Original paper

Knowledge, Attitude, and Practice of Breast Self-Examination among Female Students in University of Kerbala 2021.

Estbraq Mohammed Mageed^, Salam Sahib Alrubiyii^, Baydaa Ibrahim Salman^

^Karbala health directory/ Karbala/ Iraq

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Correspondence: Estbraq Mohammed
Email: estbraq9191@gmail.com

Abstract

Background: Breast cancer is one of the most common cancers among females worldwide. Early detection of breast cancer plays the leading role in reducing mortality rates and improving the patients' prognosis.

Aim of the study: To assess the level of female University students' knowledge attitude and practice of breast self-examination among Kerbala University student in 2021.

Subject & Methods: A cross-sectional study. It was conducted in the University of Kerbala. Four colleges were chosen randomly as two medical and other two non-medical colleges. The study samples include 389 female students from 18 to 26 years.

Results: The mean age of the responders was 19.9± (1.45) years. Most of the participants 310 (79.9%) were aware about breast self examination. The highest accurate responses were observed (91.0%) following the question "Is breast self examination important to diagnose early breast cancer?", mean±SD (0.91±0.290), and 95% Cl (0.88-0.94). The awareness rate of this section was calculated as (61.1%). Similarly, the overall proportion of positive attitude and breast self examination practice were found (71.0%) and (39.0%), respectively .

Sociodemographic characteristics such as subject of education, high financial wellbeing, and urban resident were found to correlate positively with Breast self examination (BSE) practice, (P=0.017), (P=0.029), and (P=0.01), respectively.

Conclusion: Although the study documented good level of awareness among the university students of Kerbala, practicing breast self-examination was relatively low. This is mostly due to not knowing the exact technique to follow and/or students do not trust themselves in finding any medical benefit from practicing.

Key words: Breast self examination (BSE), Breast cancer (BC), knowledge, attitude and practice

Introduction

Breast cancer (BC) is a significant issue globally. It is the most commonly diagnosed cancer in women with an estimated 2.1 million new cases being diagnosed each year and representing 24.2% of all cancer diagnoses among women[(1)]. Breast cancer accounts for 1 in 4 cases in women globally and contributes to 15% of mortality[(2)].

In the less developed countries, low survival rates are mainly attributed to the lack of awareness leading to late-stage diagnosis of the disease specifically in the absence of adequate capacity for early diagnosis and multimodality management[(3)].

The figure (1) shows Iraqi cancer incidence number and rate in both sexes of all ages at 2020. Where the breast cancer contributes to the major portion (22.2%) according to the GLOBOCAN statistics, the global cancer observatory.

Early detection remains the primary way to prevent the development of life-threatening breast cancer. Breast cancers that are detected when smaller or no palpable are more treatable and thus are associated with a more favorable prognosis.

Beast Self Examination (BSE)

It is a breast cancer screening method that involves the woman looking at and feeling her own breasts for possible lumps, distortions, or swellings. BSE is a simple exercise that can potentially save women's lives. BSE is recommended for every woman from the age of 20 years onwards, and BSE is recommended to be performed for 20 minutes every month.[(4)]

The World Health Organization has concluded that BSE has the potential to provide an early diagnosis of breast cancer in many parts of the world. BSE is recommended to be performed routinely on a monthly basis in all the women and the importance of raising knowledge on breast cancer via BSE is noted. BSE is an easy-to-apply, economical, safe, non-invasive procedure with no special material/tool requirements, and it is an effective diagnostic method for breast cancer.[(5)]

The United State Preventive Task Forces (USPSTF) encouraged patients to be aware of changes in their bodies and discussing these changes with clinicians[(6)].

Subjects and methods

Study design: Observational cross-sectional study conducted in the University of Kerbala, through online questionnaire sent to the study groups of the involved students as a link by the telegram program. The questionnaire was prepared under supervising of two-family medicine specialists. The questionnaire was modified). The two previous studies [5, 7]; made of twenty-nine questions that depict the four main finding sections of the study, including, sociodemographic characteristics of the participants, knowledges, attitudes, and practices toward breast self-examination (BSE). The study was carried out between 25th of March to the 2nd of August 2021.

Sample selection: The participant female students age was between 18- 26 years. This study included 389 female students from four different colleges in Kerbala University, the way of randomization was made by random selection of four colleges, that's two medical and other two non-medical colleges, to be college of medicine, college of dentistry, administration and economics, and college of education for human sciences.

Data collection: The information was taken via questionnaire developed for this study and filled through online link on network that was sent for students through their online study groups in the telegram program. The minimum required sample size was calculated according to the standard equation for cross-sectional study as follows [8]:

$$N = \frac{Z^2 pq}{d^2}$$

Were:
N: the required sample size,
Z: standard normal variant at type one error (Value) ≤ 0.05
Z = 1.96
p: expected proportion assumed in this study as equal to 0.5 (50%), to get the larger possible sample size.
q: (1- expected proportion)
d: Absolute error or precision, assumed 0.05.

According to these values and applying the equation

$$N = \frac{(1.96)^2 (0.5 \times 0.5)}{(0.05)^2}$$

The calculated sample size was 384, and 389 data were collected. A structured questionnaire consisted of 29 questions (as shown in appendix 1) that elicited demographic data, knowledge, attitude and practice of BSE. Socio-demographic data elicited from participant included their age, residency, College name, stage of the study, perceived income level, history of chronic disease or chronic use of drugs, history of breast disease and whether it is benign, malignant or don't have and if had how it was diagnosed, by x-ray, mammogram, Fine Needle Aspiration (FNA). Others three parts of the structured questionnaire included students' knowledges, attitudes and practices of breast self-examination.

At the end of the questionnaire educational video for the correct way to perform BSE was attached, to increase awareness of the proper way when doing BSE that would help in early detection of breast cancer.

Ethical and administrative approval:

Ethical approval of the study was obtained from Iraqi Ministry of Health Department of the Arab Board for Health Specialization and from the four colleges involved in the study in the department of scientific purposes.

Statistical analysis:

Data of the 389 students were entered and analyzed using the Statistical Package for Social Sciences (SPSS) software for windows, version 23. Descriptive statistics presented as mean, standard deviation (SD), frequencies and proportions. Responses of the participants were categorized as accurate, inaccurate or don't know, and then scored accordingly. Scoring and evaluation was performed according to [9] were score "Poor" for blow 50%, "Good" for values between 50% and 70%, and "Very good" for values above 70. The mean score for each participant was then calculated for per question and per section. The overall awareness score was calculated as a weighted mean for all questions in the questionnaire and evaluated in a similar way for domains. Cross-tabulation was used to assess the relationship between overall awareness score categories against other variables, Chi square test was used to assess the significance of association, Fisher's exact test was used as an alternative for 2X2 tables. Analysis of variances (ANOVA) test was used to assess the significance of differences in mean awareness score of students across the source of information. Post-hoc, least square difference, test was used for multiple comparison of mean awareness score of the subgroups of participant students across the source of information. Level of significance of ≤ 0.05 considered significant difference or association, finally results and findings were presented in tables and figures with an explanatory paragraph for each

using the Microsoft Office Word software version 2010.

Results

Participants' sociodemographic characteristics

The minimum and maximum age of the individuals was 18years to 26years respectively. Distribution of age into three age groups showed that 258 (66.3%) of the participants were located in the first age group of (18-20) years, 108 (27.7%) in the second age group (21-23) years, and 23 (5.9%) in the third age group (24-26) years. All the data regarding the sociodemographic characteristics of the participants are displayed in Table 1.

As illustrated in the Table (2), 310 (79.9%) individuals have heard about it, whereas one-fifth (20.3%) answered with no previous information about BSE. Table (3) and figure (1) illustrate the distribution of participant across the source of information that contributed to acquiring knowledge and BSE. Responses' evaluation was performed by finding the mean of the disparities between individuals who responded accurately, and others do not. Findings as is shown the Table (4) present an "Excellent" awareness level among participant regarding the importance of BSE in diagnostic early forms of breast cancer, being the mean score at (0.91±0.290), and the 95% confidence interval (CI) (0.88-0.94). An overall "Good" evaluation was obtained from four parts of this section regarding "how often to do BSE?", "do you know what to look for in BSE?", "do you know the three positions of BSE?", and "how would perform BSE?", being mean score and 95% Cl (0.61±0.489, 0.56-0.66), (0.67±0.471, 0.62-0.72), (0.56±0.497, 0.51-0.61), (0.68±0.469, 0.63-0.72), respectively. Inquiring individuals about age and time of BSE, yielded "Fair" overall awareness. Therefore, the awareness rate for the participants in this section of the study was calculated as 61.1%.

