Evaluation of breast cancer awareness among female university students in Duhok public universities, Iraq

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Abstract

Background and objective: Early diagnosis and proper awareness of Breast Cancer conditions may aid in reducing the morbidity and mortality rate among women. The main goal of this study was to determine the awareness and knowledge levels of women undergraduate students at three public universities in Duhok province (Duhok, Zakho, and Polytechnic) on Breast Cancer, as well as evaluate their attitudes toward breast self-examination.

Methods: This study was conducted from October to December 2021, and it consisted of a cross-sectional survey. A questionnaire was used to collect data from 904 female students aged 18-30 years. The mean participant age was 22.5 years with SD of 2.0. The percentiles were determined to classify the general level of knowledge, with values below the 25th percentile denoting poor knowledge, between the 25th and 75th percentile denoting a fair level, and above the 75th percentile denoting a good level of knowledge.

Results: In the present study, the majority of participants (96.46%) had a fair knowledge level and awareness regarding breast cancer and breast evaluation practice. About 1.78% of female students had poor or good knowledge of breast cancer and practiced breast self-examination. The findings show that participants within the age group of 21-25 showed the highest overall knowledge (7.66±2). While 64% and 31% of the respondents could not able to identify early signs of breast cancer and are not even aware that a breast self-examination is an important tool in the early detection of breast cancer, respectively.

Conclusion: The respondents' knowledge about breast cancer is fair, but their comprehension of risk factors is poor. In order to increase the awareness of risk factors, counseling programs for women in schools and universities are very important. These programs should focus on breast self-examination and women's reproductive health.

Keywords: Breast Cancer; Awareness; Female University Students; Duhok.

Introduction

Breast Cancer (BC) is a malignant tumor that develops from breast cells. Breast cancer usually begins in the cells of the lobules, which produce milk, or the ducts, which drain milk from the lobules to the nipple. BC is the most frequent type of cancer in women globally, accounts for 25% of all cancers in women. Furthermore, the global rate of breast cancer is rising, particularly among younger women.[1,2]

Every year, more than a million women in the world are diagnosed with breast cancer, and more than half of them die as a result of it.[3] Due to its high associated mortality in developing countries in Asia, the Middle East, and Africa during the last two decades, BC has become a major public health problem, and it is currently the second leading cause of cancer death in more developed countries, behind lung cancer.[4]

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Screening is the most effective way to avoid BC, with three modalities for early detection: breast self-examination (BSE), clinical breast examination (CBE), and breast mammography.[5-6] Cuzick found that in most developing countries, people will seek medical advice and treatment for a BC condition only when it has progressed to the point that no improvement can be expected from any treatment.[7] As a result, the prevalence of BC in the Arab world and developing countries is extremely high, and it is rapidly increasing.[8]

In Iraq, BC is the most common malignancy in women, as well as the leading cause of cancer-related mortality. In 2011, the incidence of BC was 18.96% among population, with a morbidity rate of 11.53%.[9] By 2020, these values had risen to 22.2% and 15.3%, respectively, according to GLOBCAN 2020.[10] The number of BC cases in Duhok province more than doubled between 2013 and 2019, growing from 486 cases (36 per 100,000 persons) to 1365 cases (85 per 100,000 population).[11] The objectives of this study were to assess the knowledge about breast cancer and awareness among female students at three public Universities in Duhok province, Iraq in 2021.

Methods

Study population and Data collection
A cross-sectional study was conducted from October to December 2021, among female university students of three public universities (Duhok, Zakho, and Polytechnic) in Duhok province. We used a simple random sampling method among students of three target universities in Duhok. A total of 1000 Kurdish-translated pre-tested questioners were distributed to ensure the highest response. The corrected responses were 904 (90.4%).

The self-administered questionnaire was used to gather study data. Each participant was requested to complete a pre-coded, standardized questionnaire created by the researchers to gather socio-demographical data as well as the personal history of BC

and family history of BC, and knowledge about BSE and BC.A correct response received one point, whereas a wrong response received zero points. The frequencies of the correct responses relative to all of the answers to the same question were used to determine the results. The percentiles were calculated to categorize the overall knowledge level, where the value below the 25th percentile represents poor knowledge, between the 25th-75th percentile represents a fair level, and >75th percentile is a good level of knowledge.

