Breast Cancer Screening Knowledge, Attitudes, and Practices Among Korean American Women

Youngshook Han, PhD, RN, Roma D. Williams, PhD, CRNP, and Renee A. Harrison, PhD

Purpose/Objectives: To describe the knowledge and beliefs about breast cancer and breast cancer screening and practices of clinical breast examination (CBE) and mammography of Korean American women.

Design: Cross-sectional survey.

Setting: Two Korean churches in a mid-sized Southeastern U.S. city.

Sample: A convenience sample of 107 Korean women ages 40 and older.

Methods: Data were collected using Champion's Health Belief Model instrument (susceptibility, seriousness, benefits, and barriers) and the Breast Cancer Knowledge test through mailed questionnaires.

Main Research Variables: Knowledge and beliefs about breast cancer screening and practices of CBE and mammography.

Findings: The percentages of Korean American women who ever had a CBE and mammography were 67 and 58, respectively. Among the Health Belief Model variables, women who never had a CBE had significantly lower knowledge scores and higher perceived barriers to CBE than those who had. Women who never had a mammogram reported significantly higher perceived barriers to mammography. Logistic regression analyses demonstrated that husband's nationality, regular checkups, and encouragement from family members and physicians were significant predictors of CBE and mammography use.

Conclusions: The frequency of breast cancer screening practices among Korean American women is below national objectives.

Implications for Nursing Practice: As healthcare professionals in a culturally diverse nation, nurses need to increase their awareness of cultural variations and provide culturally and linguistically appropriate breast health education. Additional studies with women from a variety of settings are needed to validate present study findings.

Key Points . . .

- The incidence of breast cancer among Asian American women is increasing.
- The Health Belief Model is a useful framework to understand Korean American women's breast cancer screening behaviors.
- Family members and physicians play an important role in fostering Korean American women's breast cancer screening behaviors.
- Nurses must modify breast cancer screening programs to reflect the cultural diversity among Asian American women.

Asian Americans, largely because of immigration, are the fastest growing minority in the United States and comprise many diverse ethnic groups. The 1997 census indicated that 9,253,000 Asians were living in the United States, a 160% increase over the 1980 census count of 3,466,847 (U.S. Department of Commerce, Bureau of the Census, 1998). Asian Americans currently constitute 3% of the population, and this number is expected to increase to 11% by the year 2050, representing a 300% overall increase in size (U.S. Department of Commerce, Bureau of the Census, 1996).

Among Asian American women, breast cancer rates have increased relatively rapidly, doubling between 1973 and 1986 (Stanford, Herrinton, Schwartz, & Weiss, 1995) and increasing sixfold between 1983 and 1987 (Ziegler et al., 1993). Breast cancer rates among Asian American women now are approaching those of non-Hispanic Caucasian women (Stanford et al.). Furthermore, late stage of diagnosis, high recurrence rates, and poor survival are evident among Asian American women diagnosed with breast cancer (Jenkins & Kagawa-Singer, 1994; Lin-Fu, 1993).

Breast cancer is the most frequently diagnosed cancer among Korean American women, with an age-adjusted rate of 28.5 per 100,000 compared with a rate among non-

Youngshook Han, PhD, RN, is an instructor, and Roma D. Williams, PhD, CRNP, is a professor, both in the School of Nursing at the University of Alabama at Birmingham. Renee A. Harrison, PhD, is a research associate in the Biostatistics Unit of the Comprehensive Cancer Center at the University of Alabama at Birmingham. *This research was supported by the School of Nursing, University of Alabama at Birmingham "Dean's Research Award." (Submitted November 1999. Accepted for publication May 1, 2000.)*

Hispanic Caucasian women of 111.8 per 100,000 (Parker, Davis, Wingo, Ries, & Heath, 1998). Although the breast cancer rates among Korean American women are approximately four times lower than non-Hispanic Caucasian women, Korean American women are more likely to be diagnosed at a later stage and, as a result, have an increased mortality (National Cancer Institute, 1995).

