



Effectiveness of Intervention on Awareness and Knowledge of Breast Self-Examination among the Potentially at Risk Population for Breast Cancer

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Authors' contributions

This research work was carried out in collaboration among all authors. Author ANA designed the study and protocol. Authors FJU and CHY were involved in data collection and data entry. Author NZA performed the statistical analysis. Authors ANA, FJU and CHY wrote the first draft of the manuscript, managed the analyses of the study. All authors read and approved the final manuscript for submission.

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ABSTRACT

Aims: The aim of this study was to estimate the awareness and knowledge of breast cancer and breast self-examination and to estimate the effectiveness of intervention on awareness and knowledge of breast cancer (BC) and breast self-examination (BSE) among the potentially, at risk population for breast cancer.

Study Design: Pre-post study design.

Place and Duration of Study: Private University students of faculty of pharmacy, AIMST University, Kedah state, Malaysia, between September, 2018 and May, 2019.

Methodology: A pre-validated questionnaire containing socio-demographic details along with awareness and knowledge based items regarding breast cancer (BC) and breast self-examination (BSE) was distributed in class room setting after obtaining informed consent from study participants. A well-constructed and validated educational intervention tool (pamphlet) was

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distributed to all participants after baseline study. The original Blooms cut-off grades were used to categorize the scores. Descriptive statistics for categorical variables; numerical data as median (IQR); McNemar's test for pre- and post-test differences was computed, $P < .05$ was considered significant.

Results: The overall response rate of the study population was around 92% (183/200). The awareness score regarding breast cancer was moderate (64%) at baseline. The most identified risk factors was smoking (56%) and symptoms was presence of lumps (61%). Only 65% and 31% were aware that, breast cancer is most common among women and their age-specific incidence rates. About 64% knew it could lead to death and 69% thought early detection improves survival rates. Upon intervention, there was a significant increase (64%→99%, $p < .001$) in awareness scores and (51%→95%, $P < .001$) in knowledge scores. At baseline, the knowledge score was poor (51%), only 43% had any knowledge about breast cancer and only 32% were ever taught of how to perform BSE. About 33% knew how often the BSE should be performed and 40% knew the best time for performing BSE. Hardly 24% ever practised BSE though 72% accepted performing BSE is good. However, only 38%, 28% and 22% knew the need of mirror, part of hand and direction of hand movement for performing BSE. The average awareness and knowledge scores showed statistically significant ($P < .05$) differences between baseline and post intervention studies.

Conclusion: This study results confirm that the study population had a fair awareness and poor knowledge at baseline. Intervention tool such as pamphlet providing clear, precise and required information about breast cancer, its signs, symptoms, risk factors, screening and steps for performing BSE are important to reduce breast cancer mortality. A nation wide reach-out with barrier-specific counseling, community-based interventions and nationwide population driven breast cancer screening are recommended for rural and urban area female population.

Keywords: Awareness; knowledge; breast self-examination; breast cancer.

1. INTRODUCTION

Breast cancer (BC) is a global health issue and a leading cause of death among women [1]. Data from the National Cancer Registry of Malaysia for 2007-2011 accounted for about 32% of breast cancer; the second leading cause where the death rate is in fourth place (6-8%) among all female cancers and related deaths. The GLOBOCAN 2018 estimated the global burden of cancer worldwide and reported 11.6% of female breast cancer with a focus on geographic variability across 20 world regions [2]. The age pattern in 2007-2011 National Cancer Registry of Malaysia showed a peak age-specific incidence rate at 50-59 years. However, the rate differs between the three main races and the incidence was highest among Chinese followed by Indian and Malay. The overall Age-Standardized Rate (ASR) was 31.1 per 100,000 populations. The ASR in Chinese was the highest with 41.5 per 100,000, followed by Indians at 37.1 per 100,000. This accounts for 1 in 22 Chinese, 1 in 24 Indians and 1 in 35 Malay women developing breast cancer at some stage in their lives [3].