Data analysis
Data were analyzed using the Statistical Package for Social Sciences version 20 (SPSS Inc. Chicago, IL). Descriptive statistics were reported by frequency and mean ± standard deviation (SD) for qualitative and quantitative data, respectively. The appropriate statistical tests (Chi-square test) were used to determine the significant differences between the different groups. A *P*-value ≤0.05 was considered statistically significant.

Results

This study evaluated the level of awareness among women students in three public universities in the Duhok province. The total participants were 1000randomly selected women from various departments, with a corrected response rate of 904 (90.4%).

Table 1 shows the demographic characteristics of female college students at Duhok public universities. The women in the study ranged in age from 15 to 30 years old, where the mean age of the respondents was 22.5 years and SD of 2.0. The biggest percentage (67.7%) was noted in the age group (21-25 years) and the lowest percentage (8%) in the age group of 26-30 years. 77.3% of them were single, 21.5% were married, and only 0.9% were divorced.54.5% of them resided in the city while 45.5% were from rural areas.

More than half of them (60.4%) were Muslims and others followed Yazidie (34.5%) and Christianity (5.1%).

According to the data, 92 % of women students have heard of breast cancer. A little more than half of them (51%) had no family members diagnosed with breast cancer, whereas 49% had a family member diagnosed with BC. Scientific books (31%) and primary health care centers (28%) were found to be the most common sources of information about breast self-examination among students. For 23% of them, the media was their primary source of information. Furthermore, 13% of them cited seminars and lectures as a source of information, while 5% cited friends as a source of information (Table 2).

More than half of the study sample (52%) heard about BSE , whereas 48% had never heard of it. The relevance of BSE in the early diagnosis of BC was mentioned by 69% of those who knew about breast self-examination. The remaining 31% did not believe it was necessary for early breast cancer screening. Out of 904 women, only 25% have been aware of the correct age for starting BSE while 75% of the participants have not been properly aware of that fact. 55% were correctly aware that BSE should be done on a monthly basis, but the rest of the 45% were not aware of the correct time period for performing BSE. Further, 67% of women participants were unaware that BSE should be performed by themselves, but not by the doctor. In addition, 60% said they had ever had a mammogram for breast cancer detection.

Table 1 Demographic Characteristics of Study Sample (n = 904).

Variables	No.	%
Age (years)		
15-20	220	24.3
21-25	612	67.7
26-30	72	8.0
Marital status		
Single	699	77.3
Married	196	21.6
Divorced	9	0.9
Religion		
Muslim	546	60.4
Christian	46	5.1
Yazidie	312	34.5
Residence		
Urban	493	54.5
Rural	411	45.5
Total	904	100%

Table 2 Statistical analysis of knowledge regarding breast self-examination among study population (n = 904).

	Frequency	Percentage (%)
Have you heard of Breast Cancer?		
Yes	828	92
No	76	8
What are your sources (s) of information on Breast Cancer?		
Media	206	23
Hospital	254	28
Seminars/lectures	119	13
Books	280	31
Friends	45	5
Has any member of your family been diagnosed with breast cancer?		
Yes	446	49
No	458	51
Have you heard of Breast Self‑Examination (BSE)?		
Yes	474	52
No	430	48
Do you know that BSE is a useful tool for the early detection of breast cancer?		
Yes	620	69
No	284	31
At what age should BSE be started?		
From birth	72	8
From puberty	148	16
From 20 years	228	25
From 30 years	259	29
After menopause	162	18
No idea	35	4
How often should BSE be done?		
Daily	104	11
Weekly	162	18
Monthly	496	55
Yearly	98	11
No idea	44	5
BSE should be done by?		
Doctor	606	67
Individual	298	33
Have you ever done mammography?		
Yes	538	60
No	366	40
Total	904	100%

