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Knowledge Assessment on Breast Cancer and Breast Self-Examination Practice among Female University Students in Kedah, Malaysia

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ABSTRACT

Objective: To review the knowledge on breast cancer (BC), breast self-examination (BSE) and clinical breast examination (CBE) practices among female university students in a private University, Malaysia.

Methodology: This is a cross-sectional study conducted in a private university teaching medical and healthcare courses in Malaysia. Simple random sampling method was used. A structured questionnaire consisting of 4 sections was used for data collection. Data obtained were coded and SPSS Statistics (version 25) was used for analysis. Categorical data were presented as frequency and percentage whereas chi-square test was used to find the association between two different categorical variables.

Results: A total of n=309 responses were collected from female students in a private university in Malaysia. The mean age of the respondents was 20.58 years (SD = 1.479, range = 19 - 30). One tenth of the respondents had family history of breast cancer [32 (10.4%)]. 304 students (98.4%) have heard of breast cancer. The study revealed media as the major source of information on breast cancer. 276 respondents (89.3%) have heard of BSE. 72.5% of respondents did not practice BSE. 291 (94.2%) respondents think that BSE is a useful tool to detect breast cancer. 85.8% of the respondents knew that BSE is performed by the individual. More than half of the students [193 (62.5%)] have not been taught on how to do BSE. Only [116 (37.5%)] of the respondents correctly stated that BSE should be performed monthly. 194 respondents (62.8%) have heard of CBE. Majority wrongly identified that CBE is done by using mammography [209 (67.6%)] and ultrasound [125 (40.5%)]. Only 13.6% of respondents identified that CBE is done by hand. There was significant association between education field and awareness of CBE.

Conclusion: Most of the respondents are mindful of the existence of breast cancer and BSE but majority did not practice BSE as a routine. besides, they have lack of awareness and practice of CBE.

Keywords: Breast Cancer, Breast Self-Examination, Clinical Breast Examination, Malaysia, screening

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INTRODUCTION

Breast cancer is the most typical cancer among women in today's world. It ranks 2nd among cancer diseases and ranks 5th in terms of cancer mortality among women [1]. It is a malignant tumor that occurs primarily in the cells of the breast. Malaysian women have greater prevalence of breast cancer at the age of 40- 49 years as compared to women of 50 - 59 years of age in West. The Age Standardized Rate (ASR) of female breast cancer among Malaysian women was 47.4 per 100,000 populations [2,3]. The Chinese ethnic group had ASR of 59.7 per 100,000 population (highest rate), followed by Indian: 55.8 and Malay: 33.9 per 100,000 population in 2003 [3-7]. However, most women do not routinely check their breasts for abnormalities or go for annual screenings after the age of 40.

Delay in diagnosis and treatment of this disease decreases the survival rates [2]. When breast cancer is detected early (stage 1), the survival rate is approximately 90%. At stage 2, the survival rate drops to about 70% [8]. At stages 3 and 4, the outcome is even less positive, and treatment is more complex. In Malaysia, about half of the newly diagnosed breast cancer cases are in stages 3 and 4. There are 3 main activities for breast cancer screening in Malaysia, which are Breast Self-Examination (BSE), Clinical Breast Examination (CBE) and mammography screening [7,9-11]. Breast self-examination (BSE) is a screening method employed monthly in an attempt to detect breast cancer earlier. One of the main determinants of survival from breast cancer is early detection, which is dependent on disease awareness and uptake of screenings [8]. Monthly breast self-examination (BSE) plays an extremely crucial role in the health care of all women in every stages of life. It's an easy, simple, safe, feasible and free of charge method without any need for specific screening tools. If properly performed, BSE enables one to detect the palpable masses in early stages. The method involves the women herself looking at and feeling each breast for possible lumps, distortions or swelling. Early detection is key when it comes to surviving breast cancer [6].

