ORIGINAL ARTICLE

Determinants of monthly breast self-examination among women in Samut Songkhram Province, Thailand

Iona Koike[1, 2], Jiraporn Chompikul[3], Bang-on Thepthien[3] and Naruemon Maikhan[4]

[1] M.P.H.M., ASEAN Institute for Health Development, Mahidol University, Thailand
[2] M.P.H.M., Mediva Inc. 2-32-18-301, Yoga, Tokyo, Japan
[3] Ph.D., ASEAN Institute for Health Development, Mahidol University, Thailand
[4] B.N.S., Laemyai Health Promoting Hospital, Samut Songkhram Province, Thailand

Corresponding author: *Jiraporn Chompikul* ***Email:*** *jiraporn.chm@mahidol.ac.th*
Received: *11 October 2017* ***Revised:*** *10 March 2018* ***Accepted:*** *24 March 2018*
Available online: *March 2018*

Abstract

Koike I, Chompikul J, Thepthien B and Maikhan N
Determinants of monthly breast self-examination among women in Samut Songkhram Province, Thailand. J Pub Health Dev. 2018;16(1):29-43

The breast cancer incidence rate is highest among women in Thailand. Monthly breast self-examination (BSE) which is simple, inexpensive and effective to detect breast cancer is recommended for every woman as the first step for early detection. Therefore, cross-sectional study was conducted to identify factors associated with monthly BSE among Thai women aged 20 years old and over in Samut Songkhram Province, Thailand. Data collection procedure was carried out from April to May, 2017. A sample of 405 women was selected by multi-stage cluster sampling to participate to face to face interviews. Chi-square tests and multiple logistic regression were used to examine association between independent variables and monthly BSE.

The results of this study showed that only 18.8% of women reported doing monthly BSE while 47.2% never practised BSE. In Chi-square test, variables significantly associated with monthly BSE were family income, health insurance situation, breast cancer knowledge, BSE knowledge, health motivation, BSE training experiences, and mammography experiences. After adjusting for other factors in the multiple logistic regression model, breast cancer knowledge (Adj OR= 3.85; 95% CI= 1.95-7.62), BSE knowledge (Adj OR= 7.31; 95% CI= 2.98-17.93), health motivation (Adj OR= 2.10; 95% CI= 1.14-3.39) and BSE training experiences (Adj OR= 2.85; 95% CI= 1.48-5.49) remained significantly associated with monthly BSE.

These findings suggest that providing BSE training to the women is the key in promoting monthly BSE. Therefore, promoting effective BSE training to increase their knowledge about BSE and breast cancer will result in a widespread of monthly BSE among women.

Keyword: breast self-examination, breast cancer, Thai women

วารสารสาธารณสุขและการพัฒนา
ปีที่ 16 ฉบับที่ 1 มกราคม-เมษายน 2561

ปัจจัยที่มีความสัมพันธ์กับการตรวจเต้านมด้วยตนเองในหญิงไทย จังหวัดสมุทรสงคราม ประเทศไทย

อิโอนา โคอิเกะ[1, 2] จิราพร ชมพิกุล[3] บังอร เทพเทียน[3] และนฤมล ไม้แก่น[4]

[1] *M.P.H.M. สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล ประเทศไทย*
[2] *M.P.H.M., Mediva Inc. 2-32-18-301, Yoga, Tokyo, Japan*
[3] *Ph.D. สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล ประเทศไทย*
[4] *พย.บ. โรงพยาบาลส่งเสริมสุขภาพตำบลแหลมใหญ่ จังหวัดสมุทรสงคราม ประเทศไทย*

บทคัดย่อ

อิโอนา โคอิเกะ จิราพร ชมพิกุล บังอร เทพเทียน และนฤมล ไม้แก่น
ปัจจัยที่มีความสัมพันธ์กับการตรวจเต้านมด้วยตนเองในหญิงไทย จังหวัดสมุทรสงคราม ประเทศไทย
ว. สาธารณสุขและการพัฒนา 2561;16(1):29-43

