Journal of Korean Academy of Nursing (2005) Vol. 35, No. 8, 1443-1450

Predictors of Mammography Participation Among Rural Korean Women Age 40 and Over

Hea Kung Hur, RN, PhD[1], Gi Yon Kim, RN, PhD[2], So Mi Park, RN, PhD[2]

Purpose. The study was conducted to identify predictors of mammography screening for rural Korean women according to 'Stage of Change' from the Transtheoretical Model which, along with the Health Belief Model, formed the theoretical basis for this study.

Methods. A cross-sectional descriptive design was utilized. Through convenience sampling 432 women were selected from 2 rural areas. Data were collected by survey. Health beliefs constructs were measured with Champion's HBM Scale-Korea version. Mammography participation was measured using the Stage of Mammography Adoption Scale developed by Rakowski, et al. (1992).

Results. The most frequent stage of mammography adoption was 'contemplation' (40.5%). Predictors of stage of mammography adoption included 'mammogram recommended by health professional' (beta=0.59, t=16.12, p=.000), 'perceived benefits' (beta=0.09, t=2.21, p=.050), 'perceived susceptibility' (beta=0.09, t=1.98, p=.050), and 'perceived barriers' (beta=-0.07, t=-2.05, p=.041). 'Mammogram recommended by health professional' demonstrated the greatest association with having a mammogram.

Conclusion. Health professionals play key roles in improving mammography participation and should recognize the importance of their role in cancer prevention and be more actively involved in education and counseling on prevention of breast cancer.

Key Words : Mammography, Health behavior, Participation

INTRODUCTION

The incidence of breast cancer in Korean women across all age groups has increased from 10.0% in 1991 to 16.8% in 2002; with the highest rate being the 2002 rate of 23.2% for cancers of the reproductive organs in women aged 35 to 64. Breast cancer mortality in women increased from 3.5 persons per hundred thousand in 1990 to 5.0 in 2000 (National Cancer Center, 2002). In order to achieve the greatest reduction in breast cancer mortality, mammography screening programs need to achieve maximum participation within the target population. Compared to 80% of American women (Han, William & Harrison, 2000; Wismer et al., 1998), only 10-38% of Korean women reported having a mammogram (Choi, Park, & Han, 2001; Ham, 2004; Shin et al., 2001). Screening proportions may vary within a country and lower mammography screening rates have been found for women living in rural areas in USA and Korea (Korea Ministry of Health & Welfare, 2002; Ruchlin, 1997). In studies with urban Korean women, the screening rates were 38% (Ham, 2004) and 27.3% (Park, Chang, & Kang, 2001), compared to only 10% for rural Korean women (Shin et al., 2001). Periodic mammography screening has been shown to reduce breast cancer

1. Associate professor, Department of Nursing, Wonju College of Medicine, Yonsei University
2. Assistant professor, Department of Nursing, Wonju College of Medicine, Yonsei University
This work was supported by Korea Research Foundation Grant.(KRF-2003-002-E00149)
Corresponding author: So Mi Park, PhD, RN, Department of Nursing, Wonju College of Medicine, Yonsei University
162 Ilsan-dong, Wonju, Kangwon-do 220-701, Korea
Tel: 82-33-741-0388 Fax: 82-33-743-9490 E-mail: somi@wonju.yonsei.ac.kr
Received May 6, 2005 ; Accepted November 18, 2005

mortality by 25-35% in USA (Anderson & Janzon, 1997), 27-44% in Sweden (Bjurstam et al., 1997), and 10-30% in Japan (Marimoto & Sasa, 1998). Despite its known value, many women in Korea have never had a mammogram or do not have them regularly, especially women living in rural areas.

Significant predictors of under-use that are consistent with previous observations from USA and Canada include age, low level of education and income, weak social support, poor health behavior, ethnic background and rural residence (Anderson & May, 1995; Bryant, & Mah, 1992). Variables in the Health Belief Model(HBM) such as perceived susceptibility, benefits, and barriers have also been found to be significant predictors of mammography behavior (Champion & Skinner, 2003). In one study among African American women in the rural American, women reported that the reasons for not having a mammogram regularly were 'I cannot afford it', 'I am afraid', and 'I have never been told to get a mammogram' (Grindel, Brown, Caplan, & Blumenthal, 2004).

