RESEARCH ARTICLE

The Effects of Education Program on Knowledge and Intention of Breast Cancer Screening in Taiwan

Hsiu-Ho Wang[1], Yu-Chu Chung[2], Jia-Ling Sun[3]*

Abstract

Aims: The purpose of this study was to investigate the effects of a breast cancer screening educational program on women's knowledge and intention to seek breast cancer screening in Taiwan. Materials and Method: This study describes the knowledge and intention of breast cancer screening changes during the period pre and post group education. A pre-test and post-test were used in both the experimental and the control groups. A convenience sampling was used. Two structured questionnaires were used. Results: The mean knowledge of breast cancer screening scores (pre-test and post-test) of the experimental group participants were 12.6 and 14.0. Then the mean knowledge of breast cancer screening scores (pre-test and post-test) of the control group participants were 11.8 and 12.1. The mean intention of breast cancer screening scores (pre-test and post-test) of the experimental group participants were 11.4 and 13.5. And the mean intention of breast cancer screening scores (pre-test and post-test) of the control group participants were 11.6 and 12.4. An independent-t test was applied to examine the differences among the two groups, revealing that the average post-test knowledge score differ significantly between the two groups (t =4.18, p<.00); and the post-test intention also demonstrate a marked statistical difference (t = 2.07, p<.05). A paired-t test was applied to examine the differences of each group, revealing that the total average scores of the experimental group participants on the knowledge of breast cancer screening scale clearly differ statistically (t =-5.54, p<.00); and the pre-test and post-test intention testing also demonstrate a marked statistical difference (t =-7.70, p<.00). Conclusions: These findings are helpful in understanding the knowledge and intention of breast cancer screening changes during the period pre and post group education. It is expected that these results can offer a reference for clinical breast cancer prevention.

Keywords: Breast cancer screening - knowledge - intention - educational program

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Introduction

Breast cancer is the most common type of cancer among women worldwide, and the global incidence of breast cancer increases annually (Jemal et al., 2011). Thus, breast cancer poses a threat to the health of the women on global scale. In Taiwan, breast cancer occurs most frequently in women 45 to 49 years old, an age group that is significantly younger than their European and American counterparts, among whom the peak prevalence occurs between the ages of 50 and 59 years (Taiwan Cancer Registry, 2010). The majority of patients contributing to the rise in breast cancer incidence have stage II disease (36.4%) (Taiwan Cancer Registry, 2010). Thus, most women are unaware they have breast cancer until after they have reached the second stage. However, breast cancer screening can early detection and early treatment is more likely to have a better prognosis and more successful treatment (Bener et al., 2009). Therefore, increased breast cancer screening is critical for reducing breast cancer mortality (Bener et al., 2009). Breast cancer screening include (a) breast self examination, BSE; (b) clinical breast examination, CBE; (c) mammogram (National cancer institute, 2011). According to the American Cancer Society recommendations, women age 40 and older should have a screening mammogram every year. Women in their 20s and 30s should have a clinical breast exam (CBE) as part of a periodic (regular) health exam by a health professional, at least every 3 years. Breast cancer mortality in the United States has decreased as a result of increased screening (Brinton et al., 2008; American Cancer Society, 2009).

The five-year relative breast cancer survival rate in United States was reported 91.4% in White people and 77.4% in Black people (National Institutes of Health 2010). From 2001 to 2006, the relative survival rates of breast cancer in the UK and Australia were shown to be 82% and 88.3% (Cancer research UK, 2009; Cancer Australian, 2011). At the same time, a similar tendency was found in many Asia areas. The five-year relative breast cancer survival rate has been reported 82.6% in Taiwan and 82% in Japan (Coleman et al., 2008, Taiwan Cancer Registry, 2010). In Taiwan, the five-year relative survival rate for stage 0 was 97%, for stage I was 95%, for

*[1]Department of Nursing, Yuanpei University & National Taipei University of Nursing and Health Sciences, Taipei, [2]Department of Nursing, [3]Department of Nursing, Yuanpei University, Hsinchu, Taiwan *For correspondence: ling5966@yahoo.com.tw*

stage II was 89%; for stage III was 70%, For stage IV was 21% (National Institutes of Health, 2010). Based on the above, it is an essential issue to understand and improve the breast cancer screening and early detection increases the opportunity of survival.

