



## Effect of Cultural-Based Breast Self-Examination Educational Program on BSE Self Efficacy Among Nursing Student, Indonesia

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### Abstract

The clinical breast self-examination is one of the strategies to prevent breast cancer to women. Previous study was conducting to promote breast self-examination, but the study did not consider about the role of culture on health behavior. The purpose of this quasi-experimental design was to examine the effect of cultural-based breast self-examination (BSE) educational program on BSE self-efficacy among nursing students. The cultural-based BSE educational program was developed based on Bandura's Social Cognitive Theory and Islamic Culture. A stratified proportionate random sampling method was employed to recruit nursing students at Public Nursing College, Faculty of Medicine, Syiah Kuala University in Aceh, Indonesia. Seventy-six students who met the inclusion criteria were recruited, 36 students were in the experimental group and 40 students were in the control group. The experimental group received the cultural-based BSE educational program including exploring Islamic mandate on prevention and individual responsibility in health promotion and cultural related beliefs toward BSE, health education, BSE training, and follow-up. The BSE self-efficacy scores were examined after 3 weeks of program implementation. The statistical analysis was conducted using dependent t-test and independent t-test. The results showed, the BSE self-efficacy of the nursing students in the experimental group were significantly higher than before participation ( $t_{(35)} = -5.02, p < .001$ ). Further, the BSE self-efficacy score in the experimental group was significantly higher than the control group after participation the program ( $t_{(74)} = 3.49, p < .01$ ). The result showed differences of the overall BSE self-efficacy and the subscale: BSE procedural efficacy ( $p < .01$ ), but not significant differences for the subscale: BSE barrier management efficacy ( $p > .05$ ). The cultural-based BSE educational program is effective in enhancing BSE self-efficacy among nursing students. The study suggests that the application of the cultural-based BSE educational program would be extended for other women and other nursing students in different areas.

*Keywords: breast self-examination, cultural, educational program, self-efficacy*

### Background

Breast cancer, one of the main health problems, remains the most common type of cancer in women worldwide (American Cancer Society [ACS], 2009). Breast cancer is widely suffered by Indonesian women with the incidence of 26 per 100,000 women (Ministry of Health Republic of Indonesia, 2010). Breast cancer is the leading cause of death among young women. In Indonesia, especially in the past 5 years the number of women under 25 with breast cancer has increased significantly (Sutjipto, 2010).

Breast cancer in the early stages can be detected by several methods such as mammography, clinical breast examination (CBE), and breast self-examination (BSE) (ACS, 2010). In developing countries, BSE is a simple, inexpensive, non-invasive, and

non-hazardous method. Based on the benefits, women should be advised to perform BSE (Dahlui, Al Sadat, Ismail, and Bulgiba, 2011). The ACS (2010) recommended that all women should have information about the benefits and limitations of BSE, and BSE should begin when women are 20 years old.

Muslim women have lower rates of preventive care, such as breast examinations (Al-Qattan *et al.*, 2008; Heidari *et al.*, 2008). There are several factors that influenced they BSE practice including low of knowledge about BSE (Heidari, *et al.*, 2008; Banning and Hafeez, 2010), the confidence to carry out BSE (Khatun, 2010), fear of cancer discovery, forgetfulness (Al-Qattan, *et al.*, 2008), a belief it is unnecessary to do BSE (Heidari *et al.*, 2008), education level

(Petrus-Nustus and Mikhail, 2002), and a having family history of breast cancer and marital status (Avci, 2008). Moreover, the qualitative studies have demonstrated that although health promotion and disease prevention are highlighted and encouraged by the *Holy Al Qur'an* and the *Prophet Mohammed*, several teachings may, however, become barriers to perform BSE among Muslim women, especially from the Islamic views related to female modesty and male control in marriage (Bottorff *et al.*, 1998; Rajaram and Rashidi, 1999; Underwood *et al.*, 1999). This creates another barrier to breast cancer screening practices among Muslim women (Rajaram and Rashidi, 1999). Inevitably, strategies to increase BSE practice should consider these issues.