This part of the study was measured by answering three questions, which were as follows: (Do you feel embarrassed during BSE?). Do you opt not to perform BSE in fear of discovering breast cancer, and most importantly is to answer the question Would you inform your doctor if you find abnormal changes in the breast following BSE.

Results from this part showed that one-third (97(31.3%)) of the individuals stated no feeling of embarrassment during BSE, whereas one-quarter (83(26.8%)) of all included responders felt embarrassed by following the described BSE procedure.

Table 1. Socio-demographic characteristics of participant selected from undergraduate students from University of Kerbala (n=389) in 2021.

Variable		No. (%)
Age (year)	18-20	258 (66.3)
	21-23	108 (27.7)
	24-26	23 (5.9)
	Mean ± SD	19.9± (1.45)
	Range	18-26
	Total	389(100%)
Residence	Urban	295 (75.8)
	Rural	94 (24.2)
	Total	389(100%)
Marital status	Single	333 (85.6)
	Married	52 (13.4)
	Divorced	3(1%)
	Widow	0(0.0%)
	Total	389(100%)
College	Medicine	98 (25.2)
	Dentistry	97 (24.9)
	Faculty of administration and economics	97 (24.9)
	Human sciences	97 (24.9)
	Total	389(100%)
Stage of the study	1st	84 (21.6)
	2nd	84 (21.6)
	3rd	86 (22.1)
	4th	83 (21.3)
	5th	37 (9.5)
	6th	15 (3.9)
	Total	389(100%)
Economic status	Low	50 (12.9)
	Moderate	137 (35.2)
	High	202 (51.9)
History of chronic disease		No. (%)
Not found		345 (91.0%)
Hypertension		19 (4.9%)
Asthma		10 (2.6%)
Diabetes mellitus		4 (1.0%)
Other diseases		2 (0.5%)
Total		389(100%)
Medication		
Oral contraceptive pills		12 (3.1%)
Anti-Diabetic		4 (1.0%)
Anti-hypertension		16 (4.1%)
Anti-asthma		10 (2.6%)
Do not take medications		347 (89.2%)
Total		389(100%)
Previous breast disease		
No		359 (92.3%)
Yes (benign)		30 (7.7%)
Yes (malignant)		0 (0%)
Total		389(100%)
Method of diagnosis		
X-ray		8 (2.1%)
Mammogram		2 (0.5%)
FNA		17 (4.4%)
Other		3 (0.8%)
Total		389(100%)

Table 2. Participants' responses regarding having knowledge about BSE.

Age of BSE should be started	No. (%)
Before 20years	97(31.3)
From 20 to 30 years	171(55.1)
Over 30years	8(2.6)
I do not know	34(11.0)
Total	310(100%)
Frequency of BSE	No. (%)
Weekly	20(6.5)
Monthly	193(62.3)
Yearly	60(19.4)
I do not know	37(11.9)
Total	310(100%)
What to look for in BSE	No. (%)
No	63(20.3)
Yes	209(67.4)
I do not know	38(12.3)
Total	310(100%)
The best time to do a monthly BSE	No. (%)
Before day 1	99(31.9)
At day 1	30(9.7)
At day 7	133(42.9)
Other	10(3.2)
I do not know	38(12.3)
Total	310(100%)
Importance of BSE to diagnose early breast cancer?	No. (%)
No	10(3.2)
Yes	282(91.0)
Maybe	8(2.6)
I do not know	10(3.2)
Total	310(100%)
The three positions of BSE	No. (%)
No	129(41.6)
Yes	111(35.8)
During bathing	9(2.9)
In front of the mirror	44(14.2)
Lying supine	9(2.9)
Other	8(2.6)
Total	310(100%)
How to perform BSE	No. (%)
Palm and pads of fingers	209(67.4)
One finger	37(11.9)
Other	28(9.0)
N/A*	36(11.6)
Total	310(100%)

N/A* Not Applicable

Regarding the second question, large number of the responders (137(44.2%)) stated they are not in fear of performing BSE if the procedure led to discovering breast cancer. Others of the other hand were felt in fear of that, and they were (29(9.4%)) individuals.

Some levels of uncertainty were also observed while answering this question, as the general attitude of those (69(22.3%)) felt "to some extent" in fear of the outcome of the procedure, and others (75(24.2)) were obviously uncertain and stated "I do not know". The last question from this part of the analysis, revealed that most of the individuals (281(90.6%)) would inform their doctors if finding any abnormal changed in the breast following BSE. While only (9(2.9%)) of them stated "No". As shown in table (5).

