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Evaluation of a Community-Based Program for Breast Self-Examination Offered by the Community Health Nurse Practitioners in Korea

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Background. Breast cancer is the most common form of cancer among Korean women. Only 14% of urban women and 10% of rural women in Korea, however, participated in breast cancer screening behavior in 1998 (Korean Ministry of Health & Welfare, 1999).

Purpose. The aim of this study was to evaluate the effect of community-based breast self-examination (BSE) education programs in Korea.

Methods. First, breast cancer risk appraisals were done with 1,977 rural women. Of the 1,977 women, nearly 30% (n= 494) had a higher or equal to borderline risk of developing breast cancer. This quasi-experimental study was conducted to target these women with a high or equal to borderline risk of breast cancer. The risk appraisal feedback and breast self-examination education were used as an intervention for breast cancer prevention and early detection.

Results. After a 3-month follow-up, 30.5% of the women in the intervention group performed regular BSE compared to 10.2% of women in the control group. The mean knowledge score related to breast cancer and BSE was significantly higher for the women in the intervention group than that in the control group.

Key Words: Breast self-examination, Rural women, Risk appraisal

INTRODUCTION

Cancer is the leading cause of death among Koreans, constituting 25.6% of all deaths in the country (Korean National Statistical Office, 2003). Breast cancer is the most common form of cancer among Korean women (The Korean Ministry of Health & Welfare, 2002). The mortality rate among breast cancer has increased 280% since 1983. According to the Korean Ministry of Health and Welfare (2002), 7.1% of all types of cancer were breast cancer and 16.1% of women who had cancer were afflicted with breast cancer and the proportion is continually increasing.

The death rate from breast cancer could be reduced if more women were engaged in breast cancer early detection activities such as a breast self-examination (BSE), clinical breast examination (CBE), and/or mammography. Among these, the BSE is a client-centered, inexpensive, and noninvasive method of screening for breast cancer (Nekhlyudov & Fletcher, 2001). Researchers in China and Russia, however, found that regular BSEs can be detrimental to women's health, in that as a result of regular BSEs, more women sought medical attention and had evaluations with false-positive results. Moreover, they found that the mortality benefits were

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not clear (Nekhlyudov et al., 2001). Although questions were raised about the benefits of regular BSEs, most new breast lumps, whether cancerous or not, were discovered by women themselves who then brought them to medical attention (Nekhlyudov et al., 2001). Aspinall (1991) found that more than 90% of breast cancer was found by patients themselves. Thus, monthly BSEs are still recommended by the American Cancer Society for women 20 and older (The American Cancer Society, 2002).

Most women in Korea, however, are unaware of the BSE and its methods and underutilize it. Study results revealed that among Korean rural women aged 35 and over, only 25.9% indicated that they were aware of BSE methods and only 25.3% performed a BSE regularly (Lee, Kim, & Ham, 2000). Studies have shown that regular and irregular BSE practice rates among women in the United States were 77% to 90.6% (Glenn & Moore, 1990; Lierman, Young, Kasprzyk, & Benoliel, 1990), whereas, the BSE practice rates among Korean women were 23.4% to 37.8% (Choi, Park, & Han, 2001; Choi & Suh, 1998). Compared to American women, Korean women practice BSEs less frequently. These facts indicate that education programs are needed to promote breast cancer early detection activities for Korean women.

Many studies have identified that teaching and education sessions for increasing the knowledge of breast cancer and early detection methods, and for the promotion of positive attitudes toward BSE and mammography were effective in increasing participation in such early detection activities (Ludwick & Gaczkowski, 2001; Nettles-Carlson, Field, Friedman, & Smith, 1988; Vietri, Poskitt, & Slaninka, 1997). Likewise, cancer risk appraisal has been proven to increase participation rates in the early detection activities of breast cancer (Lee, 1991; Salazar, Wilkinson, DeRoos, & Lee, 1994).