There are some studies which showed that less than half of the female nurses performed BSE regularly. A study by Agboola (2009) with 115 female health workers in Nigeria found that among 70 female nurses, 30% of them performed BSE regularly. Similarly, Khatun (2010) also found that among 273 female nurses in Bangladesh, only 13.3% of them performed BSE regularly. The study found a significant relationship between BSE self-efficacy and BSE practice. Therefore, an education program is needed to increase BSE self-efficacy and practice among nurses, especially to emphasize BSE knowledge in undergraduate nursing students.

Self efficacy is one's self-judgments of his or her personal capabilities to initiate and successfully perform specified tasks at designated levels, expend greater effort, and persevere in the face of adversity (Bandura, 1997). High self-efficacy positively correlates with BSE knowledge, BSE proficiency, and BSE practice (Luszczynska, 2004). Furthermore, previous research has found that perceived barriers and perceived self-efficacy were the strongest predictors of BSE behavior (Canbulat and Uzun, 2008; Tavafian, *et al.*, 2009). Therefore, BSE training programs that advertise self-efficacy and focus on perceived barriers are recommended (Tavafian *et al.*, 2009).

There are many interventions have been developed to increase breast cancer screening rates. In general, significant increases in BSE practice and BSE self-efficacy have been reported in several studies (Hacihasanoglua and Gozum, 2008; Hall *et al.*, 2007; Luszczynska, 2004; Sangchan *et al.*, 2008; Secginli and Nahcivan, 2010). In many studies aiming to promote breast health, health beliefs and BSE self-efficacy significantly increased the BSE practice (Hacihasanoglua and Gozum, 2008; Hall *et al.*, 2007; Sangchan *et al.*, 2008; Secginli and Nahcivan, 2010). Luszczynska found that self-efficacy was a significant predictor of intention, planning, and behavior change. Moreover, the perception of self-efficacy, an important variable in the process of behavior change, is a necessary component of changing and maintaining the practice of BSE (Hacihasanoglua and Gozum, 2008).

On the other hand, those previously mentioned studies had several strengths and weaknesses. One factor that could be the weakness of BSE training programs is that the programs did not examine the role of culture on health behaviors, and thus, the programs could affect BSE practices (Hacihasanoglua and Gozum, 2008; Luszczynska, 2004; Secginli and Nahcivan, 2010). However, the programs which used multifaceted, cultural sensitivity and appropriate linguistics were most effective in increasing BSE practices (Chan *et al.*, 2007; Sangchan, Tiansawad, Yimyam, and Wonghongkul, 2008). Therefore, a new program for promoting BSE should consider these factors in order to increase self-efficacy and BSE practice.

Another issue to BSE practice is in Banda Aceh, where, most women are Muslim, the Islamic legal system derived from the *Al Qur'an* and *Sunnah* (traditions of the Prophet) is implemented in the community. Being Muslim, these women understand that they should manage a healthy life and try to find treatment for any disease. There is Prophetic statement related to health "*There is no disease that Allah has created, except that he also has created its treatment*," "that is obvious to the people that Allah has provided a strong impetus for

Muslim scholars to undertake medical investigations (Yousif, 2003). For this reason, BSE is a part of healthy self-care, is a greatly recommended screening method to identify breast cancer at its early stages. Yet, there is no policy for women to practice BSE, and there is no program to promote BSE among women in Banda Aceh.

The BSE educational program developed for nursing students is important since the students are mostly women and have the potential to be at risk of getting breast cancer. The nursing students have a responsibility to give instructions to other women on how to perform BSE correctly in primary health care settings (Alsaif, 2004). Furthermore, health education for nursing students is very necessary to increase the students' knowledge, confidence, and performance of BSE. In other words, if the students are confident to perform BSE by themselves, they will also be confident to teach BSE to other women (Memis, Balkaya, and Demirkiran, 2009). Based on these previous studies, the researcher developed a cultural-based BSE educational program for nursing students in order to increase self-efficacy and BSE performance.

## Materials and Methods

This study is a quasi-experimental study using two-group, pretest and posttest design. This study was conducted in the Public Nursing College of Banda Aceh, Aceh Province, Indonesia. Aceh is a province comprising of the largest Muslim population of the country. This Public Nursing College is the biggest and most famous nursing school in Banda Aceh, and most of the students come from each part of Aceh province. Therefore, the nursing students of this nursing college can be representative of nursing students in Indonesia.

The college had a population of the female nursing students of 309 persons. The nursing students who met the inclusion criteria were recruited to the study. The inclusion criteria of this study was 1) the first, second, and third year Muslim nursing students, and 2) do not have an infection (mastitis) and/or skin problems around the breast areas.

The estimation of the required sample size was based on a power analysis. The effect size ( $d$ ) was calculated from a previous study (Sangchan *et al.*, 2008). This study tested a culturally sensitive educational program to increase the perception, self-efficacy, and BSE practice of Thai Muslim women. The calculated effect size was 0.83.

According to Polit and Beck (2008) (Table 20.6, page 497), the necessary sample size for a significant level of  $\alpha = .05$ , power = .80 and effect size ( $d$ ) = 0.80 is 25 subjects per group or 50 subjects for a total. In order to ensure an achieved power for a newly designed, cultural-based program, increasing the sample size by adding 60% was more desirable as the effect size may be lower in this study, although this is an arbitrary determination. Therefore, the samples of this study were 40 subjects per group or 80 nursing students for a total. Finally, 36 students in the experimental group and 40 students in the control group completed the study. Four students from first year nursing students in the experimental group were excluded. These students did not attend the program in the first meeting because they did not have any available time; they had to prepare themselves for a class presentation. The data collection of this study was started from taking the name list of the students from the academic staff, then, the students were selected by using stratified proportionate random sampling

Prior to conducting the study, the researchers obtained approval from the Ethics Committee of Faculty of Nursing of Prince of Songkla University, Thailand. To maintain confidentiality, subjects did not record their name on any of the questionnaires, and they can withdraw from the study at any time they want without any negative consequences. The implementation of the study was started by identifying the health information of the nursing students by conducting the pre-screening process, and asking their willingness to join in the program. The eligible nursing students who met the inclusion criteria were recruited in the program. The data was first collected from the control group within the first three

weeks, then, the next set of data was collected from the experimental group within the same time period. The cultural-based BSE educational program was given to the experimental group after the pretest questionnaire were administered within two weeks intervention. The program was conducted in the class room and not opens to other students. All of the students were called at set up time to join in the follow up meeting at the third week, then, completed the posttest questionnaire after three weeks program implementation (Figure 2).

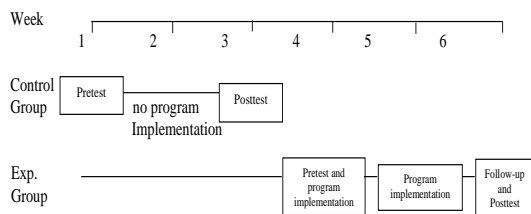


Figure 2. Flowchart of completion of the program.

There were two parts of the instruments used in this present study. Part I: Cultural-based BSE Educational Program Instruments that consisted of the cultural-based BSE educational program guideline, teaching plan, booklet, and video; and Part II: Data Collection Instruments that consisted of the Demographic Data Questionnaire (DDQ) and the BSE self-efficacy Questionnaire, it was developed by Khatun (2010).

In this descriptive statistics and inferential statistics study were used to analyze the data. The level of significance was set at  $p < .05$ . Demographic and health information data were analyzed by using frequencies, percentages, means and standard deviations. BSE self-efficacy was analyzed using the mean and standard deviation. To test the equivalence of the proportion of demographic data and health information data between the experimental and the control group, Chi-square test and independent t-test were used. If there was 20% of the expected frequency in the two-by-two contingency table was too small (less than 5), then the Fisher's exact test was used.

The comparison of the BSE self-efficacy means scores within the experimental group before and after the intervention was analyzed using the dependent t-test (paired t-test). The comparison of the BSE self-efficacy mean scores between the experimental and the control group after the intervention was analyzed using the independent t-test.

## Results

Demographic characteristics and health information of the samples are shown in Table 1. The average age of the students in this study is 19 years old. All were single and had no history of breast illness. Most of the students in the experimental group (97.2%) and the control group (95.0%) did not have a family history of breast cancer. More than half of them (58.3%) in the experimental group had received information about breast cancer and BSE, and the major source of information was from books (52.4%). More than half of the students in the experimental group (58.3%) and control group (62.5%) did not practice BSE, only 15 students in both groups practiced BSE. Most of them did not practice it routinely (73.3% in experimental group and 66.7% in control group) and not on specific days (80.0% in experimental group and 93.3% in control group). There were no statistical differences in the demographic characteristics and health information of the samples between the experimental and the control group.

In order to determine the within-group effect of a cultural-based BSE educational program on BSE self-efficacy, a set of analyses was conducted. The total mean score of BSE self-efficacy after the intervention was significantly higher than that of before the intervention ( $t_{(35)} = -5.02$ ,  $p < .001$ ) (Table 2). The findings revealed differences in three characteristics including total BSE self-efficacy, BSE procedural efficacy, and barrier management efficacy. However, the differences of BSE self-efficacy also found in the control group ( $p < .05$ ). The findings showed differences in the total BSE self-efficacy and BSE barrier management efficacy, but no significant

difference was found for BSE procedural efficacy ( $p > .05$ ).

Table 1. Frequency, Percentage, Means, and Standard Deviations of the Sample in Control and Experimental Group Classified by Demographic Characteristics and Health Information (N = 76)

Characteristics	Experiment Group (n = 36)		Control Group (n = 40)		Statistic Test value	p- value
	n	%	n	%		
Age (years)	M (SD) 19.3 (1.09)		M (SD) 19.0 (1.08)		1.33 <sup>a</sup>	.19
17	1	2.8	2	5.0		
18	8	22.2	13	32.5		
19	11	30.6	12	30.0		
20	10	27.8	9	22.5		
21	6	16.7	4	10.0		
Grade of Class						
1 <sup>st</sup> year	10	27.8	14	35.0		
2 <sup>nd</sup> year	12	33.3	12	30.0		
3 <sup>rd</sup> year	14	38.9	14	35.0		
Family History of Breast Cancer					0.25 <sup>d</sup>	1.00
No	35	98.2	38	95.0		
Yes	1	2.8	2	5.0		
Friends' Family History of Breast Cancer					0.05 <sup>c</sup>	.82
No	28	77.8	33	82.5		
Yes	8	22.2	7	17.5		

<sup>a</sup> = Independent t-test, <sup>b</sup> = Chi-square test, <sup>c</sup> = Chi-square with Yates correction, <sup>d</sup> = Fisher's exact test.

Table 2. Comparison of the BSE Self-Efficacy Mean Scores Before and After Intervention in the Experimental Group Using Paired t-test (n = 36)

BSE Efficacy	Before Intervention		After Intervention		t	p-value
	Mean	SD	Mean	SD		
Total BSE Self-Efficacy	3.65	0.44	4.06	0.39	-5.02	.000
BSE procedural efficacy	3.72	0.49	4.15	0.42	-4.91	.000
BSE barrier management efficacy	3.52	0.43	3.89	0.43	-4.24	.000

Table 3. Comparison of the BSE Self-Efficacy Mean Scores Before and After Intervention in the Control Group Using Paired t-test (n = 40)

BSE Efficacy	Before Intervention		After Intervention		t	p-value
	Mean	SD	Mean	SD		
Total BSE Self-Efficacy	3.59	0.46	3.77	0.35	-2.22	.033
BSE procedural efficacy	3.65	0.49	3.80	0.42	-1.86	.071
BSE barrier management efficacy	3.49	0.49	3.71	0.42	-2.07	.045