BSE should be done by all women, usually monthly, to be mindful of how the breasts appear and feel normally. Few days after the period ends is the best time to perform breast self-examination because the breasts are less likely to be swollen. In 2014, a study by Universiti Putra Malaysia researchers revealed that 70.5% of respondents (female undergraduates) did not perform regular breast self-examinations (BSE) and they did not know how to do it [12]. Their knowledge of breast cancer and BSE was inadequate. CBE is an action of inspecting and palpating the entire breast area of an individual by a well-trained health care professional or doctor. It also includes the lymph nodes located around the collarbone as well as under the armpits area [13]. From previous research, addition of CBE to screening mammography could increase the detection rate of breast cancer [14]. CBE could detect about 60% of cancers detected by mammography

as well as some cancers, which are not detected by mammography [15,16]. National Comprehensive Cancer Network (NCCN) recommends women to start CBE at the age of 25 and continue after they starts mammograms [17].

For early detection by using CBE, health care providers are required to have sufficient knowledge and training on how to correctly assess breast masses [18]. CBE can be embarrassing, painful as well as could lead to false positives. However, it is essential to note that the over treatment related to false positives is of less concern with CBE than with mammography [14]. Annual practice of CBE could increase the compliance with screening as well as increase the awareness and chances for discussion between women and health care professionals on breast health issues. Study in Malaysia have suggested that CBE can significantly downstage breast cancer in screened populations [19]. CBE is done by visually inspecting the breasts where the individual sit down or lie down and next, palpate the breast area with the individual lying down. Any abnormality of the breasts could be examined, including the shape, size, texture and presence of lumps or swelling, rashes, nipple changes or fluid discharge. The health care professional will apply pressure through the fingers to screen for any lumps in the tissue, thickening of the tissues or whether there is tenderness or pain. In 2003, Noel S. Weiss mentioned in his study report that CBE appears to be promising means of averting some deaths from breast cancer as it could identify lesions early enough for effective intervention to be used [15]. Although the evidence for this modality remains uncertain, there was indirect evidence showing that CBE can be recommended as a systematic method for detecting breast cancer, providing public health benefits [20]. After reviewing several literatures, it could be noted that there are still many barriers to achieve high level of awareness on breast health topics as well as BSE and CBE practices. This includes social and cultural perceptions of breast cancer and breast self-examination, sociodemographic factors, level of knowledge, and awareness [21]. In year 2015, there were studies conducted among different groups of women in Malaysia showing that monthly BSE practice ranged from 19.6 to 36.7%, respectively [12,21]. Although early detection of breast cancer can increase the survival rate, many women miss early detection due to lack of knowledge and information about breast health awareness [22]. Thus, there is a clear phenomenon indicating that the population lacks the knowledge and awareness of breast cancer and BSE.

METHODOLOGY

An institution-based cross-sectional study was conducted among female students in a private university in Kedah, Malaysia using structured questionnaires. All female university students of were the target for this study, which includes students from foundation level of study to any higher education qualifications available in University. Male university students were excluded from the study. Female university students from other universities were also excluded from this study. Incomplete data filling or repeated data were also considered invalid and excluded from the study. Ethical approval was obtained from the AIMST University Human Ethics Committee (AUHEC) [AUHEC/FOP/2020/18].

A structured questionnaire consisting of 33 questions was designed to be used as research tool for data collection. The questions comprised of open-ended and closed-ended questions. The questionnaire consists of 4 sections, aimed to recruit and record the sociodemographic data of respondents, their knowledge on breast cancer, knowledge and practice of BSE and CBE. As per the inclusion criteria of the study, the questionnaires were distributed to female university students after their consent to participate in this study.

All the data received were analyzed by using IBM SPSS Statistics for Windows (Ver. 25.0. Armonk, NY: IBM Corp). Descriptive data was presented with mean and standard deviation as appropriate. Categorical data were presented as counts and valid percentage whereas Pearson's chi-square test was used to define the association between two different categorical variables. In present study, Pearson's Chi-square test was used to recognize the significant differences among participants' level of knowledge between different education field and ethnicity. P value obtained which is lesser than 0.05 is significant in this study. Data analysed were presented using tables and figures.

