Knowledge, attitudes and practice of breast cancer screening among female personnel of Walailak University

Manas Kotepui BSc PhD,* Duangjai Piwkhram BSc PhD,† Chaowanee Chupeerach BSc PhD‡ and Suwit Duangmano BSc MSc PhD§

*Lecturer in Medical Technology, †Lecturer in Medical Technology, Medical Technology Program, School of Allied Health Sciences and Public Health, Walailak University, Nakhon Si Thammarat, ‡Lecturer in Nutrition, Institute of Nutrition, Mahidol University, Nakhon Pathom and §Lecturer in Medical Technology, Department of Medical Technology, Faculty of Associated Medical Sciences, Chiang Mai University, Chiang Mai, Thailand

Abstract

Correspondence

Manas Kotepui BSc, PhD
Medical Technology Program
School of Allied Health Sciences and
Public Health
Walailak University
Nakhon Si Thammarat 80161
Thailand
E-mail: manas.ko@wu.ac.th

Accepted for publication

29 September 2014

Keywords: attitudes, breast cancer screening, knowledge, practice, Walailak University

Background Breast cancer is the most common cancer among women worldwide.

Methods This study aimed to assess the knowledge, awareness and practice of breast cancer screening for early detection of breast cancer among female personnel at a university. A cross-sectional descriptive study was administered to female personnel of Walailak University in Nakhon Si Thammarat, Thailand. Data were analysed by SPSS version 16.

Results Among total of 217 female personnel, the lecturers and laboratory scientists and general officers had a significantly higher mean knowledge score about the practice of breast cancer screening than temporary employees ($P < 0.0001$). The level of education and income of respondents may be involved with this difference in knowledge ($P < 0.05$).

Conclusion This study concludes that knowledge about the practice of breast cancer screening could be attributed to different career groups, level of education and income of respondents. There is a very urgent need for regular learning courses for personnel concerning knowledge about the practice of breast cancer screening especially for those personnel with less formal education and low income.

Introduction

Globally, as well as in Thailand, breast cancer has been reported as the most common cancer among women and the second leading cause of death; the global age-standardized incidence rate in 2012 was 29.3 per 100 000 and the

death rate was 11.0 per 100 000 per year.¹ According to the latest report by the National Cancer Institute of Thailand, breast cancer comprises 37.5% of all cancers among Thai women, with the highest rate occurring in those aged over 30 years.² Various risk factors for breast cancer have been reported including

increased age, being overweight, use of hormone replacement therapy (HRT), physical inactivity, high dietary fat, high breast tissue density, excessive alcohol consumption, early menarche, late menopause, having no children, smoking and family history.³

Early diagnosis of breast cancer results in treatment before metastasis and signifies a better outcome of management.⁴ To seek medical care which will help early in the course of disease, women need to have knowledge about risk factors and must perform surveillance of their breasts to detect any unusual condition. In addition, to ensure participation in future population-based screening programmes, women must have knowledge about and a positive attitude towards breast cancer screening. Thus, it is important to educate the public about the importance of early detection of breast cancer by specific screening methods. The recognized screening methods for breast cancer include clinical breast examination (CBE), mammography and magnetic resonance imaging (MRI).⁵ Breast self examination (BSE) as a screening method has been subject to trials, but it has been reported that it makes women more aware of signs of breast cancer, which may lead to earlier diagnosis.⁶ It is stated that 90% of the times breast cancer is first noticed by the person herself.⁷ Women become familiar with both the appearance and the feel of their breast and detect any changes in their breasts as early as possible.⁸ Moreover, barriers to diagnosis and treatment can be addressed by increasing women's awareness of breast cancer.⁹ Mammography is the most effective diagnostic method for reduction of mortality due to breast cancer. However, it is not regarded as a suitable modality for poor countries due to its costly nature and requirement of technical specialty. Therefore, routine BSE on a monthly basis in all the women over the age of 20 is recommended because it is an easy to apply, economical, safe, non-invasive procedure with no special material or tool requirements.

Few studies have examined the knowledge of women in Thailand about breast cancer.^{10–14} The low rate of breast cancer screening among

Thai women is of concern in the public health and medical fields.¹⁵ Study findings have shown that 40.0% of Thai women perform BSE and 46% of those women perform BSE monthly. Nearly 29.0% had had CBE, and 8.0% had CBE regularly, while 5.8% of participants had a mammogram in the past, with only 4.0% having annual mammograms.¹⁵ This study was designed to evaluate the knowledge, attitudes and practices regarding breast cancer screening among female personnel at Walailak University in Nakhon Si Thammarat, Thailand.