อัตราอุบัติการณ์ของมะเร็งเต้านมในสตรีสูงที่สุดในประเทศไทย การตรวจร่างกายด้วยตนเองเป็นประจำทุกเดือนซึ่งเป็นวิธีที่ง่ายราคาไม่แพงและมีประสิทธิภาพในการตรวจหามะเร็งเต้านมได้รับการแนะนำสำหรับผู้หญิงทุกคนเป็นขั้นตอนแรกของการตรวจหามะเร็งในระยะเริ่มแรก ดังนั้นการศึกษาแบบภาคตัดขวางนี้จึงได้ทำการศึกษาปัจจัยที่มีความสัมพันธ์กับการตรวจเต้านมด้วยตนเองทุกเดือนของสตรีไทยอายุ 20 ปีขึ้นไปในจังหวัดสมุทรสงครามประเทศไทย เก็บข้อมูลตั้งแต่เดือนเมษายนถึงเดือนพฤษภาคม พ.ศ. 2560 ได้สุ่มเลือกตัวอย่างสตรีจำนวน 405 คนจากการสุ่มตัวอย่างแบบกลุ่มแบบหลายขั้นตอนเพื่อเข้าร่วมการสัมภาษณ์ การทดสอบไคสแควร์และการถดถอยลอจิสติกพหุคูณถูกนำมาใช้เพื่อทดสอบความสัมพันธ์ระหว่างตัวแปรอิสระกับการตรวจเต้านมด้วยตนเองทุกเดือน

ผลการศึกษาแสดงให้เห็นว่ามีเพียง 18.8% ของผู้หญิงที่รายงานว่าการตรวจเต้านมด้วยตนเองทุกเดือน ในขณะที่ 47.2% ไม่เคยมีประสบการณ์การตรวจเต้านมด้วยตนเองทุกเดือน จากการทดสอบไคสแควร์ตัวแปรที่มีความสัมพันธ์กับการตรวจเต้านมด้วยตนเองทุกเดือนได้แก่ รายได้ของครอบครัวสถานการณ์การประกันสุขภาพ ความรู้โรคมะเร็งเต้านม ความรู้เกี่ยวกับการตรวจเต้านมด้วยตนเองทุกเดือน ความแรงจูงใจด้านสุขภาพ ประสบการณ์การฝึกอบรมการตรวจเต้านมด้วยตนเองและประสบการณ์ในการตรวจเต้านมการตรวจเต้านมด้วยเครื่องแมมโมกราฟฟี่ หลังจากปรับอิทธิพลของปัจจัยอื่นๆในตัวแบบการถดถอยลอจิสติกพหุคูณแล้ว ความรู้เกี่ยวกับโรคมะเร็งเต้านม (Adj OR = 3.85; 95% CI = 1.95-7.62) ความรู้การตรวจเต้านมด้วยตนเอง (Adj OR = 7.31; 95% CI = 2.98-17.93) แรงจูงใจด้านสุขภาพ (Adj OR= 2.10; 95% CI= 1.14-3.39) และประสบการณ์การฝึกอบรมการตรวจเต้านมด้วยตนเอง (Adj OR = 2.85; 95% CI = 1.48-5.49) ยังคงมีความสัมพันธ์กับการตรวจเต้านมด้วยตนเองทุกเดือน

ผลการวิจัยเหล่านี้ชี้ให้เห็นว่าการจัดการฝึกอบรมการตรวจเต้านมด้วยตนเองให้กับสตรีเป็นกุญแจสำคัญในการส่งเสริมการตรวจเต้านมด้วยตนเองทุกเดือน ดังนั้นการส่งเสริมให้มีการฝึกอบรมการตรวจเต้านมด้วยตนเองที่มีประสิทธิภาพเพื่อเพิ่มความรู้เกี่ยวกับการตรวจเต้านมด้วยตนเองและความรู้เกี่ยกับโรคมะเร็งเต้านมจะส่งผลให้มีการตรวจเต้านมด้วยตนเองในผู้หญิงเป็นประจำทุกเดือนอย่างการแพร่หลาย

คำสำคัญ: ตรวจเต้านมด้วยตนเอง มะเร็งเต้านม สตรีไทย

Introduction

In Thailand, breast cancer was the most common cancer and age-standardized incidence rate (ASR) of breast cancer was 29.3 per 100,000 in 2012[1-2]. This incidence and mortality rate have been increasing rapidly.

Early detection and effective treatment for the early stage of breast cancer is the most important approach to reduce breast cancer mortality rate[3]. Experimental evidences suggested that mammography, clinical breast examination (CBE) and monthly breast self-examination (BSE) help to detect breast cancer in early stage[4-6]. Mammography is said that effective method to discover breast cancer in the earliest stage, however this screening require high cost for sustainable and proficient skill[7].

In the context of the limited resources, BSE and CBE are useful as an alternative and conjunctive screening approaches in the developing countries[5, 8]. BSE is the multistep examination to feel and observe their breast abnormalities like lumps, thickening, hardened knot or any other changes using women's eyes and hands by individuals for monthly basis. Since BSE is safe, easy to apply, non-invasive procedure with no special material or tool requirements[9-10]. It is very valuable method for people in rural and/or economically developing area who have difficulty to access to the CBE and mammography for regular breast examination[4]. Also self awareness and self management would be enhanced by practicing regular BSE, with the result that women could link to CBE and mammography screening in early stage[11].

