

Cervical Cancer Screening Among Southeast Asian American Women

Ivy K. Ho · Khanh T. Dinh

Published online: 23 June 2010
© Springer Science+Business Media, LLC 2010

Abstract The incidence of cervical cancer is high among Southeast Asian American women, but their participation in preventive cervical cancer screening is alarmingly low. This paper reviews the literature on factors associated with participation in cervical cancer screening among women of Vietnamese, Cambodian and Hmong descent in the United States. These factors include acculturation, age, marital status, knowledge about cervical cancer, apprehension about cervical cancer screening, financial concerns, access to health care, and physician characteristics and recommendation. Suggestions for future research include the need to investigate the role of physicians treating Southeast Asian American women, the need for more extensive up-to-date studies on the current generation of young Southeast Asian American women, and the use of more advanced assessments of acculturation. Overall, much more work is needed in order to deepen our understanding of the various ways to improve the rate of cervical cancer screening among Southeast Asian American women.

Keywords Southeast Asian American women · Cervical cancer · Cervical cancer screening · Pap testing

Introduction

Cancer is a significant health challenge faced by Southeast Asian Americans [1]. The rate of one specific form of cancer, cervical cancer, is high among Southeast Asian American women, among whom participation in cervical

cancer screening falls short of Healthy 2010 recommendations [2], and is markedly below that of non-Hispanic White women [3]. In the US, the majority of Southeast Asians trace their origins to Vietnam, Cambodia and Laos, because the Vietnam War precipitated a mass exodus of refugees and immigrants from these three countries to the US [4]. A large proportion of Laotians in the US are of Hmong ethnicity [4], and although the Hmong people live in a number of countries across Asia, the majority of ethnic Hmong in the US came from Laos. Therefore, the present paper is focused on Southeast Asian American women of Vietnamese, Cambodian and Hmong backgrounds. Although these three cultures are not homogenous, they share some common family traditions and gender roles, as well as a turbulent history associated with the Vietnam War, all of which may influence participation in cervical cancer screening among the women of these cultures. Furthermore, these specific segments of the US population face several socioeconomic disadvantages. The 2000 Census data summarized by McCracken et al. [5] indicated that median annual household income ranged from \$32,284 for Hmong to \$47,103 for Vietnamese Americans, lower than the median income (\$59,324) across all Asian groups; indeed, two-thirds of Southeast Asian Americans live below the poverty line [5]. A disproportionate number of Southeast Asians did not complete high school. Compared to an average 44% of Asians with a bachelor's degree, less than 10% of Cambodians and Hmong have college degrees [5]. Although there are significant within-group and between-group differences, as a whole, less than half of Vietnamese, Cambodians and Hmong reported that they spoke English "very well." In this review, we will (a) discuss guidelines and goals for cervical screening by the American Congress of Obstetricians and Gynecologists and Healthy People 2010, (b) outline cervical cancer and

I. K. Ho (✉) · K. T. Dinh
Department of Psychology, University of Massachusetts Lowell,
870 Broadway Street, Lowell, MA 01854, USA
e-mail: Ivy_Ho@uml.edu

cervical cancer screening rates among Southeast Asian American women, (c) identify factors associated with participation in cervical cancer screening, and (d) provide suggestions for future research in this area.

Cervical Cancer and Screening Recommendations

Cervical cancer is caused, in most cases, by certain types of the human papillomavirus (HPV) [6]. Transmitted via sexual intercourse, these types of HPV may lead to high-grade lesions of the cervix, which may in turn develop into cervical cancer. The Papanicolaou (Pap) test is an effective method of identifying early stages of cervical cancer, and of revealing high-grade lesions so that they can be removed before they progress into cancer. The American Congress of Obstetricians and Gynecologists provided guidelines for cervical cancer screening [7]: (a) Women should begin obtaining Pap tests at age 21 years; (b) prior to age 30, cervical cancer screening should be repeated every 2 years; (c) healthy women ages 30 or older who have had three consecutive normal Pap tests should obtain a Pap test every 3 years; (d) healthy women ages 65–70 who have had at least three consecutive normal Pap tests, and who have not had an abnormal Pap test in the previous 10 years, may discontinue Pap testing; and (e) Pap testing is not necessary for women who have had a complete hysterectomy and who never had severe cervical abnormality. Healthy People 2010 [2] also emphasizes the importance of Pap testing, and its objective is for 97% of women ages 18 and above to obtain a Pap test; this is an increase from Healthy People 2000s target of 95%. Although Healthy People 2020 is still under development, increasing the percentage of women receiving Pap tests will continue to be one of the objectives [8].

Cervical Cancer Among Southeast Asian American Women

Southeast Asian American women have some of the highest rates of cervical cancer. Vietnamese cervical cancer rates are four times that of all Asian American and Pacific Islander women [9], and three times that of Chinese and Japanese American women [10]. The percentage of Vietnamese American women who reported ever having had a Pap test was low, ranging from 37 to 74% [11–19]. Between two-thirds to three-fourths reported having had a Pap test within the previous one to 3 years [14, 16, 17].

Cervical cancer affects twice as many Cambodian American women (15.0 out of 100,000) as White women [20], making it the fourth most common type of cancer in this population [20, 21]. Studies conducted in the 1990s

among Cambodian American women across different parts of the United States revealed low rates of cervical cancer screening. In one study conducted in Seattle, Washington, only 76% of the Cambodian American women surveyed reported having ever been screened for cervical cancer, and only 32% reported having been screened within the past year [22]. A low rate of cervical cancer screening was also found among Cambodian women in Houston, Texas, where only approximately one-fourth had ever had a Pap test [23]. Finally, in a survey of women over 50 years of age in Olmstead County, Minnesota, rate of cervical cancer screening over a 1-year period was 16% for Cambodian American women; in contrast, 37% of non-Cambodian women had been screened during the same time period [24].