Table 3 shows the students' responses to BC indications and symptoms. Therefore, it is important to evaluate the responses of participants to each question to finally assess the overall knowledge of BC. Unusual pain in the breast (23%) was the most commonly mentioned sign or symptom, followed by the presence of a breast lump visible to the naked eye (19%), change in size or shape of the breast (13%), bloody discharge from the nipple (13%), ridges or pitting of the breast (13%) and skin itchiness (13%) by 102 students (11%), while 8% of them said that BC has no symptoms or signs. Therefore, on average only 36% have identified the correct possible symptoms of BC and only 38% have identified the early signs of BC correctly. Out of the total respondents, 644 were not properly acknowledged with stages of breast cancer and only 260 (29%) knew that there were four stages of BC.

Furthermore, 37% of the students were only aware that the highest risk age for having BC is 51 years and older. It also shows that a majority of participants (79%) have not properly identified the risk factors (obesity, having children early, Malnutrition) of BC, however, a majority of 70%and 75% have identified smoking tobacco as a high-risk factor and breastfeeding is protective factor for BC respectively. Moreover, 69% and 75% knew that BC is a genetic disease passing from parents to children and men are not at a risk for BC respectively, while 69% of students were aware that if breast cancer is not treated in its early stages, it will result in the patient's death.

In the present study, the majority of participants (96.46%) had a fair knowledge level and awareness regarding BC and breast evaluation practice. About 1.78% of women had poor or good knowledge about BC and practicing BSE as shown in Table 4.

Depending on the overall knowledge level, the data were further analyzed to assess the knowledge variation among different demographic factors. Participants within the age group of 21-25 years showed the maximum overall knowledge with a mean of 7.66, while a minimum mean of 6.8 was shown in the age group of 26-30 years, and there was a significant mean difference in knowledge between each age group (P <0.001). Though the mean overall knowledge between urban and rural respondents and Muslim, Christian and Yazidie respondents were not significantly different, still the mean knowledge of BC and BSE practice is higher (7.6) in urban women than in rural (7.44). Considering the religions of participants, Muslims showed a higher mean knowledge level (7.56) when compared to Christian and Yazidie (7.34 and 7.39 respectively). Among different marital status of participants, the married group showed a slightly higher mean overall knowledge of BC and BSE practice when compared to single and divorced.

groups. There was a statistically significant difference between the mean knowledge of singles and married (P = 0.016). The divorced group showed the minimum mean overall knowledge (5.5) on BC, as shown in Table 5.

Table 3 Participants' knowledge on symptoms, signs, treatment, and possible risk factors of breast cancer (n = 904).

	Frequency	Percentage (%)
Which of the following are possible symptoms of breast cancer?		
Change in size or shape of the breast	198	22
Nipple discharge or tenderness	192	21
Ridges or pitting of the breast	190	21
All of the above	324	36
Early signs of breast cancer?		
Are often painful	340	38
Are often visible to the naked eye	281	31
Are skin itchiness	161	18
Do not cause any symptoms	122	13
Which age range has a higher risk for breast cancer?		
Below 25	64	7
26-40	249	28
41-50	254	28
51 andAbove	337	37
How many stages of breast cancer are there?		
One	97	11
Two	286	32
Three	247	27
Four	260	29
Fife	14	1
Which of the following is a risk factor for developing breast cancer?		
Obesity	186	21
Having children early	311	34
Having sex frequently	191	21
Malnutrition	216	24
Do you think Breast Cancer is a genetic disease passed from parent to children?		
Yes	628	69
No	276	31
Does smoking tobacco appear to increase the risk of breast cancer?		
Yes	634	70
No	270	30
Breastfeeding is one of the methods to reduce the risk of breast cancer?		
Yes	676	75
No	228	25
Which of the following is not a treatment option for breast cancer?		
Surgery	174	19
Chemotherapy	104	12
Radiotherapy	162	18
Drink more water	464	51
Will breast cancer cause death?		
Yes	624	69
No	280	31
Total	904	100%

Table 4 Respondent response on the level of breast cancer awareness and breast self-examination among female students in Duhok public universities (n = 904).

knowledge level	Frequency	Percentage (%)	Min-max	Mean (SD)
Poor	16	1.78	01-03	2.63 (0.72)
Fair	872	96.46	04-11	7.50 (1.78)
Good	16	1.78	12-13	12.50 (0.52)

Table 5 Socio-demographic factors associated with participants knowledge.