The prevalence rate for breast cancer screening, many studies are listed below. The prevalence rate for breast examination in Malaysia was 70.35% where the highest was for BSE (57.14%), followed by CBE (51.77%) while for mammography it was 7.57% (NHMS, 2006). One study reported that only 31.7% of women that were interviewed had ever performed a breast self-examination (BSE), and that only 7.1% of them had performed BSE on at least a monthly basis (Tavafian et al., 2009). Another study found that only 17% of women conducted regular BSEs, and that 63% of women had never performed a BSE (Montazeri et al., 2008). Similarly, a study of Iranian women reported that BSE practices ranged from 3% to 17% (Sadjadi et al., 2009). In constrast, a study of 384 women in Taiwan found that 69% of the women had performed BSE, and that 24% of them had undergone mammography screening (Chiang et al., 2011).

Some factors are consistent among the reasons women cite for infrequently practicing the BSE. In Asia, women cite modesty and lack of encouragement by family members and physicians as factors that have contributed to infrequent breast cancer screening (Parsa et al., 2006). Habib et al. (2010) reported that barriers to BSE included the lack of knowledge of the effectiveness of BSE and the lack of privacy. Studies of the barriers to women receiving mammography reported a variety of factors, such as cost, accessibility, self-neglect, lack of symptoms, not sensing the need for screening, and not knowing how to perform a BSE (Cam and Gumus, 2009; Hajian et al., 2011). Therefore, not only the problem of low BSE, but also some studies have indicated women also lack of knowledge of breast cancer screening. Habib et al (2010) also reported that female university students lacked knowledge of the key issues concerning breast cancer. Thus, in addition to low rates of regular BSE practices, studies also show that women lack knowledge regarding the importance of routine breast cancer screening. Breast cancer screening programs increase public awareness about the early detection of breast cancer (Sadjadi et al., 2009). Cognitive factors are thought to play important roles in the performance of BSEs. It is also important to consider that teaching and reinforcing BSE are costly activities (Babu et al., 2011). The success of a screening program often depends on the modification of its strategies and policies to meet the needs of the local community (Dahlui et al., 2011). In addition to education, breast cancer awareness programs should also include instruction in the techniques of BSE to improve women's motivation and skill to increase the likelihood of early detection (Ceber et al., 2010). And Ma et al. (2012) study suggest that breast cancer screening programs will be more effective if they include the cultural and health beliefs, enabling, and social support factors.

Health education through the mass media and community health programs have been used to create public awareness regarding breast cancer (Parsa et al., 2006). Mass media campaigns, internet resources, and health education have been used to promote public awareness of breast cancer and the importance of routine screening for many years in Taiwan, but the effectiveness of these measures has not been assessed. Many studies have shown that education has a positive impact on women's knowledge of breast cancer and increases their participation in prevention and screening (Burgess et al., 2008; Kim and Menon, 2009; Ceber et al., 2010; Gözüm et al., 2010; Secginli and Nahcivan, 2011). Han et al. (2009) found that a 120-min classroom training program combined with follow-up counseling significantly increased mammography, clinical breast exam, and BSE rates. In addition to discussing the benefits of screening, health professionals should also emphasize screening timeliness (Ritvo et al., 2012). The purpose of this study was to investigate the effects of a breast cancer screening educational program on women's knowledge and intention to seek breast cancer screening in Taiwan.

Materials and Methods

Design

The goal of the educational program was to improve women's knowledge about breast cancer screening. A pre-test and a post-test were used in both the experimental and control groups, and the changes in the women's knowledge of the importance of breast cancer screening and their intention to seek screening afterward were evaluated. A convenience sampling was used. Participants in the experimental group received the breast cancer screening educational program, while participants assigned to the control group received none. Before breast cancer screening educational the experimental group and the control group received a pre-test questionnaire. The program consisted of three parts: (1) educational presentations, (2) discussion and sharing about BSE experiences, and (3) demonstrations and practice. (clinical breast exam). Group education included cancer statistics, high risk factors of breast cancer, symptoms of breast cancer, screening methods. Group education process takes about 40 minutes. Two weeks after the breast cancer screening educational program, a post-test was applied to the experimental and control groups.