Hmong American women also experience a significantly higher incidence of cervical cancer compared to Asian/Pacific Islander women overall [25], non-Hispanic white women [25], and the general population [26]. Furthermore, cervical cancer among Hmong women tends to occur at a younger age [27], but is diagnosed at later stages [25, 27]. Indeed, cervical cancer incidence and mortality rates are three times higher for Hmong women than for Asian/Pacific Islander women, and four times higher than for non-Hispanic White women [25]. The rate of cervical cancer screening is extremely low among Hmong women; in one report, only slightly more than one-fourth (28%) reported ever having had a Pap test [28].

Factors Associated With Rate of Cervical Cancer Screening

This section examines published research on factors associated with participation in Pap tests among Southeast Asian American women. Most of the research focused on Vietnamese American women, whereas there were very few reports on Hmong American women. Table 1 summarizes the sample sources and sizes, response rates and data collection methods, and approaches of the articles reviewed. Table 2 lists the factors reported by the published studies, and describes, when applicable, whether the results were based on bivariate or multivariate logistic analyses. Odds ratios and 95% confidence intervals derived from multivariate logistic analyses are also presented in Table 2. The primary outcomes were lifetime receipt of a Pap test (i.e., whether or not a participant has ever had a Pap test) and recency of a Pap test. The operational definition of recency varied across studies (the previous year, the previous 2 years, or the previous 3 years). Although the latest guidelines recommend screening every 2 or 3 years for healthy women with no history of cervical abnormality, some of the studies

Table 1 Summary characteristics of published research reviewed in article

Author	Ethnic group	Sample source	Response rate (%)	Sample size	Data collection method	Quantitative/qualitative
Pham and McPhee [15]	Vietnamese	Community	31	107	Mailed questionnaires	Quantitative
Yi [18]	Vietnamese	Community	61	141	Telephone interviews	Quantitative
Kelly et al. [24]	Cambodian	Community	Not reported	Not reported	Focus groups	Qualitative
Yi [23]	Cambodian	Community	52	216	Telephone interviews	Quantitative
McPhee et al. [13]	Vietnamese	Community	74–77	645	Face-to-face interviews	Quantitative
McPhee et al. [14]	Vietnamese	Community	50	933	Telephone interviews	Quantitative
Yi [19]	Vietnamese	College	53	207	Mailed questionnaires; telephone interviews	Quantitative
Taylor et al. [22]; Taylor et al. [29]; Jackson et al. [30] ^a	Cambodian	Community	89; 73	413; 42	Face-to-face interviews; focus groups	Quantitative & qualitative
Schulmeister and Lifsey [34]	Vietnamese	Churches	Not reported	96	Face-to-face interviews	Quantitative
Nguyen et al. [32]	Vietnamese	Community	54–63	1566	Telephone interviews	Quantitative
Taylor et al. [16]; Taylor et al. [17]; Do et al. [33] ^a	Vietnamese	Community	82	518; 370	Face-to-face interviews	Quantitative
Ho et al. [11]	Vietnamese	Community	17	209	Mailed questionnaires	Quantitative
Yang et al. [28]	Hmong	Community	Not reported	248	Group or individual interviews	Quantitative

^a These articles were based on the same research project

reviewed here examined Pap test within the preceding year because previous guidelines recommended that women undergo screening annually [6].

Acculturation

Number of Years Living in the US

Vietnamese women who have been in the US for a greater number of years were more likely to have ever had a Pap test [13–15, 18, 19], and to have had a Pap test within the preceding year [14]. In a study published in the early 1990s, it was reported that, among Vietnamese American women who arrived in the United States prior to 1981, 76% reported that they had ever received a Pap test. In contrast, among those women who arrived in the United States after 1981, only 33% reported ever having had a Pap test [15]. Similar results were found for Cambodian and Hmong American women. Cambodian American women who have lived in the US for a longer period of time were more likely to report ever having had a Pap test than those who have spent fewer years in the US [23, 29]. Those women who immigrated to the US at a younger age—prior to age 20 [22] or 40 [29] years—were more likely to report ever having had a Pap test, and to have had a Pap test within the previous 1 year [29], compared to women who arrived in the US when they were older.

Hmong women who were born in the US or had lived in the US for at least 20 years were also more likely to have had a Pap test [28]. These consistent findings suggest that the longer Southeast Asian American women have lived in the US, the more likely they are to adopt various mainstream practices, including engaging in the practice of receiving Pap tests.

Fluency in English

Vietnamese American female college students who were less fluent in English were less likely to have had a Pap test than their counterparts who were more fluent in English [19]. Compared to those who were only literate in Khmer and those who were illiterate in both Khmer and English, Cambodian women who were literate in both Khmer and English were more likely to have had a Pap test [23]. For both Vietnamese and Cambodian American women, difficulties with the English language posed obstacles in scheduling a medical appointment [15, 29, 30], as well as problems with understanding medical terms [22, 24, 30]. A lack of interpreters who were able to help translate technical terms posed as an additional obstacle to obtaining a Pap test [22, 24, 30]. The barrier posed by lack of fluency in English is especially troubling because access to multi-lingual screening services is limited for Southeast Asian Americans [31].