Methods

This was a cross-sectional, descriptive study carried out between August and December 2012 among female personnel at Walailak University in Nakhon Si Thammarat, Thailand. The study was approved by The Ethical Clearance Committee on Human Rights Related to Researches Involving Human Subjects of Walailak University (EC number 042/2556). The categories of female personnel included lecturers, laboratory scientists and general officers, and temporary employees. The minimum sample size required for the study was 84 based on a mammography practice rate of 5.8%¹⁵ using a formula for sample size determination for a cross-sectional, descriptive study.¹⁶ All female personnel employed by the university at the time of the study were eligible to participate. A total of 217 of 240 eligible female personnel completed and returned questionnaires, for a response rate of 90.4%. Information was collected on socio-demographic characteristics, knowledge of risk factors for breast cancer, and screening methods and practice of BSE, CBE, and mammography.

Knowledge of risk factors was assessed by requesting respondents to determine which of the following were risk factors for breast cancer – *family history, use of oral contraceptives, hormone therapy, having a first child after age 30 years, early menarche (< 12 years), late menopause (> 55 years), alcohol drinking, increased age, obesity, and breast feeding*. Each correct response was awarded one (1) point and each incorrect response was scored zero (0).

The total score ranged from 0 to 10. Respondents with scores of 0–2 were considered to have poor knowledge, those with 3–6 points were considered to have fair knowledge, and those with 7–10 points were considered to have good knowledge. The mean knowledge score of risk factors for each personnel group was calculated and compared between groups using one-way ANOVA.

To determine knowledge of BSE, respondents were asked to answer the following questions: *Should BSE be performed once a month for those with age > 20? Should BSE be performed during the three days post-menstruation? Are there two steps of breast self-examination: (1) breast observation, (2) palpation of breast? Do signs of breast cancer include a lump, skin retraction, abnormal appearance of the breast including more blood vessels, skin edema, and water or blood leaking from the nipples? Are most breast cancers found when the breast is palpated for hard tissue and pain is felt or a palpable lump is detected?*

For knowledge of CBE, respondents were asked to answer the following question: *Should women aged over 35 years or at risk of breast cancer receive a clinical breast examination by a doctor with breast X-ray once a year?* For knowledge of mammography, respondents were asked to answer the following questions: *What is mammography? How often should mammography be performed? Is mammography beneficial? Is mammography safe? Can mammography detect early stage breast cancer before it is palpable? Is mammography more beneficial for women ≥ 50 years than for those < 50 years?* Each correct response was awarded one (1) point and each wrong response was scored zero (0). The total score ranged from 0 to 12. Respondents with scores of 0–4 were considered to have poor knowledge, those with 5–9 points were considered to have fair knowledge, and those with 10–12 points were considered to have good knowledge. Mean scores for knowledge of BSE, CBE and mammography for each personnel group were calculated and compared between groups using one-way ANOVA. The practice of BSE, CBE and mammography was considered for each group

and correlated with selected demographic variables using Pearson's chi-squared test (χ^2). Data analysis was performed using the SPSS version 16.0 (SPSS Inc., Chicago, IL, USA) statistical package, and differences were considered statistically significant at $P < 0.05$.

Results

Socio-demographic data

Table 1 shows the demographic profile of the respondents. A total of 217 female personnel participated in the study. Most of the respondents were aged between 30 and 39 (108, 49.7%), followed by those aged 40–49 (72, 33.2%), those aged 20–29 (23, 10.6%), those aged 50–59 (11, 5.1%), those aged over 60 (2, 0.9%), and those aged under 20 (1, 0.5%). Fifty-four respondents (24.9%) were lecturers, 87 (40.1%) were laboratory scientists or general officers, and 76 (35%) were temporary employees. Most respondents were married (136, 62.7%) and Buddhist (204, 94%). Many respondents had a bachelor's degree (78, 35.9%), income between 5000 and 10 000 baht per month (67, 30.9%) and had one or two children (105, 48.4%). One respondent reported a history of breast cancer (0.5%), and 44 respondents reported a history of cancer in their family (20.3%).