In previous studies in Korea, constructs from the (HBM) were found to be useful in predicting use of mammography (Choi et al, 2001; Park et al, 2001). Age, family cancer history, knowledge and having done breast self examination at least once were found to be predictive of having a mammogram (Ham, 2004). However, most previous studies were done in urban areas, did not provide adequate empirical support for the ability of the HBM to explain and predict the use of mammography, defined mammography participation as a dichotomous event and reported controversial results (Allen, Bastani, Bazargan, & Leonard, 2002; Choi et al., 2001; Ham, 2004). In rural areas in Korea the houses are scattered geographically, and people generally have lower income and education levels than people in urban areas. Most large hospitals and breast clinics are located in metropolitan areas and accessibility to health services is more limited for rural women which may reflect a reduced use of services, and differences in women's attitudes and beliefs toward cancer prevention behavior.

Appropriate cancer prevention strategies should be designed to enable a change in behavior by meeting the participant's beliefs rather than by attempting to change their existing beliefs (Erwin, Spatz, Stotts, Hollenberg, & Deloney, 1996). To facilitate continued periodic screening, cancer prevention behavior such as mammography needs to be understood as a process rather than as a dichotomous event and health care professionals should formulate strategies to accompany the process of change. Thus, prior to developing interventions, it is important to identify the predictors of the process towards mammography by rural women in Korea.

Research objectives

The objective of this study was to identify the predictors of rural Korea women undergoing mammography screening participation based on health belief variables. The specific research questions were the following:

1) What is distribution of 'Stages of Change' in mammography participation (precontemplation stage, contemplation stage, action stage, and maintenance stage)?

2) Does the stage of mammography participation differ according to demographic or health belief (perceived seriousness, perceived susceptibility, perceived benefits, and perceived barriers) variables?

3) What variables are predictors of mammography participation?

Conceptual Framework

A variety of theories have been employed to increase understanding of the factors that influence health behavior change. HBM was one of the first theories to gain widespread use in developing interventions to increase cancer screening (Haire-Joshue & Nanney, 2003). HBM postulates that people will take action to prevent or control an illness, (1) if they perceive the illness to be serious (perceived seriousness), (2) if they believe that they have a chance of developing the illness (perceived susceptibility), (3) if they believe in the efficacy of action taken to control the illness (perceived benefits), and (4) if the impediments or barriers (perceived barriers) they see are outweighed by the perceived benefits. Several studies have used the HBM to describe breast cancer screening behaviors (Choudhry, Srivastava, & Fitch, 1998; Ham, 2004; Han et al, 2000). However, HBM is limited in that it does not explain the process of behavior change. According to the Transtheoretical Model (TTM) (Prochaska & DiClimente, 1983), health behavior change is not a dichotomous event but rather a continuum of stages with an accompanying process of change. The construct, 'Stages of Change' is the key-organizing construct of this model. In the TTM change is described as a process involving progress through a series of five stages: precontemplation, contemplation, preparation, action and maintenance. The integration of HBM concepts and the TTM 'Stages of Change' is useful

in developing interventions for an individual's specific stage for any health behavior.

METHODS

Design

A cross-sectional descriptive design to identify predictors of mammography participation by rural Korea women based on the HBM and TTM.

Sample

W City is made of a distinct urban area and several rural areas. For this study convenience sampling was used to select 432 women from 2 rural areas in W city. The inclusion criteria were over 40 years of age and not having had breast cancer. Only women over 40 were included because the recommend age to beginning regular mammography is 40 in Korea (National Cancer Center, 2002). The minimum sample size needed was estimated to be 232 cases based on Cohen equation, with power set at .90, significance at .05, and effect size at moderate (Cohen, 1988).

The mean age of the women was 57.21 years (SD=8.62) and ranged from 40 to 70 years. For marital status, 97.3% were married, 2.1%, widowed, and 0.6%, divorced. For 372 (86.3%) women, their education level was middle school graduation or less, and for 60 (13.7%) woman high school or above. The mean BMI was 25.22 (SD= 3.63) and ranged from 16.2 to 38.9. The mean chest circumference was 37.38 inches (SD= 3.54) and ranged from 27.0 to 49.0 inches. Of the women, 92.4% answered 'Yes' to having breastfed their children. To the question about whether they had ever had a health care professional recommended a mammogram, about half of the women (50.9%) answered 'Yes'

Measures

The instrument for this study was a 37-item questionnaire designed to assess demographics, perceived susceptibility and seriousness, perceived benefits and barriers, and stage of mammography participation.