In order to determine the effect of a cultural-based BSE educational program on BSE self-efficacy between-groups, a set of analyses was conducted. The total means scores of BSE self-efficacy before (Table 4) and after (Table 5) the intervention between the experimental and control group were examined. Concerning the total mean score and the subscale mean scores, an independent *t*-test was used. The total mean

scores of BSE self-efficacy in the experimental group was significantly higher than those of the control group after receiving the program ( $t_{(74)} = 3.49, p < .01$ ) (Table 6). The findings showed differences in two characteristics including total BSE self-efficacy and BSE procedural efficacy ( $p < .01$ ), but no significant difference was found for BSE barrier management efficacy ( $p > .05$ ).

Table 4. Comparison of the BSE Self-Efficacy Mean Scores before Intervention between the Control and the Experimental Group Using Independent t-test (N = 76)

BSE Efficacy	Control Group (n = 40)		Experimental Group (n = 36)		t	p-value
	Mean	SD	Mean	SD		
Total BSE Self-Efficacy	3.59	0.46	3.65	0.44	0.56	.58
BSE procedural efficacy	3.65	0.49	3.72	0.49	0.64	.52
BSE barrier management efficacy	3.49	0.49	3.52	0.43	0.29	.77

Table 5. Comparison of the BSE Self-Efficacy Mean Scores after Intervention between the Control and the Experimental Group Using Independent t-test (N = 76)

BSE Efficacy	Control Group (n = 40)		Experimental Group (n = 36)		t	p-value
	Mean	SD	Mean	SD		
Total BSE Self-Efficacy	3.77	0.35	4.06	0.39	3.49	.001
BSE procedural efficacy	3.80	0.42	4.16	0.42	3.7	.000
BSE barrier management efficacy	3.71	0.42	3.89	0.43	1.87	.066

## Discussion

The effectiveness of the program was evaluated by changes in BSE self-efficacy. The results of this study support both hypotheses. Firstly, the results showed that at the end of the study, the BSE self-efficacy of the nursing students who received the cultural-based BSE educational program (experimental group) was significantly higher than those of the nursing students who did not receive the program (control group) (Table 5). Secondly, the results also showed that the BSE self-efficacy of nursing students after receiving the cultural-based BSE educational program was higher than before receiving the cultural-based BSE educational program (Table 2). Further, after analyzing each subscale (BSE procedural efficacy and BSE barrier management efficacy), the result was significantly higher for each subscale in the experimental group after receiving the program (Table 2).

These findings were completely accepted because there was no confounding variable revealed in the experimental group and the control group. The subjects' characteristics of both groups were similar (Table 1), and there were no statistical differences of BSE self-efficacy mean scores ( $p > .05$ ) between the experimental and the control group before (pretest) receiving the intervention (Table 4).

The findings of this present study were consistent with previous studies that

inform a BSE educational program effectively improved BSE self-efficacy of the subjects (Hacihanoglu and Gozum, 2008; Luszczynska, 2004; Sangchan *et al.*, 2008; Secginli and Nahcivan, 2010). Those previous studies showed the improvement of BSE self-efficacy immediately after the program (Hacihanoglu and Gozum), at 3 months (Sangchan *et al.*), at 3 and 6 months (Secginli and Nahcivan), and at 3 and 4 months (Luszczynska) after the program. However, this present study evaluated the increase of BSE self-efficacy only in the third week after the program ended.

By evaluating the methods and designed strategies used in the previous studies, this present study added a component to the program which related to Islamic culture, including exploring the Islamic mandate on the prevention and individual responsibility in health promotion, and culture-related beliefs toward BSE. Most of the previous studies did not consider the role of cultural values on BSE practice. It was found that only a few studies that included cultural sensitivity in the program (Hall *et al.*, 2007; Sangchan *et al.*, 2008). Most of the previous studies used only multifaceted methods including teaching, watching a video, BSE instruction and follow-up (Lu, 2001; Luszczynska, 2004; Secginli and Nahcivan, 2010).