In Thailand, Ministry of Public Health have strongly recommended the practicing monthly BSE for all women aged 20 years and older. However this examination is still not familiarized with most of Thai women[6, 12-13]. Therefore it is important to understanding why Thai women do not perform BSE monthly.

It is important to conduct BSE regularly once a month as the habit in order to be familiarize with how our breast look and feel normally. However few studies focused "monthly" BSE in statistical analysis part. Moreover, Samut Songkhram province had much higher prevalence rate in Thailand but there were not many researches related to breast cancer examination in this area[14]. Understanding Thai women's factors related to BSE behaviors will help public health officers, nurses, health village volunteers and other healthcare professionals to choose more effective health education programs and thus increase monthly BSE practices in this area[4]. Thereby, the aim of this study was to identify the determinants of breast self-examination among Thai woman aged 20 years old and over who were living in Samut Songkhram province, Thailand.

Methods

Study design

A community based cross-sectional study was carried out Samut Songkhram province. The data collection was conducted from April to May, 2017 after getting approval from the Office of the Committee for Research Ethics, Faculty of Social Sciences and Humanities, Mahidol University Institutional Review Board (Certificate of Approval No. 2017/054.1403).

Sample size and sampling technique

The sample size was determined using confidence interval of 99%, and acceptable error of 5%, and

the proportion of practicing monthly BSE of 18.4% that was obtained from Thailand Health and Welfare Survey reported[15]. An additional 10% was added calculated sample size of 399 to allow for any missing or incomplete data occurring during data collection as some participants may withdraw from the study. Consequently, the required sample size was 440 women.

Multistage cluster sampling with proportional to size of population were used to randomly select a sample of 440 women from Samut Songkhram province. Stage 1, one districts named Mueang Samut Songkram district were randomly selected from three districts since these three districts have similar characteristics. Stage 2, one sub-district named Laem Yai sub-district was randomly selected from Mueang Samut Songkram district. Stage 3, three villages were randomly selected from Laem Yai sub-district. Stage 4, 440 households were selected by proportional to size of the population from the three selected villages by using household profile obtained from Health promoting hospital.

The inclusion criteria were 20 years old and over and living at Samut Songkhram province which is located at the central region in Thailand. The exclusion criteria were being pregnant, having had breast cancer or any other cancers, during breast feeding, having mental or physical disabilities, and not being able to communicate.

From the total of 440 women, 35 participants left interview without finishing it, thus they were excluded from the study. The final sample included in this analysis was 405 women.

Instrument and Measures

The women were interviewed face to face by the Thai coordinator and research assistances using questionnaire. One day training was conducted to introduce objectives and methodology of the study to the coordinator and two reserch assistants. The objects of the study and ethics matters were explained to respondents to obtain informed consent from all participants before the study began. The structured questionnaire based on the literature reviews and part of the Champion's Health Belief Model Scale (CHBMS) which is a reliable valid tool to measure the Health Belief Model (HBM) to practice BSE[16] and this permission to use and modify was obtained from Champion[17-18]

The questioner was included the information about the participant's socio-demographic characteristics including age, education level, marital status, family income, health insurance situation, number of children, menstruation situation, and family history of breast cancer.

The knowledge about breast cancer and BSE comprised 20 questions. Answers were recoded into 1 or 0. If correct answers were scored one, incorrect answers and "I don't know" were scored zero. Bloom's cut off point was used to classified into three levels (total score <60%=low level, 60% - 80%=moderate level and >80 %=high level)[19]. Kuder-Richardson (KR-20) was used to measure the reliability of the knowledge part and it was high. KR-20 was equal to 0.883 for the breast cancer knowledge and 0.743 for the BSE knowledge.

Using the CHBMS, the questionnaire contains 42 items. Perceived susceptibility to breast cancer

(4 items), perceived seriousness of the breast cancer (7 items), perceived benefits of practicing BSE (6 items), perceived barriers of practicing BSE (6 items), self-efficacy that was women's confidence to execute BSE successfully (11 items), health motivations that was women's general concern about health (8 items). All items were formatted with a 5-point Likert scale, with the following given responses: 1="strongly disagree", 2="disagree", 3="neutral", 4="agree" and 5="strongly agree" for positive statements. All of these statements were positively related to practicing BSE except perceived barriers with negatively associated. Therefore, the score was reversed. Median score for each component was used to categorize women's perception (Equal and more than median was high perception, less than median was low perception).