Variables	Levels	Total	Mean	SD	*P*-value	Post Hoc Test	
						Category	*P*
Age groups (years)	15-20	220	7.26	1.88	<0.001	15-20 vs 21-25 years	0.027
	21-25	612	7.66	2.00		15-20 vs 26-20 years	0.20
	26-30	72	6.80	1.92		21-25 vs 26-30 years	0.01
Residence	Urban	468	7.60	1.95	0.701	-	-
	Rural	416	7.44	2.00			
	Missing	20	7.55	1.96			
Religion	Muslims	545	7.56	2.01	0.411	-	-
	Cristians	46	7.34	2.14			
	Yazidie	313	7.39	1.90			
Marital status	Single	702	7.51	1.99	0.016*	Single vs Married	0.985
	Married	194	7.53	1.93		Married vs Divorced	0.012
	Divorced	8	5.50	1.19		Single vs Divorced	0.012

Discussion

Breast cancer can be identified as a pervasive condition existing among the worldwide women population. Though, males and women have both been diagnosed with breast cancer, the extensive spread and surpassing risk of severity and mortality reported among women due to breast cancer, have driven to engage in this model of study.[12] In the Arab world, female breast cancer is alarmingly common and affects a younger generation than it does in the West. There are very few breast cancer awareness campaigns in the nations of the Arab world.[13-14] In Iraq, breast cancer is the most common type of cancer for women, and every year, 900 women die from it.[15-16]

A questionnaire-based assessment was utilized under several sections including sociodemographic data, knowledge of breast cancer, details on BSE practicing, to investigate attitudes and knowledge on breast cancer among undergraduate female students in Iraq from this selected sample. The research problem which was constructed, considering that prevention is always better than cure, study aimed at assessing women's knowledge of breast cancer and its' early detection methods. So that to explicit the significance of identifying risk factors and awareness of the public on those factors to avoid severity and mortality rates of breast cancer.[12]

When discussing the parallel studies conducted related to the breast cancer awareness measurements in many countries of the world, they showed several variations in their results, meanwhile, they have selected samples with participants diagnosed with breast cancer or participants in a cancer clinic, etc. However, According to our findings, 96.46% of participants have a fair knowledge of breast cancer, whereas only 1.78 % have a very excellent understanding and 1.78 % have a very poor understanding. These findings are in agreement with earlier research findings among female teachers in Sri Lanka 2020,

which revealed that 91% of participants have good or exceptional awareness of breast cancer, whereas only 9% have a low level of understanding.[17] However, University of Gondar students in Northwest Ethiopia had a lower overall knowledge about breast cancer (61.7%) than the students in our study.[18] The variation in knowledge levels between these studies could be attributed to the different study populations. Our study participants were university students, whereas theirs were female school teachers.

The findings of this study depict that patient age is an outstanding factor in awareness measures of breast cancer among women. Participants within the age group of 21-25 years showed a maximum overall knowledge. The marital status also had a significant effect on the knowledge level of respondents on BC (Mean knowledge of Married; 7.53, Single; 7.51, Divorced; 5.5), contrary to a study among a sample of Kurdish women in the West of Iran, which revealed, the mean difference in awareness of the BC was not significant within the marital status.[30] The residential status and the religious backgrounds of students also have shown a non-significant effect on the awareness level of breast cancer, which is most obvious that students must be given a proper education regarding the general factors, risk factors and the screening methods related to breast cancer condition irrespective their social or cultural backgrounds. Our results are consistent with a study by Ashokamala and Weerakoon in Sri Lanka (2014), which found no significant correlation between participant demographics and knowledge and awareness of breast cancer risk factors and symptoms.[17]