Table 2 Factors by published report and types of data analyses

Author	Factor	Type of analyses/OR and 95% CI
Pham and McPhee [15]	Acculturation: No. of years in US	Bivariate ^a
	Knowledge	Descriptive/qualitative
	Apprehension: Embarrassment	Descriptive/qualitative
	Financial concerns: Cost	Descriptive/qualitative
Yi [18]	Physician characteristics: Recommended Pap	Descriptive/qualitative
	Acculturation: No. of years in US	1.16 (1.27, 1.05) ^a
	Marital status	8.80 (3.29, 23.56) ^a
	Financial concerns: Income	0.11 (0.02, 0.73) ^{a,c} ; 0.12 (0.01, 0.88) ^{a,c}
Kelly et al. [24]	Knowledge	Descriptive/qualitative
	Apprehension: Embarrassment	Descriptive/qualitative
Yi [23]	Acculturation: No. of years in US	Bivariate ^a
	Acculturation: Fluency in English	2.91 (1.31, 6.44) ^a
	Access to health care	Bivariate ^a
McPhee et al. [13]	Acculturation: No. of years in US	1.80 (1.20, 2.70) ^a
	Marital status	0.20 (0.10, 0.30) ^b
	Knowledge	Descriptive/qualitative
	Financial concerns: Cost	Descriptive/qualitative
	Access to health care	0.60 (0.40, 0.90) ^a
McPhee et al. [14]	Acculturation: No. of years in US	1.06 (1.02, 1.17) ^a ; 1.04 (1.00, 1.08) ^b
	Age	1.09 (1.04, 1.10) ^a
	Marital status	11.80 (6.08, 22.90) ^a ; 7.96 (3.83, 16.50) ^b
	Financial concerns: Health insurance	1.93 (1.09, 3.39) ^a
	Physician characteristics: Gender	0.56 (0.39, 0.81) ^{b,d}
	Physician characteristics: Ethnicity	0.44 (0.29, 0.69) ^{a,e} ; 0.55 (0.37, 0.80) ^{b,e}
Taylor et al. [22]	Acculturation: No. of years in U.S.	Bivariate ^a
	Age	Bivariate ^{a,b}
	Marital status	Bivariate ^b
	Apprehension: Embarrassment	Descriptive/qualitative
	Financial: Health insurance	Descriptive/qualitative
Yi [19]	Acculturation: No. of years in US	Bivariate
	Acculturation: Fluency in English	Bivariate ^a
	Marital status	7.50 (1.83, 30.72) ^a
	Access to health care	Bivariate ^a
Schulmeister and Lifsey [34]	Marital status	Bivariate ^a
	Knowledge	Descriptive/qualitative
	Apprehension: Embarrassment	Descriptive/qualitative
	Apprehension: Fear	Descriptive/qualitative
Taylor et al. [29]	Acculturation: No. of years in US	2.60 (1.30, 5.00) ^a
	Age	1.70 (0.60, 4.30) ^a ; 3.50 (1.80, 7.00) ^b
		2.50 (1.20, 5.40) ^a ; 1.60 (0.80, 3.20) ^b
	Knowledge	2.60 (1.20, 5.80) ^{b,f}
		1.80 (1.10, 3.00) ^{b,f}
		2.40 (1.50, 3.90) ^{b,f}
	Physician characteristics: Gender	2.30 (1.40, 3.80) ^b
	Physician characteristics: Recommended Pap	4.90 (2.90, 8.60) ^a ; 3.50 (2.10, 5.90) ^b
Jackson et al. [30]	Knowledge	Descriptive/qualitative
	Apprehension: Embarrassment	Descriptive/qualitative
	Apprehension: Fear	Descriptive/qualitative

Table 2 continued

Author	Factor	Type of analyses/OR and 95% CI
Nguyen et al. [32]	Financial: Cost	Descriptive/qualitative
	Financial: Health insurance	Descriptive/qualitative
	Age	Bivariate ^{a,b}
	Marital status	5.49 (3.28, 9.19) ^a
	Physician characteristics: Gender	1.85 (1.19, 2.88) ^a
Taylor et al. [16]	Physician characteristics: Recommended Pap	7.98 (5.69, 11.90) ^a
	Marital status	2.54 (1.39, 4.56) ^b
	Financial concerns: Cost	Bivariate ^b
	Financial concerns: Health insurance	Bivariate ^b
Taylor et al. [17]	Access to health care	Bivariate ^{a,b}
	Physician characteristics: Gender	0.53 (0.33, 0.88) ^b
	Marital status	2.70 (1.10, 6.50) ^b
	Knowledge	Bivariate ^b
	Apprehension: Fear	Bivariate ^b
	Access to health care	Bivariate ^b
Ho et al. [11]	Physician characteristics: Recommended Pap	6.80 (3.20, 14.40) ^b
	Marital status	Multivariate; OR and 95% CI not reported ^a
	Knowledge	Descriptive/qualitative
Yang et al. [28]	Acculturation: No. of years in US	Bivariate ^a
	Age	Bivariate ^a
	Financial: Income	Bivariate ^a
Do et al. [33]	Marital status	3.10 (1.60, 6.20) ^b

^a Ever received Pap testing

^b Recently received Pap testing

^c \$20,000–29,999 and <\$19,000 compared to >\$30,000

^d Reference group = female provider

^e Reference group = Non-Vietnamese provider

^f Beliefs that regular checkups are important, that Pap can lengthen life, and that sexually active women should receive Pap tests

Age

Overall, younger women were more likely than older women to have had a Pap test. Nguyen et al. [32] reported that Vietnamese women over the age of 65 were less likely to have participated in cervical cancer screening than were younger women, and Vietnamese American women above the age of 40 [14] and 65 [32] were less likely to have had a recent Pap test within the previous year, as compared to their younger counterparts in these respective studies. A similar association between age and cervical cancer screening was also found for Cambodian and Hmong American women. Cambodian American women under 59 years of age were more likely to have ever had a Pap test [29], and to have had a recent Pap test [22, 29] than those who were 60 years of age or older. Hmong American women under the age of 40 were also more likely to have ever had a Pap test than their older counterparts [28].

A closer examination of the association between age and past receipt of Pap tests revealed a non-linear relationship. For example, among Vietnamese American women, the likelihood of ever having had a Pap test was positively associated with age for those between the ages of 18 and 39 [14]. However, among women who are older than age 40, there was a negative relationship between participation in cervical cancer screening and age, such that likelihood of having had a Pap test decreased as age increased [14].

Marital Status

Being married has been associated with increased likelihood of having ever participated in cervical cancer screening among Vietnamese [11, 12, 14, 18, 19, 32] and Cambodian [29] American women. Indeed, among Vietnamese American women, compared to women who had never been married, those women who were married were

almost nine [18] or 12 times [14] more likely to have had a Pap test. With regard to recency of Pap test, women who had been married were more likely to have had a Pap test during the preceding 1 to 3 years [13, 14, 16, 17, 22, 29, 33]. Yi [23] found that Pap test was more common among women who had children, suggesting that cervical cancer screening rates may be higher among married women because these women are more likely to have also received reproductive health services from their physicians [14, 32]. Furthermore, unmarried Vietnamese American women, including those who were sexually active, tended to believe that Pap tests are only necessary among those who are married [19]. Virginity is highly regarded in Vietnamese culture, and unmarried heterosexual Vietnamese American women who believe that a Pap test would damage their virginity may prefer to therefore wait until they are married before obtaining their first Pap test [18].