A structured questionnaire was used to conduct face-to-face interviews with the participants. The three interviewers were nursing students. Before executing the interviews, interviewers were educated.

Subjects

The study participants were recruited from two companies in Taiwan. The inclusion criteria were (a) age greater than 30 years, (b) able to communicate in Chinese. The research proposal was approved by the ethics committee of the Institutional Review Board (IRB).

Instruments

The participants were demanded to complete the knowledge and intention of breast cancer screening scales (pre-test and post-test), as well as general demographic information. Most items for the questionnaire were

obtained from literature and existing questionnaires. We conducted a content validity assessment using professional experts. We invited three clinical nursing professionals to accomplish expert content validity review the items using a content validity index (CVI) (Lynn, 1986).

Demographic (e.g. age, education, marital status, family history of cancer, menopausal status) and clinical information (e.g. learn BSE, Mammography, BSE or breast ultrasound) was collected.

Knowledge of breast cancer screening scale

This scale includes 15 items; each item is answered true or false. The correct answer is 1 score, wrong answer 0. Total scores range from 0 to 15, with a higher score indicating a higher knowledge level of breast cancer screening. The Cronbach's alpha of knowledge of breast cancer screening scale is 0.82.

Intention of breast cancer screening scale

This scale includes 3 items that are rated based on five grades: strongly oppose - strongly agree (1-5). Total scores range from 3 to 15, with a higher score indicating a higher intention level of breast cancer screening. The Cronbach's alpha of knowledge of breast cancer screening scale is 0.94.

Analysis

SPSS 20.0 (SPSS, Inc., Chicago, IL, USA) for Windows software analyzed data to decide demographic characteristic percentages, means, and standard deviations (SD). A paired-t test was applied to examine the differences of each group pre-test and post-test. An independent-t test was applied to examine the differences of two groups pre-test and post-test.

Results

The average age of the experimental group was 37.8 (SD=5.8) years. The mean age of the control groups was 39.7 (SD=9.5) years. Among the experimental group in this study, 76.7% completed education at a college and above level, 70% were married and only 6.7% had received mammography. Among the control group in this study, 53.1% completed education at a college and above level, 53.1% were married and 15.6% had received mammography. Participants in the two groups had similar characteristics and did not differ significantly (p >.05) (Table 1).

This knowledge of breast cancer screening scale includes 15 items. The mean knowledge of breast cancer screening scores (pre and post) of the experimental group participants were 12.6 (SD=1.75) and 14.0(SD=1.13), respectively, and the mean knowledge of breast cancer screening scores (pre and post) of the control group participants were 11.8 (SD=3.29) and 12.1 (SD=2.35), respectively (Table2).

This intention of breast cancer screening scale includes 3 items. The mean intention of breast cancer screening scores (pre and post) of the experimental group participants were 11.4 (SD=2.22) and 13.5 (SD=1.48). And the mean intention of breast cancer screening scores (pre and post) of the control group participants were 11.6 (SD=2.80) and 12.4 (SD=2.53) (Table2).

Table 1. Demographic Characteristics (N=62)

Variables	Experimental group (n=30)		Control group (n=32)		*P*
	n(%)	*M±SD*	*n(%)*	*M±SD*	
Age		37.8±5.8		39.7±9.5	0.68
Graduation					0.83
Junior high school	2(6.6)		3(9.4)		
Senior high school	5(16.7)		12(37.5)		
College and above	23(76.7)		17(53.1)		
Marital status					0.45
Unmarried	9(30.0)		11(34.4)		
Married	21(70.0)		17(53.1)		
Divorce	0(0)		4(12.5)		
Menopausal status					0.10
No	26(86.7)		24(75.0)		
Yes	4(13.3)		8(25.0)		
Family history of cancer					0.31
No	24(80.0)		25(78.1)		
Yes	6(20.0)		7(21.9)		
Learn BSE					0.10
Yes	26(86.7)		24(75.0)		
No	4(13.3)		8(25.0)		
Mammography					0.06
Yes	2(6.7)		5(15.6)		
No	28(93.3)		27(84.4)		
BSE or breast ultrasound					0.20
Yes	22(76.5)		22(68.7)		
No	8(23.5)		10(31.3)		