Cronbach's Alpha was high for the reliability of the perception of susceptibility (0.859), severity (0.813), barriers (.679), benefit (0.896), self-efficacy (0.916) and health motivation (0.901).

Cues to action to BSE dealing with information of BSE and training experiences of BSE comprised 5 questions. Breast cancer examination experiences were including experiences of BSE, CBE and mammography. The respondents who answered practice monthly BSE were classified as performance monthly BSE as dependent variable.

All questions were originally designed in English and translated to Thai version questionnaires by Thai and English bilinguals. And the other bilingual person validated by the back translation technique. The translated instruments were reviewed by a group of Thai health education experts.

Data analysis

Descriptive statistics was used to describe the socio-demographic characteristics. Mean, standard deviation (SD), median, quartile deviation (QD), and percentage were used to describe each independent and dependent variables.

Chi-square tests and simple logistic regression were used to identify an association between each independent variable and monthly BSE in this study. Multiple logistic regression was used to determine associations between the independent variables and monthly BSE.

Results

Table 1 shows the distribution of 405 women classified by socio-demographic characteristics. Median age was 48 years which ranged from 20 to 79 years. Over half of women (57.0%) completed primary school and 20.6% finished secondary school. Nearly two-thirds of women (64.9%) were married. About family income question, some women did not know or did not want to answerer family income. Only 287 women answered this question. Median monthly family income was 9,000 Baht which ranged from 400 Baht to 100,000 Baht. Majority (71.3%) were covered by Universal Coverage Schema (UC). Concerning number of children, 78.5% of women had more than one children. More than half of women (59.5%) had menstruation. Only a few women (7.7%) had family history of breast cancer.

Table 2 shows distribution of knowledge levels and perceptions levels. More than half of women (53.6%) were in a high level of breast cancer knowledge. However only 16.0% of women had good BSE knowledge. Nearly half of women (45.9%) were

moderate level and about one-three were (38.1%) poor level of BSE knowledge. About 54.1% of women had high level of perceived susceptibility to breast cancer and 45.9% of women had low level of perceived susceptibility. About perceptions, 77.3% of women had high level of perceived barriers.

Table 1 Distribution of respondents by socio-demographic characteristics

Socio-demographic factors	Number	Percent
Age group (years)	405	
20-34	87	21.5
35-49	138	34.1
50-64	140	34.5
≥65	40	9.9
(Median = 48, QD = 11, Min = 20, Max = 79)		
Education	402	
No education	8	2.0
Primary school	229	57.0
Secondary school	83	20.6
Vocational	36	9.0
Bachelor	46	11.4
Marital status	405	
Single	74	18.3
Married	263	64.9
Divorced	10	2.5
Widowed	49	12.1
Separated	9	2.2
Family income (Baht)[a]	287	
<9000	139	48.4
≥9000	148	51.6
(Median = 9000, QD = 4500, Min = 400, Max = 100000)		
Health insurance situation	405	
No insurance	8	2.0
Civil Servant Medical Benefit Scheme (CSMBS)	17	4.2
Social Security Schema (SSS)	81	20.0
Universal Coverage Schema (UC)	289	71.3
Private insurance	10	2.5
Number of children	405	
0	87	21.5
1-2	213	52.6
3-10	105	25.9
(Median = 2, QD = 1, Min = 0, Max = 10)		
Menstruation situation	405	
Menstruation	241	59.5
Menopause	164	40.5
Family history of breast cancer	405	
Yes	31	7.7
No	374	92.3

a=34 Baht for 1 USD

Table 2 Distribution of respondents by levels of knowledge and perception

Knowledge and perception	Number	Percent
Levels of breast cancer knowledge		
Good (>8.8)	217	53.6
Moderate (6.6-8.8)	70	17.3
Poor (<6.6)	118	29.1
(Median= 9.0, QD=2.5, Min=0, Max=11)		
Levels of BSE knowledge		
Good (>8)	65	16.0
Moderate (6-8)	186	45.9
Poor (<6)	154	38.1
(Median=6.5, QD=1.75, Min=0, Max=10)		
Levels of perceived susceptibility		
High (≥11)	219	54.1
Low (<11)	186	45.9
(Median=11, QD=2, Min=4, Max=20)		
Levels of perceived severity		
High (≥22)	210	51.9
Low (<22)	195	48.1
(Median=22, QD=3.5, Min=7, Max=33)		
Levels of perceived benefit		
High (≥24)	222	54.8
Low (<24)	183	45.2
(Median=24, QD=1.5, Min=6, Max=30)		
Levels of perceived barriers		
Low (<12)	92	22.7
High (≥12)	313	77.3
(Median=12, QD=1.5, Min=6, Max=24)		
Levels of perceived self-efficacy		
High (≥39)	222	54.8
Low (<39)	183	45.2
(Median=39, QD=4, Min=11, Max=55)		
Levels of perceived health motivation		
High (≥31)	217	53.6
Low (<31)	188	45.2
(Median=31, QD=2, Min=8, Max=40)		

