

## Breast cancer awareness among female University students in Ajman, UAE

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### ABSTRACT

**Objectives:** Knowledge of female university students regarding breast cancer and its preventive measures and the main misconceptions regarding breast cancer were assessed

**Materials and Methods:** This cross-sectional study was conducted among female university students in three large Universities in Ajman, namely Gulf Medical University (referred to as U1), offering health related programs; Ajman University of Science and Technology (referred to as U2) offering mostly science and technology programs; and Preston University Ajman (referred to as U3) offering science programs. A validated, pilot-tested self-administered questionnaire was used as a tool for data collection. A score less than 60% was considered as inadequate knowledge. Data were entered in to Excel sheets and analyzed using PASW 19. The tests used were Independent Samples Kruskal-Wallis test and x<sup>2</sup> test.

**Results:** Family history of Breast cancer was reported by 9.2% (36) of the participants, which had affected mostly second degree relatives (63.9%). None of the students had a personal history of breast cancer. The most widely known risk factors for breast cancer were previous cancerous growth in the breast (72.4%), family history of breast cancer (70.2%), radiation to chest (67.9%), and smoking cigarettes (65.3%). The most frequent correct response about the warning signs of breast cancer (61%), was "Painless breast lump", next was "change in the size or shape of the breast" (60.2%). Among the participants, 53.8% had heard about Breast Self-Examination and 44.1% Clinical Breast Examination. Significantly higher knowledge scores regarding risk factors for breast cancer are noticed among participants from countries in the Americas, from universities offering only medical/ health related programs, and those having family history of cancers compared to their respective counterparts in the nationality, university and family history subgroups respectively. The most frequent misconceptions are "Treatment for breast cancer affects woman's femininity", "Herbal remedies and dietary supplements can treat breast cancer" and "There is little that I can do to prevent cancer" reported by 62.5%, 56.4% and 49.7% respectively.

**Conclusion:** Inadequate knowledge (scores <60%) regarding breast cancer among a high proportion of female university students and on knowledge about the risk factors, warning signs and methods for early detection of breast cancer was observed. Most frequent misconception reported was "Treatment for breast cancer affects woman's femininity". Educational campaigns are necessary to fill the gap in knowledge.

**Key words:** breast cancer, preventive measures, university, female student

### INTRODUCTION

Breast cancer is the second most common cancer in the world and the most common cancer in women, comprising 16% of all female cancers<sup>1</sup> and resulting in the death of 519 000 women worldwide in 2004<sup>2</sup>. In the Eastern Mediterranean Region, breast cancer is the most commonly diagnosed cancer in women and the second ranking cause of cancer death<sup>3</sup>.

Breast cancer survival rates vary greatly worldwide, ranging from 80% or over in the developed countries to less than 40% in low-income countries<sup>4</sup>.

In the UAE, cancer among women is a problem of public health concern<sup>5</sup>. It is the most common cancer among the UAE population, and the most common female cancer, accounting for 22.8% of the cases. About 12% of the registered cases were less than 35 years of age and about 74% of them less than 54 years of age when first diagnosed<sup>6</sup>. This is earlier than that found in many developed countries. Available data from the United States of America showed that the highest incidence rate was among women aged 75-79 years and the median age at the

time of diagnosis 61 years<sup>7</sup>. In the United Kingdom, approximately 80% of cases occurred in women over the age of 50 years, with the peak in the 50–64 years<sup>8</sup>. These data show that in the UAE, raising awareness of women on the breast cancer problem is required to be conducted early in their lives.

In the UAE, there is marked underutilization of the existing public screening services. In 2007, only 12% of the targeted women population underwent screening via mammography<sup>9</sup>. Inadequate awareness of women and common myths about breast cancer were identified as barriers for their utilization of the existing public screening services<sup>9</sup>.

Female university students are an easily accessible target group for education and they have been included in educational programs for breast cancer<sup>10</sup>. It has been suggested that enhancement of knowledge and correction of misconception among young women will stimulate positive attitude and make them more “breast aware”, which in turn may promote earlier detection of breast cancer<sup>11</sup>. In addition, female university students well oriented regarding breast cancer will help in disseminating proper information and help develop positive attitudes in their communities among relatives, family members and friends. This will magnify the benefit received by the community as a whole. Therefore as a baseline to plan health education programs, we undertook a study to assess the knowledge of female university students regarding breast cancer and its preventive measures and to identify the main misconceptions regarding breast cancer.