*p-value corresponds to the Pearson chi-square test or t-test

Table 2. Two Groups Pre-test and Post-test (N=62)

Variables	Experimental group (n=30) *M±SD*	Control group (n=32) *M±SD*	*t*	*p*
knowledge (Pre-test)	12.6±1.75	11.79±3.29	1.22	0.20
knowledge (Post-test)	14.0±1.13	12.06±2.35	4.18	<.00
intention (Pre-test)	11.4±2.22	11.6±2.80	-1.88	0.09
intention (Post-test)	13.5±1.48	12.4±2.53	2.07	0.03

An independent-t test was applied to examine the differences in the pre-test and post-test scores among the two groups. The t-test results showed that the average pre-test knowledge score did not differ significantly between the two groups (t=1.22, p>0.05). And the average pre-test intention score did not differ significantly between the two groups (t=-1.88, p>0.05). But the average post-test knowledge score differ significantly between the two groups (t=4.18, p<0.00); and the post-test intention also demonstrate a marked statistical difference (t=2.07, p<0.05). And that increased knowledge of breast cancer screening was demonstrated more frequently in the experimental group than in the control group. Intention of breast cancer screening improves the experimental group better than the control group (Table 3).

A paired-t test was applied to examine the differences of each group pre-test and post-test, revealing that the total average scores of the experimental group participants on the knowledge of breast cancer screening scale clearly differ statistically (t=-5.54, p<0.00); and the pre-test and post-test intention testing also demonstrate a marked

Table 3. Each Group Pre-test and Post-test (Knowledge of Breast Cancer Screening) (N=62)

Variables	Experimental group (n=30)			Control group (n=32)		
	M±SD	*t*	*p*	*M±SD*	*t*	*p*
Total score		-5.54	<0.00		-.75	0.46
Pre-test	12.6±1.75			11.79±3.29		
Post-test	14.0±1.13			12.06±2.35		
1. Breast cancer has the highest mortality among female cancer patients in Taiwan.		-3.54	<0.00		-0.44	0.66
Pre-test	0.27±0.55			0.53±0.51		
Post-test	0.83±0.67			0.59±0.50		
*2. Women still having the menstrual cycle, the best to do BSE a few days before each menstrual		-2.18	0.02		-0.20	0.81
Pre-test	0.53±0.38			0.54±0.50		
Post-test	0.83±0.65			0.57±0.51		
3. Menopausal women the best to do BSE monthly fixed date		-0.30	0.11		-0.41	0.17
Pre-test	0.93±0.70			0.82±0.46		
Post-test	0.97±0.23			0.88±0.34		
4. do BSE, to check the breast shape, contour and skin		1.31	0.18		-0.63	0.54
Pre-test	1.00±0.00			0.91±0.40		
Post-test	1.00±0.00			0.92±0.34		
5. do BSE, should touch with pulp		0.00	1.00		0.00	1.00
Pre-test	1.00±0.00			0.88±0.42		
Post-test	1.00±0.00			0.88±0.37		
6. do BSE to be consistent, pressing, spiral, sliding forward		-0.23	0.10		-0.33	0.75
Pre-test	0.97±0.72			0.81±0.40		
Post-test	1.00±0.00			0.83±0.37		
7. do BSE, should check with ring		0.00	1.00		0.00	1.00
Pre-test	1.00±0.00			0.88±0.42		
Post-test	1.00±0.00			0.88±0.42		
*8. do BSE, should not squeeze the nipple		-1.70	0.08		0.65	0.52
Pre-test	0.60±0.35			0.53±0.51		
Post-test	0.77±0.42			0.44±0.50		
9. lying to do BSE, the pillow should be placed under the right scapula to check the right breast		-0.48	0.13		-2.15	0.06
Pre-test	0.83±0.65			0.75±0.44		
Post-test	0.90±0.45			0.87±0.18		
10. do BSE, should check the armpit, the lower edge of the clavicle and breast		-0.62	0.65		0.44	0.66
Pre-test	0.93±0.25			0.94±0.25		
Post-test	0.97±0.25			0.91±0.30		
11. more than 20-year-old female should do BSE every month		0.00	1.00		-1.44	0.16
Pre-test	0.97±0.12			0.78±0.42		
Post-test	0.97±0.34			0.91±0.30		
12. abnormal breast can contract a professional physician for further examination		0.00	1.00		-1.00	0.33
Pre-test	1.00±0.00			0.91±0.30		
Post-test	1.00±0.00			0.97±0.18		
*13. Menopause not need to do BSE		-0.26	0.99		1.72	0.10
Pre-test	0.93±0.65			0.91±0.30		
Post-test	0.97±0.54			0.75±0.44		
14. early menstruation (before age 12), late menopause (after age 55), easy to get breast cancer		0.00	1.00		0.00	1.00
Pre-test	0.70±0.33			0.66±0.50		
Post-test	0.77±0.44			0.66±0.50		
15. women who have a mother or a sister with a history of breast cancer have a greater risk of breast cancer		0.00	1.00		-1.44	0.16
Pre-test	1.00±0.00			0.94±0.25		
Post-test	1.00±0.00			1.00±0.00		