Knowledge About Cervical Cancer and Cervical Cancer Screening

One barrier to participating in cervical cancer screening is a lack of knowledge about cervical cancer [15]. Several misconceptions about cervical cancer and cervical cancer screening have been reported by Southeast Asian women. Some Cambodian American women believed that they were not at risk for cervical cancer because it was an “American disease” [22, 30]. Other Cambodian American women indicated that they believed that cervical cancer was not curable [24, 30], and that it was contagious [24]. It is therefore not surprising that many Southeast Asian women are afraid of receiving unfavorable Pap test results, given that having an incurable and contagious disease is both hopeless and stigmatizing [22, 29, 30].

Southeast Asian women, especially those who are recent immigrants, may be unaccustomed to the notion of preventive medical care [22, 30]. In terms of cervical cancer, one reason cited by Vietnamese American women for not obtaining a Pap test was the belief that one did not need a Pap test if one was healthy [11, 13, 34]. Cambodian American women who believed that women who were not sexually active, post-menopausal, or who did not have any gynecological problems did not need to have a Pap test were less likely to have had one [22, 29, 30]. On the other hand, among Vietnamese American women, the knowledge that Pap tests were needed for women who did not have gynecologic symptoms, were not sexually active or were postmenopausal was associated with an increased likelihood of having had a Pap test within the previous 3 years [17]. Those who believed that Pap tests were effective in reducing one’s risk of developing cervical cancer, and who believed that early detection increased one’s chances of being cured, were more likely to participate in cervical

cancer screening [17]. Among Hmong women, low rate of cervical cancer screening and late diagnosis of cervical cancer may also be associated with lack of compatibility between traditional Hmong views of health and Western biomedical practices and misgivings about Western medicine [27].

Apprehension About Pap Tests

A deterrent to participation in cervical cancer screening among Vietnamese and Cambodian American women was embarrassment about receiving a gynecological examination [15, 22, 30, 34], especially from a male physician [24]. Fear of pain during a Pap test was another deterrent among Southeast Asian women [17, 22, 30]. Women reported being afraid of the Pap test itself [22, 30, 34], as well as fear of the treatments needed if unfavorable results were found [22, 30].

Financial Concerns

Vietnamese [13, 15, 16] and Cambodian [30] American women reported that concern about costs was a barrier against obtaining a Pap test. Vietnamese [18] and Hmong [28] American women who earned higher incomes were more likely to have had a Pap test than those from a lower income bracket. Having health insurance also emerged as an important factor in participation in Pap testing. Vietnamese American women who had health care insurance were more likely to have had a Pap test [14, 16]. Cambodian American women also indicated that not having health insurance was a barrier to obtaining a Pap test [30].

Access to Health Care

Vietnamese [16] and Cambodian [23] women who did not have a regular physician were less likely, compared to their counterparts who did have a regular physician, to report ever having had a Pap test. Vietnamese women who had a regular health care setting to attend were more likely to have ever received a Pap test [19], and to have received one in the preceding 3 years [17]. Furthermore, one study [17] found that women who received their care from a private clinic were less likely to have had a Pap test within the past 3 years, compared to women who received their care from a community clinic or hospital, perhaps because community clinics and hospitals played a more proactive role in reminding women to participate in preventive care. Taken together, these findings suggest that having access to a regular physician and source of health care is conducive to Pap testing among Southeast Asian American women, especially in light of the barriers against Pap testing in this population.

Physician Characteristics and Recommendation

Gender of Physician

Vietnamese American women who had a female physician were more likely to report ever having had a Pap test [32], and were more likely to report having had a recent Pap test over the preceding 1 year [14] or 2 years [16], compared to those women who had a male physician. Similarly, Cambodian American women who had a female health care provider were more likely to have had a recent Pap test than those who had a male health care provider [29]. Taylor and her colleagues speculated that women may be less willing to receive a Pap test from a male physician; alternatively, female physicians may subscribe more strongly to regular Pap testing than did male physicians [16, 29].

Ethnicity of Physician

Among Vietnamese American women, those who had a Vietnamese physician were less likely to report ever having had a Pap test or a recent Pap test within the preceding year [14] than those who had a non-Vietnamese physician. McPhee et al. [14] hypothesized that this finding may be due to the fact that most Vietnamese physicians received their medical training in Vietnam where preventive care is not emphasized, or because Vietnamese physicians were predominantly male who may have refrained from performing gynecologic examinations on their female patients out of respect for these patients' modesty [14, 35].

Recommendation by Health Care Provider

Recommendation of a Pap test by a physician was consistently associated with higher participation in cervical cancer screening. Vietnamese women whose physicians recommended the Pap test were more likely to have ever obtained one [15, 17], and to have had a recent Pap test within the preceding 3 years [17]. In fact, one study found that those women whose physicians recommended a Pap test were almost eight times more likely to have ever had a Pap test than women whose physicians did not make such a recommendation [32]. Furthermore, women were five times more likely to indicate that they planned to obtain a Pap test if their physician had recommended one [32]; in contrast, women whose physicians had not recommended a Pap test were likely to report that they did not intend to obtain one [13]. Similarly, Cambodian women whose physicians recommended Pap testing were five times more likely to have ever had a Pap test, and three times more likely to have had recent a Pap test over the previous 1 year [29].

