |