

## Prevention of Breast Cancer: Effects of Early Education on Knowledge and Practice of University Students in Saudi Arabia

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### **Abstract:**

**Background:** Breast cancer is perceived as being the leading cause of death among women in developing countries. Efforts to combat this disease must begin with women at earlier ages, so that perception of breast cancer prevention is a major issue in reducing breast cancer morbidity and mortality.

**Objective:** The study aimed to evaluate the Effects of early education on knowledge and practice of university students in Saudi Arabia

**Study design:** A quasi-experimental design – one group pre-posttest.

**Subjects and sampling:** Convenient sample was used to select the students in Non-health College Princes Nourah University of different academic levels and who were agreeable to join in the study that include (293 students)

**Setting:** The study was conducted in Non-health College Princes Nourah University in Saudi Arabia.

**Tools:** A constructed self-governing questionnaire was established in Arabic by the author after reading the relevant publications. It contains four tools: **I:** Demographic data of university students such as age, students' grade & marital status. **II:** Source of information on breast cancer, for example the press (television, radio set, newsprint), therapeutic personnel, family and friends. **III:** knowledge of university students about breast cancer as definition, leading factors by means of family medical history, menarchal period, symptoms of the disease, by means of lump in breast, nipple discharge, pain and soreness & change in size, prevention and methods of early detection. **V:** Subjective preventive practice of breast cancer as perform of breast self examination, intake soybeans & perform exercises

**Results:** About two thirds 62.2% of the The research population aged 20 with less than 22 years old. Half of the 50.2% of the research group does not even have a source of information on breast cancer. The participants in the study had limited knowledge of the nature of breast cancer, possible risk, and preventive measures in the pre-test which improved later the education implementation.

**Conclusion:** The conclusion of the present study was that most of research group had inadequate information on the symptoms of breast cancer, factors as well as preventive measures and early detection methods. The applicable health education activity had a significant effect on a in participants' awareness of breast cancer and increased breast self-examination experience.

**Key Words:** Breast Cancer – Education – knowledge and practice- University students

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### **I. Introduction**

Cancer is a serious health problem with big geographic variances in occurrence, now it is being main element for all nation's health programme. It is the constant production and distribution of cells, the growth most often invades surrounding tissues and can metastasize to distant places. It could impair other body parts (1). Globally, the occurrence of breast cancer (BC) is more than 1.15 million reported patients per year, with a cumulative death rate of 502,000 losses per year, next only to lung cancer as the source of cancer-related deaths among females. (2). In the US, 7 % of breast cancer women were diagnosed before age 40 and the rate of survival of these women was worse than those diagnosed at older ages. (3). Compared to other nations, the incidence rate of BC in Jordan and Asia is lower than the global level. For example, the occurrence of breast cancer ranged from 19.3 per 100,000 females in Eastern Africa to 89.7 per 100,000 women in Western Europe, While in several developed countries, incidence rates are below 40 per 100,000. Annual U.S. Surveillance Epidemiology and End Results rates are considerably higher than the one seen in women in the Middle East. (4). Breast cancer is a common type of cancer among young age in the Arab World. The regionally developed disease is quite prevalent and overall mastectomy is most frequently used for treatment. (5) Jordan is ranked among the three main types of cancer between Jordanian women and constitutes 30.9% (6), in Saudi Arabia, it is the ninth major cause of death which constitutes around 21.8 % and in Egypt it is ranked first among affecting females & it constitutes

29% of female cancers<sup>(7)</sup>. Breast cancer is a disease in which the cells in the breast tissue develop and split without ordinary command. This kind of cell growth creates a mass or lump called a tumor. Tumors are either benign (not cancerous) or malignant (cancerous)<sup>(8)</sup>. Several factors leading to breast cancer that rises with increasing age and has an elevated occurrence rate in females between 40 and 55 years of age<sup>(9)</sup>. Also, females with ovarian cancer or family history of breast or ovarian cancer. Females who initiated menstruation early or menopause after 55 then used hormonal replacement treatment (HRT) with mixed estrogen and progesterone<sup>(9)</sup>. Breast cancer in the earliest phases usually does not generate symptoms, but as the tumor enlarges, the symptoms generated include painless lump in the breast, lump under the armpit, breast pain, inflammation or thickness of the breast skin, spontaneous release of the nipple, especially in cases of bleeding and erosion or inversion of the nipple<sup>(8)</sup>. Therefore, Preventing or identifying breast cancer at an earlier time is therefore of paramount significance in saving and improving the quality of life. Breast health consciousness appears to be a pragmatic approach to this. Breast health perception tends to be an essential requirement for the early detection of breast cancer in low-income countries<sup>(10,11)</sup>. Although breast awareness has long been advocated as a health promotion action in many areas of the globe, evidence demonstrate that females, in particular, do not yet breast aware. Early detection processes, including breast self-examination (BSE), clinical breast examination (CBE) by the physician, as well as ultrasound and mammography, are the secondary preventive approaches used to screen for early diagnosis of BC<sup>(12,13)</sup>. According to the American Cancer Society (ACS), BSE is a choice for females beginning in the early '20s<sup>(14)</sup>. Research has revealed that breast self-examination is the major step in early tumor discovery so that the patient can discover more than 65 percent of breast lumps<sup>(13)</sup>. Today, a large proportion of diagnosed females with progressed phases of the disease, which can be linked to a deficiency of knowledge about screening importance<sup>(12)</sup>. All university students are at a stage where it is important that they must have sufficient knowledge and understanding of breast cancer to affect their communities and families in the future. Therefore, this study aimed to evaluate the effects of early education on knowledge and practice of university students in Saudi Arabia.

## **II. Aim of the Study**

To evaluate the Effects of early education on knowledge and practice of university students in Saudi Arabia

## **III. Subjects and Methods**

**3.1. Study design:** A quasi-experimental design – one group pre-posttest.

**3.2. Research hypothesis:**

University students' perception of breast cancer prevention will improve on the basis of a health education session.

**3.3. Study Setting:**

The study was done in Non-health College Princes Nourah University in Saudi Arabia.

**3.4. Subjects and Sampling:**

The sample was chosen by a convenience method in Non-health College Princes Nourah University of different academic levels and who were agreeable to join in the study that include (293 students)

**3.4.1 Inclusion criteria**

- Female students
- Ages 18 and older.
- Non-health college
- Students were agreeable to take part in the study

**3.4.2 Exclusion criteria:**

- Pregnant students
- Students who were breast feeding

**3.5. Tools of the study:**

A constructed self-governing questionnaire was established in Arabic by the author after reading the relevant publications to use for collect data according the following classification :-

**Tool I:** Demographic data of university students such as age, students' grade & marital status.

**Tool II:** Source of information on breast cancer, for example the press (television, radio set, newsprint), therapeutic personnel, family and friends.

**Tool III:** Structured self-administered questionnaire about knowledge of university students about breast cancer as definition, leading factors for example family medical history, menarchal period, disease symptoms, by means of lump in breast, nipple discharge, pain and soreness & change in size, prevention and methods of early detection.

**Tool IV:** Structured self-administered questionnaire about subjective preventive practice of breast cancer as perform of breast self examination, intake soybeans & perform exercises.

### 3.6. Methods:

#### 1- Ethical consideration:

Written agreement was taken from students. Students are free to worry regarding information privacy and educated that they can leave the study when want.

#### 2. Tools development:

Following reading the local and global literature the tool was developed.

#### 2.1 Scoring of knowledge:

Scoring of the questionnaire is mark of one for the right answer, zero for the wrong answer & do not know. For the knowledge score about breast cancer: poor < 50 %; fair from 50 - < 65%; good ≥ 65.

#### 2.2 Scoring of practice:

For each question; one mark was given for right practice and zero for wrong practice. For the practice score about breast cancer: unsatisfactory < 60 % while satisfactory ≥ 60

#### 3. Validity and reliability of tools

29 of the college student were taken questionnaire for investigate the applicability and clearness of allocated form in addition to compute the sample proportions. Essential changes were prepared and excepted this participants from the total number. The reliability was tested by statistical SPSS package to yield a Cronbach's alpha of 0.92.

#### 4. Fieldwork:

The health education lecture on breast cancer was conducted on the context of a review of the literature. The color pamphlet was designed according to the review in a plain Arabic. The material submitted to four academics to provide their views and feedback on the material. The content was adapted based on expert's suggestions.

#### 5. Data collection:

The study was conducted from the beginning of September to January 2016 among college student in Non-health College Princes Nourah University in Saudi Arabia. About 20 sets were used for intervention in College Princes Nourah University, every set contained of 10-15 students and received one lecture. A test was done previous to the lecture by administering the questionnaire after adequate clarification. Each group took 15-20 minutes to finish the questionnaire, afterward an interactive powerpoint was given, accompanied with brain storming. Lecture contained breast cancer meaning, symptoms, leading factors, prevention, detection methods and, after completion of lecture, a colorful Arabic pamphlet on breast cancer was provided to the participants. The post-test was carried out directly after the implementation of the education lecture. Three months later the follow-up was carried out, using the same questionnaire. There was 23 students dropouts.

#### 6. Data analysis:

For the analysis of the collected data, the Statistical Package for Social Sciences (SPSS) version 20.0 was used. Statistical significance was considered at p-value < .05, a highly significant difference obtained at p < .01 and non-significant difference obtained at p > .05. Descriptive statistical analysis was conducted to accomplish the goal of the research.

## IV. Results

**Table 1.** Distribution of students according to their demographic data

Items	N (293)	%
<b>Age</b>		
18 -	69	23.5
20 -	182	<b>62.1</b>
22-	34	11.6
25 to above	8	2.7
<b>Marital status</b>		
Single	236	<b>80.5</b>
Married	48	16.4
Widow	7	0.9
Divorce	2	0.7
<b>Students' grade</b>		
First year	39	13.3
Second grade	81	27.6
Third grade	102	<b>34.8</b>
Fourth grade	71	24.2

Table(1) Designates the features of students with approximately two thirds of them (62.1%) aged from 20 to less than 22 years old, the majority of them (80%) were single and more than one third of them (34.8%) had third grade of faculty

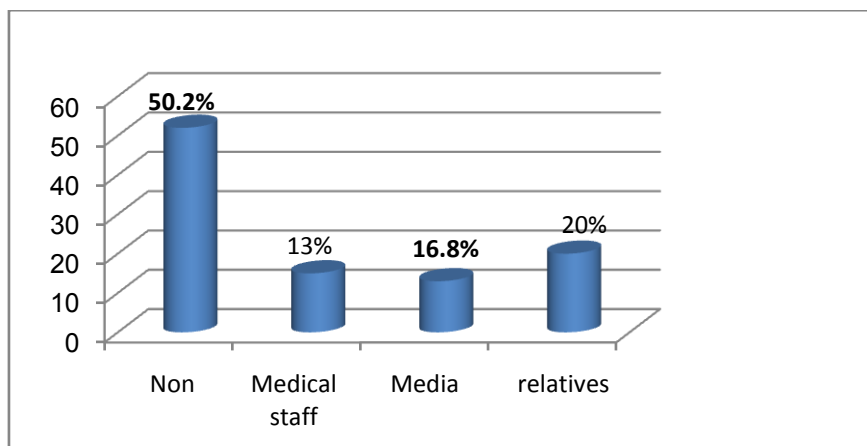


Figure 1. Distribution of the students by a source of breast cancer information

Respects source of information Figure 1 indicates that half (50.2%) The research group didn't even hear regarding breast cancer.newspaper ,television, andradio set, as mass mediadenoted (16.8%). Health education via the curative personnelwas (13%). hose who listed family and friends as a source of information was (20%) of them .

Table 2. Distribution of the students according to their right knowledge of breast cancer

Items	Pre (293)		Immediate post (293)		Follow up (270)	
	N	%	N	%	N	%
<b>Risk factors</b>						
Increasing age	52	17.7	240	81.9	212	78.5
Family history	60	20.4	290	98.9	190	70.4
First child at late age	16	5.5	250	85.3	188	69.6
Late menopause	67	22.9	292	99.6	206	76.3
Radiation exposure	62	21.2	291	99.3	179	66.3
Intake of oral contraceptive	58	19.7	230	78.5	187	69.3
Early menarche less than 12yrs old	277	94.5	274	93.5	205	75.9
<b>Symptoms of breast cancer</b>						
Lump in breast	60	20.4	260	88.7	217	80.4
Nipple discharge	38	12.9	287	97.9	183	67.8
Pain and soreness	54	18.4	282	96.2	208	77.0
Change in size	58	19.7	250	85.3	232	85.9
Inverted nipple	52	17.7	270	92.1	190	70.4
Itching in the breast	18	6.1	230	78.5	205	75.9

Table (2)Table (2) indicates that the students 's awareness of breast cancer, risk factors and signs of breast cancer increased in post-test and follow-up test.concerning the family history, radiation exposure & late menopause as risk factors the correct answer of the students improved from pretest (20.7%, 21.2% & 22.9%) respectively to (98.9%, 99.3 % & 99.6%) respectively in posttest. On the other hand, use of pain & soreness , change in size & lump in breast as symptoms reported by the students in the pretest (18.4%, 19.7% & 20.4%) respectively and it was more improved in posttest (96.2%,85.3% & 88.7%), matched to follow up (72.0% , 77.5%) respectively.

Table 3. Distribution of students according to their correct knowledge of prevention breast cancer

Items	Pre (n=293)		Immediate post (n=293)		Follow up (n=270)	
	N	%	N	%	N	%
<b>Prevention of breast cancer</b>						
Avoidance use of hormonal replacement therapy	11	3.8	250	85.3	223	82.9
Physical exercises	10	3.4	270	92.1	230	85.5
Perform breast self-examination	60	20.4	282	96.2	241	89.6
Perform mammogram	0	0	260	88.7	194	72.1
Breast feeding	69	23.5	287	97.9	221	82.2
Intake foods rich with soya beans	0	0	280	95.6	205	76.2

Table (3)It illustrates that there was a change in the knowledge of the students on breast cancer prevention on the three tests. Concerning breast self-examination & breast feeding as prevention of breast cancer the right answer of the studentsbetter from pretest (23.5% ,20.4% ) respectively and improved in the post test was (97.9% , 96.2%) respectively.

**Table 4.** Distribution of the students according to their correct knowledge of early detection methods of breast cancer

Item	Pre (n=293)		Immediate post(n=293)		Follow up(n=270)	
	N	%	N	%	N	%
<b>Types of early detection methods</b>						
Self-breast examination	46	15.7	287	97.9	222	82.5
Clinical examination	33	11.3	260	88.7	217	80.7
Mammography	26	8.6	282	96.2	208	77.3
Ultrasound	22	7.5	250	85.3	215	79.9
<b>Age of starting BSE</b>						
Before 25 yrs	69	23.5	293	100	260	96.2
<b>The best time for self-examination</b>						
5 days after period	45	15.5	287	97.9	230	85.5
<b>Frequency of BSE</b> Monthly	45	15.5	293	100	260	96.2
<b>CBE frequency</b> Once in three years	21	7.1	293	100	245	90.7
<b>Recommended age of mammography</b> 40 years old	30	10.2	282	96.2	241	89.2

Table (4) Demonstrates that there has been an increase in the awareness of the students regarding methods of early detection of breast cancer. Regarding the breast self-examination, screening method of early detection the right answer of the students improved from pretest (15.7%) to (97.9%) posttest. As regards age of starting of breast self-examination and frequency of breast self-examination & clinical breast examination the correct answer in the pretest was (23.5% ,15.0% & 7.1%) improved in the post tests (100%). Finally recommended age of mammography, the correct answer in pretest was 10.2 % after posttest improved was 96.2 %