Tables 3 presents most of the women (92.8%) received BSE information, especially from public health officers (66.0%). TV (51.1%) were major sources of BSE information. Around half of women (48.4%) had got experience of BSE training. Among them around three-four of women (77.6%) had got training from public health officers and the most common organization was Health Promoting Hospitals (88.3%).

Table 3 Distribution of respondents by cues to actions

Cues to actions	Number	Percent
BSE information	**405**	
Yes	376	92.8
No	29	7.2
Sources of information (Multiple answers) [b]	**376**	
TV	192	51.1
Newspaper	46	12.2
Radio	35	9.3
Internet	51	13.6
Pamphlets	127	33.8
Physicians/Nurses	131	34.8
Public health officers	248	66.0
Village Health Volunteers (VHVs)	135	36.0
Family, Relatives, Friends and others	120	31.91
BSE training experiences	**405**	
0	209	51.6
1-2	182	44.9
≥3	14	3.5
Median = 0, QD =0.5, Min = 0, Max = 5)		
Provider of BSE training [c]	**196**	
(Multiple answers)		
Village Health Volunteers (VHVs)	61	31.1
Nurses	10	5.1
Public health officers	152	77.6
Others	3	1.5

b = The number of respondents who had ever got BSE information

c = The number of respondents who had ever got BSE training

The study revealed only 5.4% of women had got mammography and nearly one-four of women (28.6%) had got CBE at the hospital. And more than half of women (52.8%) had tried BSE at least one time, while only 18.8% of those were doing monthly BSE as recommended. As a reasons of not doing regularly BSE, one-third of women (35.7%) selected "Unsure of BSE techniques" (Table 4).

Table 4 Distribution of respondents by breast cancer examination

Breast cancer examination	Frequency	Percent
Mammography	**405**	
Yes	22	5.4
No	383	94.6
Clinical breast examination	**405**	
Yes	116	28.6
No	289	71.4
Breast self-examination	**405**	
Yes	214	52.8
No	191	47.2
Frequency of doing BSE	**405**	
Never	191	47.2
Whenever curious	33	8.1
Irregularly	105	25.9
Every month	76	**18.8**
The reasons that why don't do BSE regularly [d]	**321**	
(Multiple answers)		
Busy	72	22.4
Forget	65	20.2
Unsure of BSE techniques	115	35.7
Not at risk of breast cancer	69	21.4
Embarrass	16	5.0
BSE is not important	29	9.0
No private space	6	1.9

d = The number of respondents who had not done BSE regularly

Table 5 describes association between each independent variable and monthly BSE. The following factors were significantly associated with monthly BSE; family income, health insurance situation, breast caner knowledge, BSE knowledge, Health motivation, BSE training experiences and taking mammography. The women having low family income were more likely to practice monthly BSE (OR= 2.02, 95% CI= 1.14-3.57). Family income was not included in the multiple logistic regression as around 30% of women appeared to avoid answering this question. Women who had good knowledge about breast cancer were 7.64 times more likely to do monthly BSE than those with poor knowledge (OR= 7.64; 95% CI= 3.19-18.27). The women who had good knowledge about BSE were 19.87 times more likely to do monthly BSE (OR=19.87; 95% CI=7.67-51.46) and the women who was a moderate level of BSE knowledge were around 7 times more likely to do monthly BSE (OR= 6.99; 95% CI: 2.87-16.9). The women who have ever got BSE training were 5.32 times more likely to do monthly BSE (OR= 5.32; 95% CI= 2.94-9.63). On the other hand, age, education, marital status, number of children, menstruation situation and family history of breast cancer were not significantly associated with monthly BSE.