Studies have demonstrated the effectiveness of clinical breast examination (CBE) and mammography and have showed that regular mammography screening can reduce breast cancer mortality by up to 40% among women ages 50 years and older (Harris, Lippmann, Veronesi, & Willett, 1992; Miller, 1993; White, Urban, & Taylor, 1993). However, ethnic minority women, especially Asian Americans, are much less likely to participate in breast cancer screening practices (Helstrom, Coffey, & Jorgannathan, 1998; Hiatt et al., 1996; Hoeman, Ku, & Ohl, 1996; Kang et al., 1997; Wismer et al., 1998). Helstrom et al. reported that 43% of Korean American women surveyed never had a CBE and 33% never performed breast self-examination (BSE). Maxwell, Bastani, and Warda (1998b) found that only 49% of the Korean American women they surveyed reported having had a mammogram. Factors contributing to inadequate participation of Asian Americans in breast cancer screening practices include economic and cultural barriers between themselves and providers and barriers related to knowledge, beliefs, and attitudes about screening (Baumann, Han, & Love, 1997; Choudhry, Srivastava, & Fitch, 1998; Kang et al.; Maxwell, Bastani, & Warda, 1998a; Wismer et al.; Yi & Prows, 1996; Yu, Seetoo, Tsai, & Sun, 1998). In addition, several researchers have highlighted language barriers (Choudhry et al.; Sent, Ballem, Paluck, Yelland, & Vogel, 1998; Yi & Prows). Helstrom et al. reported that a high percentage of Asian American women suffer from language barriers—83% of Chinese and 64% of Koreans spoke little or no English, and more than 50% of all Asian Americans are linguistically isolated.

Few studies have examined breast cancer screening practices among Asian American women, and even fewer studies have included Korean women (Maxwell et al., 1998a, 1998b; Wismer et al., 1998). These studies have been conducted primarily on the West Coast in California and Washington.

The purpose of this study was to describe the knowledge and beliefs about breast cancer screening and practices of CBE and mammography among Korean American women residing in the Southeastern United States.

Theoretical Framework

The Health Belief Model (HBM) (Rosenstock, 1974) was the theoretical framework that guided this study. The major dimensions of this model are perceived susceptibility, seriousness, benefits, barriers, cues to action, and health motivation. According to the HBM, people's perceptions of their susceptibility to the illness and the severity of the disease produce a readiness to take action. This readiness will result in the behavior with an appropriate cue to action, lack of significant barriers, and belief in the efficacy of taking action.

The HBM has had the greatest influence on research related to predicting breast cancer screening behaviors. Several studies have used the HBM to understand breast cancer screening behaviors among Asian American women (Choudhry et al., 1998; Hoeman et al., 1996; Yi & Prows, 1996). These studies have demonstrated that significant relationships exist among actual breast cancer screening, knowledge about breast cancer screening (Choudhry et al.; Yi & Prows), perceived barriers (Yi & Prows), social support (Hoeman et al.), and language acculturation (Choudhry et al.).

Methods

Sample and Setting

The study design was a cross-sectional survey. The subjects in this study were part of a larger sample of women ages 35 years or older (N = 133) who were recruited in a mid-sized Southeastern U.S. city. For this study, only respondents ages 40 years or older (N = 107) were included because the American Cancer Society (2000) recommends mammography for women 40 years of age and older. For this study, the following inclusion criteria were used: 40 years of age or older, ability to read and write Korean, no current or previous diagnosis of breast cancer, and consent to participate in the study.

For this study, a sample size of 107 was considered adequate to obtain reliable estimates based on the number of items per scale. According to Hatcher and Stepanski (1994), five subjects are needed per item. In this study, the largest number of items per scale was 18.

Eligible participants were recruited from two Korean churches. Using church directories, the minister along with the principal investigator identified Korean American women whom they believed met the eligibility criteria. These women were invited to participate in the study. After initially procuring and interviewing subjects, snowball sampling (Woods & Catanzaro, 1988) was implemented to broaden the sample. Using this technique, each successive participant was asked to suggest the names of additional individuals who met the criteria for being included in the study. They, in turn, were contacted.