RESULTS

A total of 309 respondents which met the inclusion and exclusion criteria were included in this study. The mean age of respondents is 20.58 years (SD = 1.479, range = 19 - 30). Dentistry students who responded were greater in number [132 (42.7%)], followed by Pharmacy students [126 (40.8%)], Medical students [44 (14.2%)], Physiotherapy students [6 (1.9%)], and others [1 (0.3%)]. Majority of the respondents are from Chinese ethnic group [249 (80.6%)]. From the study, one tenth of the respondents had family history of breast cancer [32 (10.4%)]. Table 1 shows the sociodemographic distribution data of the study population.

Table 1: Sociodemographic distribution of AIMST's female university students (N=309)

DESCRIPTIVE STATISTICS					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Age (Years)	306	19	30	20.58	1.469
SOCIODEMOGRAPHIC CHARACTERISTICS					
			Frequency (N)		**Percentage (%)**
Education Field					
Pharmacy			126		40.8
Medicine			44		14.2
Dentistry			132		42.7
Physiotherapy			6		1.9
Others			1		0.3
Ethnicity					

Chinese	249	80.6
Malay	3	1.0
Indian	51	16.5
Others	6	1.9
Family History of Breast Cancer		
Yes	32	10.4
No	277	89.6
Relationship to participant		
Mother	3	9.4%
Aunt	21	65.6%
Cousin	2	6.3%
Others	6	18.8%

98.4% of respondents have heard of breast cancer (Table 2). The major source of information of respondents for the female respondents' knowledge of breast cancer was through media (Internet, TV, radio, etc) at 86.1% (Table 3). The study found there was a statistically significant association between education field and source of information such as books (p-value 0.016), conference/seminars (p value-0.046). Majority of the respondents had chosen lumps in the breasts [295 (95.5%)] as the primary sign and symptom of breast cancer. Other sign and symptoms remain unpopular. Only less than half of the respondents identified them. It was also found there was a significant association with symptoms such as nipple retraction (p value 0.01*) and bloody discharge from nipple (p value 0.015*) [292 (94.5%)] correctly identified family history of breast cancer as a risk factor. History of BC was identified by 59.5% of the students. Other risk factors were unpopular. Table 4 shows the knowledge of respondents on breast cancer and its prevention. The study also founds statistical significance between education field and ways to prevent breast cancer such as avoiding long term use of HRT (p- value 0.034).

Majority [276 (89.3%)] have heard of BSE. 291 (94.2%) respondents think that BSE is a useful tool to detect breast cancer. The study shows significance between education field and knowledge on how BSE is done such as Palpate with palm and minimum of 3 fingers (p value 0.039*), inspecting breast in the mirror (p value 0.025*). The respondents' awareness and knowledge of BSE were included in Table 5. Table 6 summarises the respondents' practice of BSE.

Table 2: Respondents' awareness on Breast Cancer

Have you heard of BC	Frequency (N)	Percentage (%)
Yes	304	98.4
No	5	1.6
Total	309	100

Table 3: Respondents' source of information about Breast Cancer

Source	Frequency (N)	Percentage (%)
Books	114	36.9
Lectures	124	40.1
Media (Internet, TV, Radio, etc.)	266	86.1
Hospital	112	36.2
Conferences/Seminars	48	15.5
Friends	106	34.3

Table 4: Respondents' knowledge on Breast Cancer and its prevention

Variables	Frequency (N)	Percentage (%)
Sign and symptoms		
Lumps in the breasts	295	95.5
Nipple retraction (pulled inside)	121	39.2
Bloody discharge from nipple	119	38.5
Irregular folds of skin of breasts	90	29.1
Weight gain	12	3.9
No idea	15	4.9
Risk factors		
Young Age (<40 years old)	44	14.2
Family History	292	94.5
Past History of Breast Cancer	184	59.5
Diet High in Fats	45	14.6
Menopause after 55 years old	123	39.8
Women on HRT	97	31.4
How can breast cancer be diagnosed early?		
Self - Examination	254	82.2
Clinical Breast Examination	147	47.6
Mammography	73	23.6

Breast Ultrasound	52	16.8
No Idea	14	4.5
Ways to prevent breast cancer		
Maintain Healthy BMI	134	43.4
Reduce Alcohol Intake	90	29.1
Avoid long term use of HRT after menopause	130	42.1
Mammography Screening	195	63.1
No idea	39	12.6