Risk factors for breast cancer

Table 2 shows the responses to questions about the knowledge of specific risk factors for breast cancer. A majority of the sample group (161, 74.2%) were aware of that a positive family history of breast cancer was a risk factor for developing breast cancer, followed by increased age (134, 61.8%), use of oral contraceptives (126, 58.1%), use of hormone therapy (126, 58.1%) and drinking alcohol (113, 52.1%). The same trends of knowledge were noted for lecturers, laboratory scientists and general officers, and temporary employees. The overall mean knowledge score was 4.75 ± 2.66 out of a maximum score of 10 points, (95% CI = 4.39–5.10). There

Table 1 Demographic characteristics of respondents

Characteristics	Frequency (<i>n</i> = 217)	%
Age group (years)		
<20	1	0.5
20–29	23	10.6
30–39	108	49.7
40–49	72	33.2
50–59	11	5.1
>60	2	0.9
Career		
Lecturers	54	24.9
Laboratory scientists and general officers	87	40.1
Temporary employees	76	35.0
Marital status		
Single	72	33.2
Married	136	62.7
Separated	9	4.1
Religion		
Buddhist	204	94
Christian	2	0.9
Islam	11	5.1
Education		
Primary school	36	16.6
Secondary school	33	15.2
Bachelor's degree	78	35.9
Master's degree	43	19.8
Ph.D. degree	27	12.4
Income (baht)		
<5000	4	1.8
5000–10 000	67	30.9
10 001–20 000	42	19.4
20 001–30 000	54	24.9
>30 000	50	23
Number of children		
1–2	105	48.4
≥3	21	9.7
No children	91	41.9
History of breast cancer		
Yes	1	0.5
No	216	99.5
History of cancer in family		
Yes	44	20.3
No	173	79.7

was no significant difference in mean knowledge scores between the categories of personnel ($P > 0.05$).

Knowledge about breast cancer screening

Assessment of knowledge about breast cancer screening among respondents is shown in

Table 3. Results revealed that 76 respondents (35%) had good knowledge, while 125 (57.6%) had fair knowledge and 16 (7.4%) had poor knowledge of breast cancer screening. A majority of the sample group (207, 95.4%) knew that there are two steps of breast self-examination, that women aged over 35 or at risk of breast cancer should receive CBE by a doctor with a breast X-ray once a year 206 (94.9%) and that most breast cancers are found when the breast is palpated for hard tissue, and pain is felt or a palpable lump is detected (203, 93.5%). There were different trends of knowledge. For lecturers and temporary employees, the trend was the same as trend of the majority of the total population. For laboratory scientists and general officers, 86 (98.9%) knew that women aged over 35 or at risk of breast cancer should receive a CBE by doctor with a breast X-ray once a year.

The overall mean knowledge score of breast cancer screening was 8.01 ± 2.63 out of a maximum score of 12 points (95% CI = 7.66–8.36). The lecturers and laboratory scientists and general officers had significantly higher mean knowledge scores (9.22 ± 2.19 and 9.10 ± 2.24 , respectively) than temporary employees (5.89 ± 1.95) ($F = 57.586$, $P < 0.0001$). Overall assessment of temporary employees' knowledge revealed that 76 (35%) had good knowledge, 125 (57.6%) had fair knowledge and 16 (7.4%) had poor knowledge about breast cancer screening. The lecturers and laboratory scientists and general officers groups (48.9%) had significantly higher knowledge scores for breast cancer screening than those of temporary employees (9.2%) ($X^2 = 50.173$, d.f. = 2, $P < 0.0001$).

Information in Table 4 shows that the majority of the respondents (172, 79.3%) performed BSE, and 67 reported performing BSE monthly (39%). A majority of respondents (105, 48.4%) had received a CBE; 62.9% of respondents who had received a CBE were in the 30–39 age group (66); 83.8% received a CBE annually. A majority of the respondents (136, 68.7%) had never received a mammogram and were in the 30–39 age group (49, 60.5%) and mostly (66, 81.5%) received one annually.