Instruments

Using Champion's (1993) **HBM instrument,** the HBM variables were measured using a five-point Likert scale summated with markers from 1 (strongly disagree) to 5 (strongly agree). Three susceptibility items measured women's beliefs about the likelihood of getting breast cancer. Severity was measured using items that asked about the seriousness of breast cancer. The benefits of obtaining CBE and mammography were assessed as the perceived importance of CBE and mammography. Barriers to obtaining CBE and mammography were examined with items that asked about worry, embarrassment, cost, transportation, and ability to speak English. The Korean principal investigator and a Korean research assistant translated Champion's HBM instrument then translated it back to ensure conceptual equivalence. A few items from the HBM instrument (e.g., barrier items) were modified to improve clarity and cultural sensitivity. Champion reported Cronbach's alpha reliability coefficients for the scales on BSE to be 0.80–0.93 and test-retest correlations to be 0.45–0.70.

Construct validity was established by analyzing all items with principal component factor analyses and varimax rotation. Content validity was established by consulting with two Korean nursing faculty members to evaluate the appropriateness of the instrument for this particular population.

An 18-item knowledge scale was adapted from the **Breast Cancer Knowledge** test (McCance, Mooney, Smith, & Field, 1990) to measure subjects' knowledge of breast cancer detection and screening practices. It consisted of 18 multiple-choice and dichotomous (true/false) responses. A knowledge score was computed by totaling the number of correct answers for all items. McCance et al. reported the internal consistency reliability for this scale to be 0.81.

Rates of CBE and mammography use were measured using dichotomous questions (e.g., Have you ever had a CBE/mammogram? [yes/no]). Researchers did not distinguish between diagnostic and screening examinations.

The demographic characteristics that were collected included age, education level, income, marital status, and, if married, husband's nationality (Korean, Caucasian American, or other). Health-related characteristics such as perceived health status, regular checkups, and health insurance coverage also were included.

Two items measured social support regarding CBE and mammography: encouragement from physicians (yes/no) and encouragement from family members (yes/no).

Data Collection and Statistical Analysis

To ensure the cultural sensitivity of the instrument, a female bilingual research assistant and the principal investigator conducted focus groups and individual interviews with 22 Korean American women in Korean churches or their homes. Following completion of the informed consent and demographic questionnaires, the participants were asked to discuss beliefs and attitudes about breast health using a semistructured interview format. The instruments were revised according to the findings from focus groups and individual interviews. The final survey was mailed to the subjects with a self-addressed, stamped envelope. For test-retest reliability, subjects were reassessed with the same survey two weeks after the initial testing.

Data reported in this article, which were obtained from 107 women, were analyzed using the Statistical Package for Social Sciences (SPSS) (SPSS, Inc., 1993).

Using a series of Chi-square analyses, bivariate analyses were performed to determine the effect of all variables on CBE and mammography use. The differences in knowledge and the HBM variables (susceptibility, seriousness, benefits, and barriers) between the women who had undergone a CBE and mammogram and those who had not were analyzed using t-tests. Finally, logistic regression analyses were used to simultaneously control for the effects of those variables that were identified as being significant ($p < 0.05$) in the Chi-square analyses. Analyses focused on participation in CBE and mammography practices rather than frequencies of the practices because the vast majority of women had their most recent CBE (81%) and mammogram (77%) within the prior two years.

Results

Demographic Characteristics

Table 1 presents the demographic and health-related characteristics of the sample. The mean age of the 107 subjects was 48 years, with a range of 40–80. The majority (88%) were married, and 56% (n = 59) reported their husband's nationality as Caucasian American. Thirty-three percent (n = 35) had more than a high school education. All subjects were immigrants, with a mean length of residence in the United States of 17 years (range was from a few months to more than 30 years). Of the 107 total subjects, 67% (n = 69) had undergone a CBE and 58% (n = 62) reported that they had undergone a mammogram.

Factors Influencing Obtaining Clinical Breast Examination

Factor analysis established independent factors that matched each of the scales as specified in the HBM instrument. Using Cronbach's alpha, internal consistency reliabilities ranged from 0.73–0.92. Coefficient alpha reliability estimates (Cronbach, 1951) all exceeded 0.70 (see Table 2). The test-retest method was used to assess the reliability of the instrument, with a two-week interval between administrations. Test-retest reliabilities using Pearson correlation coefficients ranged from 0.51–0.88.

The bivariate analyses identified three variables as having a significant association with CBE: husband's nationality (χ^2 [1, n = 101] = 7.615, $p < 0.01$); encouragement from family members (χ^2 [1, n = 103] = 23.864, p = 0.000); and encouragement from physicians (χ^2 [1, n = 103] = 11.734, p = 0.001). Women who had Caucasian American husbands and those who received encouragement from family members and physicians were more likely to have had a CBE.