Table 3. Participants' responses regarding having knowledge about BSE, and the source of information that contributed to acquiring knowledge about BSE

Have you heard about BSE?	No. (%)
No	79(20.3)
Yes	310(79.7)
Total	389(100%)
How have you heard about BSE?	No. (%)
Family	29(7.5)
Television	103(26.5)
Physician or nursing staff	53(13.6)
Friends	19(4.9)
Educational brochure	54(13.9)
Internet	14(3.6)
School	8(2.1)
Never heard	79(20.3)
N/A*	30(7.7)
Total	389(100%)

N/A* Not Applicable

Participants' knowledge toward BSE

Participants' practice toward BSE

Assessing BSE practicing among responders in this study was achieved by evaluating findings from answering the following questions; Have you performed BSE to yourself?, Following BSE, have you found abnormal changes in the breast?, Do you check your breasts in front of the mirror regularly?, Do you check your armpit during BSE?, Do you lift your arms over the head alternatively during BSE?, Do you press firmly on the entire region of your breast during BSE?, and Following BSE, have you been diagnosed with a disease in the breast?.

It is worth noting that all individuals who answered the first question with "No" (126(40.6%)) were omitted from answering the rest of the questionnaire and only those who by stating "Yes" have confirmed performing BSE on themselves (184(59.4%)) were allowed to answer the rest of the questions. Hence, the total number of the individuals from this part onward is (184) individuals representing 100% of the responders.

Regarding the question "have you found abnormal changes in the breast?", only 9(4.9%) individuals have confirmed finding abnormal changes or growth on at least one side of the body, whereas most of the responders (175(95.1%)) mentioned no apparent abnormal changes following BSE. Surprisingly however, only 19(10.3%) of the responders stated "Yes" when asked "Do you check your breasts in front of the mirror

regularly?". Concerning checking the armpit during BSE, findings revealed that two-thirds 131(71.2%) of the responders do check their armpit, whereas 53(28.8%) stated "No". Additionally, when asked about "Do you lift your arms over the head alternatively during BSE?", more than fifty percent 99(53.8%) of them stated "No". Similarly, large number of the responders 126(68.5%) do not usually press firmly on the entire region of the breast as a standard procedure. The last question was oriented toward showing if the BSE can help in early diagnosis of breast disease among the selected individuals in the study. Findings showed that only a single responder 1(0.5%) have benefited from BSE

Total level of awareness among responders of the three sections of this study was calculated as shown in the Table (7). The overall responses evaluation for the three studied sections revealed that the most common evaluation gained either per question or per section is (Good), being counted in six questions out of fifteen (40%). Four of these questions were concentrated in the first (Knowledge) section, and the rest distributed equally in (Attitude) and (Practice).

Additionally, (Fair) responses were counted in four questions out of fifteen (26.6), two were in Knowledge) section, and the one each distributed equally in (Attitude) and (Practice) sections. The least evaluation marks were (Poor) and (Excellent), being recorded at 20% and 13.3%, respectively. Hence, the overall awareness rate among all responders participated in this study is 57.03% (equivalent to Fair). The results also showed that levels of financial well-being (low, moderate, and high) of the responders have a significant impact on the overall level of awareness towards BSE table 8.