**Table 5.** Distribution of students according to their knowledge score of breast cancer

Items	Pre (n= 293)						Immediate post(n=293)						Follow up(n=270)					
	Poor		Fair		Good		Poor		Fair		Good		Poor		Fair		Good	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<b>Definition</b>	191	65.1	12	4.0	90	30.7	0	0	15	5.1	278	94.8	0	0	35	12.9	235	87.0
$\chi^2$	665.932																	
<b>P- Value</b>	<0.001																	
<b>Risk factors</b>	233	79.5	15	5.1	45	15.3	0	0	33	11.3	260	88.7	34	12.5	39	14.4	197	72.9
$\chi^2$	330.104																	
<b>P- Value</b>	<0.001																	
<b>Symptoms</b>	245	83.6	10	3.4	38	12.9	0	0	18	6.1	275	93.8	13	4.8	78	28.9	179	66.3
$\chi^2$	190.802																	
<b>P- Value</b>	<0.001																	
<b>Methods of early detection</b>	235	80.2	18	6.1	40	13.6	0	0	10	3.4	283	96.5	40	14.9	18	6.7	212	78.5
$\chi^2$	636.073																	
<b>P- Value</b>	<0.001																	
<b>Prevention of breast cancer</b>	225	76.7	13	4.4	55	18.7	0	0	16	5.5	277	94.5	11	4.1	68	25.3	191	70.7
$\chi^2$	289.830																	
<b>P- Value</b>	<0.001																	

Table (5) Concerning knowledge score of the students, findings in Table 5 illustrates that, less than one third (30.7%) of students had respectable knowledge about the definition, despite the fact that only 12.9%, 13.6%, 15.3%, 18.7 % of them had good knowledge about symptoms, risk factors, methods of early detection and avoidance. Afterward, a dramatic increase in the level of knowledge of students (93.8%, 94.8%, 94.5%, 95.5% & 96.5%) respectively in symptoms definition, risk factors, prevention & methods of early detection regarding the outcomes of the follow up was weakened. There is a significant difference among the female college students with regard to all items of knowledge about breast cancer (P: <0.001).

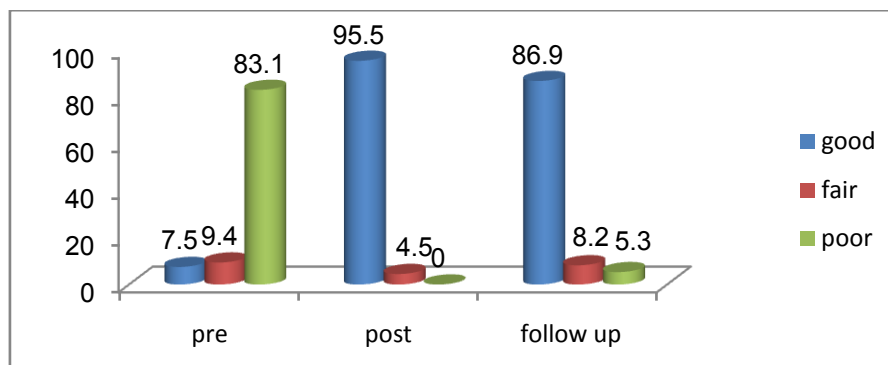


Figure 2. Total students knowledge score of the breast cancer

Knowledge of students, in Figure 2 illustrates that (7.5%) of university students had good knowledge about breast cancer during pre-test. After intervention, the majority of them (95.5%) had good knowledge. Regarding the findings of the follow-up to the change were decreased to (86.9%). There was a highly statistically significant difference ( $p = .001$ ) between the knowledge score of the study group pre, post and follow up.