Perceived susceptibility and seriousness were measured using Champion's HBM Scale-Korea version (CHBMS-K; Lee, Kim, & Song, 2002), with five items for perceived susceptibility and seven for seriousness, The instrument was previously tested for validity and reliability (Lee et al., 2002). High scores in perceived susceptibility indicate that women feel a greater risk of contracting breast cancer. Perceived seriousness of breast cancer indicates that a woman believes she is vulnerable to the sequelae of breast cancer. A 5-point Likert scale of anchored items was used with responses ranging from 'strongly agree' to 'strongly disagree'. The scales had a reliability of 0.89 (range= 5 to 20, mean = 10.97) for susceptibility and 0.89 (range= 7 to 28, mean =18.07), for seriousness.

Perceived benefits and barriers were measured with the instrument developed by Rakowski et al. (1992) based on the constructs of pros and cons regarding the adoption of mammography screening. This instrument was validated in Korea by Park et al. (2001). Seven benefit items were used to assess perceived positive aspects of obtaining a mammography and eleven barrier items to assess perceived negative aspects of mammography. Both scales used a 5-point Likert format from 'strongly agree' to 'strongly disagree'. Reliabilities for the scale were 0. 93 (range= 7 to 28, mean = 23.70) and 0.76 (range= 11 to 44, mean= 24.48), respectively.

Mammography participation was measured on the Stage of Mammography Adoption Scale developed by Rakowski et al. (1992) to assess current stages of adoption for mammography. Mammography adoption consists of four stages: maintenance, action, contemplation and precontemplation. The definition of each stage of mammography adoption is presented in Table 1.

Procedure

For this study, the research team explained the research purposes and procedures to the two division heads in the health center of W city, from whom permission to collect data was obtained. Computer analysis identified 4,470 eligible women from the W city health center, of whom 1,250 were contacted by telephone and gave permission to send a letter explaining the purpose and detailed procedures for the research. Five hundred and twenty women who were willing to participate met on the appointed day at the local community centers. Eighty-eight women who did not understand, did not completely filled out the questionnaires or quit during the data collection period were excluded, leaving 432 women as the study sample. Data were collected through interviews using a structured questionnaire. Weight (kg), height (cm) and the chest circumference (cm) were measured with an automated obesity measuring machine (Jenix Com) and measuring tape. Written informed consent was obtained from all of the women after the study purpose had been fully described. They

were told that they could withdraw from the study at anytime if they felt uncomfortable or wanted to quit. Information was provided about breast self examination, clinical breast examination, and mammography screening after the data had been collected.

Statistical analysis

Using SPSS Win 11.0, susceptibility, seriousness, benefits, and barriers according to the stage of mammography adoption were tested by one-way ANOVA. Summated scales were tested using one-way ANOVA with post hoc (LSD) tests (alpha = 0.05) for assessing group differences. Multiple regression analysis was done using the enter method with the stage of mammography adoption as the dependent variable. Health belief variables and demographic variables were entered simultaneously as predictors.

RESULTS

Distribution for stages of mammography participation

The most frequent stage was 'contemplation', at 40.5% (n=175), followed by 'precontemplation' at 27.8% (n=120), 'action' at 17.8% (n=77), and 'maintenance' at 13.9% (n=60) (Table 1).

Differences in mammography participation according to demographic variables

The demographic variables, age, education, BMI, chest circumference, experience of breastfeeding and at least one recommendation by a health professional for a mammogram were assessed for significant relationships to stage of mammography participation. There were significant differences in stage according to age, education, BMI, and recommendation by a health professional (Table 2).