Table 5 Association between independent variables and monthly BSE

Variables	Monthly BSE			Crude OR (95% CI)	P-value
	n	Yes%	No%		
Family income	287				
Low (<median)	139	28.1	71.9	2.02 (1.14-3.57)	**0.016**
High (≥median)	148	16.2	83.8	1	
Health insurance situation	405				
UC	289	21.8	78.2	2.21 (1.16-4.19)	**0.015**
Others	116	11.2	88.8	1	
Breast caner knowledge	405				
Good (>8.8)	217	29.0	71.0	7.64 (3.19-18.27)	**<0.001**
Moderate (6.6-8.8)	70	10.0	90.0	2.07 (0.67-6.44)	**0.207**
Poor (<6.6)	118	5.1	94.9	1	
BSE knowledge	405				
Good (>8)	65	44.6	55.4	19.87 (7.67-51.46)	**<0.001**
Moderate (6-8)	186	22.0	78.0	6.99 (2.87-16.9)	**<0.001**
Poor (<6)	154	3.9	96.1	1	
Health motivation	405				
High (≥Median)	217	25.3	74.7	2.70 (1.56-4.67)	**<0.001**
Low (<Median)	188	11.2	88.8	1	
BSE training experiences	405				
Yes	196	30.6	69.4	5.32 (2.94-9.63)	**<0.001**
No	209	7.7	92.3	1	
Mammography	405				
Yes	22	36.4	63.6	2.65 (1.07-6.56)	**0.035**
No	383	17.8	82.2	1	

All significant independent variables from the Chi-square tests were included in the full model of the multiple logistic regression excluding "family income" and "mammography experience" as limited number of women answered and few women had got mammography. Table 6 shows breast cancer knowledge, BSE knowledge, Health motivation and training experience remained significant predictors for monthly BSE.

Table 6 Multiple logistic regression for predictors of monthly BSE

Variables	Adj. OR	95% C.I. for OR		P-value
		Lower	Upper	
Health insurance				
UC	1.65	0.80	3.38	0.175
The other	1			
Knowledge about breast cancer				
Good	3.85	1.95	7.62	**<0.001**
Moderate to poor	1			
Knowledge about BSE				
Good to Moderate	7.31	2.98	17.93	**<0.001**
Poor	1			
Health motivation				
High	2.10	1.14	3.39	**0.018**
Low	1			
Training experience				
Yes	2.85	1.48	5.49	**0.002**
No	1			

Discussion

This study revealed that only 18.8% of the women reported doing monthly BSE while 47.2% of women had never tried BSE. This result was relatively lower proportion of BSE when compared with some other study in Thailand. For instance, the study among women in northeast region in Thailand was reported 49% of women doing monthly BSE[12], 33.0% of women did monthly BSE among Thai breast cancer patients in 2012[20]. However, this study revealed similar result when compared to the previous Thai national household survey in 2007 (18.4% of women did monthly BSE[15]) and other researches in low and middle income countries these showed low prevalence of BSE, 19% in Malaysia[21], 17% in Turkey[22] and 14.4% in Ethiopia among health extension workers[23]. These rates were lower than high income countries prevalence such as 61% of Canada women did regularly BSE[24]. This present result agreed with Asian women had lower breast cancer screening prevalence than western women[15].

In this study, there were two significant predictors in the socio-demographic characteristics; family income and health insurance situation. The low income women and the women who covered by UC were nearly twice more likely to practice monthly BSE. Most of the low income women were covered by UC thus the health insurance situation also significant. These findings were contrary to the previous studies. In the Turkey study, the women with good perceived income level more likely to perform BSE[22]. Thai women who covered by the CSMBS had higher likelihood of practicing BSE than the women who covered by UC[15]. This contrast would be because the lower income women could not afford to take breast cancer examination in the hospital. However, they had more chance to visit Health Promoting Hospital which regularly providing BSE training in the study area. This might contribute of the prevalence of BSE practice.

This study didn't show any association between age, education levels, marital status, having children, menstruation status and family history of breast cancer and monthly BSE. This result was similar to the studies in the Thai[12], Malaysia[16] and Ethiopia[23]. However, most of researches found the association between the family history of breast cancer and BSE3,[25-26]. In this study, it was difficult to find out the association because insufficient sample size for statistical analysis (7.7%), also this result was consistent with some previous studies[12, 21-22].

Perceived susceptibility was not influential predictors to practicing monthly BSE. Previous studies in Iran[3] and Turkey[22] were inconsistent with this finding. One explanation of this inconsistent is that most of Thai women believed breast cancer is still disease of western women and that was not relevant to them[12].

Perceived seriousness was not significantly related to doing monthly BSE. Though this result was contrast to HBM theory, it was in agreement with the results of previous studies such as the study among western Turkey[27] and Iranian women[28]. This would be the possible explain that breast cancer might be generally perceived as a serious disease by the most of the women and therefore it did not work as a good predictor of monthly BSE.

Perceived benefits was not significantly related to doing monthly BSE. There were conflicting in the previous findings. For example, the studies among western Turkey[27] and Saudi women[25] mentioned that perceived benefits was the significant predictor of BSE performance. However these studies among Iranian women[28], in Nigeria[29] and among Malaysian women[21] supported this present result. One explanation for the conflict might be different based on the population context.