Table 2 Knowledge of specific risk factors of breast cancer among respondents

Parameters	Lecturers Freq%	Laboratory scientists and general officers Freq%	Temporary employees Freq%	Total Freq%
Family history	50 (92.6)	63 (72.4)	48 (63.2)	161 (74.2)
Contraceptives	40 (74.1)	46 (52.9)	40 (52.6)	126 (58.1)
Hormone therapy	39 (72.2)	49 (56.3)	38 (50)	126 (58.1)
Having first child after age 30	18 (33.3)	32 (36.8)	32 (42.1)	82 (37.8)
Early menarche (<12 years)	17 (31.5)	29 (33.3)	26 (34.2)	72 (33.2)
Late menopause (>55 years)	16 (29.6)	28 (32.2)	19 (25.0)	63 (29.0)
Drinking alcohol	28 (51.9)	42 (48.3)	43 (56.6)	113 (52.1)
Increased age	38 (70.4)	45 (51.7)	51 (67.1)	134 (61.8)
Obesity	29 (53.7)	31 (35.6)	35 (46.1)	95 (43.8)
Breast-feeding	9 (16.7)	23 (26.4)	26 (34.2)	58 (26.7)
Mean score ($X \pm SD$)	5.26 $\pm$ 2.47	4.46 $\pm$ 2.94	4.71 $\pm$ 2.42	4.75 $\pm$ 2.66
95% CI	4.58–5.93	3.83–5.08	4.15–5.26	4.39–5.10

Freq, frequency.

Table 3 Knowledge of breast cancer screening among respondents

Parameters	Lecturers Freq%	Laboratory scientists and general officers Freq%	Temporary employees Freq%	Total Freq%
Should BSE be practised once a month for age>20	41 (75.9)	68 (78.2)	58 (76.3)	167 (77.0)
Should BSE be practised in the 3-day period post-menstruation	34 (63)	59 (67.8)	48 (63.2)	141 (65.0)
There are two step of breast self-examination: (1) breast observation and (2) palpation of breast	53 (98.1)	83 (95.4)	71 (93.4)	207 (95.4)
Breast cancer signs are a lump, skin retraction, abnormal appearance of the breast including more blood vessels, skin oedema and water or blood leaking from the nipples	53 (98.1)	82 (84.3)	60 (78.9)	195 (89.9)
Most breast cancers are found when the breast is palpated and hard tissue, pain or a palpable lump is found.	51 (94.4)	84 (96.6)	68 (89.5)	203 (93.5)
Women over 35 years or with a risk of breast cancer should receive a clinical breast examination by a doctor with a breast X-ray once a year	51 (94.4)	86 (98.9)	69 (90.8)	206 (94.9)
What is mammography?	44 (81.5)	68 (78.2)	12 (15.8)	124 (57.1)
How often should it be done?	33 (61.1)	58 (66.7)	11 (14.5)	102 (47.0)
Is its beneficial?	41 (75.9)	66 (75.9)	12 (15.8)	119 (54.8)
Is mammography safe?	36 (66.7)	43 (49.4)	6 (7.9)	85 (39.2)
Can it detect early stage breast cancer before it is palpable?	35 (64.8)	51 (58.6)	11 (14.5)	97 (44.7)
Is mammography more beneficial in women ≥ 50 years than those <50 years?	20 (37)	38 (43.7)	6 (7.9)	64 (29.5)
Mean score ($X \pm SD$)	9.22 $\pm$ 2.19	9.10 $\pm$ 2.24	5.89 $\pm$ 1.95	8.01 $\pm$ 2.63
95% CI	8.62–9.82	8.62–9.58	5.45–6.34	7.66–8.36

Freq, frequency.

Table 4 Breast cancer screening practice among respondents

Practice	Frequency	%
Breast self-examination		
Have had a breast self-examination		
Yes	172	79.3
No	45	20.7
Frequency (per month)		
1	67	39.0
2–3	34	19.8
Rarely	71	41.3
Clinical breast examination		
Have had a clinical breast examination by a doctor		
Yes	105	48.4
No	112	51.6
Age when having clinical breast examination		
<30	20	19.0
30–39	66	62.9
40–49	17	16.2
≥50	2	1.9
Frequency (per year)		
1	88	83.8
2–3	16	13.3
4–5	1	1.0
≥6	2	1.9
Mammography		
Have had a mammogram		
Yes	81	31.3
No	136	68.7
Age when had mammography		
<30	10	12.3
30–39	49	60.5
40–49	18	22.2
≥50	4	4.9
Frequency (per year)		
1	66	81.5
2–3	8	9.9
4–5	7	8.6

Practice of breast cancer screening

Table 5 shows the correlation of BSE, CBE and mammography practices with selected demographic variables. Laboratory scientists and general officers (37.8%) and temporary employees (38.4%) had higher proportions of those respondents who practice BSE than lecturers (23.8%), but the difference was not statistically significant, $X^2 = 4.118$, d.f. = 2, $P = 0.128$. Practice of BSE was not significantly different with respect to age groups,