Breast cancer is distinguished from other types of cancer as it occurs in visible organ and can be treated if detected at an early stage [4]. The 5-year survival rate reached to 85% with early detection whereas, late detection decreased the

survival rate to 56% [5]. The low survival rates can be attributed to lack of early detection as well as inadequate diagnosis and treatment facilities in less developed countries [5].

Breast self-examination (BSE), clinical breast examination (CBE) and mammography are the screening methods recommended for breast cancer. BSE is the most cost-effective method of early detection especially in resource poor countries. Over 90% of females breast cancer cases, when BSE performed accurately and regularly for differences in breast tissue and lumps at an early stage can be detected by female themselves. Focusing on monthly examination between the 7th and 10th day of the menstrual cycle ensures a better prognosis when treated [6,7]. Therefore, it is important to have adequate awareness and knowledge about regular practice of BSE.

The outcome measures of this study were: to estimate the awareness and knowledge of breast cancer and breast self-examination and to estimate the effectiveness of intervention on awareness and knowledge of breast cancer and breast self-examination among the potentially, at risk population for breast cancer. The study findings could provide the health care system with a better understanding on the awareness and knowledge status of breast cancer and

formulate appropriate strategy to address the national demon.

2. MATERIALS AND METHODS

2.1 Study Design, Study Population and Sample Size

A 'Pre- post' study design using convenience sampling was conducted among the female respondents from faculty of pharmacy, a private university in kedah state, Malaysia between September, 2018 and May, 2019. All male students, those involved in pilot study and those not willing to participate in the study were excluded. The estimated sample size was calculated at 95% CI, 5% margin of error, 50% response distribution plus a 10% margin for drop-outs was added and the final recommended sample was rounded off to a minimum of 165 participants [8,9].

2.2 Development and Validation of Questionnaire

The questionnaire was developed in English and contained socio-demographic details such as age, race, year of study, etc. (listed in Table 1), ten awareness related items (BC risk factors, signs and symptoms, preventive measures and management) and 21 knowledge related items (multiple-choice questions with one or multiple correct answers) about BC and BSE [10,11,12]. The questionnaire was first content and construct validated among two academicians, each from faculty of medicine, faculty of pharmacy and school of nursing, AIMST University, Malaysia. Later it was face validated among potential respondents (n=23) and reliability tested using Cronbach's alpha coefficient for internal consistency. The questionnaire showed acceptable reliability and stability ($\alpha = .78$) with positive correlations.

2.3 Development and Validation of Education Intervention Tool (Pamphlet)

The educational pamphlet/ Fact sheet was developed with at-most care, so that the most important information's relating to breast cancer identification (BSE), prevention and management were clearly and precisely conveyed to the study populations and will be able to gain the necessary awareness and knowledge for need and practice of breast self-examination. The contents of the educational pamphlet were derived from the fact sheets regarding breast

cancer from WHO and other informative sites from the internet sources [13,14]. The prepared intervention tool (Pamphlet) was subjected for content validation to the mentioned panel in section 2.2 and their remarks were accommodated. Hence, the finalized intervention tool (educational pamphlet) was prepared.

2.4 Awareness and Knowledge Scores

The scoring grades attributed to each domain and overall were based on the original Blooms' cut-off grades. a score < 60% was considered 'poor', 60%-79% was considered 'moderate', and scores $\geq 80\%$ was considered 'good' [15,16]. One point was given for each correct answer and a cumulative higher score indicates better awareness and knowledge scores.

2.5 Modality of Obtaining Response

The pre-validated questionnaires were distributed to female students in the class room setting after getting their signed ICF and the completed questionnaires were used for data analysis.

2.6 Statistical Analyses

The analysis was performed using IBM SPSS statistics for windows (version 23). Descriptive statistics for frequency and percentage was computed for categorical variables. Numerical data was not normally distributed and hence presented as median and interquartile range (IQR). Differences in awareness and knowledge scores at pre- and post-test were computed using McNemar's test. The Chi-square test for independence was used to discover the association / differences between categorical variables and P -value < .05 were considered significant. All percentages displayed in text or parentheses are with no decimal places.