Multivariate logistic regression analyses were performed to examine the potential impact of the three variables on having had a CBE (see Table 3). In this model, all three variables were identified as significant predictors of having had a CBE. Women who had Caucasian American husbands and those who received encouragement from physicians were three to four times more likely to have had a CBE. Women who received encouragement from family members were approximately 10 times more likely to have had a CBE.

An examination of the HBM variables showed that women who never had a CBE reported significantly higher perceived barriers to CBE (t[75] = 3.143, $p < 0.01$) and were less knowledgeable about breast cancer screening (t[80] = –3.127, $p < 0.01$) than women who had undergone a CBE. The mean scores for perceived barriers to CBE for women who never had a CBE ($\bar{X}$ = 24.12, SD = 5.9) were significantly higher than corresponding mean scores for those who had undergone one ($\bar{X}$ = 20.57, SD = 5.1). The knowledge scores of all subjects ranged from 1–16 ($\bar{X}$ = 9.08, SD = 3.4). Women who never had a CBE ($\bar{X}$ = 7.57, SD = 2.9) had significantly lower knowledge scores than those who had undergone a CBE ($\bar{X}$ = 9.91, SD = 3.3).

Factors Influencing Mammography Use

The bivariate analyses showed that regular checkups (χ^2 [1, n = 98] = 6.006, $p < 0.05$), length of residence in the

Table 1. Sociodemographic and Health-Related Characteristics of the Sample

Characteristics	n	%
Age (years)		
40–49	68	64
≥ 50	39	36
Marital status		
Married	88	85
Unmarried	16	15
Education (years)		
≤ 12	70	67
> 12	35	33
Husband's nationality		
Korean	46	44
Caucasian American	59	56
Household income		
≤ $40,000	44	47
> $40,000	50	53
Length of residence in the United States (years)		
< 15	32	30
≥ 15	73	70
Health insurance		
No	16	15
Yes	89	85
Health status		
Poor/fair	43	41
Good/excellent	61	59
Regular checkup		
More than two years ago	32	33
Within past two years	66	67
Clinical breast examination (CBE)		
Never had one	34	33
Have had one	69	67
Support from family members to have CBE		
No	36	35
Yes	68	65
Support from physicians to have CBE		
No	48	46
Yes	56	54
Mammography		
Never had one	45	42
Have had one	62	58
Support from family members to have mammography		
No	42	39
Yes	65	61
Support from physicians to have mammography		
No	50	47
Yes	57	53

N = 107; some participants did not respond to every question.

United States (χ^2 [1, n = 105] = 5.128, p < 0.05), encouragement from family members (χ^2 [1, n = 107] = 20.670, p = 0.000), and encouragement from physicians (χ^2 [1, n = 107] = 30.076, p = 0.000) were associated with having had a mammogram. Women who had a regular checkup in the prior 2 years and those who had lived in the United States for more than 15 years were more likely to have had a mammogram. In addition, encouragement from family members and physicians had significant associations with having had a mammogram.

Table 2. Subscale Scores and Reliabilities for Health Belief Model Scales

Subscale	Items	Range of Scores	Cronbach's Alpha	$\bar{X}$ (SD)
Susceptibility	3	3–12	0.92	7.20 (2.34)
Seriousness	8	8–39	0.83	26.48 (5.45)
Benefits of clinical breast examination (CBE)	5	5–25	0.88	19.33 (3.54)
Barriers to CBE	9	9–45	0.78	21.81 (5.55)
Benefits of mammography	5	5–25	0.89	19.33 (3.73)
Barriers to mammography	9	9–40	0.78	20.76 (5.21)
Knowledge	18	1–16	0.73	9.08 (3.36)

N = 107

The results of the multivariate analysis illustrated that when all four variables were controlled statistically, only three were found to be significant predictors that affected women's mammography use (see Table 3). In the multivariate model for mammography, physician encouragement retained the strongest relationship, followed by encouragement from family members and regular checkups. The relationship between length of residence in the United States and mammography was no longer significant when controlling for other factors. Women who had a regular checkup in the prior two years were four times more likely to have had a mammogram. Women who received encouragement from family members and physicians were four to six times, respectively, more likely to have had a mammogram.