Table 5: Respondents' awareness and knowledge on Breast Self-Examination

Variables	Frequency (N)	Percentage (%)
Have you heard of Breast Self-Examination?		
Yes	276	89.3
No	33	10.7
Is BSE a useful tool for detection of breast cancer?		
Yes	291	94.2
No	18	5.8
Have you been taught how to do BSE?		
Yes	116	37.5
No	193	62.5
How is BSE done?		
Palpate with 1 finger	12	3.9
Palpate with palm and minimum of 3 fingers	220	71.2
Palpate with fingertips	77	24.9
Age to start performing BSE		
From Birth	0	0
From Puberty	201	65
From 20 years	59	19.1
From 30 years	16	5.2
After menopause	9	2.9
No idea	36	11.7
How often should BSE be done		
Daily	12	3.9
Weekly	57	18.4
Monthly	116	37.5
Yearly	35	11.3
No idea	89	28.8
Best time to do BSE		
During menstrual flow	27	8.7
A week after period	134	43.4
During breastfeeding	3	1.0
No idea	145	46.9
BSE should be done by		
Doctor	30	9.7
Trained Nurse	11	3.6
The individual	265	85.8
Others	3	1
BSE is done by		
Inspecting the breast in the mirror	168	54.4
Feeling the breast with hand	278	90
Feeling the armpit with hand	134	43.4
Doing ultrasound of the breast	53	17.2
Mammography	68	22
What to do when there's abnormalities?		
Do some lab tests	46	14.9
Refer doctor	295	95.5
Do nothing	3	1
Others	2	0.6
Benefits of BSE		
Familiar with breast texture	47	15.2
Early detection of Breast Cancer	285	92.2
Detection of any abnormal changes in breast	225	72.8
Good breast exercise	24	7.8

Table 6: Respondents' practice of BSE

Variable/Response	Frequency (N)	Percentage (%)
Do you practice BSE		
Yes	85	27.5
No	224	72.5
How often?		
Weekly	6	7.1
Monthly	19	22.4
Occasionally	29	34.1
Rarely	31	36.5
Detection of abnormality in breast?		
Yes and referred doctor	6	1.9
No	303	98.1
Is BSE a good practice?		
Yes	308	99.7
No	1	0.3

Only [194 (62.8%)] respondents have heard of CBE. Majority [302 (97.7%)] thinks CBE is a good practice. 87.4% correctly identified doctor to be the person to perform CBE. Only 33.0% respondents recognized trained nurse to perform CBE. Less than half [134 (43.4%)] respondents think CBE should be performed yearly. More than half had wrongly identified that CBE is done by using mammography [209 (67.6%)] and ultrasound [125 (40.5%)]. The study shows statistical significance between education field and Education field and awareness of CBE (p value 0.019*) Only 42 (13.6%) respondents identified that CBE is done by using hand. Table 7 shows the respondents' knowledge and practice of CBE.

Table 7: Respondents' knowledge and practice of CBE

Variable/ Response	Frequency (N)	Percentage (%)
Have you heard of Clinical Breast Examination?		
Yes	194	62.8
No	115	37.2
Is CBE a good practice?		
Yes	302	97.7
No	7	2.3
Who will perform CBE?		
Doctor	270	87.4
Trained Nurse	102	33
Individual	18	5.8
Others	2	0.6
How often to perform CBE?		
Daily	4	1.3
Weekly	7	2.3
Monthly	35	11.3
Yearly	134	43.4
When abnormality is found on BSE	90	29.1
No idea	73	23.7
CBE is done by using		
Ultrasound	125	40.5
Mammography	209	67.6
Hand	42	13.6
Others	5	1.6