The purpose of this study was to evaluate the effects of an outreach education program offered by the Community Health Nurse Practitioners (CHNPs) and a cancer risk appraisal program to increase the knowledge and competency of BSE as well as to increase regular BSEs among rural women in Korea.

LITERATURE REVIEW

Efforts have been made to increase women's participation in recommended breast cancer screening behavior. To attract more people to cancer detection and prevention procedures, the American Cancer Society developed cancer risk appraisal instruments for various types of cancer, using the instruments they began to categorize high-risk groups for each cancer. Salazar et al. (1994) conducted a quasi-experimental study using breast cancer risk appraisal instruments to evaluate the effect of risk appraisals on breast cancer screening behavior. Study results indicated that participation rates in breast cancer screening behavior including mammography, BSE, and CBE were increased significantly as a result of risk appraisal.

Using the Health Belief Model, Ludwick et al. (2001) developed intervention programs in promoting the BSE, which targeted high school adolescents. The purpose of the education intervention was to evoke susceptibility, increase recognition of the seriousness of the disease, increase perceived benefits of BSE, and decrease perceived barriers in performing BSE. As a result, the researchers found that knowledge scores increased significantly after the intervention. Moreover, after the intervention, 68% of the students performed a BSE and 23% performed monthly BSEs compared with 34% and 3%, respectively, before the intervention. They found that increased knowledge, however, did not proportionally increase the performance of the BSE. All students increased their knowledge of BSE, but only 23% practiced regular monthly BSEs.

Mishra, Chavez, Magana, Nava, Valdez, & Hubbell (1998) developed a breast cancer control program based on the empowerment model and Bandura's self-efficacy theory (1977). By posing questions to the participants, they encouraged thought and discussion about the potential impact of breast cancer as well as solutions to the problem of breast cancer control. This program was effective in changing breast cancer-related knowledge, attitudes and practices. Nettles-Carlson et al. (1988) recognized that after education sessions on BSE, the number of women performing BSE increased more than 200%. Heyman, Tyner, Phipps, Cave, and Owen (1991) pointed out that groups of women who had obtained instruction on BSE methods from health professionals (e.g., nurses and/or physicians) performed BSE better than those who had obtained information from other sources.

Vietri et al. (1997) conducted a quasi-experimental study targeting women working in universities. The experimental group was offered education sessions on BSE and supportive care, whereas the control group was not

provided any interventions. More women in the experimental group performed regular BSEs. Mammography participation and CBE rates, however, did not differ significantly between the two groups after the interventions.

Kim (1994) compared the knowledge and attitudes toward the BSE before and after the education sessions, which used videotapes as teaching media. Both the knowledge and attitudes increased as a consequence of the education, while, Kang (1996) tested for knowledge and attitudes relating to breast cancer after providing three different techniques of education to three different groups. Each group was provided one of the following: Pamphlets, videotapes, or silicone breast models. After the intervention, the silicone breast model group achieved the highest score on knowledge among three groups, and attitudes relating to health concerns increased significantly in this group compared to the other two groups.

Various interventions have been offered to different groups of women to encourage participation in breast cancer screening behavior. Most studies were successful in increasing knowledge, attitudes, and practices. However increased knowledge and attitudes do not automatically promote BSE practices (Ham, 2002).

METHODS

Sample

Women with a high risk of developing breast cancer, including borderline risk and moderate risk cases were included in the study. Women with a high risk of breast cancer were selected through the risk appraisal process. Participants for the baseline data collection were recruited among women who visited 55 Community Health Care Posts (CHPs) the during data collection period to obtain services and who agreed to participate in the baseline data collection. A total of 1,977 women aged 35 to 65 living in the rural area of Chung-cheong and Kyong-gi provinces participated in the breast cancer risk appraisal and baseline data collection. Among them, 25% (n=494) had a higher or equal to borderline risk of breast cancer. Targeting these 494 women, education sessions were offered and a post-test survey was conducted. Of these 494 women, 65.6% (n=324) agreed to participate in the intervention and post-test survey. These women were classified into the intervention and control groups. Women reside in Chung-cheong province were placed into the intervention group (n=226), while the residents of Kyong-gi province were placed into the control group (n=98). This study excluded women who had been given a breast cancer diagnosis.