## **MATERIALS AND METHODS**

A cross sectional study was conducted during the period April 2011–June 2012. The study included female students in three large Universities in Ajman, namely Gulf Medical University (referred to as U1), offering health related programs; Ajman University of Science and Technology (referred to as U2) offering mostly science and technology programs; and Preston

University Ajman (referred to as U3) offering science programs. A stratified random sampling procedure was adopted in recruiting the participants. A validated, pilot-tested self-administered questionnaire was used as a tool for data collection. The questionnaire included 35 knowledge questions in three knowledge sub-domains testing knowledge regarding risk factors (19 questions with reference to the EMRO guidelines for the early detection and screening of breast cancer<sup>12</sup> and the American Cancer Society Breast Cancer Facts and Figures<sup>13</sup>). The questions were with regard to Family history of breast cancer, Personal history of breast cancer, Early menarche (< 12 years), Late menopause (> 55 years), Aging, Late age at first full-term pregnancy (> 30 years), Never breastfed a child, Recent oral contraceptive use, Alcohol consumption, Smoking of cigarettes, shisha, or midwak (the latter two being locally popular modes of tobacco smoking), Obesity (postmenopausal), Recent and long-term use of hormone replacement therapy, High-dose radiation to chest, and Lack of physical activity. In addition, other protective/ non-risk factors included were parity, longer breast feeding and previous non-cancerous growth in breast. Internal consistency reliability of this set of questions was tested by Cronbach's alpha coefficient, which was 0.85.

The second knowledge sub-domain was about warning signs of breast cancer,<sup>14</sup> tested with eight questions. The third knowledge sub-domain was concerning knowledge about methods for early detection of breast cancer, also tested using eight questions. Analysis of knowledge domain was done by giving a score 1 for a correct response and zero for an incorrect. To compare knowledge of participants in the three sub domains, the total score was calculated for each participant and expressed as percentage for each sub-domain. A score less than 60% was considered as inadequate knowledge. The last section of the questionnaire collected the participants' opinions regarding<sup>10</sup> misconceptions about breast cancer identified in a

previous survey<sup>9</sup>, and their sources of information. Data were entered in to Excel sheets and analyzed using PASW 19. The tests used were Independent Samples Kruskal-Wallis test and  $\chi^2$  test.

The research adhered to ethical conduct. The study was approved by the Ethics Review Committee of Gulf Medical University, and the Ethics Committee of WHO/EMRO. Informed consent was taken from the participants before enrolment in the study. Confidentiality of information was ensured.

## RESULTS

### Socio-demographic characteristics

The study included 392 participants. Their distribution by age, nationality, marital status and university is shown in table 1. Most of the participants (63.5%) were aged between 18-22 years, from Eastern Mediterranean Countries (72.2%), and unmarried (82%).

Table 1. Distribution of participants by age, nationality, marital status and university

Variables (n=392)	Categories	No	%
Age (in years)	<18	57	14.5
	18-20	133	33.9
	20-22	116	29.6
	22-24	48	12.2
	25+	38	9.7
Nationality*	Europe	4	1.0
	South East Asia	52	13.3
	West Pacific	16	4.1
	Africa	28	7.1
	America	9	2.3
	Eastern Mediterranean	283	72.2
Marital status	Unmarried	349	89
	Married	37	9.4
	Separated/ widows	6	1.5
University	U1	142	36.2
	U2	137	34.9
	U3	113	28.8

\*Classified according to WHO regions

### Smoking history

Only 6.1% (n=24) and of the participants reported they were current smokers, while 3.8% (n= 15) were ex-smokers; 50% of the current smokers (n=12) and 73% of the ex-smokers (n=11) had started smoking before the age of 20 years.

### History of Breast Cancer

Family history of Breast cancer was reported by 9.2% (n=36) of the participants, which had affected mostly second degree relatives (63.9%, n= 23). None of the students had a personal history of breast cancer [shown in Figure. 1]

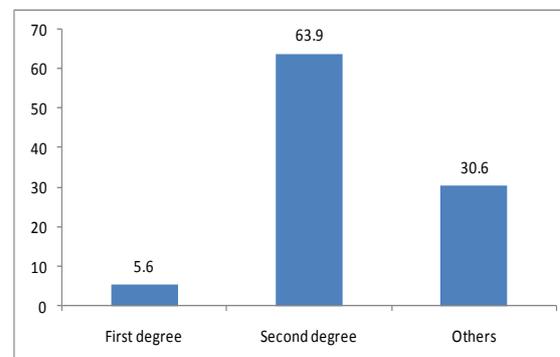


Fig.1. Family history of breast cancer

### Knowledge about risk factors

Distribution of participants by knowledge regarding factors that are likely to affect the risk for breast cancer is shown in table 2. More than 60% of the participants do not have correct knowledge regarding most of the risk factors studied. The

most widely known risk factors for breast cancer were previous cancerous growth in the breast (72.4%), family history of breast cancer (70.2%), radiation to chest (67.9%), and smoking cigarettes (65.3%). Only 23% of the participants knew that early menarche is a risk factor for breast cancer.

### Knowledge regarding warning signs of breast cancer

The distribution of participants by knowledge about the warning signs of breast cancer is shown in table 3. The most frequent correct response (n=239, 61%), was "Painless breast lump", next

was "change in the size or shape of the breast" (n= 236, 60.2%).

### Knowledge regarding measures for early detection of breast cancer

The distribution of participants by knowledge regarding methods for early detection of breast cancer is shown in table 4. Among the participants, 53.8% had heard about Breast Self-Examination and 44.1% Clinical Breast Examination. Fewer participants (n=69, 17.6%) stated correctly mammography as a method for early detection of breast cancer.

Table 2. Distribution of participants by knowledge regarding factors likely to affect risk for breast cancer

Factors affecting the risk for breast cancer (N=392)	Wrong knowledge		Correct knowledge	
	No.	%	No.	%
Aging*	150	38.3	242	61.7
Early menarche (<12 Ys)*	301	76.8	91	23.2
Late menopause(>55 Ys)*	233	59.4	159	40.6
Increase in parity [No of children]	305	77.8	87	22.2
Late age at first full-term pregnancy*(> 30Ys)	225	57.4	167	42.6
Never breast fed*	200	51.0	192	49.0
Longer breast feeding	255	65.1	137	34.9
Recent oral contraceptive use*	199	50.8	193	49.2
Family history of breast cancer*	117	29.8	275	70.2
Obesity[post menopausal]*	185	47.2	207	52.8
Hormone therapy after menopause*	191	48.7	201	51.3
Lack of physical activity*	176	44.9	216	55.1
Previous non-cancerous growth in breast	206	52.6	186	47.4
Previous cancerous growth in breast*	108	27.6	284	72.4
Alcohol consumption*	153	39.0	239	61.0
Radiation to chest*	126	32.1	266	67.9
Smoking cigarettes*	136	34.7	256	65.3
Smoking shisha*	159	40.6	233	59.4
Smoking Midwakh*	162	41.3	230	58.7

- Risk factors for breast cancer

Table 3. Distribution of participants by knowledge about warning signs of breast cancer

Warning signs of breast cancer (N=392)	Wrong Knowledge		Correct Knowledge	
	No.	%	No.	%
Painless breast lump or thickening*	153	39.0	239	61.0
A change in the size or shape of the breast*	156	39.8	236	60.2
A discharge or blood from the nipple*	200	51.0	192	49.0
Dimpling of the breast skin*	207	52.8	185	47.2
Inversion/pulling in of the nipple*	230	58.7	162	41.3
Redness or flaky skin in the nipple region or the breast*	300	76.5	92	23.5
Small size breast	160	40.8	232	59.2
Large size breast	211	53.8	181	46.2

\* Warning signs of breast cancer

Table 4. Distribution of participants by knowledge regarding methods for early detection of breast cancer

Knowledge regarding methods for early detection of breast cancer.(N=392)	Wrong/ no Knowledge		Correct / presence of Knowledge	
	No.	%	No.	%
Have you heard about Breast Self-Examination (BSE)?	181	46.2	211	53.8
Do you know the appropriate age to start BSE?	64	16.3	328	83.7
Do you know how often BSE should be performed?	307	78.3	85	21.7
what is the appropriate time to do BSE in relation to menstruation	368	93.9	24	6.1
Have you heard about Clinical Breast Examination (CBE)?	219	55.9	173	44.1
What is the appropriate age to start CBE?	22	5.6	370	94.4
How often should it be performed	384	98.0	8	2.0
State mammography as a method for early detection of breast cancer	323	82.4	69	17.6

Table 5. Distribution of participants by the percentage of knowledge scores in the three sub-domains

Knowledge Scores	Knowledge on risk factors (K1) (n=392)		Knowledge on warning signs(K2) (n=392)		Knowledge on methods for early detection(K3) (n=392)	
	No.	%	No.	%	No.	%
< 20	54	13.8	120	30.6	138	35.2
20-39	83	21.2	60	15.3	201	51.3
40-59	91	23.2	75	19.2	34	8.7
60-79	118	30.1	130	33.2	18	4.6
≥ 80	46	11.7	7	1.7	1	0.2

### Knowledge Scores in the three sub-domains

Distribution of participant by the percentage of knowledge scores in the three sub-domains is shown in table 5. It can be seen that 58.2%, 65.1% and 95.2% of the participants had inadequate knowledge (scores below 60%) in the three knowledge sub-domains (K1, K2 and K3 respectively). The most frequent gap in knowledge was regarding methods for early detection of breast cancer.

The mean, standard deviation (SD,) median and range values for the participants' knowledge scores in the three knowledge sub-domains are shown in table 6. The lowest scores are noticed regarding methods for early detection of breast cancer. Variability between participants' knowledge scores, evident by wide standard deviation shown in table 6, makes the mean an unreliable measure of the knowledge of the group. This observation explains the use of median scores in comparing the knowledge between groups in this study.

Table 6. The mean, standard deviation (SD,) median and range values for the participant's knowledge scores in the three knowledge sub-domains

Knowledge on	Mean (SD)	Median (range)
Risk factors (K1) (n=392)	9.8(4.8)	11.0(0-18)
Warning signs (K2) (n=392)	3.9(2.7)	5.0(0-8)
Methods for early detection (K3) (n=392)	3.2(1.2)	3.0(0-8)

### Knowledge domain scores and demographic variables

The median knowledge scores of participants by age, nationality, university, marital status, family history of breast cancer and the significance of median differences are shown in table 7. Significantly higher knowledge scores regarding risk factors for breast cancer are noticed among participants from countries in the Americas, from universities offering only medical/ health related programs, and those having family history of cancers compared to their respective counterparts

Table 7. The median Knowledge (range) scores of participants in subcategories of age, nationality, university and marital status, and the significance of median differences

Demographic Variables	Sub-Category	No.	Median Scores					
			K1 (range)	P	K2 (range)	P	K3 (range)	P
Age (Years)	<18	57	10.0(0-18)	NS	5.0((0-8)	0.421	3.0(1-6)	<0.01
	18-20	133	10.0(0-18)		5.0(0-8)		3.0(0-6)	
	20-22	116	11.0(0-18)		5.0(0-8)		3.0(1-6)	
	22-24	48	11.0(0-18)		5.0(0-7)		4.0(2-7)	
	25+	38	10.5(0-18)		5.0(0-8)		4.0(2-8)	
Nationality	Europe	4	11.5(0-16)	<0.001	4.5(0-7)	0.026	3.0(2-4)	NS
	South East	52	12(0-18)		5.0(0-8)		3.0(2-6)	
	Asia							
	West Pacific	16	10(2-15)		6.0(0-7)		3.0(2-6)	
	Africa	28	12.5(5-18)		6.0(0-8)		4.0(2-7)	
	America	9	15(8-17)		5.0(0-7)		3.0(2-5)	
	Eastern Mediterranean	283	10(0-18)		5.0(0-8)		3.0(0-8)	
University	U1	142	12.0(0-18)	<0.001	5.0(0-8)	0.012	3.0(0-7)	<0.001
	U2	137	11.0(0-18)		5.0(0-8)		3.0(1-8)	
	U3	113	8.0(0-17)		4.0(0-8)		3.0(1-6)	
Marital status	Unmarried	349	11.0(0-18)	NS	5(0-8)	0.457	3(0-7)	NS
	Married	37	11(0-17)		5(0-8)		4(2-8)	
	Separated/ widows	6	9.5(0-7)		1.5(0-7)		3.5(2-6)	
Family History of cancer	Yes	36	12.5(2-18)	<0.05	5.0(0-8)	0.629	3.0(2-7)	NS
	No	356	11.0(0-18)		5.0(0-8)		3.0(0-8)	

Table 8. Distribution of participants by misconception regarding breast cancer

Misconception regarding breast cancer (n=392)	Yes		No	
	No.	%	No.	%
Breast cancer equals death	174	44.4	218	55.6
Treatment for breast cancer affects woman's femininity	245	62.5	147	37.5
Breast cancer comes as a result of curse or due to bad /evil eye	76	19.4	316	80.6
You only get breast cancer if you have a family history	84	21.4	308	78.6
Men do not get breast cancer	149	38.0	243	62.0
I'm too young to worry about breast cancer	139	35.5	253	64.5
There is little that I can do to prevent cancer	195	49.7	197	50.3
Herbal remedies and dietary supplements can treat breast cancer	221	56.4	171	43.6
Surgical intervention will cause the cancer to spread	128	32.7	264	67.3
If I have a breast lump, it's cancer	81	20.7	311	79.3

in the nationality, university and family history subgroups respectively. With regard to knowledge about warning signs, significant differences by nationality and university are noticed, while in methods for early detection of breast cancer, significant differences by age and university are noticed.

### **Misconceptions regarding breast cancer**

The most frequent misconceptions are "Treatment for breast cancer affects woman's femininity" "Herbal remedies and dietary supplements can treat breast cancer" and "There is little that I can do to prevent cancer" reported by 62.5%, 56.4% and 49.7% respectively (shown in table 8)

### **Source of information for breast cancer**

The most common sources of information for breast cancer were the media, internet, and doctors/nurses/health workers, as reported by 72.4%, 59.9% and 37% of the participants (table 9)

Table 9. Distribution of participants by source of information for breast cancer

Source	No	%
Media [TV, radio, newspaper.]	284	72.4
Internet	235	59.9
Scientific journals/ meetings	96	24.5
Lecture in college/ curriculum material in previous years	124	31.6
Doctors/nurses/health workers	145	37.0
Relative	106	27.0
Others	6	1.5

Note: participants may have more than one source of information

### **DISCUSSION**

In the UAE, breast cancer is the most common female cancer for both citizens and non-citizens<sup>6</sup>. The Ministry of Health, UAE 2008 Report showed that 28% of the deaths attributed to breast cancer occurred in women of less than 45 years of age<sup>15</sup>. Data regarding knowledge, attitudes and preventive practices of female university students regarding

breast cancer in the UAE is limited. Hence, the present study was conducted.

### **Knowledge about risk factors**

Several factors affect the risk of females for breast cancer, some modifiable and largely related to life style, social, economic and environmental factors<sup>16</sup>. A recent study in the UK showed that 26.8% of incident breast cancer cases were attributed to lifestyle and environmental factors<sup>17</sup>. It is essential for women to know about these factors early in their lives to make the right choice.

In this study, the majority of the participants (more than 70%) correctly identified personal and family history of breast cancer as risk factors, which is in agreement with available literature<sup>18</sup>. However, lack of knowledge was noticed among a large proportion regarding the modifiable risk factors for breast cancer. Only 35% knew about the benefit of longer breast feeding in reducing the risk of breast cancer. The proportion of those who knew that obesity, lack of physical activity and cigarettes smoking increased the risk were 53%, 55% and 65% respectively. A Similar study in Turkey<sup>19</sup> reported correct knowledge for the previous three factors as about 23%, 43%, and 64% respectively. Knowledge about the risk of smoking is very important since more than 6% of participants were current smokers, half of them had started smoking before the age of 20 years. It has been found that women who started smoking as teenagers and continue to smoke for at least 20 years may increase their breast cancer risk<sup>20</sup>. It is worth noting that in this study, other smoking modalities (shisha and midwakh) were less frequently identified as risks for breast cancer in comparison to cigarette smoking, which reflect the participants' false perception that these modalities are less risky than cigarette smoking. As there is evidence of a link between water pipe use and health and cancer risks<sup>21</sup>, correction of this misconception is needed in any educational program directed to university students.