There were several reasons underpinning the effectiveness of the program in this present study including the

theory-based program, the combined method, the program design, and the cultural-based program application. The following sections explain in detail each reason for this.

*The theory-based program.* This study used Bandura's Social Cognitive Theory and used four sources of self-efficacy as the strategies to enhance BSE self-efficacy. According to Bandura (1997), the self-efficacy could increase by using four sources of self-efficacy, including enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. All of these strategies provided four kinds of experiences including; mastery experience through the return demonstration of the BSE procedure using a breast model; vicarious experience by learning from another Muslim woman who was successful in performing BSE regularly and learning from their friends who succeeded in performing BSE using the breast model in the group training; verbal persuasion through providing feedback when performing BSE correctly, motivational conversations with the health messengers, and suggestions; and physiological and affective states which provided opportunity to the students to express their feelings and concerns about BSE.

*The combined method applied.* The significant effect on BSE self-efficacy after attending the program could be explained by the methods that had been used by the researcher when delivering the program. The researcher used multifaceted methods including teaching, watching a video, and BSE training. The students in the present study learned about BSE not only by hearing the information from the researcher, but also by watching the video on how to do BSE correctly and by returning the demonstration of the BSE procedure using the breast model. The findings of this present study are congruent with the study conducted by Secginli and Nahcivan (2010) which reported increasing women's confidence in performing proper BSE by using this multifaceted method. In addition, all of the methods and strategies used in this study provided opportunities to increase the

likelihood of learning accurate BSE skill (Park, Song, Hur, and Kim, 2009).

*The program designs applied.* The application of this program also significantly influenced the BSE self-efficacy of the students. This program was conducted in four sessions including exploring the Islamic mandate on the prevention and individual responsibility in health promotion, and cultural-related beliefs toward BSE; health education; BSE training activities; and follow-up. In the session of exploring the Islamic mandate, the students shared their perceptions and beliefs about Islamic mandate and BSE. By exploring the Islamic mandate, the students learnt about Islamic mandate in health prevention which required each individual to take care of their body because it was a gift given from the God (Allah SWT), and the belief in taking care of the breast as a part of the body was consistent with Islamic teaching in relation to health. Sangchan *et al.*, (2008) reported that BSE practice was motivated by the participants' personal beliefs, the Islamic teaching in relation to health, and the BSE practice being performed in harmony with religious practice.

The second session was health education which was a session that gave information about breast cancer and BSE. It is sensitive to change self-efficacy but a significant increase of self confidence happens when education is offered (Aksayan and Gozum, as cited in Hacıhasanoglu and Gozum, 2008). The education effects positive changes in beliefs about BSE self-efficacy and other breast cancer screening (Hacıhasanoglu and Gozum, 2008; Lu, 2001). Moreover, the group-based educational session that had been given in the present study provided opportunities for the students to ask questions about their concerns and discuss some issues including their barriers to BSE practice, their plans to do BSE, and their feelings after the session. All of these opportunities provide experience for them to learn from each other.

The third session was the BSE training activities. These activities were conducted in a small group of students. Therefore, each student had the same

opportunity to practice the demonstration BSE procedure by using a breast model, and providing feedback and reinforcement if they did it correctly. Abbrier, Nour, and Ragheb (as cited in Seif and Aziz, 2000) emphasized that careful training and instructions about the BSE procedure significantly increased the ability of the women to overcome any adverse effects. Sangchan *et al.*, (2008) also reported that the BSE training session provided an opportunity for the women to practice BSE on the tactile breast model. As a result, the students knew how to do the BSE procedure correctly so that they became more confident in doing BSE by themselves. Furthermore, these BSE training activities were conducted in a private place. Lu (2001) emphasized that an appropriate environment for demonstrating with a breast model was necessary for the effectiveness of BSE education programs. By providing a good environment including the quiet room and the place not open to others, having a close relationship among the researcher and the students, and reinforcement by the researcher for the students, could increase the students' confidence in demonstrating the BSE procedure using a breast model.