A power analysis was conducted to estimate the sample size. In a two-group test of mean differences to reach 80% power with an alpha value of .05, 98 subjects in each group were required to fall within the medium effect size of .40 (Cohen, 1988). In a 2×2 contingency table, 80 subjects per group were necessary when 20 percentage point differences were expected. Therefore, 98 subjects per group were included in this study.

Instrumentation

The questionnaire, which included demographic information, knowledge and practices related to breast cancer and early detection activities, and breast cancer risk appraisals were used for the study instrument. A breast cancer risk appraisal tool was developed by Lee et al. (1998). Variables for the breast cancer risk appraisal included age, family history, history of breast disease, frequency of high fat diets, number of children, and breast-feeding experiences. Relative risk status of developing breast cancer in women was calculated based upon the scores from the Cancer Risk Appraisal table (Table 1). Based on each woman's score, those with a score of 70 and over were placed into the high-risk group, those who scored 40 to 69 were grouped into the moderate risk group, those with a score of 20 to 39 were placed into the borderline group, and scores of 19 or less were

Table 1. Breast Cancer Risk Appraisal Table

Risk factors	Classification	Value
Age	35 - 39	5
	40 - 59	10
	60 and over	7
Family history of breast cancer	No	0
	Yes	45
History of breast disease	No	0
	Yes	20
Breast feeding	No	10
	Yes	0
Number of children	3 children $\leq$	0
	$\leq$ 2 children	8
Meat consumption/week	All most none	0
	Once/week $\leq$	7
High risk	(70 or over)	
Moderate risk	(40 - 69.9)	
Borderline	(20 - 39.9)	
Normal	(19.9 or less)	

arranged into the normal group. The risk status of the two groups was comparable.

Trends in breast cancer incidence, health behavior that may reduce breast cancer risk, and the significance of early detention activities were included in the knowledge items. The frequency and regularity of BSE performances were included in the practice items. The instrument used to measure the program effects was the questionnaire used for the baseline data and post data collection. Only the risk appraisal part was removed from the questionnaire for the post-test survey. Instrument reliability was tested. The reliability coefficient (Chronbach's alpha) was .82 in this study.

Procedure

Targeting women who had a higher or equal to borderline risk of breast cancer, a quasi-experimental study was conducted. Pre- and post-tests were conducted for both the intervention and control groups. The BSE education and risk appraisal feedback programs were given to women in the intervention group only. For women in the control group, the BSE education and risk appraisal results were offered after the post-test was completed.

A convenient sample of 55 CHNPs, working in Kyong-gi and Chung-cheong provinces, were invited to join the study for purposes of data collection and delivering health education. They collected baseline data from 1,977 women residing in Kyong- gi and Chung-cheong Province from April to July 2000. An introduction letter outlining the program and data collection methods was delivered to each CHNP prior to data collection via mail. The CHNPs collected data through face-to-face interviews.

The trainer's training program was offered to the CHNPs of the intervention group (45 CHNPs from Chung-cheong province) so that they could communicate information obtained through the education program to community women. Each CHNP takes charge of one CHP and covers no more than 5,000 residents in a rural area. The education session was held in November 2000.

The program comprised of four education sessions. The first session focused on the anatomy and physiology of the breast, and the incidence and prevalence of breast cancer in Korea. The second session focused on the instruction of the BSE using silicone breast models. The third was a video session, which embodied the BSE and mammography. The last session was a group practice session. The participating CHNPs convened to practice BSEs and to instruct each other.

The instructor for the program, a health educator who specialized in breast cancer prevention education, was invited from the American Cancer Society. Breast cancer prevention and early detection pamphlets were developed by the researchers of this study and distributed to the CHNPs to use while they educated women in the intervention group.