### **Knowledge regarding warning signs of breast cancer**

Lack of knowledge regarding warning signs of breast cancer was noticed in more than 40% of participants for most of the signs listed in this study. This is in agreement with data from Saudi Arabia<sup>22</sup>. In Nigeria, 70.7% of undergraduate females knew that there were warning signs of breast cancer<sup>23</sup>.

### **Knowledge regarding measures for early detection of breast cancer**

The majority of the study participants failed to correctly state mammography as a method used for early detection of breast cancer and only about half of them had heard about BSE and CBE. A study among female health workers in Nigeria<sup>24</sup> showed that 81% of the respondents mentioned mammography as a breast cancer diagnostic method and about 46% mentioned BSE and CBE. In Saudi Arabia, 51.8% of the female university students knew that mammography was a screening tool for breast cancer<sup>22</sup>. The majority of the current participants lack knowledge regarding the frequency (about 78%) and timing of BSE in relation to menstruation (about 94%). This is in agreement with data from Saudi Arabia<sup>22</sup> (about 86%) for frequency, and Nigeria<sup>25</sup> (about 86%) for timing of BSE in relation to menstruation.

### **Knowledge Scores in the three knowledge sub-domains and factors associated with knowledge scores**

The most frequent gap in knowledge and the worrying finding were that most of the participants (> 95%) did not have adequate knowledge regarding methods for early detection of breast cancer. A greater emphasis is required to be directed to this sub-domain in future educational campaigns.

Regarding the knowledge scores and age, lower knowledge scores observed among younger age groups reinforce similar findings from Australia<sup>26</sup>.

Concerning the nationality, the significant differences between knowledge scores of participants from different

nationalities can be attributed to the possible cultural and ethnic factors, as has been documented in another study from Singapore<sup>27</sup>.

The difference in knowledge scores among participants from different universities may be attributed to the differences in basic curriculum given in different programs. A similar observation was reported in another study on university students from Angola<sup>28</sup>. The results point to the need for providing basic information about breast cancer to young females through different programs to enhance public awareness and influence behaviour related to breast cancer.

### **Family history of breast cancer and knowledge regarding breast cancer**

Family history of breast cancer was reported by about 9% of the participants, and this is very similar to data from Saudi Arabia (9.8%)<sup>29</sup>, and the 2009 Lebanese National Mammography Campaign (8.9%)<sup>30</sup>. However, these figures are lower than the data from Pakistan<sup>31</sup> (13.4%). Interestingly, participants with a family history of breast cancer had significantly higher knowledge scores for risk of breast cancer.

### **Misconceptions**

Many misconceptions were reported by the subjects. A study from the US, identified misconception as one of the independent factors potentially associated with delay in seeking health care among symptomatic urban breast cancer patients<sup>32</sup>. Another study showed that misconceptions affected how the respondents assessed screening efficacy and took informed decisions about screening mammography<sup>33</sup>. In this study, more than 44% of the participants thought that breast cancer equaled death. A study from Pennsylvania, United States, showed that fatalism influenced breast cancer knowledge and screening practices among the participants since it led them to believe that there was not much they could do to prevent cancer and death<sup>34</sup>.

## SOURCE OF INFORMATION

The major contribution of media in education of the public regarding breast cancer observed in this study has also been reported by other researchers from Lebanon<sup>30</sup>, Saudi Arabia<sup>35</sup> Nigeria<sup>36</sup> and Iran<sup>37</sup>. This shows the need to pay greater attention to this source of information to ensure that the correct information reaches the target population.

## CONCLUSION

This study revealed the inadequacy of knowledge (scores <60%) regarding breast cancer among a high proportion of female university students and on knowledge about the risk factors (58.2%), warning signs (65.1%) and methods for early detection of breast cancer (95.2%). Misconceptions most frequently identified were "Treatment for breast cancer affects woman's femininity", "Herbal remedies and dietary supplements can treat breast cancer" and "There is little that I can do to prevent cancer".

## RECOMMENDATION

There is great need to include female university students in Ajman among the target population in educational campaigns about breast cancer taking into consideration the specific needs identified.

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