The last session was a follow-up on the students' competency in practicing BSE. In this session the students had several opportunities including repeatedly demonstrating the BSE procedure, openly discussing their barriers in doing BSE and their plans to perform BSE monthly. Furthermore, in this session the researcher also provided prompt feedback, motivational conversation, and suggestions to perform BSE monthly. These activities were seen to lead to a decrease in the barriers to perform BSE (Sangchan *et al.*, 2008). Moreover, these activities addressed mastery and vicarious experience regarding the students' ability to cope with the barriers that might be perceived by them. They felt more confident to do BSE because they knew about the proper BSE procedure, and they were motivated to do BSE by observing their friends' success in doing BSE correctly during the group training. Peers were appropriate educators for BSE training (Lu, 2001). Additionally, providing written

materials such as a booklet was quite helpful because it addressed many issues about the BSE procedure (Secginli and Nahcivan, 2010). Therefore, the students could learn more about the BSE procedure by themselves.

#### *The cultural-based program applied.*

In order to overcome the cultural issues perceived by the students, the researcher added the Islamic culture into the program. The addition of Islamic culture into the program made the program different from other BSE educational programs (Hacihasanoglu and Gozum, 2008; Luszczynska, 2004; Secginli and Nahcivan, 2010). The researcher was concerned about the role of culture on BSE self-efficacy. Based on Secginli and Nahcivan study (2010), culture plays a crucial role in health behaviors. Moreover, Avci (2008) stated that there was an important aspect in Islamic culture including the modesty of women and the view that the breast is an intimate organ. This modesty can cause embarrassment when the health care professionals discuss and educate on BSE. Therefore, by exploring the Islamic mandate and individual responsibility in health promotion, the students realized that being Muslims, they should manage a healthy lifestyle in order to prevent disease. It means that they should be more active in taking care of their body, especially their breasts by doing BSE monthly, then, if they find any lumps in their breasts, they should be more active to find treatment by checking with the health care professionals. As a result, the cultural barriers would decrease, and the students would feel more confident to perform BSE.

Nonetheless, the results of this study also indicated that the BSE self-efficacy of the students in the control group showed significant improvement. After analyzing each subscale (BSE procedural efficacy and BSE barrier management efficacy), the significant improvement was detected only in the barrier management efficacy, but not in the BSE procedural efficacy (Table 3). However, after analyzing between the two groups, the experimental group had significantly higher total BSE self-efficacy and BSE procedural efficacy than the



control group, but there was no significant difference for BSE barrier management efficacy (Table 5). This might be due to maturation and testing threats, the low reliability of the BSE barrier management efficacy scale, self-report questionnaire, and a short-term period of the intervention.

The maturation refers to the learning process of the subjects that occurred during the study because of the duration of the study period. Maturation is a relevant factor considered in many nursing research (Polit and Beck, 2008). In this study, it was possible that a maturation threat occurred simply because of the characteristics of the nursing students and the nursing students' self-learning. The students might have developed their self-learning ability during data collection between the pre-test and post-test, and they had motivation in learning things related to health information. The testing threat can be due to the number of times the subject's responses have been tested (Burns and Grove, 2001). The questionnaire might have acted as a kind of intervention. The question about BSE self-efficacy might have reminded the students in the control group about the BSE procedure and BSE barrier management efficacy. Further, before the pretest, the students had received an informed consent form explaining the activities of the study, so the students knew beforehand the exact activities provided in this program. However, the students in the experimental group also received this kind of information. Therefore, this threat had little influence on the result.

## Conclusion

In conclusion, the cultural-based BSE educational program in the present study significantly enhanced BSE self-efficacy among the nursing students. All of the students in the experimental group reported their satisfaction with the program, and felt more confident in doing BSE practice. Most of the students said that they plan to perform BSE regularly because previously, they only obtained the information on BSE procedure from books and multimedia sources. Furthermore, the students said that they had not yet practiced

BSE regularly because previously, they had not known the BSE procedure correctly. This indicated that the program implemented in this study was effective and appropriate in the Indonesian context.

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