After training, the CHNPs returned to their communities and delivered the breast cancer prevention and early detection education as they learned from the trainers' training program between December 2000 and February 2001 to women in the intervention group using pamphlets, video and breast models. The risk appraisal results were announced to each woman in the intervention group at the time of the education program. Three months after the education was completed, a post-test survey to evaluate the effects of the program was conducted between May and July 2001. For women in the control group, no interventions were conducted until they had finished the post-test survey. Then, the BSE education (same as the intervention group) was delivered and the risk appraisal results were announced to women in the control group.

Analysis

T-tests and chi-square tests were employed to analyze differences between the two groups to determine whether the level of knowledge and competency, and the frequency of BSE practice of women changed as a result of having participated in the program. The differences in the level of knowledge in the post-test between the two groups were analyzed using ANCOVA to correct for the confounding effect caused by the education level.

RESULTS

Demographic Characteristics of the Study Participants

The mean age for the intervention group was 48.3± 9.4 years and the mean age for the control group was 44.5±8.5 years. The average monthly income was higher for the control group ($1,450±$866) than the intervention group ($1,000±$675). Among women in the intervention group, 57% (n=122) had received an elementary school level of education or less compared to only 27.1% (n=26) of women in the control group. For both groups, more than 90% were married. In terms of

age, income, and education, the two groups were significantly different (Table 2).

The higher education and income levels positively affected the performance of the BSE. Since the control group had a higher education and income level than the intervention group, those variables were not collected in the analysis.

BSE Knowledge and Practices

Breast Cancer and BSE Related Knowledge: Before the intervention, the mean knowledge scores of the BSE were not different significantly between the two groups (p=.34). After the intervention, however, the mean knowledge score of 10.0±4.5 for the intervention group significantly increased compared to the pre-test results (7.1±2.7) and was significantly higher than the mean score of 7.6±2.4 for the control group after correcting for the confounding effect of the education level (p=.00, Table 3).

Proportion of Women Practicing BSE: Before the intervention, the two groups did not differ significantly in terms of the BSE experience, regular BSE practices, or competency in performing the BSE. The BSE experience indicated that women who have performed a BSE at least once in their lifetime, while the regular BSE indicated that women performed a BSE once a month or more frequently. After the intervention, 87.2% (n=197) of the women in the intervention group had a BSE experience, whereas, 68.4% (n=67) of the control group had a BSE experience. The difference was statistically significant (p=.00). Likewise, in the intervention group, 31.1% (n=69) performed a BSE regularly after the intervention compared to 10.4% (n=10) of the women in the control group who practiced regular BSEs and the difference was statistically significant (p=.00). More women in the intervention group (57.3%) perceived that they were confident in performing a BSE compared to 23.5% of women in the control group who felt confident in practicing a BSE. The competency in practicing a BSE was significantly higher for women in the intervention group (p=.00, Table 3).

BSE Related Factors: Participants were allowed to select items that matched their status in both questionnaires regarding reasons for not performing BSE and the sources of information about BSE. Feeling that a BSE was not needed was the main reason for not performing one for women in both groups. This result indicated that most women in Korean rural areas were unaware of the importance of a BSE in detecting early breast cancer. Other reasons such as ignorance of BSE methods and a

Table 2. Homogeneity Test Between the Two Groups (N=324)

Variables	Intervention Group	Control Group	t (p)
	Mean (S.D)	Mean (S.D)	
Age (Years)	48.3 (9.4)	44.5 (8.5)	3.39 (.00)
Monthly income	$1000 ($675)	$1450 ($866)	- 4.76 (.00)
	N (%)	N (%)	Statistic
Education			
No formal education	24 (11.2)	4 (4.2)	x^2 = 39.38
Elementary school	98 (45.8)	22 (22.9)	p = .00
Middle school	59 (27.6)	27 (28.1)	
High school	23 (10.7)	37 (38.5)	
College or Higher	10 (4.7)	6 (6.3)	
Marital Status			
Married	208 (95.0)	87 (90.6)	Fisher's
Unmarried	3 (1.4)	-	Exact = 5.15
Other	8 (3.6)	9 (9.4)	p = .12

Note: Education was not determined in 14 cases, and 9 participants failed to respond to the marital status question.