Table (6) : Distribution of the students according to their correct preventive practices of breast cancer

Items	Pre (293)		Follow up (270)	
	N	%	N	%
<b>Diet</b>				
Vegetables	155	52.9	270	100
Fruits	166	56.6	270	100
Soya beans	50	20.9	260	96.2
Vitamins	130	44.3	250	92.5
Perform the exercise	293	100	270	100
<b>Types of exercises</b>				
Walking	293	100	270	100
Running	239	100	270	100
<b>Stress coping</b>				
Praying	200	68.2	270	100
Verbalization	90	37.9	200	74.0
Watch movies	230	78.4	240	88.8
Rest and sleep	200	68.2	250	92.5

# More than one answer

Table (6) shows correct preventive practices of the students. As regard foods rich with vegetables & fruits, in pre test more than half (52.9 & 56.6 %) of the students were consumed vegetable & fruits while only 20.9% of them were consumed soy foods, while in follow up, all (100%) of students were consumed vegetable & fruits also the majority of them (96.2%) consumed soyabeans. Regarding practicing of the exercise, in pre test all of the studied students performed exercises as walking, running. Concerning the coping with the stress, in pre test, more than three quarter (78.4%) of the studied students were coping by watch movies, more than two thirds (68.2%) of them were coping with praying & rest while in follow up, all of the studied students stress coping with praying

Table 7. Distribution of the students according to their subjective practice regarding breast self-examination

Item	Pre (293)		Follow up (270)	
	N	%	N	%
<b>Frequency of practicing breast self-examination:</b>				
Not practicing BSE	270	92.1	20	7.4
Monthly	0	0	250	92.5
Yearly	0	0	0	0
Occasionally	23	7.8	0	0
<b>Method of breast self-examination</b>				
In front of the mirror	23	7.8	70	25.5
During bathing	0	0	0	0
Lying down on bed	0	0	200	74.0
<b>Causes of do not make BSE</b>				
Fear to discover any abnormalities	293	100	0	0
Don't know the technique	270	92.1	0	0

\* More than one answer

Table (7) shows correct practice of breast self-examination of the students. As regards to the frequency of practicing breast self-examination, in pre-test, the majority of the student (92.1%) reported that they were not practicing breast self-examination and only (7.8%) of them were practicing occasionally while in follow up, the majority (92.5%) of them reported practicing breast self-examination. In relation to methods of breast self-examination, in pre-test, only 7.8% of the students performed breast self-examination in front of the mirror while follow up more than three quarter (74.0%) of them performed breast self-examination in front of the mirror. Concerning reasons for not practicing breast self-examination, in pre-test, the majority of the students (92.1%) did not know technique of breast self-examination & feared to discover any abnormalities while in follow up all (100%) of the students know technique of breast self-examination

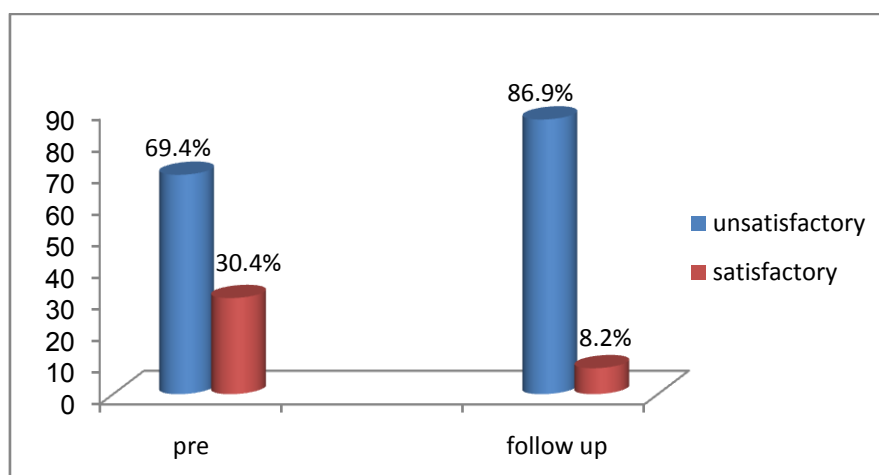


Figure 3. Practice level of the students about breast cancer prevention

Relating to the practice level of the students Figure 3 illustrates that, (30.4%) of them had satisfactory about practice level of breast cancer prevention during pre-test. After intervention, the follow up the majority (86.9%) of them had satisfactory about practice level of breast cancer prevention.