There was no association between perceived barriers and doing monthly BSE in this study. This finding was contradicted HBM theory and prior researches. For example, the study in Turkey and Iran found that women who perceived greater barriers to BSE were somewhat less likely to perform BSE[22, 28]. However Nigeria[29] supported this present result. This reason could be explained that most of women answered disagree and strongly agree with all perceived barriers' questions in this study. Because of that, any association in this analysis could not be found.

Self-efficacy was not significant predictor of doing monthly BSE. This result was contrary to the

previous studies. Previous studies found out self-efficacy as the most powerful predictor of doing BSE in western Turkey[11], Iran[4], and Nigeria[29]. Because the women who had high self-efficacy are willing to control and management health obstacle[3]. This inconsistency may be because of the difference of education levels, media exposure and culture of the participants.

Health motivation and doing monthly BSE were significantly associated. The women who had high level of health motivation were 2.85 times more likely to do monthly BSE than the women who had low level. This result was consistent with studies done in Iran[28] and Nigeria[29]. Because the women who had high concern about general health were interested in health education program that was held at the community. These women were able to get knowledge of BSE, too, and follow that health promotion behavior.

Among cues to actions, while information of BSE was failed to find to be associated with doing monthly BSE, experience of BSE training was founded as the main predictors of doing monthly BSE. This result was consist with the study in Thai Roiet province showed experiences of practice was significantly related to practice BSE[6].

The association between mammography and doing monthly BSE was significant by Chi-square test and simple multiple logistic. The previous study showed a contrast result that there was no association between regularly BSE and having mammogram in Thailand[15]. In this present study, the women who had got mammography had high health motivation, and thus they might intend to do monthly BSE.

There was some limitation of the study. The self-reported data was used to investigate doing monthly BSE. Recall bias might be occurred during the data collection. Also this study could not found women's BSE correct skill. Thereby, future research should focus women's BSE skill using breast model to invest their correctly BSE. About the research assistants, this study hired VHVs who are familiar with villagers. Thus, bias of the interviewers might affect the result and sensitive questions were difficult to get answer such as family income. Thereby, the medical persons who are unrelated to target area such as nursing students should be hired in the future research. The strength was the study design which was a community-based study. It was conducted for wide range of women age and focused on "monthly" BSE.

Recommendations

This study revealed that even though Thai government recommend monthly BSE for the women aged 20 years old and over, the prevalence of monthly BSE was still low in this area. From the findings, there were four important factors to design BSE promotion programs: 1) breast cancer knowledge 2) BSE knowledge 3) Heath motivation 4) BSE training. Thus, health education focusing on breast cancer risk factors and BSE technics should be more promoted to help women assess their risk and enhance their awareness of the importance of early breast cancer detection and monthly BSE. Moreover, for the sustainable awareness, women should be encouraged to obtain other breast cancer screening method like CBE and mammography with low cost. Because these methods also very effective to find breast cancer at early stage. Moreover it will increase contact with the health care system and in turn, lead to increased opportunity for health care providers to encourage

women to do monthly BSE. Thus, the holistic breast cancer examination package including BSE education, CBE, and mammography should be provided by multi-sectorial approaches in accordance with appropriate age, for example, annual breast checkup at health promoting hospitals.

Acknowledgements

I thank all the village health volunteers and women in Laem Yai sub-district who participated in the data collection of the study. I am very grateful to the ASEAN Institute for Health Development for the financial support of my study.