DISCUSSION

In this study, high proportions (98.4%) of the female university respondents have heard of breast cancer. This is higher compared with other studies done where 88.8% and 88.1% of respondents have heard of breast cancer. [6,32] In line with most of the other research, media is the major source of knowledge to raise awareness of public regarding breast cancer [33-36]. Our finding has revealed a poor understanding of signs, symptoms and risk factors of breast cancer. It was encouraging as a good proportion of respondents managed to identify lumps in the breast (95.5%) as the major sign and symptom of breast cancer. However, more than half of the respondents did not recognize nipple retraction (39.2%), bloody discharge from nipple (38.5%), irregular folds of skin of breasts (29.1%) as potential signs of breast cancer. This finding concurs with other studies done in Ethiopia [37] and Egypt [38]. On the other hand, most respondents (94.5%) correctly perceived that family history is the main risk factor but have shown deprived understanding regarding diet high in fats (14.6%), late menopause (39.8%) and women on HRT (31.4%) as risk factors of breast cancer. This finding is consistent with a few local studies which revealed knowledge of women on risk factors of breast cancer is relatively poor [5,28,32]. However, the finding is contradict to the study involving

Malaysians which shows good awareness on dietary factors [39]. It has been reported that the established modifiable risk factors include post-menopausal hormone use, moderate alcohol intake, weight gain [40]. Majority (82.2%) of the respondents mentioned self-examination as an early diagnosis method. This is consistent with the Nigeria study where two-third of the study population agreed that BSE is a screening method for breast cancer [41]. Only a less population of respondents agreed that CBE, mammography, breast ultrasound could diagnose breast cancer earlier. Interestingly, more than half of the respondents (63.1%) identified mammography screening to prevent breast cancer. In fact, the first and most universally accepted breast screening modality is mammography where BSE and CBE are supplemental roles in early detection of breast cancer [14]. Mammography is associated with a reduction in mortality and in the rate of presentation at advanced stages of breast cancer [42,43].

Most of the respondents (89.3%) knew about the detection method is BSE but only 27.5% of them practiced it. Awareness on the existence of BSE is higher than 69.1% observed in Malaysian students [12] and 58% among students in United Arab Emirates [44] but the practice of BSE is much lower than the study in Bahir Dar University, Ethiopia [24] where 54.1% of their students practiced BSE. In contrast to the awareness on BSE, only a smaller number of respondents knew how often to do BSE, which is monthly (37.5%) and the best time to do it is a week after period (43.4%). This finding is consistent with reports from Ghana study [45]. It is contradicting to the Shatra, Dhi-Qar Province, Iraq study where majority had the right information about the best time to do BSE [46].

From our finding, 62.5% of the respondents have not been taught on how to do BSE and only 37.5% of them have been taught. Many had addressed the reason for not performing BSE was having no idea on the right procedures to perform it. This is similar to other studies conducted in Ethiopia [47], Malaysia [35], Saudi Arabia [48] and Iran [49] where unawareness and did not know the techniques are the main reasons. Previous study by had proven that teaching BSE practice increases its rate and frequency of doing BSE among those who did not practice BSE before health education programme [50]. A study among nurses in tertiary hospitals in Malaysia mentioned that BSE taught during undergraduate programme was found to have a significant relationship with practice of BSE [51]. From our finding, it showed that parents, teachers and involvement of health care professional turned out only to have a small role as sources of information on BSE although majority of the students are from health science background. It is congruent with findings from the study [28]. These findings highlighted the need of health care providers and educators to work together in emphasizing the importance of BSE to students and include the training of BSE skills across the community to raise interest and compliance on BSE practice. Out of 85 respondents who practices BSE, only 22.4% practice it monthly. This finding is lower than that of 28.5% [35]and 41% [53] However, it is higher than 4.3%, 10.1% and 13.5% reported in the study in Turkey [54] and Iran [55] respectively. It shows that different societies have different perception and attitudes towards practicing BSE regularly.

Most of the students (94.2%) have positive attitude and recognized BSE as a useful tool for detection of breast cancer. Majority think that it could help in early detection (92.2%) and for the detection of abnormality of the breasts (72.8%). 95.5% of them will refer doctor if she happens to detect any abnormality. This finding is congruent with the study [56] and where majority of the participants would go to health facilities if they had symptoms of breast cancer [57]. While evaluating the students' perception on how to perform BSE, 71.2% of the respondents had successfully identified the right way, which is to palpate with palm and minimum of 3 fingers. In addition, a good proportion correctly identified how to perform BSE by an individual is by feeling the breast with hand (90%), inspecting the breast in the mirror (54.4) and feeling the armpit with hand (43.4%). Unfortunately, few participants had wrong beliefs and identified wrongly that doing ultrasound of the breasts and mammography are part of the BSE. It was mentioned in a Vietnam study having insufficient knowledge of BSE is associated with insufficient performance of BSE [58]. The results pointed out that there is still inadequate knowledge and practice of BSE among the early-20's female students.