Limitations of the Studies Reviewed

Several shortcomings were discussed by the authors of the studies reviewed here. These studies were limited to a local geographical region (e.g., Seattle, northern California), and may therefore not be generalizable to Southeast Asian women living in other regions of the US [13, 15–18, 32, 33]. Furthermore, many of these studies relied upon small samples [15]. Studies conducted using telephone surveys sampled only those families with listed telephone numbers [16, 17, 32, 33]. Mailed surveys had the limitation of not being accessible to women who were illiterate [34]. Many researchers observed a low response rate [14, 15, 19, 32], which may be due to high mobility and illiteracy [15], and reticence about disclosing personal information [14, 15]. Finally, studies on Pap test receipt relied upon self-report [13–15, 17, 19, 32], and most did not have independent corroboration from medical records. Self-report data are susceptible to misunderstanding about medical terms [32], inaccurate recollection and social desirability [13, 14, 17].

Finally, while this is not a limitation, it should be noted that some of the obstacles to cervical cancer screening reviewed in this paper are not unique to Southeast Asian women [36]. Nonetheless, these obstacles may be amplified among Southeast Asian women when compounded with the combination of immigrant or refugee status, socioeconomic barriers, and other challenges faced by these women.

Discussion

An Ecological Model of Cervical Cancer Screening Among Southeast Asian American Women

The published research on cervical cancer screening among Southeast Asian American women reveals a spectrum of factors, ranging from demographic to health care access issues. One way to summarize and conceptualize these seemingly disparate factors is by applying the framework Bronfenbrenner [37] described in his ecological model. Bronfenbrenner's "ecological levels of analysis" refers to the approach of understanding an issue by considering the multiple levels of influence related to that problem. These multiple levels include "proximal" factors that are most closely linked to the individual, such as one's family and school, as well as "distal" factors which are less directly associated with the individual but which have broad implications, such as one's culture and governmental institutions [38]. The first level, the *individuals* level, encompasses the most proximal factors and comprises personal characteristics. Acculturation (as

indicated by number of years living in the US and English language proficiency) and demographic characteristics (such as age and marital status) are factors associated with cervical cancer screening that fall within this ecological level. Next, the *microsystems* level includes interpersonal relationships and interactions. In the context of cervical cancer screening, a Southeast Asian woman's relationship with her physician is an important issue within the microsystems level. As reviewed, physician gender and ethnicity may influence the patient-physician interactions surrounding the topic of cervical cancer; for example, a male physician's consideration for his female patients' modesty may discourage him from recommending Pap testing. Thirdly, the *organizations* level consists of settings such as schools and community groups, which may be instrumental in encouraging Pap test participation by providing information to increase knowledge and dispel myths about cervical cancer and its prevention. Fourthly, the *localities* level refers to neighborhoods and cities, and is of particular relevance to cervical cancer screening among Southeast Asian women who may not have clinics that provide multi-lingual services close to their neighborhoods, and who have difficulties accessing healthcare or establishing regular healthcare resources. Finally, the *macrosystems* level encompasses cultural and societal factors, including normative beliefs about cervical cancer and Pap tests, cultural beliefs about preventive healthcare, especially the cultural and gendered stigma associated with Pap test, and overarching barriers that confront those who lack financial resources and English proficiency. Bronfenbrenner's ecological framework provides a cohesive way of conveying the multiple levels of influence of cervical cancer screening, and a basis for generating future research directions.

Implications for Future Research

Health Care Providers

One objective of Healthy People 2010 is for 85% of primary care providers to discuss Pap test with their patients [2]. This objective is of relevance to Southeast Asian American women because, as reviewed, among these women, having a recommendation from one's physician significantly increases the likelihood of obtaining a Pap test. A large proportion of Vietnamese American women have Vietnamese American physicians as their primary care provider. There has been preliminary research on reasons why these physicians might not recommend Pap tests. Many of these physicians did not receive training in preventive care in their native country, and lack knowledge about cervical cancer and the risk factors for cervical

cancer [35]. Vietnamese American physicians also indicated other barriers to recommending Pap test to their female patients, including uneasiness and unwillingness to discuss the topics of Pap test and cervical cancer, especially with older patients, and worry about losing their patients [39]. It is encouraging that, after attending seminars educating Vietnamese American physicians about cervical cancer, the level of knowledge on this topic among these physicians increased significantly [35]. Further investigations and interventions that focus on Vietnamese American physicians, and other Southeast Asian American physicians, are therefore crucial. Future research on Southeast Asian female physicians will shed light on the importance of physician gender versus physician ethnicity. For example, Southeast Asian female physicians may have different perspectives and relational dynamics with their female patients around cervical cancer and Pap testing than do their male counterparts. Enhanced understanding of these perspectives and dynamics may inform interventions aimed at increasing Pap testing among Southeast Asian American women.

Research is also needed to study non-Asian providers who treat Southeast Asian American women to determine whether they are aware that Southeast Asian women are at risk for cervical cancer, and whether they are actively recommending Pap tests to their Southeast Asian female patients. Non-Asian health care providers may not realize that Southeast Asian women are at higher risk for cervical cancer due to the model minority myth, which implies that Asian Americans are hardworking, successful, and in good health [40]. An assessment of the extent to which the model minority myth influences health care providers' perception of their Southeast Asian women patients is another important consideration for future research.

Current Generation of Young Southeast Asian Women in the US

According to the 2000 US Census, Southeast Asian Americans are a relatively young segment of society, with the median age ranging from 15.8 years among the Hmong to 25.2 years among the Vietnamese [5]. The majority of research conducted on cervical cancer screening rates and factors associated with receipt of Pap test were conducted in the 1990s. Therefore, updated research on cervical cancer screening participation among young Southeast Asian American women is much needed, especially because many of these individuals are currently coming of age, or have recently arrived at the age when Pap tests are recommended.