$X^2 = 4.789$, d.f. = 5, $P = 0.442$ (data not shown). However, it was significantly difference among married respondents (116, 85.3%) compared to others groups, $X^2 = 13.932$, d.f. = 2, $P = 0.001$. Lecturers (64, 37.2%) and laboratory scientists/general officers (89, 51.7%) with at least one child practised BSE at significantly higher proportions than those without children, $X^2 = 7.956$, d.f. = 2, $P = 0.019$. The proportion of laboratory scientists and general officers who had received a CBE (54, 62.1%) was significantly higher than the proportion of lectures (22, 40.7%) and temporary employees (29, 38.2%) who had, $X^2 = 10.970$, d.f. = 2, $P = 0.004$. Practice of CBE was significantly different with respect to age groups of respondents, $X^2 = 23.552$, d.f. = 5, $P < 0.001$. Practice of CBE was also significantly different for married respondents (76, 55.9%) compared to other groups, $X^2 = 8.499$, d.f. = 2, $P = 0.014$. Moreover, practice of CBE was significantly different with respect to the education level of respondents; 60.3% of respondents with a bachelor's degree had received a CBE, a rate which is higher than those of others groups, $X^2 = 10.281$, d.f. = 4, $P = 0.037$. Practice of CBE was significantly different with respect to the income of respondents, income of 20 001–30 000 baht was proportion 36 (66.7%), which higher than those of others groups, $X^2 = 17.526$, d.f. = 4, $P = 0.002$. Practice of CBE was significantly different with respect to children; respondents who had one or two children (34, 37.4%) and more than two children (59, 56.2%) had higher rates of CBE practice than those who had no children, $X^2 = 7.633$, d.f. = 2, $P = 0.022$.

For the practice of mammography, laboratory scientists and general officers (53, 60.9%) had a significantly higher proportion than others groups, $X^2 = 46.438$, d.f. = 2, $P < 0.0001$. Practice of mammography was significantly different with respect to marital status (61, 44.9%) compared to other groups, $X^2 = 11.459$, d.f. = 2, $P = 0.003$. Practice of mammography was significantly different with respect to respondents with bachelor's degree (44, 56.4%) compared to other groups, $X^2 = 38.087$, d.f. = 2, $P < 0.001$.

Table 5 Comparison of breast cancer screening practice with selected demographic variables

Variable	Practice		P-value
	Yes freq %	No freq %	
BSE			
Marital status			
Single	47 (65.3)	25 (34.7)	0.001 ¹
Married	116 (85.3)	20 (14.7)	
Separated	9 (100)	0 (0)	
Number of children			
1–2	64 (70.3)	27 (29.7)	0.019 ¹
≥3	89 (84.8)	16 (15.2)	
No children	19 (90.5)	2 (9.5)	
Clinical breast examination			
Age group (years)			
<20	0 (0)	1 (100)	0.001 ¹
20–29	3 (13)	20 (87)	
30–39	47 (43.5)	61 (56.5)	
40–49	46 (63.9)	26 (36.1)	
50–59	7 (63.6)	4 (36.4)	
>60	2 (100)	0 (0)	
Career			
Lecturers	22 (40.7)	32 (59.3)	0.004 ¹
Laboratory scientists and general officers	54 (62.1)	33 (37.9)	
Temporary employees	29 (38.2)	47 (61.8)	
Marital status			
Single	25 (34.7)	47 (65.3)	0.014 ¹
Married	76 (55.9)	60 (44.1)	
Separated	4 (44.4)	5 (55.6)	
Education			
Primary school	11 (30.6)	25 (69.4)	0.037 ¹
Secondary school	14 (42.4)	19 (57.6)	
Bachelor's degree	47 (60.3)	31 (39.7)	
Master's degree	22 (51.2)	21 (48.8)	
Ph.D. degree	11 (40.7)	16 (59.3)	
Income			
<5000	1 (25)	3 (75)	0.002 ¹
5000–10 000	26 (38.8)	41 (61.2)	
10 001–20 000	13 (31)	29 (69)	
20 001–30 000	36 (66.7)	18 (33.3)	
>30 000	29 (58)	21 (42)	
Number of children			
1–2	34 (37.4)	57 (62.6)	0.022 ¹
≥3	59 (56.2)	46 (43.8)	
No children	12 (57.1)	9 (42.9)	