In this study, there was significant association between knowledge on how to do BSE and education field. The sources of information which includes teacher, doctors and friends were statistically significant with education field. There was a statistically significant association between education field and belief of BSE is done by palpating with palm and minimum of 3 fingers. BSE is done by inspecting the breast in the mirror had significant association with education field. There also exists a significant association between the knowledge level of respondents on BSE as in who should perform BSE and ethnicity. Doctors play a role as source of information of BSE is also having significant association with ethnicity of respondents. A benefit of BSE as in to help women to be familiar with the breast texture was significantly associated with ethnicity.

Moving on to Clinical Breast Examination (CBE), the awareness of it is significantly poorer than BSE. Only about half of the respondents (62.8%, P=0.019) have heard of CBE. This finding was lower than 77% observed from the Kitwe study [59] but better when compared with a study in India [60]. This phenomenon is similar to what was being mentioned in the study that 'although there are health education, facilities and health care providers trained to conduct CBE in government health clinics, the awareness of CBE remains below the desired level' [61]. The young age of the study sample may have affected the CBE knowledge rate. Due to the low level of knowledge of CBE, only less than half (43.4%) of the respondents correctly identified that CBE should be performed yearly. Almost a quarter of them have exactly no idea how often it should be done. Only a small proportion of respondents agreed that CBE is done by using hand. A large portion of respondents have wrong assumptions that mammography (67.6%) and ultrasound (40.5%) are used to do CBE. These false assumptions may have accounted for part of the reason why there are breast cancer cases which present late to hospitals as they do not have the habit of taking up breast examination annually. Despite the low level of knowledge of CBE, the respondents have a positive attitude towards it and 97.7% agreed that CBE will be a good practice. There was significant association between education field with awareness of CBE and the person responsible to perform CBE is trained nurse. From

the findings, no significant association could be identified between ethnicity and knowledge of CBE.

In this study, the findings had suggested a definite need to raise awareness of women on breast cancer, BSE as well as CBE as screening tool of breast cancer. There is an imperative need to include breast health training and input of knowledge towards public especially on risk factors and symptoms of breast cancer. The focus group to deepen awareness on these should be young women or university students aged in the early-20s to encourage them to start practicing BSE and CBE, thus allowing early detection of breast cancer among women. Being young is never an excuse to not take attention about breast health care and take light of the practices of BSE and CBE. In one study, it was reported that regular visit with doctor was a strong predictor for CBE practice [62]. Primary health care settings could initiate free or cheaper public screening for Malaysian so that more people have awareness towards the available services in our country and learn the details regarding breast health from health care providers.

CONCLUSION

From the research study, most of the respondents are mindful of the existence of breast cancer and BSE. However, majority of the female students from AIMST University do not practice BSE. It was noted that more than half of the female students did not get a chance to be taught on how to perform BSE correctly. Efforts should be intensified by responsible authority in modifying the school's education system in order to introduce and incorporate knowledge and skills about breast health into teaching curriculum. Knowledge related to CBE certainly need to be enhanced among the female students. Educational workshops or short courses on breast self-examination (BSE) and clinical breast examination (CBE) should be planned and held in universities to enhance its role to spread awareness on this topic. Media should definitely be fully utilized to increase the general population's awareness on breast health education and promoting the screening services available in this century of media.

STUDY LIMITATIONS

As this research was conducted in an educational institution, where the targeted population were having education background. It may be biased towards more educated and more privileged socioeconomic status. Thus, it could not act as a full picture to portray the awareness towards breast cancer, BSE and CBE of all women in the country, either rural or urban area, educated or less educated. As it was a randomized sampling, there was a huge, unbalanced distribution of respondents' educational field background. As per the mentioned limitations, there might be an overestimation of awareness level of breast cancer in this study.

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