One area of investigation when studying young Southeast Asian American women is family factors. For example, many of these women are offspring of refugees from

Southeast Asia. Parents' refugee status and past trauma may have a detrimental impact on the quality of their relationships with their children, which in turn may be linked to adverse behavioral and psychological outcomes among Southeast Asian American youth [41, 42]. Therefore, the quality of parent–child relationships may potentially be associated with youth's self-care behaviors, such as taking part in preventive health examinations. Another family factor that ought to be a focus of future research is intergenerational conflict. Intergenerational conflict is common in Southeast Asian American families, because an acculturative gap [43] may exist between refugee/immigrant parents—who may have left their home countries involuntarily and have greater difficulty adjusting to living in the US—and their offspring who were either born in the US or arrived at a very young age [44]. Intergenerational conflict within Southeast Asian families has been associated with mental health problems among young Southeast Asian Americans [44]. It is plausible that these factors may also play a role in Pap test receipt among young Southeast Asian American women. For example, interpersonal problems in the family or acculturative conflict between parents and children, especially conflict between mothers and their daughters, may adversely affect discussion of sensitive health issues or needs, including the issue of cervical cancer screening.

Another issue that is relevant to young Southeast Asian American women is the advent of vaccines such as Gardasil and Cervarix, which protect against certain types of HPV, including those believed to cause cervical cancer. The Centers for Disease Control and Prevention recommends HPV vaccination for young girls and women ages 9 through 26 years [45]. Research is needed to understand factors, such as acculturation and knowledge about the vaccines, which may be linked to Southeast Asian American parents' decision whether to have their daughters obtain the vaccination. Parents who are aware that these vaccines prevent sexually-transmitted HPV may view vaccination as being stigmatizing and inconsistent with traditional norms and expectations for females. Fears and misunderstandings regarding the safety of the vaccines [46] may also deter Southeast Asian American parents from consenting to have their daughters receive the vaccination. The potential influence parents and other family members can have was underscored in an online study which found that young women who listed a family member as a source of information about HPV vaccine were more likely to have received the vaccination [47]. Therefore, further research ought to investigate the importance of family in HPV vaccination among young Southeast Asian women. For example, intervention programs ought to target families' beliefs about HPV and HPV vaccines.

Measures of Acculturation

Previous work on factors associated with Pap test receipt had used proxy measures of acculturation, such as years in the US and fluency in English. Measuring acculturation with instruments designed to tap into different aspects of cultural identity may yield more in depth findings about the relationship between acculturative experiences and participation in cervical cancer screening. For example, one particular acculturation inventory, the Khmer Acculturation Scale [48], should be considered in future research with Cambodian American women. Another way to study acculturation among Southeast Asian American women is to examine cultural orientation. Bicultural orientation is a buffer against stress among young Southeast Asian Americans [42]. The General Ethnicity Questionnaire [49], an instrument originally developed to measure both identification with Chinese culture and identification with mainstream American culture, has been adapted for use with Asian Americans of other ethnicities, including Southeast Asians [50, 51]. The inclusion of more sophisticated assessments of acculturation can yield a more nuanced understanding of the relationship between acculturative factors and participation in preventive health care among Southeast Asian women.

Other Factors for Exploration

Research on cervical cancer screening among Southeast Asian American women has so far identified a number of key issues associated with Pap test receipt. Other factors are also important to explore. For example, some researchers have investigated the potential link between smoking within one's household and receipt of Pap tests among women overall [52] and Vietnamese American women in particular [53]. Although the results of these studies are equivocal, they nonetheless provide an example of a potential avenue of research that may enhance our understanding about cervical cancer screening behaviors, within the broader conceptual framework of health risk behaviors, among Southeast Asian American women. Future research ought to also include investigation into the role of racism: To what extent do prejudice against Asians, perception of Asian Americans as "perpetual foreigners" and anti-immigrant sentiment influence health care providers' interactions with Southeast Asian American women? In what ways do perceived and institutionalized racism in the health care setting serve as barriers against Pap test receipt among these women? Furthermore, because the decision to receive a Pap test is multifaceted, it would be ideal to explore interactions among the factors associated with Pap test receipt across different levels of influence [37]. For example, how do race of the provider

and embarrassment regarding gynecological examinations, combined with cultural norms for gender roles, jointly predict participation in cervical cancer screening?

Finally, theory-driven research can further contribute to our understanding about Pap testing among Southeast Asian American women and how best to develop intervention programs that would increase Pap testing and therefore decrease rates of cervical cancer. For example, the transtheoretical model of change [54] has been adopted to understand Pap testing among Vietnamese [55] and Cambodian [56] American women. Among Vietnamese American women, those in the maintenance stage (have been receiving regular Pap tests and plan to continue doing so) reported more perceived benefits and fewer perceived barriers with regard to Pap tests than did women in the pre-contemplation stage (never had a Pap test and did not plan to obtain one within the next 6 months) [55]. These findings may aid in tailoring interventions for women who are in different stages of Pap test participation.

Interventions to Increase Cervical Cancer Screening

Although a thorough review of the intervention research among Southeast Asian American women is beyond the scope of this paper, findings from this body of research point to three common strategies that deserve further exploration: (1) employing trained community outreach workers [57]; (2) combining multiple approaches, such as various types of media and small group meetings [58]; and (3) customizing the intervention to meet specific “cultural, historical and structural” [57] circumstances of the target communities. For example, misunderstanding and misgivings about cervical cancer and its screening procedures are major factors contributing to low participation in Pap testing. Previous intervention efforts have employed a variety of media (television, radio, posters, booklets) and community health workers to disseminate information about cervical cancer and Pap testing to Vietnamese women [58]. Further research is needed on these and other effective modes of disseminating information among Southeast Asian American women. It is crucial that such information is presented in a culturally-appropriate format. Machloch et al. [59] described the development of a cervical cancer screening video to educate Cambodian American women. This video was created on the basis of qualitative interview data collected from Cambodian American women, and encompassed linguistic and cultural considerations, role modeling, and the use of analogies to explain medical concepts. More resources, such as the one described by Machloch [59], are needed to increase knowledge and decrease fear among Southeast Asian American women regarding cervical cancer screening.