Table 3. Breast Knowledge and Practice

	Pre-test			Post-test		
	G1[1]	G2[2]	Statistic	G1[1]	G2[2]	Statistic
BSE knowledge:	7.1	7.2	t = .96	10.0	7.6	F = 11.51
Mean (S.D)	(2.7)	(2.6)	p = .34	(4.5)	(2.4)	p < .00
Competency in BSE:	73	51	x^2 = .364	129	23	x^2 = 34.2
Person (%)	(23.5)	(28.0)	p = .16	(57.3)	(23.5)	p < .00
BSE experience[3]:	186	109	x^2 = .001	197	67	x^2 = 17.14
Person (%)	(60.0)	(59.9)	p = .98	(87.2)	(68.4)	p < .00
Regular BSE[4]:	62	28	x^2 = 2.51	69	10	x^2 = 15.33
Person (%)	(20.0)	(15.4)	p = .64	(31.1)	(10.4)	p < .00

1) Intervention group
2) Control group
3) For the post-test, people who practiced the BSE more than once during the intervention period
4) People who practiced the BSE regularly

fear of detecting breast cancer were more frequently selected among women in the control group than those in the intervention group. The differences were statistically significant (p=.00, Table 4).

Nearly 90% (n=202) of the intervention group responded that nurses were the source of information regarding BSE, whereas mass media was the main source of information regarding BSE for 59.2% (n=58) of women in the control group. Only 11.9% (n=27) of women in the intervention group and 18.4% (n=18) of those in the control group, however, reported that they obtained BSE information from physicians (Table 4).

The chi-square test and the Pearson correlation tests were conducted to examine if an association exists between the demographic profile and BSE practice, BSE knowledge, and competency. The results indicated that there was no association between the BSE practice and demographic profile such as age (p=.12), income (p=.45), or education (p=.47). Likewise, there was no association observed between the demographic profile and knowledge (p=.19 - .65) or competency (p=.09 - .85). The number of barriers of performing BSEs, however, was significantly related to the BSE practice. Only 2% of people who practice regular BSEs had two or more barriers, compared to 32.8% of people who didn't practice regular BSEs (p<.00).

DISCUSSION

The interventions that included feedback of breast cancer risk appraisals and the BSE education sessions that used pamphlets, videos, and silicone breast models were effective in increasing women's knowledge about breast cancer and BSE, as well as promoting regular BSE practices. The results were consistent with Salazar et al.'s study (1994) that risk appraisal was effective in increasing women's participation in early detection activities. It was also consistent with the study results of Kang (1996) who used pamphlets, videotapes, and breast models as teaching media, and was successful in increasing knowledge and attitudes toward breast cancer and BSE.

The demographic composition of the two groups revealed that the mean age was higher for the intervention group, whereas the income and education levels were higher for the control group. These factors may impact on the frequency and regularity of BSEs and/or BSE knowledge. Therefore, chi-square tests and correlation analysis were performed to examine whether these three factors, age, income, and education were correlated with BSE practices and knowledge. The results revealed that age, income, and education weren't neither associated with BSE practices nor knowledge.