3. RESULTS

3.1 Response Rate

The overall response rate of the study population was 92% (183/200).

3.2 Socio-demographic Characteristics of the Study Population

The average age of respondents were 22±4 years. Table 1 shows the distribution of socio-demographic characteristics among the study population.

Table 1. Socio-demographic characteristics of the study population (N=183)

Variables	N (%)
Age in Years	
18-20	41 (22)
21-23	128 (70)
24-26	14 (8)
Race	
Malay	3 (2)
Chinese	150 (82)
Indian	26 (14)
Others	4 (2)
Year of Study	
Year 1	42 (23)
Year 2	47 (26)
Year 3	40 (22)
Year 4	54 (30)
Marital Status	
Single	165 (90)
In relationship	18 (10)
Smoking History	
Yes	1 (1)
No	182 (99)
Family History of Breast Cancer	
Yes	22 (12)
No	161 (88)
Family Relationship with Breast Cancer	
Mother	3 (14)
Siblings	1 (4)
Aunts	11 (50)
Relative	7 (32)
Native Location	
City	70 (38)
Town	83 (45)
Rural	30 (17)

3.3 Awareness of the Respondents towards Breast Self-examination

A total of ten awareness-based items were used, of which six were with one correct answer and '1' point was given for each correct response. The proportion of correct responses is summarized in Table 2 with statistically significant differences in awareness levels at two time points, baseline and post-intervention.

Table 3 summarizes the multiple responses to each awareness based items. Most respondents came to know about breast cancer through news or multimedia (76%), whereas, 78% ascertained BSE as the tool for early breast cancer detection, 69% thought healthy diet prevents breast cancer,

whereas 50% conferred alcohol abstinence. The most identified symptoms/risk factors were presence of lumps (61%) and smoking (56%).

3.4 Knowledge of the Respondents towards BSE

Out of 21 knowledge-based items, 17 items were given '1' point for each correct answer to test the knowledge domain. All correct responses were summed-up to obtain the total knowledge score. Table 4 depicts the responses of the respondents towards knowledge-based items regarding BC and BSE. Among the 17 knowledge-based items, Q2, Q8 and Q11 had the maximum percentage of correct responses (91%, 72 % and 72%) respectively.

Table 2. Responses towards breast cancer awareness (Pre- vs. Post-test)

Q. No.	Awareness Items	Pre-intervention		*P value	Post-intervention		*P value
		Correct N (%)	Incorrect N (%)		Correct N (%)	Incorrect N (%)	
1.	Have you heard of breast cancer?	182(99)	1(1)	<.001	183(100)	0	-
2.	Worldwide, breast cancer is most common cancer among women.	118(65)	65(35)	<.001	183(100)	0	-
3.	What is the age at which breast cancer risk is highest?	57(31)	126(69)	<.001	183(100)	0	-
4.	Do you think breast cancer could lead to death?	118(65)	65(35)	<.001	178(97)	5(3)	<.001
5.	Is there any treatment for breast cancer?	107(58)	76(42)	.02	179(98)	4(2)	<.001
6.	Do you think early detection of breast cancer improves survival rate?	126(69)	57(31)	<.001	183(100)	0	-
Median (IQR) Awareness score		4 (2)			6 (0)		
Percentage Awareness score		64%			99%		

*Chi square test, $P < .05$ is statistically significant

Table 5 summarizes the multiple responses to each knowledge items and not included in total score calculation. Most respondents (55%) came to know about steps to perform BSE through brochures or internet sources. Mostly all respondents ascertained armpit as the area to examine when performing BSE, whereas, 61% responded looking for lumps, nipple discharge and/or pain in breast which needs a doctor's visit.

3.5 Comparison of Awareness Scores at Pre- and Post-Intervention

The awareness regarding BC was good at baseline, whereas only 64% were aware BC is most common among women and 31% knew the age-specific incidence rates. About 64% were aware BC could lead to death, 58% knew there was any treatment available and 69% thought early detection improves survival rates. Upon intervention, there was a significant improvement (64%→99%, $P < .05$) in awareness score towards all six items (Table 6).