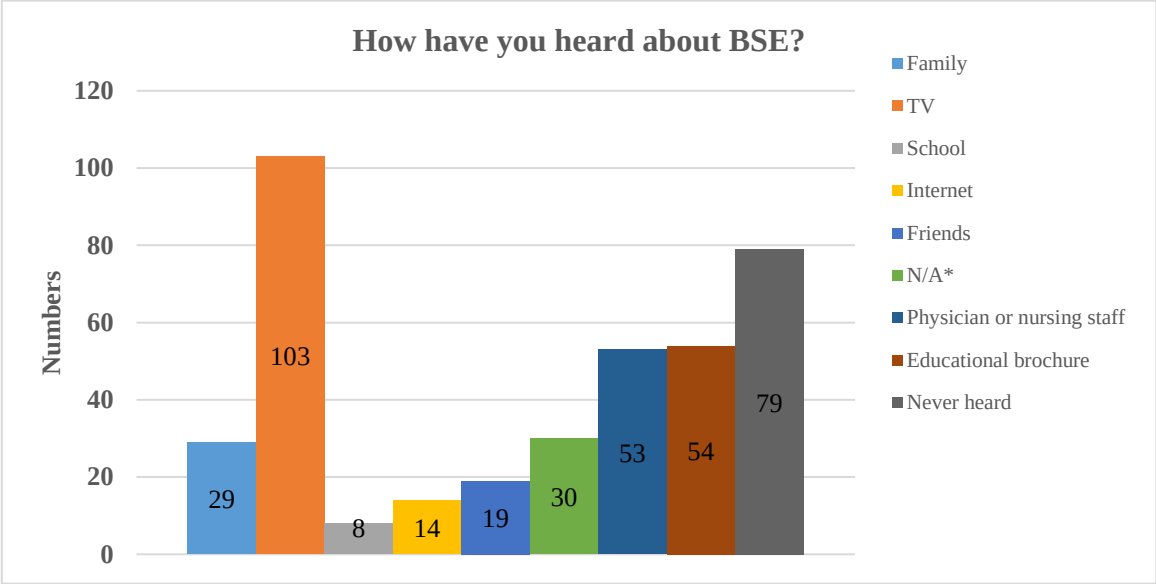

Figure 1. List of sources of information as detailed by the responders (N=389).

Table 4. Calculated overall awareness rate according to knowledge-based responses toward BSE among students from University of Kerbala 2021.

Questionnaire item	Responses		Differences Mean±SD	95% Cl Lower-Upper	Evaluation
	Positive	Negative			
	No. (%)	No. (%)			
At what age BSE should be started?	126(40.6)	184(59.3)	0.41±0.493	0.36-0.46	Poor
How often to do BSE?	193(62.3)	117(37.7)	0.61±0.489	0.56-0.66	Good
Do you know what to look for in BSE?	209(67.4)	101(32.5)	0.67±0.471	0.62-0.72	Good
What is the best time to do a monthly BSE?	133(42.9)	177(57.1)	0.43±0.496	0.38-0.48	Poor
Is BSE important to diagnose early breast cancer?	282(91.0)	28(9.0)	0.91±0.290	0.88-0.94	Very good
Do you know the three positions of BSE?	173(55.8)	137(44.1)	0.56±0.497	0.51-0.61	Good
How would perform BSE?	209(67.4)	101(32.5)	0.68±0.469	0.63-0.72	Good
Awareness rate for this domain =61.1%					

Participants' attitude toward BSE

Table 5. Calculated overall awareness rate according to attitude-based responses toward BSE among students from University of Kerbala 2021.

Questionnaire item	Responses		Differences Mean±SD	95% Cl Lower-Upper	Evaluation
	Positive	Negative			
	No. (%)	No. (%)			
Do you feel embarrassed during BSE?	211(68.1)	99(31.9)	0.67±0.472	0.63-072	Good
Do you opt not to perform BSE in fear of discovering breast cancer?	166(53.5)	144(46.5)	0.54±0.500	0.48-0.61	Good
Would you inform your doctor if you find abnormal changes following BSE?	284(91.4)	26(8.4)	0.92±0.278	0.89-0.95	Very good
Awareness rate for this this domain =71%					

Table 6. Calculated overall awareness rate according to practice-based responses toward BSE among students from University of Kerbala 2021.

Questionnaire item	Responses		Differences Mean±SD	95% Cl Lower-Upper	Evaluation
	Accurate	Inaccurate			
	No. (%)	No. (%)			
Performing BSE	184(59.4)	126(40.6)	0.59±0.492	0.54-0.65	Good
Checking breasts in front of the mirror regularly	100(54.3)	84(45.7)	0.45±0.499	0.47-0.62	Poor
Checking armpit during BSE	131(71.2)	53(28.8)	0.71±0.454	0.65-0.78	Very Good
Lifting your arms over the head alternatively during BSE	85(46.2)	99(53.8)	0.46±0.500	0.39-0.53	Poor
Pressing firmly on the entire region of your breast during BSE	61(33.2)	123(66.8)	0.33±0.472	0.26-0.40	Poor
Awareness rate for this this domain =39%					

Table 7. Calculated overall awareness rate as per question and per section toward BSE among students from University of Kerbala 2021.