There was a significantly difference in stage of mammography adoption according to age (F=21.21, p=.000). Women in precontemplation stage were older than those in other stages. There was also a significantly difference according to BMI (F=3.05, p=.001). Women in the action stage had a higher BMI score than those in the contemplation stages. There were also a significant difference among the four groups according to level of education (x^2=19.22, p=.000) and having had a recommenda-

Table 1. Definition and Distribution of Stages in Mammography Participation (N= 432)

Stage	Definition	N	%
Precontemplation	Never had a mammogram and have no plan for one in the coming year	120	27.8
Contemplation	Never had a mammogram but planning for one in the coming year, or had a mammogram but have no plan for one in the coming year	175	40.5
Action	Had a mammogram and planning for one in the coming year	77	17.8
Maintenance	Had more than one mammogram and planning for one in the coming year	60	13.9

Table 2. Differences Stage of Mammography Participation According to Demographic Variables Unit: mean(SD) or frequency(%)

	Precontemplation[1] (n=120)	Contemplation[2] (n=175)	Action[3] (n=75)	Maintenance[4] (n=60)	F/x^2
Age	61.90 (7.21)	56.91 (8.73)	54.92 (7.83)	53.53 (8.23)	21.21**
	1 different from 2, 3 and 4				
Education					19.22**
Middle school or below	114 (30.6)	148 (39.8)	67 (18.0)	43 (11.6)	
High school or above	6 (10.2)	27 (45.8)	9 (15.3)	17 (28.8)	
BMI (kg/m^2)	25.11 (3.83)	24.82 (3.62)	26.30 (3.50)	25.34 (3.13)	3.05*
	2 different from 3				
Chest circumference	37.62 (3.91)	36.73 (3.30)	38.02 (3.54)	37.42 (3.20)	1.56
Breast feeding					5.11
Yes	114 (28.5)	156 (39.0)	73 (18.3)	57 (14.3)	
No	6 (18.8)	19 (59.4)	4 (12.5)	3 (9.4)	
Ever had a health care professional recommend a mammogram?					290.20**
Yes	8 (3.6)	75 (35.4)	77 (35.0)	60 (27.3)	
No	112 (52.8)	100 (47.2)	0 (0.0)	0 (0.0)	

* p <.001, ** p <.000 post LSD

tion to get a mammogram (x^2=290.20, p=.000). The majority of women with middle school education or less were in the pre- contemplation (30.6 %) and contemplation stage (39.8%). Women in action (35.0%) and maintenance stages (27.3%) were those for whom mammography had been recommended at least once.

Differences in stage of mammography participation according to health beliefs

As shown in Table 3, there were significant differences in stage according to perceived seriousness, perceived susceptibility, perceived benefits and perceived barriers.

More women in action and maintenance stages had higher susceptibility scores than women in precontemplation and contemplation stages. In addition, contemplators were significantly different from precontemplators (F=20.81, p=.000). Women in the action stage were not significantly different from those in maintenance. For both seriousness (F=11.92, p=.000) and benefits (F=27.30, p=.000), precontemplators had lower scores than all other groups. Contemplators, and women in the action and maintenance stage were not significantly different from one another. For barriers score, women in maintenance had lower means than all other groups (F=5.92, p=.001). Women in precontemplation, contemplation, and action stages were not significantly different from one another.

Predictors of stage of mammography participation

We constructed a regression equation with the stage of mammography adoption as the dependent variable (maintenance stage=4, action stage=3, contemplation stage=2, precontemplation stage=1). As shown in Table 4, this model explained 54% of the variance (R^2=0.54). Four of the 10 independent variables on stage of adoption demonstrated significant association: 'the experience of having a health professional recommend a mammogram' demonstrated the greatest association (beta=0.59, t=16.12, p=.000), followed by benefits (beta=0.09, t=2.21, p=.050), susceptibility (beta=0.09, t=1.98, p=.050), and barriers (beta=-0.07, t=-2.05, p=.041). Women who had a recommendation for a mammogram from a health care professionals, who had higher scores for susceptibility and benefits, and lower scores for barriers to mammography, were more likely than others to proceed further through the stages of

Table 3. Differences in Stage of Mammography Participation According to Health Beliefs Unit: mean (SD)

	Precontemplation[1] (n=120)	Contemplation[2] (n=175)	Action[3] (n=75)	Maintenance[4] (n=60)	F
Susceptibility	8.92 (3.31)	11.20 (3.70)	12.42 (3.41)	12.41 (3.80)	20.81***
	1 different from 2, 3 and 4 / 2 different from 3 and 4				
Seriousness	15.80 (5.41)	18.72 (5.03)	19.42 (4.82)	19.23 (4.91)	11.92***
	1 different from 2, 3 and 4				
Benefit	20.81 (5.32)	24.40 (3.82)	25.32 (3.01)	25.34 (4.12)	27.30***
	1 different from 2, 3 and 4				
Barrier	25.30 (5.31)	24.91 (4.82)	24.13 (5.22)	22.14 (5.32)	5.92**
	1, 2 and 3 different from 4				