In terms of the HBM variables, women who never had a mammogram reported significantly higher perceived barriers to mammography (t[102] = 3.794, p < 0.01) and less perceived benefits of mammography (t[104] = 2.260, p < 0.01) than women who had one. The mean scores for perceived barriers to mammography for women who never had a mammogram ($\bar{X}$ = 22.98, SD = 4.5) were significantly higher than corresponding mean scores for those who had ($\bar{X}$ = 19.26, SD = 5.2). The finding indicated that language and cost were two major barriers among the perceived barriers items.

Discussion

The percentages of Korean American women who had a CBE and mammogram were 67 and 58, respectively. The data from this study indicated that the level of breast cancer screening practices was higher than it was in previous studies among Asian American women ages 40 years and older (Choudhry et al., 1998; Yi & Prows, 1996). The level, however, is still below national objectives. The goal of the U.S. Department of Health and Human Services for breast cancer screening for the year 2000 is to have 80% of women ages 40 years and older receive at least one CBE and mammography (U.S. Department of Health and Human Services, 1991).

Table 3. Multiple Logistic Regression Model of Associations Between Significant Variables and Clinical Breast Examination (CBE) and Mammography

Variables	CBE		Mammography	
	Odd Ratio	95% Confidence Interval	Odd Ratio	95% Confidence Interval
Husband's nationality (Caucasian American = 1)	4.10	(1.37, 12.27)	–	–
Regular checkup (in past two years = 1)	–	–	4.74	(0.29, 16.57)
Support from family members (yes = 1)	9.7	(3.26, 28.93)	3.98	(1.40, 11.30)
Support from physicians (yes = 1)	3.08	(1.07, 8.85)	6.78	(2.40, 19.11)

The strong correlates of testing in the sociodemographic variables on CBE and mammography were husband's nationality, regular checkups, and length of residence in the United States. Women who had Caucasian American husbands were more likely to have had a CBE. This interesting finding is consistent with a study on BSE among Korean American women (Han, Williams, & Harrison, 1999). In that study, women who married Caucasian Americans were more likely to practice BSE than those who married Koreans. One potential explanation for this finding is that having a Caucasian American husband reflects women's linguistic characteristics and enculturation of or adaptation to the dominant culture. This finding is consistent with that of Choudhry et al. (1998). They found that language and unfamiliarity with the Western culture acted as barriers to breast health practices. Therefore, this finding may be related to increased awareness of health promotion and disease-prevention behaviors.

Women who had a regular checkup in the prior two years were more likely to have had a mammogram than those who had not had a checkup in the past two years. This finding is consistent with previous studies (Maxwell et al., 1998a; Metsch et al., 1998; Wismer et al., 1998; Yu et al., 1998) and suggests that greater attention should be paid specifically to strategies to increase perceptions of general health-protecting behaviors. As with other studies (Maxwell et al., 1998a; Yu et al.), this study found that the length of residence in the United States was related to mammography use. Women who had lived in the United States more than 15 years were more likely to have a mammogram than those who lived in the country less than 15 years. Women in this study who had lived in the United States for a shorter period were less likely to be English-speaking and more likely to be of low economic status or uninsured. The length of residence in the United States may reflect the unfamiliarity with the medical and health-care system and could relate to potential barriers such as language.

Among the HBM variables, perceived susceptibility and seriousness were not significant factors in this study, which is consistent with other studies (Choudhry et al., 1998; Thomas, Fox, Leake, & Roetzheim, 1996; Yi & Prows, 1996). However, as in previously reported studies (Champion & Menon, 1997; Champion & Scott, 1997; Fowler, 1998; Hyman, Baker, Ephraim, Moadel, & Philip, 1994), perceived barriers were the most important factor influencing CBE and mammography use. Among the perceived barriers, the descriptive statistics revealed that Korean American women reported higher barrier scores on items such as language, cost, and discomfort. Language was the strongest barrier for these women. Approximately 66% of the Asian population in the United States is foreign born. For this reason, low literacy levels or unfamiliarity with the English language makes absorbing written information difficult, even when it is available in printed form. Poor English proficiency is likely to limit Asian women's ability to access breast cancer screening. Therefore, the educational materials must be culturally sensitive, relevant, understandable, and linguistically appropriate to the Korean American population.