3.6 Comparison of Knowledge Scores at Pre- and Post-Intervention

At baseline, only 43% knew about BC whereas, 72% have heard about BSE and only 32% were ever taught how to perform BSE for themselves. About 33% knew how often the BSE should be performed and 40% knew the best time for

performing BSE. Hardly 24% ever practised BSE, though 72% accepted performing BSE is good. However, only 38%, 28% and 22% knew the need of mirror, the part of hand to be used and the direction of hand movement for performing BSE. The average knowledge score was 51% at baseline which increased to 95% after intervention (Table 7).

4. DISCUSSION

4.1 Differences in Awareness towards BSE

Person et al., 1995 recommended girls at school age should be started with education about BSE in order to make it a habit [17]. However, over the years, there has been some debate over just how valuable BSE is in detecting breast cancer early and increasing the likelihood of survival. Due to some ongoing uncertainty, the American cancer society, no longer recommends BSE as a screening tool for women with average risk of breast cancer [18]. The U.S. preventive services task force "supports all patients being aware of changes in their bodies about breast self-awareness and discussing these changes with their clinicians" based on the frequent incidence of self-detected breast cancer [19]. This study found significant differences in distribution of age, race, relationship status, smoking history,

family history and native location. In general, the respondents' awareness of breast cancer was fair. It was also evident through earlier studies by Montazeri, et al., 2008 and Karayurt et al., 2008, the most common risk factor was poor knowledge for breast cancer [20,21]. The percentage of correct responses towards awareness based questions was only 64%, with moderate awareness level probably due to the lack of breast cancer preventive programs in rural areas of Malaysia [22].

In a study done by Adebamowo & Adekunle, 1999, it was observed that patients with positive family history tend to present early for screening and management [23]. The study results reported breast cancer (65%) was the commonest cancer among women worldwide which was slightly higher than 56% reported by Alwan et al., 2012 among the Iraqi population [24]. This study reported a better percentage of awareness (65%) about the possibility of death

by BC when compared to the study reported (46%) by Abdallah, et al. [25].

A study by Marzouni, et al., 2013, states that family history of breast cancer is significantly correlated with higher awareness, its screening and prevention [26]. It further reported that women with positive family history had better information about prevention programs ($P > .001$). In this study, respondents with family history of breast cancer have a slightly higher level of awareness regarding BSE. About 28% of respondents with family history had good awareness level compared to respondents with no family history (27%). Regardless of family history, women still need to be "breast aware" and accurately identify BC symptoms in order to receive timely treatment as quickly as possible [27].

Most of the study respondents came to know about BC through multimedia which was

Table 3. Multiple responses towards awareness items

Qn. No.	Awareness Items with Multiple Response	Response	*P value
		N (%)	
7.	What is the source of your information about breast cancer?		
	i. Newspaper/TV/Internet	138 (76)	<.001
	ii. Family doctor	6 (4)	
	iii. Family/ Friends	39 (20)	
8.	The tools utilized for early detection of breast cancer.		
	i. Self-examination (BSE)	143 (78)	<.001
	ii. Physical examination (PBE)	86 (47)	
	iii. Mammography	80 (44)	
	iv. Ultrasound	35 (19)	
9.	Preventive measures against breast cancer.		
	i. Alcohol abstinence	92 (50)	<.001
	ii. Increase physical activity	118 (65)	
	iii. Healthy diet	126 (69)	
	iv. Ideal body weight	93 (51)	
	v. Avoid hormonal therapy	103 (56)	
10.	Which of the following are risk factors/symptoms for breast cancer?		
	i. Decrease with increase in age	35 (19)	<.001
	ii. Increase with smoking	102 (56)	
	iii. Increase with alcohol consumption	92 (50)	
	iv. Increase in obesity	89 (49)	
	v. Increase with lack of exercise	86 (47)	
	vi. Increase with early menstruation (< 12 years)?	32 (18)	
	vii. Decrease in breast feeding?	46 (25)	
	viii. Increase with late pregnancy (> 30 years)	71 (39)	
	ix. Increases with contraceptive pills use	105 (57)	
	x. Increase in women never given birth	50 (27)	
	xi. Increase with presence of lump	112 (61)	
	xii. Increase with bloody discharge from nipple	115 (63)	