Conclusion

Southeast Asian Americans are a growing segment of US society that underwent a turbulent refugee and immigrant history, and that continues to grapple with social, economic and health challenges. The research reviewed here has demonstrated that cervical screening among Southeast Asian American women is a complex and multifaceted issue. Overall, much more research is needed to examine the facilitating factors at various levels of analysis, from the individual to societal, in order to understand the underlying dynamics or forces that explain participation in cervical cancer screening among Southeast Asian American women. This deeper understanding will enable us to devise more effective prevention programs to target different levels of influence, which ultimately will help reduce the high incidence of cervical cancer in Southeast Asian populations.

References

1. Xu Y, Ross C, Ryan R, Wang B. Cancer risk factors among Southeast Asian American residents of the U.S. central gulf coast. *Public Health Nurs.* 2005;22:119–29.
2. US Department of Health and Human Services. Healthy People 2010: Midcourse review. 2009. <http://www.healthypeople.gov/data/midcourse/html/default.htm#FocusAreas>. Accessed 03 September 2009.
3. American Cancer Society. Cancer facts and figures 2005. 2009. <http://www.cancer.org/downloads/STT/CAFF2005f4PWSecured.pdf>. Accessed 29 September 2009.
4. Dinh KT. The A-B-C in clinical practice with Southeast Asians: basic understanding of migration and resettlement history. In: Handbook of mental health and acculturation in Asian American families. Totowa, NJ: Humana Press, Inc.; 2009. p. 123–141.
5. McCracken M, Olsen M, Chen MS, et al. Cancer incidence, mortality, and associated risk factors among Asian Americans of Chinese, Filipino, Vietnamese, Korean and Japanese ethnicities. *CA Cancer J Clin.* 2007;57:190–205.
6. Saslow D, Runowicz CD, Solomon D, et al. American Cancer Society guideline for the early detection of cervical neoplasia and cancer. *CA Cancer J Clin.* 2002;52:342–62.
7. American Congress of Obstetricians and Gynecologists. ACOG practice bulletin No. 109: Cervical cytology screening. *Obstet Gynecol.* 2009;114(6):1409–20.
8. US Department of Health and Human Services. Developing Healthy People 2020. 2009. <http://www.healthypeople.gov/HP2020/default.asp>. Accessed 23 December 2009.
9. American Cancer Society. Cancer facts and figures 2009. 2009. <http://www.cancer.org/downloads/STT/500809web.pdf>. Accessed 08 September 2009.
10. American Cancer Society. Cancer facts and figures 2004. 2009. http://www.cancer.org/downloads/STT/CAFF_finalpwsecured.pdf. Accessed 02 August 2009.
11. Ho V, Yamal JM, Atkinson EN, Basen-Engquist K, Tortolero-Luna G, Follen M. Predictors of breast and cervical screening in Vietnamese women in Harris County, Houston, Texas. *Cancer Nurs.* 2005;28(2):119–29.