*Reversed scores

Table 4. Each Group Pre-test and Post-test (Intention of Breast Cancer Screening) (N=62)

Variables	Experimental group (n=30)			Control group (n=32)		
	M±SD	*t*	*p*	*M±SD*	*t*	*p*
Total score		-7.70	<0.00		-1.40	0.17
Pre-test	11.4±2.22			11.6±2.80		
Post-test	13.5±1.48			12.4±2.53		
1. I intend to perform BSE during the coming year.					-1.35	0.19
Pre-test	4.13±1.65	-1.84	0.06	4.00±0.92		
Post-test	4.97±1.87			4.25±.076		
2. I intend to perform monthly BSEs during the coming year.					-1.54	0.13
Pre-test	4.00±0.88	-2.83	<0.00	3.91±0.93		
Post-test	4.67±0.95			4.22±0.87		
3. I intend to receive mammography during the coming year.					-1.16	0.26
Pre-test	3.30±1.70	-1.31	0.18	3.66±1.10		
Post-test	3.80±1.23			3.94±1.01		

statistical difference (t=-7.70, p<0.00). But the total average scores of the control group participants on the knowledge score did not differ significantly (t =-0.75, p>0.05); and the pre-test and post-test intention testing also demonstrate did not a marked statistical difference (t=-1.40, p>0.05) (Table 3). These indicate that group education increased the experimental participants' knowledge of breast cancer screening and their intention to seek regular screening services.

Discussion

In this study, the 11.3% of participants had received mammography. This result is supported by some studies (NHMS, 2006; Chiang et al., 2011). The total mean knowledge of breast cancer screening scales (post-test) of the experimental group participants and control group participants were 14.0 and 12.06. These data indicate that participants' knowledge of breast cancer screening may be sufficient to improve early detection of cancer. The intention to seek breast cancer screening was also significantly higher in the experimental group, based on the mean intention of breast cancer screening scores (post-test), which were 13.5 and 12.4 for the experimental group and control group, respectively. This study applied an independent-t test to examine the differences of two groups pre-test and post-test. The knowledge and intention of breast cancer screening scores clearly differed statistically for the experimental group, indicating that group education improves women's knowledge of breast cancer screening.

Meanwhile, we applied a paired t-test to examine the differences in pre-test and post-test scores within each group. Because the experimental groups' scores for knowledge and intention of breast cancer screening were statistically different, we conclude that group education improves participants' knowledge of the importance of routine breast cancer screening and motivates them to seek out screening services from health care providers. Although these results are consistent with those of similar previous studies (Burgess et al., 2008; Kim and Menon, 2009; Ceber et al., 2010; Gözüm et al., 2010; Secginli and Nahcivan, 2011). Group education can increase the

knowledge and intention of breast cancer screening.

This study had limitations. This research was based on women's knowledge and intention of breast cancer screening. The study design could be a long-term follow-up to determine knowledge and intention of breast cancer screening factors that are more influence. Future investigations using study designs with long-term follow-up periods are warranted to determine which factors that are associated with educational programs have greater influence on the level of women's knowledge of breast cancer screening and their subsequent long term efforts to obtain routine screening services.

In conclusion: The total average scores of experimental group on the knowledge and intention of breast cancer screening scale clearly differ statistically (the differences pre-test and post-test). It is expected that these results can offer a reference for clinical breast cancer prevention.

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