Table 5 Continued

Variable	Practice		P-value
	Yes freq %	No freq %	
Mammography			
Career			
Lecturers	21 (38.9)	33 (61.1)	<0.0001 ¹
Laboratory scientists and general officers	53 (60.9)	34 (39.1)	
Temporary employees	7 (9.2)	69 (90.8)	
Marital status			
Single	20 (27.8)	52 (72.2)	0.003 ¹
Married	61 (44.9)	75 (55.1)	
Separated	0 (0)	9 (100)	
Education			
Primary school	2 (5.6)	34 (94.4)	<0.0001 ¹
Secondary school	4 (12.1)	29 (81.9)	
Bachelor's degree	44 (56.4)	34 (43.6)	
Master's degree	19 (44.2)	24 (55.8)	
Ph.D. degree	12 (44.4)	15 (55.6)	
Income			
<5000	1 (25)	3 (75)	<0.0001 ¹
5000–10 000	6 (9)	61 (91)	
10 001–20 000	10 (23.8)	32 (76.2)	
20 001–30 000	34 (63)	20 (37)	
>30 000	30 (60)	20 (40)	

¹P-value by chi-square test.

Practice of mammography was significantly different with respect to income of respondents of in the 20 001–30 000 baht income group (34, 63%) compared to other groups, $X^2 = 52.751$, d.f. = 4, $P < 0.001$. Practice of mammography was not significantly different with respect to age groups of respondents, $X^2 = 9.62$, d.f. = 5, $P = 0.087$ (data not shown).

Sources of breast cancer knowledge

Table 6 shows respondents' reported sources of information about risks, knowledge and practice of breast cancer screening. These include medical personnel (127, 58.5%), the Internet (103, 47.5%), television (99, 45.6%), journals (79, 36.4%), friends at the workplace (73,

Table 6 Sources of information about risks, knowledge and practice of breast cancer screening

Sources	Frequency (<i>n</i> = 217)	%
Medical personnel	127	58.5
Internet	103	47.5
Television	99	45.6
Journals	79	36.4
Friends at workplace	73	33.6
Posters	68	31.3
Close friends	45	20.7
Radio	30	13.8
Seminars	19	8.8
Conferences	17	7.8

33.6%), posters (68, 31.3%), close friends (45, 20.7%), radio (30, 13.8%), seminars (19, 8.8%) and conferences (17, 7.8%), respectively.

Discussion

Clinical presentation of breast cancer in Thailand has been observed in the last decade, which has affected women's quality of life.¹⁷ Early diagnosis and treatment is still considered the best defence against breast cancer morbidity and mortality. Patients diagnosed and treated at an early stage of the disease will have better quality of life and longer survival.¹⁸ Early detection of breast cancer is directly related to the increasing levels of awareness about risk factors and practice of screening methods among women. There have been studies about knowledge, attitudes and practices of breast cancer screening among female workers in various parts of Thailand.^{10–14} To promote effectiveness of breast cancer control through early detection, female personnel in universities should possess relevant knowledge as well as appropriate attitudes and beliefs concerning the disease and its early detection methods.

This results of this study show that the majority of respondents (78.0%) had fair or good knowledge about the risk factors for breast cancer with an overall mean knowledge score of 4.75 ± 2.66 , whereas the remaining respondents (22%) had poor knowledge. This finding was unexpected when compared with reports from Iran.^{19,20} However, this was consistent with a

report from Germany.²¹ This finding may be explained by the fact that lecturers, laboratory scientists and general officers, and temporary employees were included in this study, and these categories of personnel may have adequate knowledge about the pathology of breast cancer as personnel in hospitals or have close contact with breast cancer patients and the doctors and nurses who treat them. Although the majority of the respondents had fair or good knowledge about the risk factors for breast cancer, it is still important that they be included in a new model for creating life-long knowledge and awareness as part of general health maintenance.