## V. Discussion

Preventative intervention is the main factor in decreasing cancer deaths. Information is a required predisposing element in behavior modification. So that, health education as a method for health promotion is therefore essential to promoting the health of female university students through increased awareness of breast cancer detection via instructional sessions<sup>(15)</sup>.

Concerning to the student's knowledge, most students had reduced knowledge in relation to risk factors, the protecting elements needed to prevent breast cancer as avoidance usage of hormonal replacement therapy, breastfeeding, physical exercises and perform breast self-examination. This is because of lack of communication through media about breast cancer in addition to reduced consciousness related to the importance of preventive measures. Also the clearness of content of the session, the proper way of instruction and resources used. In addition, a student's willingness to in or set then keep a good habits have been concerned and to learn about the disease. The research data is well-matched by results of prior study in Saudi Arabia Akhtari-Zavare et al. 2015 in Malaysia and Early et al. 2011 in United States Zeinomar, & Moslehi, (2013) in new York and in Angola<sup>(16,17,18,19)</sup> concerning breast cancer of university students revealed that their general knowledge was quite low.

Regarding to the student's knowledge about early detection methods of breast cancer as breast self-examination (BSE), clinical breast examination & mammography. Research results revealed that most of students have reduced knowledge concerning early detection methods prior to lecture. This may possibly be because of the reduced community base awareness and screening program of BSE among young female. These findings are support by Akhtari-Zavare et al. (2014)<sup>(20)</sup>, that reported 97% of the participants did not heard about BSE & the low level of knowledge and lack of awareness about the breast screening tests can partly explain the delay in presentation of symptomatic breast cancer to health care provider (Abdul et al., 2010)<sup>(21)</sup>.

The results of the present study indicated that more than half of students had poor knowledge pre intervention about recommended age of mammogram. This was in approved by Akhtari-Zavare et al.<sup>(16)</sup> who evaluate student's awareness of recommended age of mammogram and show that students' were not knowledgeable about recommended age of mammogram

Concerning the source of information, the current results displayed the majority of students have not a few basis of information around breast cancer. This is already in accordance with Akhtari-Zavare et al.<sup>(16)</sup>

Concerning the students' practice of breast self-examination, the study results show that the majority of female college students stated that they did not practice breast self-examination before the educational session. This may be clarified by the fact that students were at a younger age and don't consider the risk for breast cancer & they were unknown technique of practice BSE. Those findings likewise to Redhwan et al. (2011)<sup>(22)</sup> in Malaysia, revealed that most of participants who never practice BSE mentioned that the lack of knowledge was the main barrier to practicing BSE. After educational session, findings showed improving practice of BSE among female students. This finding is consistent with Akhtari-Zavare et al. (2014)<sup>(20)</sup> who stated about the efficiency of such programs in educating the female university students' how to perform breast self examination.

Our analysis showed that increased the knowledge of breast cancer instantly after education. There was statistically relevant upgrading in knowledge score of the students about breast cancer (definition, symptoms, risk factor, early detection and preventive measures ) post-educational session and in follow up. Our results concur with findings of other educational interventions conducted within Saudi Arabia<sup>(23)</sup>, in Ghana<sup>(24)</sup>, in Jordan<sup>(25)</sup>, in Egypt<sup>(26)</sup> and in Turkey<sup>(27)</sup> which illustrated that educational session had profound effects on knowledge of breast cancer prevention.

## VI. Conclusion

The largest number of the students had limited information on the nature of breast cancer, risk factors and also preventive measures & early detection methods. The established health education session had a weighty impact on a dramatic rise in student's awareness of breast cancer.

## VII. Recommendations

Education programs on breast cancer should be introduced as a topic in university syllabuses for students to gain either the interest and excitement of this age .Health education campaign in non-medical faculties to raise the sensitivity of all female students about breast cancer. Media outlets should be used to spread the message on the detection of breast cancer.

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