Evaluation mark	Per question No (%)	P value	Per section No. (%)			P value
			Knowledge	Attitude	Practice	
Very good	3(20)	0.041*	1(6.6)	1(6.6)	1(6.6)	0.002**
Good	7(46.6)		4(26.6)	2(13.3)	1(6.6)	
Poor	5(33.3)		2(13.3)	0(0.0)	3(20)	
Total	15(100)		7(46.6)	3(20)	5(33.3)	
Overall awareness rate for the entire study= 57.03% (Good)						

*Chi-Square significant at P<0.05

**Chi-Square significant at P<0.01

Table 8. Impact of financial well-being and place of residence on responders' overall awareness level towards BSE among students from University of Kerbala 2021

		Financial well-being			P value	Place of residence		P value
		Low	Moderate	High		Urban	Rural	
		No. (%)	No. (%)	No. (%)		No. (%)	No. (%)	
Hearing about BSE	No	40(80.0)	45(32.8)	53(26.2)	0.012*	103(34.9)	75(79.8)	0.002**
	Yes	10(20.0)	92(67.2)	149(73.8)		192(65.1)	19(20.2)	
Importance of BSE to diagnose early breast cancer	No	31(79.4)	41(40.2)	57(33.8)	0.026*	79(33.8)	42(55.2)	0.015*
	Yes	8(20.6)	61(59.8)	112(66.2)		155(66.2)	34(45.8)	
Feeling embarrassment during BSE	No	7(17.9)	60(58.9)	106(62.8)	0.031*	125(53.2)	26(34.7)	0.008**
	Yes	32(82.1)	42(41.1)	63(37.2)		110(46.8)	49(65.3)	
Performing BSE	No	31(79.5)	49(48.1)	79(46.8)	0.029*	98(41.8)	47(62.7)	0.01**
	Yes	8(20.5)	53(51.9)	90(53.2)		137(58.2)	28(37.3)	

* Correlation significant at P<0.05

** Correlation significant at P<0.01

Students with "High" status of financial well-being were found the highest percentages of accurate responses among the key four questions. Responders from "High" financial status were accurate in 73.8% of the first question, 66.2% in the second question, 62.8% in the third question, and 53.2% in the BSE practice question. Therefore, students from "moderate" and "low" financial income were less likely to be aware or to practice BSE. Significant variances were found at (P=0.012), (P=0.026), (P=0.031), and (P=0.029)

for the first, second, third, and fourth question, respectively.

Discussion

Breast cancer is considered as one of the most frequent malignancies that effects women globally. In general, developing invasive malignant tumor is rare in young women, yet incidence increase with advancement in age. This study was designed to explore the overall level of awareness towards BSE among University undergraduate students in four major disciplines (medicine, dentistry, administration and economics, and social sciences) who are enrolled at University of Kerbala.

Regarding the question - at what age should BSE be started - results showed that (20-30 years) was the most common answer for the question as stated by 171(55.1%) of the responders, followed by (before 20 years), being 97(31.3%). Selecting (over 30years) was reported in 8(2.6%) cases, whereas 34(11.0%) individuals chose to say (I do not know). Additionally, when participants asked how often to do BSE, 193(62.3%) answered (monthly), whereas 60(19.4%) went for (yearly).

Concerning to know what to look for in BSE, 209(67.4%) individuals stated (Yes) and they were aware of what to search for in the normal BSE, whereas 63(20.3%) were unfamiliar with the procedure. Moreover, the best time of the month to perform BSE was reported as (before day 1) in 99(31.9%), (At day 1) in 30(9.7%), and (at day 7) in 133(42.9%) cases. Most importantly, knowing how important BSE to help in diagnosing of early tumor forms was identified by 282(91.0%) of the individuals. However, only 111(35.8%) of the responders were aware of the standard BSE position, and 209(67.4%) of them were acquainted with the accurate technique of BSE performance.

Similar findings were obtained by Ewaid et al.[10] in Shatra city of Dhi-Qar province. Higher levels of the knowledge were reported among female medical students at the University of Baghdad (11), non-medical working females in the University of Mosul [12], and females attending the general hospital in Duhok city north of Iraq, being the overall percentage for having heard about BSE 98.5%, 85.9%, 91.5%, and 82.5% respectively. The observed lower knowledge of BSE in the current study compared to Al-Naddawi [11] might be related to the fact that half of the current participants are studying for non-medical education programs, whereas in Al-Naddawi[11] the study only focused on the students of college of Medicine. Since such programs in Iraq are inherently limited with the information that is necessary for building the required knowledge regarding BSE, the differences in this matter become clear among learners from various education programs. For the differences between this study and Al-Qazaz et al. [12], the latter included participants that were significantly older than the mean age of the university students of this study. Here, the advancement of age as a predictive factor in this matter has been widely accepted by many studies [13, 14], that correlate positively with the overall awareness level of BSE. That would signify the observed differences between this study and other studies to the advancement in age alone and not the course of their education. Similar high level of knowledge among female participants were also detailed not in this study alone but in many regional and international studies that are associated with surveying medical and health workers. As part of the study, for instance in UAE (96%), and Malaysia (81.9%)[15].