** p <.001, *** p <.000 by One way ANOVA post LSD

Table 4. Predictors of Stage of Mammography Participation (N= 432)

Factors in set	β	t	Model R^2	F for set
Age	-.08	-1.77		
Education[¶]	.05	1.12		
BMI	.05	1.13		
Chest Circumference	-.04	-.98		
Breast feeding[¶]	-.06	-1.67	.54	49.01***
Had a recommendation[¶]	.59	16.12***		
Susceptibility	.09	1.98*		
Seriousness	.06	1.31		
Benefits	.09	2.21*		
Barriers	-.07	-2.05*		

* p <.05, *** p <.000

[¶] Dummy coded: 1= high school or above, breastfeeding, recommendation by health professional

mammography adoption. Age, education, BMI, chest circumference, breastfeeding experience, and seriousness were not related to the stage of mammography adoption.

DISCUSSION

With an increasing incidence of breast cancer in Korea, we decided in this study to focus on identifying the distribution and impact factors for rural women on mammography participation according to stage of change.

The distribution in mammography participation showed that 68.3% of the women had never had a mammogram or had no intention of having a mammogram. Moreover, 27.8% of these women did not intend to have a mammogram in the future. This rate of compliance is considerably lower than that shown in several western studies (Allen et al., 2002; Champion & Skinner, 2003). The reasons for this lower rate of compliance seem to be that rural Korean women are less concerned with preventive health behavior such as early detection of breast cancer than with other problems in everyday life. These concerns support the results of other studies that Korean rural women have a tendency to be more oriented to the health care of their families and take less care of their own health.(Yang, 2002) Despite this sample being only a small sample of rural women, an interesting result, was that 31.7% of the women had had at least one mammography, a threefold increase over the 10% previously reported for rural Korean women (Shin et al., 2001). Possible explanations for this finding may be the success of various campaigns propagated by Korean government agencies for the prevention of breast cancer. The national cancer management campaigns include the provision for free, portable mammography screening for low income women including rural women (Korea Ministry of Health and Welfare, 2002).

Differences in health belief variables as predictors of mammography participation showed that precontemplators perceived much lower susceptibility and seriousness of breast cancer than women in other stages, which may explain why women in the precontemplation stage were more likely to believe that they would be safe from breast cancer and that breast cancer is less severe than other health problems, results reported in other studies (Champion & Skinner, 2003; Chang, Park, Park, & Lim, 2000). Precontemplators in the current study perceived the lowest benefits of mammography, and the greatest barrier of all the groups. These findings suggest that in order to initiate mammography screening behavior by women in the precomtemplation stage, educational interventions directed at women in this stage should stress more benefits and fewer barriers for mammography, with an emphasis on severity and risk perception of breast cancer. Also contemplators perceived a lower susceptibility to, and less seriousness for breast cancer. While they perceived benefits in having a mammogram, they also perceived more barriers to mammography than women in the action or maintenance stages, a result similar to previous studies (Champion & Skinner, 2003; Chang et al., 2000; Park et al., 2001). In particular, significant differences were found with regard to perceived susceptibility between women in contemplation and action/maintenance stage. This result suggests that interventions that increase the perception of getting sick from breast cancer should be emphasized for women in the contemplation stage in order for them to move to action or maintenance stages. As showed from results of other studies (Champion & Skinner, 2003; Park et al., 2001), women in action stage in the current study perceived a much higher susceptibility to, and seriousness of breast cancer, and more benefits and fewer barriers to having a mammogram than precontemplators or contemplators. However, women in the action stage perceived more barriers than women in maintenance stage, which may suggest that barriers are one of the important factors influencing continuous health behavior as presented by Janz and Becker (1984). This result suggests that perceived barriers are likely to limit women's ability to practice mammography screening continuously. To promote change towards regular compliance with mammography, interventions focused on decreasing perceived barriers should be provided according to the characteristics of each stage.