*Chi square test; $p < .05$ is considered statistically significant

Table 4. Responses towards BSE knowledge (Pre- vs. Post-test)

Q. No.	Knowledge Items	Pre-Intervention		*p value	Post-Intervention		*P value
		Correct N (%)	Incorrect N (%)		Correct N (%)	Incorrect N (%)	
1.	Do you know what breast self-examination (BSE) is?	78(43)	105(57)	.05	176 (96)	7(4)	<.001
2.	Have you heard of BSE?	132(72)	51(28)	<.001	182 (99)	1(1)	<.001
3.	Do you know that BSE is a useful tool for early detection of breast cancer?	113(62)	70(38)	.001	183(100)	0	-
4.	Have you been taught how to do BSE?	59(32)	124(68)	<.001	183(100)	0	-
5.	At what age do you think BSE should be started?	108(59)	75(41)	.02	183(100)	0	-
6.	How often should BSE be done?	60(33)	123(67)	<.001	183(100)	0	-
7.	What is the best time to carry out BSE?	73(40)	110(60)	.02	183(100)	0	-
8.	Who should perform BSE?	166(91)	17(9)	<.001	183(100)	0	-
9.	What are the major benefits of BSE?	87(47)	96(53)	.50	183(100)	0	-
10.	Do you practice BSE?	44(24)	139(76)	<.001	68(37)	115(63)	<.01
11.	Do you think BSE is a good practice?	132(72)	51(28)	<.001	178(97)	5(3)	<.001
12.	Is BSE the most commonly used method for breast cancer detection?	98(54)	85(46)	.34	179(98)	4(2)	<.001
13.	What are the postures for performing BSE?	129(70)	54(30)	<.001	170(93)	13(7)	<.001
14.	Is a mirror required for performing BSE?	69(38)	114(62)	.001	183(100)	0	-
15.	Which part of the hand is used for performing BSE?	52(28)	131(72)	<.001	180(98)	3(2)	<.001
16.	What is the direction of hand movement during BSE procedure?	41(22)	142(78)	<.001	180(98)	3(2)	<.001
17.	How should one respond if any abnormality is detected?	131(72)	52(28)	<.001	181(99)	2(1)	<.001
Median (IQR) Knowledge score		9 (3)			16 (1)		
Percentage Knowledge score		51(%)			95(%)		

*Chi square test, $p < .05$ is statistically significant

consistent (76%) with the study reported by Milaat [27]. These findings indicated that multimedia continued to be one of the most important resources of information about BC & BSE and highlighted the coordination between public health educators and the multimedia in dissemination of BC related information.

A study conducted among female nursing college students in Riyadh, Saudi Arabia reported 66% of study population performed BSE, and another study among female medical students in Taif, KSA reported only 17% performed BSE regularly

whereas, 89% knew BSE should be carried out every month. Similar results were reported among women in Al-Qassim region (19%), KSA who performed BSE regularly; whereas, 70% had never heard of BSE [28,29]. This study identified 24% of the respondents practice BSE regularly, 54% accepted BSE as the most commonly used method for early detection and 72% were aware of what to do if any abnormality was detected.

Regarding symptoms for breast cancer, about 63% and 61% respectively knew that bloody

discharge from nipple and presence of lump should be reported immediately, while 57% and 56% knew, use of contraceptive pills and smoking are implicated risk factors. Most of the respondents in this study didn't know the association between breast cancer and short periods of breast feeding (25%), early menstruation (18%) and advanced age (19%). Also, around 49%, 50% and 39% of respondents

realized the effect of obesity, alcohol consumption and delivery of first child after the age of 30 years respectively has high risk factors of breast cancer. Respondents showed poor understanding about major breast cancer risk factors. The perception of the use of contraception by 57% might reflect the religious appreciation that encourages natural methods of birth control [30,31].