In this study, a misconception that breast-feeding is a risk factor for breast cancer and that early menarche and late menopause were not risk factors for breast cancer was observed. This misconception needs to be corrected, as breast-feeding or giving birth have been reported as protective factors for breast cancer, whereas early menarche and late menopause are risk factors of breast cancer.³

Knowledge of breast cancer screening was very high (overall mean knowledge score was 8.01 ± 2.63). The majority of respondents had good or fair knowledge, but some had poor knowledge (7.4%) about the importance of mammography for early detection of breast cancer. The results of this study show that the lecturers and laboratory scientists and general officers had a significantly higher mean knowledge of breast cancer screening than temporary employees. Among the predictors of a high knowledge level in this study were higher income and level of education. Temporary employees were gardeners, house cleaners and guards at the university, and their level of education was mostly primary and secondary school (89.5%). This supports the results of a previous study that found awareness of breast cancer could be attributed to the level of education of respondents.²² The income of the respondents with a poor knowledge level was mostly between 5000 and 10 000 baht per month (84.2%), which supports the previous study that income is associated with breast cancer knowledge.^{23,24} However, all personnel who participated in this

study were supported to receive health-care services once a year so income may not be the reason why temporary employees had low levels of practice of breast cancer screening.

Many factors were found to be significant for better breast cancer screening practices. Married women tended to have breast cancer screening practices including BSE, CBE and mammography. This may be explained by the fact that married women have the advantage of having economic and emotional support from their husbands. A theoretical model pointed out that marriage may be beneficial to health because spouses positively influence their partner's health behaviours.^{25,26} On the other hand, this also indicates that women without spouses lack such support and need help from other quarters to improve their health seeking behaviours and opportunities for obtaining optimum health care. Unmarried women delayed breast cancer screening more than married women.²⁵

Moreover, this study showed that woman who had children was more likely to practise BSE. This finding was supported by a previous study.²⁷ Woman who had at least one child tends to practise breast cancer screening including BSE and CBE, but not mammography. This may be explained by the collaborative reanalysis from 47 epidemiological studies in 30 countries that woman who breast-feed after they have had a child or have a long duration of breast-feeding during their lifetime may be protected against breast cancer.²⁸

The media play a significant role in the determination of risks, knowledge and practice of breast cancer. A majority of respondents got their information from medical personnel (58.5%) and searching on the Internet (47.5%). However, this benefit is limited to people who have access to these sources. Proper counselling should be routinely given by health-care providers to improve breast cancer knowledge.

The study has several limitations. First, the sample included the respondents that were present at the time of data collection. Second, this study is a cross-sectional survey which was not Follow-up the respondents. Third, this study had a small sample size. The results of this study

can be used to conclude that there is a need for health professionals at all levels to promote BSE, CBE and mammography. Health staff at the university may play a significant role in providing information about health matters. First of all, staff involved in medical and health promotion at the university need to be trained and motivated to routinely provide comprehensive health education services to all residents of the university. Cheap, effective and efficient educational opportunities such as conferences, seminars, posters, discussions with friends, searching the Internet, radio, television and reading journals for promoting information about breast cancer screening should be implemented to increase breast cancer awareness among female university personnel. This study can conclude that knowledge and practice of breast cancer screening among female university personnel, especially temporary employees, was found to be inadequate. There is a very urgent need to update the various courses of knowledge improvement and practice for early detection of breast cancer in this group of personnel. In addition, government hospitals need to establish breast imaging units that include CBE and mammography in the recently commenced national health insurance scheme.

Acknowledgement

This work was supported by fund from Walailak University (WU56413).

References

- 1 Ferlay J, Soerjomataram I, Ervik M *et al.* *GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11*. Lyon: International Agency for Research on Cancer, 2013.
- 2 Attasara BP. *Hospital-Based Cancer Registry 2011*. Bangkok: National cancer institute, Ministry of Public Health, Union Ultraviolet Co., Ltd, 2011.
- 3 American Cancer Society. *Cancer Facts and Figures*. Atlanta, GA: American Cancer Society, 2013.
- 4 Bastani R, Maxwell AE, Carbonari J, Rozelle R, Baxter J, Vernon S. Breast cancer knowledge, attitudes, and behaviors: a comparison of rural