As predictors of mammography participation, the experience of having a health care professional recommend a mammogram was a major predictor, which is consistent with findings from a study investigating breast cancer screening of Korean-American women (Han et al., 2000). The findings in this study showed that health care professionals play a key role in informing women of the importance and benefits of screening. In rural areas of Korea, community health care centers have taken charge of managing the residents' health and public health physicians and community nurses have provided information and education for general health behavior. To improve the compliance rate of preventive behavior

for breast cancer, public health physicians and community nurses should recognize the importance of preventive education on breast cancer and their role as major facilitators in women's adherence to breast cancer screening. Although age, educational level, BMI, chest circumference and breastfeeding were not significant as predictors in this study, previous studies among urban Korean women did in fact find these factors to be significant (Choi et al., 2001; Kim, Jeong, & Kim, 2004). Our result may be related to recent breast cancer prevention campaigns conducted by the Korean government and the provision since 2002 of free mammography screening for rural women over 40 without differentiating the women according to risk factors for breast cancer. In this environment, we could not identify the influences of these factors on mammography screening. For more effective prevention of breast cancer, the risk factors in rural women need to be identified prior to mammography screening and appropriate educational programs or campaigns need to be conducted through grouping according to the degree of risk and stage of mammography adoption

Although care must be taken in generalizing the study results due to the limitation of using a convenience sample from one Korean city, the findings could provide meaningful data to help identify predictors of mammography participation that reflect characteristics of rural Korean women.

CONCLUSION

The role of health beliefs as predictors in mammography participation for rural Korean women were identified in this study, and it was found that the experience of a recommendation for mammography screening from a health care professional was a significant factor.

The findings in this study have implications in nursing practice including education, and nursing research. Nurses caring for women in this age group in various health care settings should be more actively involved in preventive education for breast cancer. Health care professionals including nurses must appreciate that women rely on the advice of health care professionals regarding mammography screening. Continuing education with up-to-date information, which addresses the unique characteristics according to the stage of mammography participation should be provided to health care professionals. Since women's health beliefs influence their changing stages of mammography adoption, tailored interventions based on the core health beliefs at each stage should be provided to induce compliance with mammography. Given that the target population for interventions is women living in rural areas, interventions should be directed at increasing accessibility through mobile clinics to increase accessibility to health services.

TTM is strong in explaining health behaviors through linkage of stages of change with cognitive aspects in the process of changing health behavior (Chang et al., 2000). Integration of TTM and HBM will allow extensive, rather than fragmented, understanding of the process of changing health behavior. Such an integrated approach will present concrete guidelines for the provision of tailored interventions according to the stage of mammography.

Considering the continuum of stages of mammography participation, we suggest further study to investigate longitudinally the stages of change in mammography participation. The effects of interventions based on the integration of TTM and HBM models need to be evaluated to provide direction for increasing compliance with mammography screening. From the perspective of women's life cycle, the risk factors for breast cancer should be identified according to developmental stage. Given that breast cancer is a dominant cancers in women, education on preventive behavior for breast cancer is needed at various developmental stage.

References

Allen, B., Bastani, R., Bazargan, S., & Leonard, E. (2002). Assessing screening mammography utilization in an urban area. J *Natl Med Assoc*, 94(1), 5-14.

Anderson, L. M., & May, D. S. (1995). Has the use of cervical, *breast*, and colorectal cancer screening increased in the United States?. *Am J Public Health*, 85, 840- 842.

Anderson, I., & Janzon, L. (1997). Reduced breast cancer mortality in women under age 50: Updated results from the mammographic screening program. *J Natl Cancer Inst Monogr*, 22, 63-67.

Bjurstam, N., Bjorneld, L., Duffy S. W., Smith, T. C., Cahlin, E., & Sawe-Soderberg J. (1997). The Gothenburg breast cancer screening trail: Preliminary results on breast cancer mortality for women aged 39-49. *J Natl Cancer Inst Monogr*, 22, 53-55.

Bryant, H., & Mah, Z. (1992). Breast cancer screening attitude and behaviors of rural and urban women. *Prev Med*, 21, 405-418.

Champion, V. L., & Skinner, C. S. (2003). Differences in perceptions of risk, benefits, and barriers by stage of mammography adoption. *J Women's Health*, 12(3), 277-286.