A significant positive relationship between knowledge of breast cancer detection and screening practices and CBE use indicates the importance of knowledge about breast cancer screening. This finding is consistent with previous studies (Giuliano, Papenfuss, de Zapien, Tilousi, & Nuvayestewa, 1998; Yi & Prows, 1996). The knowledge items on which samples scored the lowest were those about the effectiveness of regular breast cancer screening and BSE technique. This finding suggests that greater attention should be given to strategies to increase general information about BSE and breast cancer screening through breast cancer education materials or outreach programs.

The results of the logistic regression illustrated that the biggest predictors of CBE and mammography use were encouragement from family members and physicians. As with previous studies (Han et al., 1999; Hoeman et al., 1996; Maxwell et al., 1998b; Metsch et al., 1998; Suarez, Lloyd, Weiss, Rainbolt, & Pulley, 1994), this study found that women who received encouragement from family members and physicians were more likely to have had a CBE and mammogram. These findings provide strong support for the influential role of social support in motivating women to adhere to breast cancer screening. Palank (1991) proposed that the most evident theme in the interpersonal influences on health-promotion behavior is the perception of social support. Social support reinforces the importance and use of preventive healthcare services. Culturally relevant interpersonal interaction is a valuable source for disseminating cancer information that hopefully increases awareness and knowledge and influences beliefs in this population.

Limitations

Because this study was conducted with a convenience sample from two Korean churches in the Southeastern United States, generalizability is limited. Additionally, the setting was located in the highest per capita income area in

the state, and the data likely overestimated the levels of CBE and mammography use among all Korean American women. Additional studies using samples with different levels of socioeconomic status are needed. In addition, women's reported CBE and mammography use was not validated. Future research should include verifying women's self-report of breast cancer screening practices via medical record review. Although the findings of this study cannot be generalized to all Korean Americans, they illustrate a particular challenge for healthcare providers to increase breast cancer screening use behaviors among Korean American women.

Implications for Nursing Practice and Research

Breast cancer risk among Asian American women is increasing, and their disease is more likely to be diagnosed at an advanced stage. Early detection through regular breast cancer screening is the best hope for all American women. Fortunately, many American women are benefiting from the messages about screening; however, others are ignoring the message or not being reached. Korean American women living in the Southeastern United States reported a slightly higher rate of CBE and mammography use than women in other parts of the United States, yet the rate is below the national goal set by the U.S. Department of Health and Human Services (1991). This study suggests the need for culturally sensitive and linguistically appropriate health education efforts to improve knowledge of breast cancer and breast cancer screening recommendations. Other findings support efforts to decrease barriers (e.g., language, cost, discomfort) identified by Korean American women. In addition to reducing barriers to screening, nurses must solicit support from families and other healthcare professionals to encourage screening. The findings from this study emphasize the significant role of healthcare professionals in the eyes of the Korean American community. Thus, strategies must incorporate all healthcare professionals who provide health checkups to Korean American women to employ culturally appropriate breast cancer screening information. Any efforts to permanently increase breast cancer screening should target physicians as the primary gatekeepers to CBE and mammography use. Use of culturally competent techniques to enhance the adherence and acceptance of efficacious healthcare values is essential to the successful implementation of culturally congruent programs especially designed to promote health-related behavioral changes among Korean American women.

Additional studies that include Korean American women from diverse settings representing varied socioeconomic backgrounds, including new immigrants, are needed to validate this study's findings. Incorporating health-protecting information (e.g., breast cancer screening) for new immigrants could help them make the transition into the mainstream United States healthcare system. Ultimately, investigations need to test interventions designed to improve Korean American women's breast cancer screening practices.

Author Contact: hany@son.uab.edu with copy to editor at rose_mary@earthlink.net

References

American Cancer Society. (2000). *Cancer facts and figure—2000.* Atlanta: Author.

Baumann, L.C., Han, Y., & Love, R.R. (1997). Beliefs about breast cancer and care seeking in Vietnam. *Clinical Excellence for Nurse Practitioners, 1,* 301–311.