The result of this study indicated that women in the intervention group were more likely to perform BSEs compared to women in the control group after the intervention. According to the initial survey results, which were conducted before the intervention, the proportion of women who had BSE experience did not differ between the two groups (p=.98). Likewise, a proportion of women who practiced regular BSEs did not differ be-

Table 4. BSE Related Factors

		Intervention Group	Control Group	x^2 (p)
		N (%)	N (%)	
Reason for not performing BSE[1)]	Ignorance of the BSE methods	35 (15.5)	30 (30.6)	9.75 (.00)
	Time & Place constraints	47 (20.8)	24 (24.5)	0.52 (.47)
	Unnecessary	56 (24.8)	35 (35.7)	4.05 (.04)
	Fear of detecting cancer	10 (4.4)	32 (32.7)	48.28 (.00)
	Found it Embarrassing	18 (8.0)	17 (17.3)	6.245 (.01)
	Lack of recommendation from physicians or nurses	8 (3.5)	16 (16.3)	16.30 (.00)
		Intervention Group	Control Group	x^2 (p)
		N (%)	N (%)	
Sources of information about BSE[1)]	Physician	27 (11.9)	18 (18.4)	2.36 (.13)
	Nurse	202 (89.4)	43 (43.9)	76.77 (.00)
	Mass Media	63 (27.9)	58 (59.2)	28.82 (.00)
	Relatives	25 (11.1)	28 (28.6)	15.32 (.00)
	Other	7 (3.1)	5 (5.1)	0.77 (.38)

1) Duplicated responses

tween the two groups as well (p=.64). Thus, it is assumed that the education intervention contributed to the increased knowledge and frequency of BSE practices among women in the intervention group.

The regular BSE rates of 31.1% after the intervention, however, were still lower for the intervention group than the reported rates from another study (Mishra et al.'s, 1998). The main reasons for not performing BSE such as feeling that a BSE is unnecessary, and time and place constraints (Table 4) may attribute to this lower compliance. Given the fact that only 14% of urban women and 10% of rural women had participated in breast cancer screening behavior in Korea (Korean Ministry of Health & Welfare, 1999), efforts should be taken to increase women's awareness as well as compliance to BSEs and other screening activities for breast cancer.

Use of CHNPs as intermediaries proved to be an effective method for delivering interventions to increase knowledge and the frequency of BSE practices to women in rural areas. Furthermore, the skills and knowledge obtained through the education sessions in this study will be invaluable assets for the participating CHNPs in carrying out their primary health care responsibilities in the community.

Lee et al. (2000) identified that when information was given by physicians or nurses more women practiced BSE than when information was obtained from the mass media or relatives. Likewise, Heyman et al. (1991) pointed out that groups of women, who obtained BSE methods from health professionals, were performing BSEs better than women who had obtained the methods from other sources. The study results, however, revealed that only 11.9% of the intervention group and 18.4% of the control group reported that they obtained the information regarding BSE from physicians, while 43.9% of women in the control group received the information from nurses. It may imply that future efforts should target health professionals such as physicians and nurses so that they could recommend and guide regular BSEs to women in the community.

The limitation of this study was that we did not examine the effects of the two interventions, risk appraisal and BSE education, separately. Thus, we are not able to explain which intervention is more useful in increasing the frequency of regular BSEs among rural women in Korea. Recommendations for future study may include analyzing the effects of the two interventions separately by providing each intervention to a different group of women.

CONCLUSION

This study was conducted in order to evaluate the effects of interventions for increasing breast cancer awareness and early detection activities. The study results indicate that women who have received risk appraisal results and BSE education were more likely to perform a BSE compared with women who have never received any interventions. Likewise, women who received interventions had higher level of knowledge and were more competent in practicing BSE. The main reasons for not performing BSE were the feeling of BSE being unnecessary, time and place constraints and fear of detecting. Regarding the sources of information about BSE, nurses were the main source of information for women in the intervention group, while the mass media was the main source for women in the control group.

The results of this study suggest that efforts to increase women's awareness of breast cancer and early detection methods targeting rural women should be made through the promotion of BSE practices. Likewise, breast cancer risk appraisals and education interventions are needed to target women who have underutilized BSE. In planning health promotion programs for the early detection of breast cancer, these programs should include health professionals in order that they could communicate with their clients the importance of breast cancer screenings. Along with these screenings, these health professionals should advocate regular screenings and provide information to their clients regarding breast cancer early detection methods.

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