It has been confirmed by several studies showing that the lower rate of knowledge towards BSE is not essentially limited to non-medical profession, but occasionally the nursing staff included in a study showed unsatisfactory knowledge related to BSE in a study by Kaur et. al.[16].

The calculated awareness rate according to knowledge-based responses toward BSE among students from University of Kerbala was (61.1%). The significant variation in knowledge which this study revealed from the previously mentioned studies is evidently linked to the responders' sociodemographic characteristics and other factors that are concerned with accessing the source of the information. Indeed, significant associations were found with the subject of education (P=0.039), higher financial well-being (P=0.012), and urban residence (P=0.002). None of the previous medical conditions nor history of medication contributed significantly to the overall awareness rate among responders.

The type of subject education can stimulate acquiring and accumulating knowledge in this field as part of their education. It was found that the level of knowledge towards BSE among medical and nursing students were found with the highest records in studies[9, 11, 17]. Those learners were also found with positive attitude to expand knowledge and to enthusiastically join BSE practicing courses[9, 17]. Similarly, high level of awareness regarding BSE was found among the communities that can be distinguished with higher financial wellbeing which mostly are found concentrated in urban areas of major cites than other low-income

rural communities that to some extent found non-compliance to breast screening [18]. A previous study associated between higher financial gain and education on participants attending routine breast screening. However, the study failed to present the interplay between those factors [19].

The current study recognized TV as the main source of information regarding BSE knowledge where TV counted for total of 103(26.5%) responses regarding the method that have been used to acquire knowledge. Here the results were consistent with findings from other studies [11, 12], yet a higher percentage of individuals acquired information from TVs in those studies than the current study. The fact that less responders acquired knowledge from TV in this study, even though TV is still the main source of information, means that being a young female student provides you with the opportunity to acquire information from various forms of platforms than older women. Hence the next source of information this study revealed are the educational brochures (13.9%) and physician and nursing staff (13.6%).

The overall awareness rate according to attitude-based responses toward BSE was found encouraging at (71%) in this study. A substantially lower attitude toward BSE was reported in (47.3%) of the non-medical staff of the university of Mosul, and (45.5%) of the medical students at Baghdad university[11]. Studies showed that most of the negative attitude towards BSE is owing to the lack in confidence in the self-examination and/or the fear of discovering abnormal changes in the breast [20, 21].

Conclusions

The proportion of knowledge-based responses among the responders was very good. The highest accurate responses were found in students of Medicine and Dentistry.

The proportion of attitude-based responses was found at (71%). Those who presented negative attitude toward the procedure were to some extent tend to not to perform BSE in fear of discovering breast cancer.

The proportion of practice-based responses among responders who are aware of BSE was found at (47.3%). The relatively low proportion is owing to not knowing the exact technique to follow and/or students do not trust themselves in finding any medical benefit from the performance.

Education, financial wellbeing, and place of residence were found to correlate positively with knowledge, attitude, and practice. However, no association was detected with age, chronic diseases, and history of breast disease.

The calculated average for the overall awareness rates for this study among all selected students from University of Kerbala was found at (57.03%), which can be regarded good according to the similar local studies.

Recommendations

Focus efforts on spreading BSE awareness among communities through building better educational programs and campaigns to educate women about the significance of early detection and how to prevent breast cancer.

Women at age of 20 years and older should be encouraged to acquire knowledge and to start practicing BSE regularly, specifically those with recorded history of breast cancer.

Educational institutions should be encouraged to establish facilities within the university supported with a dedicated mammography unit as part of the on-site health clinic, that can provide services for students and staff as well.

The study encourages researchers in this field to investigate the national level of BSE practicing among Iraqi women in different geographical locations, this would help the government to establish better approaches for better planning and intervention to reduce the burden of breast cancer.

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