Table 5. Response of knowledge towards performing BSE

Q. No.	Knowledge Items	Response N (%)	*P value
18.	Source of BSE performing knowledge		
	i. Mother	22 (12)	<.001
	ii. #Sister	1 (1)	
	iii. Teacher	15 (8)	
	iv. Doctor	15 (8)	
	v. Nurse	25 (14)	
	vi. Friend	5 (3)	
	vii. Others	100 (55)	
19.	Areas to examine when performing BSE		
	i. Breast	112 (61)	<.001
	ii. Armpit	183 (100)	
	iii. Between breast and collar bone	63 (34)	
20.	What should be looked for during BSE?		
	i. Breast skin colour/texture	62 (34)	<.001
	ii. Lumps	112 (61)	
	iii. Nipple discharge	78 (43)	
21.	What are the abnormalities that need a doctor visit?		
	i. Fixed or mobile mass	102 (56)	<.01
	ii. Difference between breasts	77 (42)	
	iii. Changes in size during menstruation	25 (14)	
	iv. Change in breast skin colour/texture	103 (56)	
	v. Nipple discharge	111 (61)	
	vi. Pain in breast	112 (61)	

*Chi square test; P < .05 is considered significant. *Ignored for results interpretation

Table 6. Comparison of awareness scores at pre- and post-intervention

Qn. No.	Awareness Item	**Pre-test N (%)	**Post-test N (%)	*P value
1.	Have you heard of breast cancer?	182 (99)	183 (100)	<.001
2.	Worldwide, breast cancer is most common cancer among women.	118 (64)	183 (100)	<.001
3.	What is the age at which breast cancer risk is highest?	57 (31)	183 (100)	<.001
4.	Do you think breast cancer could lead to death?	118 (64)	178 (97)	<.001
5.	Is there any treatment for breast cancer?	107 (58)	179 (98)	<.001
6.	Do you think early detection of breast cancer improves survival rate?	126 (69)	183 (100)	<.001
Median (IQR) Awareness Score		4(2)	6(0)	
Percentage Awareness Score		64%	99%	

*Mcnemar's Test, P < .05 Is Significant; ** The N(%) of Correct Responses to each Awareness Questions

This study outcomes are closely associated with the studies reported more than a decade ago by Adebamowo & Ajayi [31], Odusanya [32] and Adebamowo & Adekunle., 1997, that the incidence of breast cancer was slightly higher in persons with: history of first degree relatives with breast cancer; early menarche; late menopause; oral contraceptive use; does not breast feed; first birth after age 35 or nulliparous women [31,32]. The incidence is also increased with increasing age, smoking, obesity, physical inactivity, radiation exposure, intake of alcohol and high fat. Thus, further health education was recommended on associated and protective risk factor.

4.2 Differences in Knowledge towards BSE

In general, the respondents' knowledge on BSE was poor. The outcome is supported by reports from earlier studies [33]. The study reported the knowledge and behaviour of female health care workers concerning BC is relatively poor and it needs to be improved [33]. Considering the role that health care workers may play in communicating health behaviour to the general public, planning health education interventions

for females is essential [34]. The percentage of correct answers to knowledge questions was only 51% and poor.

In this study, 20% of year four students had good knowledge level. A study from Gurdal et al. [35], reported that higher educational levels were positively associated with BSE performance. Overall, the results suggest that Turkish women, regardless of their education level, need better education on BSE [35]. Most of the respondents have been taught about BSE through internet and pamphlets which included 55% of respondents. However, the print medium has been found to be the commonest source of information in other studies [36]. Other studies from developed societies reported television and radio as the most popular media and can reach a wide audience [36,37,38,39]. A study among female medical students in Nigeria reported that 97% were aware of BSE mainly through television/radio [38], while in another survey from the same country, the electronic media were found to be the major resource among female secondary-school teachers [39]. This emphasizes that source of information varies by setting, which needs to be considered when promoting health education.