Champion, V.L. (1993). Instrument refinement for breast cancer screening behaviors. *Nursing Research, 42,* 139–143.

Champion, V.L., & Menon, U. (1997). Predicting mammography and breast self-examination in African American women. *Cancer Nursing, 20,* 315–322.

Champion, V.L., & Scott, C.R. (1997). Reliability and validity of breast cancer screening belief scales in African American women. *Nursing Research, 46,* 331–337.

Choudhry, U.K., Srivastava, R., & Fitch, M. (1998). Breast cancer detection practices of South Asian women: Knowledge, attitudes, and beliefs. *Oncology Nursing Forum, 25,* 1693–1701.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16,* 297–334.

Fowler, B.A. (1998). Testing beliefs and barriers to mammogram screening in urban African American women parishioners. *Journal of Theory Construction and Testing, 2*(2), 38–43.

Giuliano, A., Papenfuss, M., de Zapien, J.D., Tilousi, S., & Nuvayestewa, L. (1998). Breast cancer screening among Southwest American Indian women living on reservation. *Preventive Medicine, 27,* 135–143.

Han, Y., Williams, R.D., & Harrison, R.A. (1999). Breast self-examination (BSE) among Korean American women: Knowledge, attitudes, and behaviors. *Journal of Cultural Diversity, 6,* 114–123.

Harris, J.R., Lippmann, M.E., Veronesi, U., & Willett, W. (1992). Breast cancer (Part 1). *New England Journal of Medicine, 327,* 319–328.

Hatcher, L., & Stepanski, E.J. (1994). *A step-by-step approach to using the SAS system for univariate and multivariate statistics.* Cary, NC: SAS Institute Inc.

Helstrom, A.W., Coffey, C., & Jorgannathan, P. (1998). Asian-American women's health. In E.A. Blechman & K.D. Brownell (Eds.), *Behavioral medicine and women: A comprehensive handbook* (pp. 826–832). New York: Guilford Press.

Hiatt, R.A., Pasick, R.J., Perez-Stable, E.J., McPhee, S., Engelstad, L., Lee, M., Sabogal, F., D'Onofrio, C.N., & Stewart, S. (1996). Pathways to early cancer detection in the multiethnic population of the San Francisco Bay area. *Health Education Quarterly, 23*(Suppl.), S10–S27.

Hoeman, S.P., Ku, Y.L., & Ohl, D.R. (1996). Health beliefs and early detection among Chinese women. *Western Journal of Nursing Research, 18,* 518–533.

Hyman, R.B., Baker, S., Ephraim, R., Moadel, A., & Philip, J. (1994). Health Belief Model variables as predictors of screening mammography utilization. *Journal of Behavioral Medicine, 17,* 391–406.

Jenkins, C.N.H., & Kagawa-Singer, M. (1994). Cancer. In Z.W. Nolan, D.K. Takeuchi, & K.N. Young (Eds.), *Confronting critical health issues of Asian and Pacific Islander Americans.* Thousand Oaks, CA: Sage.

Kang, S.H., Chen, A.M., Lew, R., Min, K., Moskowitz, J.M., & Wismer, B.A. (1997). Behavioral risk factor survey of Korean Americans. Alameda County, CA, 1994. *Morbidity and Mortality Weekly Report, 46,* 774–777.

Lin-Fu, J.S. (1993). Asian and Pacific Islander Americans: An overview of demographic characteristics and health care issues. *Asian American and Pacific Islander Journal of Health, 1,* 20–36.

Maxwell, A.E., Bastani, R., & Warda, U.S. (1998a). Mammography utilization and related attitudes among Korean American women. *Women and Health, 27*(3), 89–107.

Maxwell, A.E., Bastani, R., & Warda, U.S. (1998b). Misconceptions and mammography use among Filipino and Korean American women. *Ethnicity and Disease, 8,* 377–384.

McCance, K.L., Mooney, K.H., Smith, K.R., & Field, R. (1990). Validity and reliability of a breast cancer knowledge test. *American Journal of Preventive Medicine, 6*(2), 93–98.

Metsch, L.R., McCoy, C.B., McCoy, H.V., Pereyra, M., Trapido, E., & Miles, C. (1998). The role of the physician as an information source on mammography. *Cancer Practice, 6,* 229–236.