12. Jenkins CNH, Le T, McPhee SJ, Stewart S, Ha NT. Health care access and preventive care among Vietnamese immigrants: do traditional beliefs and practices pose barriers? *Soc Sci Med.* 1996;43(7):1049–56.
13. McPhee SJ, Bird JA, Davis T, Ha NT, Jenkins CNH, Le B. Barriers to breast and cervical cancer screening among Vietnamese-American women. *Am J Prev Med.* 1997;13(3):205–13.
14. McPhee SJ, Stewart S, Brock KC, Bird JA, Jenkins CNH, Pham GQ. Factors associated with breast and cervical cancer screening practices among Vietnamese American women. *Cancer Detect Prev.* 1997;21(6):510–21.
15. Pham CT, McPhee SJ. Knowledge, attitudes, and practices of breast and cervical cancer screening among Vietnamese women. *J Cancer Educ.* 1992;7(4):305–10.
16. Taylor VM, Schwartz SM, Yasui Y, et al. Pap testing among Vietnamese women: health care system and physician factors. *J Commun Health.* 2004;29(6):437–50.
17. Taylor VM, Yasui Y, Burke N, et al. Pap testing adherence among Vietnamese American women. *Cancer Epidemiol Biomarkers Prev.* 2004;13(4):613–9.
18. Yi JK. Factors associated with cervical cancer screening behavior among Vietnamese women. *J Commun Health.* 1994;19(3):189–200.
19. Yi JK. Acculturation and Pap smear screening practices among college-aged Vietnamese women in the United States. *Cancer Nurs.* 1998;21(5):335–41.
20. Kem R, Chu KC. Cambodian cancer incidence rates in California and Washington, 1998–2002. *Cancer.* 2007;110:1370–5.
21. American Cancer Society. California cancer facts and figures 2009. 2009. <http://www.ccrca.org/PDF/ACS2009.pdf>. Accessed 02 August 2009.
22. Taylor VM, Jackson CJ, Schwartz SM, Yasui Y, Tu SP, Thompson B. Cervical cancer control in a Cambodian American population. *Asian Am Pac Isl J Health.* 1998;6(2):368–77.
23. Yi JK. Factors affecting cervical screening behavior among Cambodian women in Houston, Texas. *Fam Commun Health.* 1996;18(4):49–57.
24. Kelly AW, Chacori MDMF, Wollan PC, et al. A program to increase breast and cervical cancer screening for Cambodian women in a midwestern community. *Mayo Clin Proc.* 1996;71(5):437–44.
25. Yang RC, Mills PK, Riordan DG. Cervical cancer among Hmong women in California, 1988 to 2000. *Am J Prev Med.* 2004;27(2):132–8.
26. Ross JA, Xie Y, Kiffmeyer WR, Bushhouse S, Robison LL. Cancer in the Minnesota Hmong population. *Cancer.* 2003;97:3076–9.
27. Mills PK, Yang R. Cancer incidence in the Hmong of central California, United States, 1987–94. *Cancer Causes Control.* 1997;8:705–12.
28. Yang RC, Mills PK, Dodge JL. Cancer screening, reproductive history, socioeconomic status and anticipated cancer-related behavior among Hmong adults. *Asian Pac J Cancer Prev.* 2006;7:79–85.
29. Taylor VM, Schwartz SM, Jackson JC, et al. Cervical cancer screening among Cambodian-American women. *Cancer Epidemiol Biomarkers Prev.* 1999;8:541–6.
30. Jackson JC, Taylor VM, Chitnarong K, et al. Development of a cervical cancer control intervention program for Cambodian American women. *J Commun Health.* 2000;25(5):359–75.
31. Tanjasiri SP, Tran JH, Kagawa-Singer M, et al. Exploring access to cancer control services for Asian-American and Pacific Islander communities in southern California. *Ethn Dis.* 2004;14(3):S1–14.
32. Nguyen TT, McPhee SJ, Nguyen T, Lam T, Mock J. Predictors of cervical Pap smear screening awareness, intention, and receipt among Vietnamese-American women. *Am J Prev Med.* 2002;23(3):207–14.
33. Do HH, Taylor VM, Burke N, Yasui Y, Schwartz SM, Jackson JC. Knowledge about cervical cancer risk factors, traditional health beliefs, and Pap testing among Vietnamese American women. *J Immigr Health.* 2007;9:110–4.
34. Schulmeister L, Lifsey DS. Cervical cancer screening knowledge, behaviors, and beliefs of Vietnamese women. *Oncol Nurs Forum.* 1999;26(5):879–87.
35. Lai KQ, Nguyen TT, Mock J, McPhee SJ, Doan HT, Pham TH. Increasing Vietnamese-American physicians' knowledge of cervical cancer and Pap testing: impact of continuing medical education programs. *Ethn Dis.* 2004;14:122–6.
36. Behbakht K, Lynch A, Teal S, Degeest K, Massad S. Social and cultural barriers to Papanicolaou test screening in an urban population. *Obstet Gynecol.* 2004;104:1335–61.
37. Bronfenbrenner U. *The ecology of human development: experiments by nature and design.* Cambridge, MA: Harvard University Press; 1979.
38. Dalton JH, Elias MJ, Wandersman A. *Community psychology: linking individuals and communities.* Belmont, CA: Thomson Wadsworth; 2007.
39. Kwon HT, Solomon FM, Nguyen S. A needs assessment of barriers to cervical cancer screening in Vietnamese American health care providers. *California J Health Promot.* 2006;4(3):146–56.
40. Chen MS, Hawks BL. A debunking of the myth of health Asian Americans and Pacific Islanders. *Am J Health Promot.* 1995;9(4):261–8.
41. Han M. Relationship among perceived parental trauma, parental attachment, and sense of coherence in Southeast Asian American college students. *J Family Social Work.* 2005;9(2):25–45.
42. Spencer JH, Le TN. Parent refugee status, immigration stressors, and Southeast Asian youth violence. *J Immigr Health.* 2006;8:359–68.
43. Dinh KT, Nguyen HH. The effects of acculturative variables on Asian American parent-child relationships. *J Social Personal Relatsh.* 2006;23(3):407–26.
44. Ying YW, Han M. The longitudinal effect of intergenerational gap in acculturation on conflict and mental health in Southeast Asian American adolescents. *Am J Orthopsychiatr.* 2007;77:61–6.
45. Centers for Disease Control and Prevention. HPV vaccine information for young women. 2009. <http://www.cdc.gov/std/hpv/STDFact-HPV-vaccine-young-women.htm>. Accessed 24 August 2009.
46. Centers for Disease Control and Prevention. Reports of health concerns following HPV vaccination. 2009. <http://www.cdc.gov/vaccinesafety/Vaccines/HPV/gardasil.html>. Accessed 26 December 2009.
47. Caskey R, Lindau S, Alexander G. Knowledge and early adoption of the HPV vaccine among girls and young women: results of a national survey. *J Adolesc Health.* 2009;45(5):453–62.
48. Lim KV, Heiby E, Brislin R, Griffin B. The development of the Khmer acculturation scale. *Int J Intercult Relat.* 2002;26:653–78.
49. Tsai JL, Ying YW, Lee PA. The meaning of “being Chinese” versus “being American”: variation among Chinese American young adults. *J Cross Cult Psychol.* 2000;31:302–32.
50. Dinh KT, Weinstein TL, Kim SY, Ho IK. Acculturative and psychosocial predictors of academic-related outcomes among Cambodian American high school students. *J Southeast Asian Am Educ Advancement.* 2008;3:1–23.
51. Ying YW, Han M. Cultural orientation in Southeast Asian American young adults. *Cultur Divers Ethnic Minor Psych.* 2008;14:29–37.
52. Clark MA, Rakowski W, Ehrich B. Breast and cervical cancer screening: associations with personal, spouse's, and combined

- smoking status. *Cancer Epidemiol Biomarkers Prev.* 2000;9: 513–6.
53. Chan NL, Yasui Y, Thompson B, et al. Secondhand smoke in the home and Pap testing among Vietnamese American women. *Asian Pac J Cancer Prev.* 2007;8:178–82.
 54. Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. *J Counsel Clin Psychol.* 1983;51:390–5.
 55. Tung WC, Nguyen DHT, Tran DN. Applying the transtheoretical model to cervical cancer screening in Vietnamese-American women. *Int Nurs Rev.* 2008;55:73–80.
 56. Taylor VM, Jackson JC, Yasui Y, et al. Pap testing stages of adoption among Cambodian immigrants. *Asian Am Pac Isl J Health.* 2000;8(1):59–68.
 57. Nguyen TUN, Tanjasiri SP, Kagawa-Singer M, Tran JH, Foo MA. Community health navigators for breast and cervical cancer screening among Cambodian and Laotian women: intervention strategies and relationship-building processes. *Health Promot Pract.* 2008;9:257–68.
 58. Nguyen TT, McPhee SJ, Bui-Tong N, et al. Community-based participatory research increases cervical cancer screening among Vietnamese-Americans. *J Health Care Poor Underserved.* 2006; 17:31–54.
 59. Machloch J, Jackson JC, Chitnarong K, Sam R, Ngo LS, Taylor VM. Bridging cultures through the development of a cervical cancer screening video for Cambodian American women in the United States. *J Cancer Educ.* 1999;14:109–14.