Table 7. Comparison of knowledge scores at pre- and post-intervention

Qn. No.	Knowledge Item	**Pretest N (%)	**Post-test N (%)	*P value
1.	Do you know what breast self-examination (BSE) is?	78 (43)	176 (96)	<.001
2.	Have you heard of Breast Self-Examination (BSE)?	131 (72)	182 (99)	<.001
3.	Do you know that BSE is a useful tool for early detection of breast cancer?	113 (62)	183 (100)	<.001
4.	Have you been taught how to do BSE?	59 (32)	183 (100)	<.001
5.	At what age do you think BSE should be started?	108 (59)	183 (100)	<.001
6.	How often should BSE be done?	60 (33)	183 (100)	<.001
7.	What is the best time to carry out BSE?	73 (40)	183 (100)	<.001
8.	Who should perform BSE?	166 (91)	183 (100)	<.001
9.	What are the major benefits of BSE?	87 (48)	183 (100)	<.001
10.	Do you practice BSE?	44 (24)	68 (37)	<.01
11.	Do you think BSE is a good practice?	132 (72)	178 (97)	<.001
12.	Is BSE the most commonly used method for breast cancer detection?	98 (54)	179 (98)	<.001
13.	What are the postures for performing BSE?	129 (70)	170 (93)	<.001
14.	Is a mirror required for performing BSE?	69 (38)	183 (100)	<.001
15.	Which part of the hand is used for performing BSE?	52 (28)	180 (98)	<.001
16.	What is the direction of hand movement during BSE procedure?	41 (22)	180 (98)	<.001
17.	How should one respond if any abnormality is detected?	130 (71)	181 (99)	<.001
Median (IQR) Knowledge score		51%	95%	
Percentage Knowledge score		9(3)	16(1)	

*McNemar Test, $P < .05$ is significant; **The N(%) of correct responses to each knowledge questions

4.3 Effect of Intervention Tool (Pamphlet)

This study found significant differences in awareness scores [64%→99%; Mdn. 4(2)→6(0)] and knowledge scores [51%→95%, Mdn. 9(3)→16(1)] between pre- and post-intervention. The overall awareness score was moderate at baseline whereas, knowledge was poor. However, after educational intervention using pamphlet, both awareness and knowledge scores improved significantly to good category. Among the age categories, participants aged 24 years and older; among the races, Chinese; and year two respondents showed greatest increase in awareness and knowledge scores between pre- and post-intervention studies. It is probably due to higher the age, better the exposure to health care related courses and greater capability of understanding [40]. Among the native location, rural areas respondents showed good awareness and knowledge scores between the two phases. These good and positive results indicate that well-structured and information tailored educational pamphlet is useful as a education tool to increase awareness and knowledge among the target population [41].

5. CONCLUSION

In conclusion, the results presented in this study give an insight into the effects of pamphlet as an intervention tool among university female students regarding BC and BSE focused on awareness and knowledge. This study results confirm that the awareness and knowledge levels in the study population was quite poor at baseline. Hence, educational intervention using pamphlet providing clear, precise and required information about breast cancer and steps for performing breast self-examination has been found to be useful. There was an increase in awareness and knowledge scores among the respondents between pre-test and post-intervention test. This study revealed that pamphlet education was equally effective in accomplishing the aims and objectives of this study.

6. LIMITATIONS OF THE STUDY

The study population of this study consisted only of pharmacy students from a private University in Kedah state, Malaysia. Hence, the results cannot be generalized to all university students or to all ages throughout Malaysia. Although the reliability coefficient was found to be high, interpretation of the results were solely limited to

responses being self-reported and prone to subject bias.

CONSENT AND ETHICAL APPROVAL

The research proposal along with the study instrument, intervention tool and informed consent form (ICF) was submitted to the Institutional Review Board (IRB), AIMST University Human Ethical Committee (AUHEC) and the ethical clearance was obtained before initiation of study and signed informed consent was obtained from each participant before distribution of survey forms.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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