References

1. Ministory of Public Health. Cancer in Thailand vol. VIII, 2010-2012. Thailand: New Thammada Press Co., Ltd.; 2015.
2. Ben A, Sanchia A, Kris C, Finola C, Polly C, Shu-Ti C, et al. Breast cancer in Asia The challenge and response. The Economist Intelligence Unit, 2015.
3. Mehdi MA, Mohammad M, Farzad J, Abbas A, Touraj AJ. Factors Related to Self-Breast Examination Based on Health Belief Model among Iranian Women. Res J Med Sci. 2015;9(3):105-8.
4. Azita N, Tayyebh J, Rahim T. Determinants of breast self-examination performance among Iranian women: an application of the health belief model. J Canc Educ. 2011;26(2):365-74.
5. Kumsuk S. Predictors of Breast Self-examination among Thai Nurses. Asia Pac J Public Health. 2010;1(1):51-8.
6. Wasana L, Khemika Y. Factors affecting breast self-examination among women in Poiet municipality, Roiet province, Thailand. J Health Res 2010;24(Suppl2):37-40.
7. Sankaranarayanan R. Screening for cancer in low- and middle-income countries. Annals of Global Heaalth 2014;80:412-7.
8. Danny RY ,Susanna MC, Cheng HY, Peter D. Baade Incidence and mortality of female breast cancer in the Asia-Pacific region. Cancer Biol Med. 2014;11(2)101-15.
9. Goulet C. Psychosocial Predictors of Breast Awareness Behaviors [Ph.D thesis]. Ann Arbor: West Virginia University; 2014.
10. Beydağ KD, Yürügen B. The effect of breast self-examination education given to midwifery students on their knowledge and attitudes. Asian Pac J Cancer Prev. 2010;11(6):1761-4.
11. Saadoon FA, Ali A, Hadeel AA, Ali EI, Gemal M, Mdhat K. Practicing breast self-examination among women attending primary health care in Kuwait. Bull Alexandria Fac. 2013;49(3):281-6.
12. Satitvipawee P, Promthet SS, Pitiphat W, Pitiphat W, Kalampakorn S, Parkin DM. Factors associated with breast self-examination among Thai women living in rural areas in Northeastern Thailand. J Med Assoc Thai. 2009;92(Supple7):S29-35.
13. Sutharat C, Panudda P, Kanokporn M. Factors Associated with Breast Self-examination Behaviors among Women Workers. Journal of Nursing Science. 2014;32(3):42-51.
14. Ministory of Public Health Thailand. Important non-communicable diseases Standard report taskforce2016. [Cited 2016 Nov 28] Available from: http://hdcservice.moph.go.th/hdc/reports/report.php?source=formated/ncd.php&cat_id=6a1fdf282fd28180eed7d1cfe0155e11&id=825c7f

bfdbde936cf821a9b16dc4189b.

15. Mukem S, Sriplung H, McNeil E, Tangcharoensathien V. Breast cancer screening among women in Thailand: Analyses of population-based household surveys. J Med Assoc Thai. 2014;97(11):1106-18.
16. Parsa P, Kandiah M, Mohd NM, Hejar AR, Nor AM. Reliability and validity of Champion's Health Belief Model Scale for breast cancer screening among Malaysian women. Singapore Med J. 2008;49(11):896-903.
17. Champion VL. Instrument refinement for breast cancer screening behaviors. NR. 1993;42(3): 139–43.
18. Champion VL. Revised susceptibility, benefits, and barriers scale for mammography screening. Res Nurs Health. 1999;22(4):341-8.
19. Bloom BS EM, Furst EJ, Hill WH, Krathwohi DR. Taxonomy of education objective. United States of America: Longmans, Green; 1956.
20. Buranaruangrote S, Sindhu S, Mayer DK, Ratinthorn A, Khuhaprema T. Factors influencing the stages of breast cancer at the time of diagnosis in Thai women. Collegian. Collegian.2014;21(1): 11-20.
21. Parsa P, Kandiah M, Parsa N. Factors associated with breast self-examination among Malaysian women teachers. Eur J Cancer. 2011;17(6): 509-16.
22. Secginli S, Nahcivan NO. Factors associated with breast cancer screening behaviours in a sample of Turkish women: a questionnaire survey. Int J Nurs Stud. 2006;43(2):161-71.
23. Birhane N, Mamo A, Girma E, Asfaw S. Predictors of breast self - examination among female teachers in Ethiopia using health belief model. Arch Public Health. 2015;73(1):39.
24. Jelinski SE, Maxwell CJ, Onysko J, Bancej CM. The influence of breast self-examination on subsequent mammography participation. Am J Public Health. 2005;95(3):506-11.
25. Mostafa AA, Ala'a AB, Aisha AM, Mohammed HAA, Amal FAJ, Ahmed SA. Using the health belief model to predict breast self examination among Saudi women. BMC Public Health. 2015;15(1):1-12.
26. Ilknur AA. Factors associated with breast self-examination practices and beliefs in female workers at a Muslim community. Eur J Oncol Nurs. 2008;12(2):127-33.
27. Dündar PE, Özmen D, Öztürk B, Haspolat G, Akyıldız F, Çoban S, et al. The knowledge and attitudes of breast self-examination and mammography in a group of women in a rural area in western Turkey. BMC Cancer. 2006;6(1):43-51.
28. Azita N. Factors influencing breast cancer screening behavior among Iranian women. Asian Pasific J Cancer Prev. 2011;12:1239-44.
29. Olowokere A, Onibokun A, Irinoye O. Women's health beliefs and breast cancer screening practices in Nigeria. J Midwifery Womens Health. 2012;6(2):91-7.