Regarding knowledge of breast cancer risk factors, approximately half of the participants (49%) stated that having a family history of breast cancer or having a family member diagnosed with the disease is thought to be a risk factor that could result in developing breast cancer among the family members. This is greater

than the disease's prevalence among women cancers (34.7%) in Iraq.[15,19]

This result is somewhat comparable to the findings of the Saudi Arabia study (57.5%)[20], in contrast to the findings of the Malaysia study, which showed that the majority (91%) of Malaysian females included in the study were aware of the family history of breast cancer and the existence of a close relative who had the disease as established risk factors.[21]

According to this study's findings, only 69% of female students were aware that BSE can help with breast cancer early detection, which is less than the results of other studies in Iraq and Saudi Arabia (85-90%).[22-23] The respondents ranged from 29 % at age beyond 30 years to 4 % with no idea as to the age at which BSE should be initiated, which was the case for the majority of participants. It should be advised for once a month, according to more than half of 496 students (55%). These results show less awareness and understanding of breast cancer and less practice of breast self-examination among women in University of Sharjah, United Arab Emirates, compared to our research.[24]

The sources of knowledge and information on breast cancer and the significance of BSE were books (31%) hospitals (28%), and media (23%). These findings were in contrast to earlier findings from a research by Suleman in 2014 among female Jordanian students, in which students learned about BC via friends or from healthcare professionals. Due to recent changes in social media and internet usage in Iraq as well as the accessibility of relevant academic medical literature, this disparity may very well be the result of these factors.[25] In other studies, the main sources of knowledge about breast cancer in Turkey (48.5%), Palestine (53%) and Yemen (16.10%) were mass media and television.[26] 52% of the participants were found to be BSE-aware, which is greater than the percentages reported for Saudi Arabia (30%)[23] and Egypt (10.4%)[27] but

lower than the study in Mosul, Iraqi city nearby, where 85.9% of participants were BSE-aware.[22] The difference between both studies may be attributable to the sample's level of education in this study, which would explain the variation.

Regarding knowledge about the signs and symptoms of breast cancer. The most common breast cancer symptom mentioned by survey participants was change in size or form of the breast (22%), followed by ridges or pitting of the breast and nipple discharge. Our statistics and the reports from Ethiopia were comparable.[18] The most common warning early signs of breast cancer was pain in breast 38% followed by often visible to the naked eye and irritation or dimpling of breast skin, and either 8% believe that there is no single symptom can be identified as an early sign of BC. Therefore, the study has unveiled the significance of assessing awareness among females since their younger ages, so as to undertake necessary steps in ameliorating the knowledge and breast self-examination practices among youth.[28]

A study conducted by Akram et al. in 2017, showed that negligence of breast self-inspection and clinical examinations may advance the risk of getting BC among females.[29] Therefore, we were much motivated to engage in this study, in the scope of assessing the awareness of patient-related factors and other general factors and their correlations with the disease in an Iraqi cohort. Due to this study sample being focused on a younger educated cohort, the significance of the study has escalated. Because it will aid to acknowledge younger generations to be aware of BC conditions from the beginning and avoid the risk and start early detection procedures without developing to severe conditions.

From the future perspective of the study, we suggest that it is important to extend our research further, by including the variation of the other associated demographic data, assessing

the economic status, literacy level, geographical factors, and anxiety level of patients corresponding to the outcomes. Therefore, we do not need to limit our study to assess just breast cancer awareness but we can combine the knowledge with the breast monitoring examinations of BSE and other radiographical breast screening methods for early detection of risky groups to increase the chance of survival among women.

Conclusion

The majority of female participants had only a fair knowledge of BC, whereas only 1.78% of respondents had good knowledge and awareness regarding BC and the significance of breast examination. There is a considerable impact of demographic factors (age, marital status, residential status, religion) on awareness level.

Furthermore, unawareness of primary facts related to early detection of BC and other radiological diagnosis methods has been explicated in the study. Therefore, the findings of the study suggest that appropriate educational interventions and socially accepted awareness programs may aid in the improvement of the knowledge about BC prevention among the younger generation.

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Competing interests

The authors declare that they have no competing interests.

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