Chang, S. O., Park, Y. J., Park, C, S., & Lim, Y. J. (2000). A study of the stage of change and decisional balance: Exercise acquisition, smoking cessation, mammography screenings and kegel's

exercise acquisition in Korea. *J Korean Acad Nurs*, 30(5), 1265-1278.

Choi, J. S., Park, J. Y., & Han, C. H. (2001). The related factors of breast self examination and mammography screening in women at health centers. *J of Kor Soc for Health Education and Promotion*, 18(1), 61-76.

Choudhry, U. K., Srivastava, R., & Fitch, M. I. (1998). Breast cancer detection practices of South Asian women: Knowledge, attitudes, and beliefs. *Oncol Nurs Forum*, 25(10), 1693-1701.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. New York: Lawrence Erlbaum Associates.

Erwin, D., Spatz, T. S., Stotts, C. R. C., Hollenberg, J. A., & Deloney, L. A. (1996). Increasing mammography and breast self-examination in African American women using the witness project TTM model. *J Cancer Educ*, 11, 211-215.

Grindel, C. G., Brown, L., Caplan, L., & Blumenthal, D. (2004). The effect of breast cancer screening messages on knowledge, attitude, perceived risk, and mammography screening of African American women in the rural south. *Oncol Nurs Forum*, 31(4), 801-808.

Haire-Joshue, D., & Nanney, M. S. (2003). Behavioral interventions for cancer prevention: Dietary intake and physical activity. In C. W. Given, B. Given, V. L. Champion, S. Kozachik, & D. N. DeVoss (Eds.), *Evidence Based Cancer Care and Prevention: Behavioral Intervention*(pp17-62). NY: Springer Publishing Company.

Han, Y., Williams, R. D., & Harrison, R. A. (2000). Breast cancer screening knowledge, attitudes, and practices among Korean American Women. *Oncol Nurs Forum*, 27(10), 1585-1591.

Ham, O. K. (2004). Analysis of factors related to mammography screening behavior women: Use of health belief model. *J Korean Comm Nurs*, 18(1), 187-194.

Janz, N. K., & Becker, M. H. (1984). The health belief model: A decade later. *Health Educ Q*, 11(1), 1-47.

Kim, S. H., Jeong, I. S., & Kim, J. S. (2004). Breast cancer screening and repeat screening. *J Korean Acad Nurs*, 34(5), 791-800.

Korea Ministry of Health & Welfare. (2002). Cancer Information in Korea. Retrieved September 2, 2004 from http://www.mohw.go.kr/

Lee, E. H., Kim, J. S., & Song, M. S.(2002). Translation and validation of Champion's health belief model scale with Korean women. *Cancer Nurs*, 25(5), 391-395.

Marimoto, T., & Sasa, M.(1998). Current status of screening for breast cancer and tasks for introduction of mammographic screening in Japan. *Breast Cancer*, 5, 227-234.

National Cancer Center. (2002). Cancer Statistics in Korea. Retrieved November 1, 2003 from http://www.ncc.re.kr/cancerboard/active.jsp/

Park, Y, J., Chang, S. O., & Kang, H. C. (2001). Assessing decisional balance toward mammography screening in Korean women. *J Korean Acad Nurs*, 31(7), 1174- 1180.

Prochaska, J. O., & DiClimente, C. C. (1983). Stage and processes of self change of smoking: Toward an integrative model of change. *Journal of Consult Clinical Psychology*, 51,390-395.

Rakowski, W., Dube, C., Marcus, B. H., Prochaska, J. O., Velicer, W. F., & Abrams, D. B. (1992). Assessing elements of women's decisions about mammography. *Health Psychol*, 11, 111-118.

Ruchlin, H. S. (1997). Prevalence and correlates of breast and cervical cancer screening among older women. *Obstet Gynecol*, 90, 16-21.

Shin, A., Yoon, H. C., Park, S. K., Shin, H. R., Chang, S. H., Lee, K. S., Lee, D. H., Kang, D. H., & Yoo, K. Y. (2001). *Breast and uterine cervical screening rate in KMCC*. The preliminary report of 2000 Korean Ministry of Health and Welfare Project II-D-3.

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. *Prev Med*, 27, 144-151.

Yang, J. H. (2002). A study on health behavior experience of middle-aged women in rural area. *J Korean Acad Nurs*, 32(5), 694-705.