- health and non-health workers. *Cancer Epidemiol Biomarkers Prevention*, 1994; **3**: 77–84.
- 5 National Cancer Institute. *Breast Cancer Screening*. The National Institutes of Health, 2014.
- 6 Siahpush M, Singh GK. Sociodemographic predictors of pap test receipt, currency and knowledge among Australian women. *Preventive Medicine*, 2002; **35**: 362–368.
- 7 Simsek S, Tug T. Benign tumors of the breast: fibroadenoms. *Sted*, 2002; **11**: 102–105.
- 8 Karayurt O, Ozmen D, Cetinkaya AC. Awareness of breast cancer risk factors and practice of breast self examination among high school students in Turkey. *BMC Public Health*, 2008; **8**: 359.
- 9 Lagerlund M, Hedin A, Sparen P, Thurfjell E, Lambe M. Attitudes, beliefs, and knowledge as predictors of nonattendance in a Swedish population-based mammography screening program. *Preventive Medicine*, 2000; **31**: 417–428.
- 10 Satitvipawee P, Promthet SS, Pitiphat W, Kalampakorn S, Parkin DM. Factors associated with breast self-examination among Thai women living in rural areas in Northeastern Thailand. *Journal of the Medical Association of Thailand*, 2009; **92**: S29–S35.
- 11 Jirojwong S, Manderson L. Beliefs and behaviors about Pap and breast self-examination among Thai immigrant women in Brisbane, Australia. *Women and Health*, 2001; **33**: 47–66.
- 12 Huang KE, Xu L, I NN, Jaisamrarn U. The Asian Menopause Survey: knowledge, perceptions, hormone treatment and sexual function. *Maturitas*, 2010; **65**: 276–283.
- 13 Crombie K, Hancock K, Chang E *et al.* Breast screening education at Australian and Thai worksites: a comparison of program effectiveness. *Contemporary Nurse*, 2005; **19**: 181–196.
- 14 Wiwanitkit V. A survey on breast self-examination among Thai adult women in a rural distant subdistrict. *Asian Pacific Journal of Cancer Prevention*, 2004; **5**: 439–440.
- 15 National Statistical Office. *Report of 2007 Reproductive Health Survey*. Bangkok: National Statistical Office, 2007: 389–390.
- 16 Eng J. Sample size estimation: how many individuals should be studied? *Radiology*, 2003; **227**: 309–313.
- 17 Glangkarn S, Promasatayaprot V, Porock D, Edgley A. Measuring quality of life in thai women with breast cancer. *Asian Pacific Journal of Cancer Prevention*, 2011; **12**: 637–644.
- 18 Richards MA, Smith P, Ramirez AJ, Fentiman IS, Rubens RD. The influence on survival of delay in the presentation and treatment of symptomatic breast cancer. *British Journal of Cancer*, 1999; **79**: 858–864.
- 19 Heidari Z, Mahmoudzadeh-Sagheb HR, Sakhavar N. Breast cancer screening knowledge and practice among women in southeast of Iran. *Acta Medica Iranica*, 2008; **46**: 321–328.
- 20 Dandash KF, Al-Mohaimed A. Knowledge, attitudes, and practices surrounding breast cancer and screening in female teachers of Buraidah, Saudi Arabia. *International Journal of Health Sciences*, 2007; **1**: 61–71.
- 21 Klug SJ, Hetzer M, Blettner M. Screening for breast and cervical cancer in a large German city: participation, motivation and knowledge of risk factors. *European Journal of Public Health*, 2005; **15**: 70–77.
- 22 Akhtari-Zavare M, Juni MH, Manaf RA, Ismail IZ, Said SM. Knowledge on breast cancer and practice of breast self examination among selected female university students in Malaysia. *Medical and Health Science Journal*, 2011; **7**: 49–56.
- 23 Breslow RA, Sorkin JD, Frey CM, Kessler LG. Americans' knowledge of cancer risk and survival. *Preventive Medicine*, 1997; **26**: 170–177.
- 24 Ramirez AG, Suarez L, Laufman L, Barroso C, Chalela P. Hispanic women's breast and cervical cancer knowledge, attitudes, and screening behaviors. *American Journal of Health Promotion*, 2000; **14**: 292–300.
- 25 Ghazali SM, Othman Z, Cheong KC *et al.* Non-practice of breast self examination and marital status are associated with delayed presentation with breast cancer. *Asian Pacific Journal of Cancer Prevention*, 2013; **14**: 1141–1145.
- 26 Umberson D. Gender, marital status and the social control of health behavior. *Social Science & Medicine*, 1992; **34**: 907–917.
- 27 Khalili AF, Shahnazi M. Breast cancer screening (breast self-examination, clinical breast exam, and mammography) in women referred to health centers in Tabriz, Iran. *Indian Journal of Medical Sciences*, 2010; **64**: 149–162.
- 28 Collaborative Group on Hormonal Factors in Breast Cancer. Breast cancer and breastfeeding: collaborative reanalysis of individual data from 47 epidemiological studies in 30 countries, including 50302 women with breast cancer and 96973 women without the disease. *Lancet*, 2002; **360**: 187–195.