Miller, A. (1993). The costs and benefits of breast cancer screening. *American Journal of Preventive Medicine, 9,* 175–180.

National Cancer Institute. (1995). *SEER cancer statistics review, 1973–1992.* (NIH Publication No. 96-2789). Bethesda, MD: Author.

Palank, C.L. (1991). Determinants of health-promotive behavior: A review of current research. *Nursing Clinics of North America, 26,* 815–832.

Parker, S.L., Davis, K.J., Wingo, P.A., Ries, L.A.G., & Heath, C.W. (1998). Cancer statistics by race and ethnicity. *CA: A Cancer Journal for Clinicians, 48,* 31–48.

Rosenstock, I.M. (1974). The Health Belief Model and preventive health behavior. *Health Education Monographs, 2,* 354–386.

Sent, L., Ballem, P., Paluck, E., Yelland, L., & Vogel, A.M. (1998). The Asian women's health clinic addressing cultural barriers to preventive health care. *Canadian Medical Association Journal, 159,* 350–354.

Stanford, J.L., Herrinton, L.J., Schwartz, S.M., & Weiss, N.S. (1995). Breast cancer incidence in Asian migrants to the United States and their descendants. *Epidemiology, 6,* 181–183.

Statistical Package for Social Sciences, Inc. (1993). *SPSS for windows: Base system user's guide, Release 6.0.* Chicago: Author.

Suarez, L., Lloyd, L., Weiss, N., Rainbolt, T., & Pulley, L. (1994). Effects of social networks on cancer-screening behavior of older Mexican-American women. *Journal of the National Cancer Institute, 86,* 775–779.

Thomas, L.R., Fox, S.A., Leake, B.G., & Roetzheim, R.G. (1996). The effects of health beliefs on screening mammography utilization among a diverse sample of older women. *Women and Health, 24*(3), 77–94.

U.S. Department of Commerce, Bureau of the Census. (1996). *Current population reports: Population projections of the U.S. by age, sex, race and Hispanic origin: 1995 to 2050* (Publication No. 25-1130). Washington, DC: U.S. Government Printing Office.

U.S. Department of Commerce, Bureau of the Census. (1998). *Current population reports: Asian and Pacific Islander population in the United States* (Publication No. 20-512). Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services. (1991). *Healthy people 2000: National health promotion and disease prevention objectives* (DHHS Publication No. 91-50213). Washington, DC: U.S. Government Printing Office.

White, E., Urban, N., & Taylor, V. (1993). Mammography utilization, public health impact, and cost-effectiveness in the United States. *Annual Review of Public Health, 14,* 605–633.

Wismer, B.A., Moskowitz, J.M., Chen, A.M., Kang, S.H., Novotny, T.E., Min, K., Lew, R., & Tager, I.B. (1998). Mammography and clinical breast examination among Korean American women in two California counties. *Preventive Medicine, 27,* 144–151.

Woods, N.F., & Catanzaro, M. (1988). *Nursing research: Theory and practice.* St. Louis: Mosby.

Yi, J.K., & Prows, S.L. (1996). Breast cancer screening practices among Cambodian women in Houston, Texas. *Journal of Cancer Education, 11,* 221–225.

Yu, M., Seetoo, A.D., Tsai, C.K., & Sun, C. (1998). Sociodemographic predictors of Papanicolaou smear test and mammography use among women of Chinese descent in Southeastern Michigan. *Women's Health Issues, 8,* 372–381.

Ziegler, R.G., Hoover, R.N., Pike, M.C., Hildesheim, A., Nomura, A.M.Y., West, D.W., Wu-Williams, A.H., Kolonel, L.N., Horn-Ross, P.L., Rosenthal, J.F., & Hyer, M.B. (1993). Migration patterns and breast cancer risk in Asian-American women. *Journal of the National Cancer Institute, 85,* 1819–1827. ONS

For more information . . .

- National Library of Medicine: Asian/Pacific Islander American Health
  http://www.nlm.nih.gov/pubs/cbm/asianam.html
- Culturally Competent Care for Southeast Asians/Asian Groups
  http://www.sunyit.edu/library/html/culturedmed/bib/asian/index.html

These Web sites are provided for information only. The hosts are responsible for their own content and availability. Links can be found using ONS Online at www.ons.org.