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Knowledge and attitude of breast self-examination toward breast cancer among nonmedical female students at Diyala University

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Abstract
Background: Women in developed and poor nations more often get breast cancer. BSE involves women frequently checking their breasts for lumps or swelling to seek medical assistance. BSE lets women know how their breasts appear and feel so they can notify their doctors of any changes.
Objectives: To determine the knowledge and attitude of breast self-examination among nonmedical female student.
Method: A descriptive cross-sectional research was conducted at Diyala University/Governorate-Iraq on fourth-grade non-medical female students. A 700-student online questionnaire was employed. We got official agreements. Fisher's exact or chi-square test was employed. Statistical significance was set at $p<0.05$.
Results: The mean age of participants was 23.12±2.832 years. Internet was the top source of knowledge for 283 (40.4%) participants. BSE can aid in early breast cancer detection (568 (81.1%)) and I think BSE is a waste of time (606) had the greatest positive knowledge and attitude, respectively. 528 (75.4%) had negative knowledge. Negative information was considerably greater among Agriculture College female students, those without a history of breast cancer, and those who had not previously visited PHC for BSE or CBE ($p<0.001$). Science college women had a more positive attitude, P=0.009.
Conclusion: The findings of this study were considerable for inadequate knowledge and attitude towards BSE among female students.

Keywords: Knowledge, attitude, breast, self-examination, breast cancer, nonmedical female, students

Introduction

Breast cancer remains the most prevalent cancer among women globally, with over 1.15 million cases diagnosed annually and 502,000 deaths each year, making it a leading cause of cancer-related mortality among women, second only to lung cancer [1, 2]. Early detection plays a critical role in linking patients to care promptly and reducing breast cancer complications, significantly affecting survival rates and quality of life. In regions with limited resources, the mortality rate for those diagnosed with breast cancer is substantially higher, with 70% of patients dying from the disease compared to 20% in well-resourced settings, emphasizing the disparity in outcomes based on resource availability [2, 3]. Risk factors for breast cancer include age, family history, early menstruation or late menopause, and hormonal replacement therapy usage. Screening methods such as breast self-examination (BSE), clinical breast examination (CBE), and mammography are vital for early detection. Mammography is notably effective but cost-prohibitive in areas lacking robust healthcare infrastructure [4, 5]. Johns Hopkins Medical Center highlights the importance of BSE, noting that 40% of diagnosed breast cancers are detected by women noticing lumps themselves. Regular BSE, especially between the 7th and 10th days of the menstrual cycle, is crucial for early-stage detection, improving treatment outcomes and survival rates [6, 7]. Despite the proven benefits of early detection, studies reveal low BSE practice rates among university students due to insufficient knowledge about breast cancer and the importance of self-examination. For instance, research in Cameroon showed only a small fraction of female undergraduate students were knowledgeable or regularly practiced BSE, with many citing lack of knowledge as the primary barrier [7, 8]. The significance of self-detected breast lumps is underscored by evidence suggesting women identify nine out of ten breast lumps themselves.

Therefore, promoting knowledge, positive attitudes, and practice of BSE is essential [9, 10]. Understanding BSE procedures, recognizing signs of breast cancer, and fostering a proactive attitude towards self-examination can significantly impact early detection and encourage seeking medical advice promptly. In Iraq, studies have shown that while a high percentage of women diagnosed with breast cancer discover the disease themselves, it is often at advanced stages due to inadequate awareness and practice of BSE [11, 12]. A study by the National Clinical Research Center (NCRC) found that half of the educated Iraqi women aware of BSE never practiced it, mainly due to unawareness of the correct techniques. The level of knowledge among Iraqi women about breast cancer prevention and early detection was directly linked to their BSE practices. Addressing this gap in knowledge and practice is critical, especially among non-medical female students, as seen in a study at Diyala University. Enhancing awareness and knowledge about breast cancer through targeted health education interventions can promote preventive health behaviors and potentially improve early detection rates, thereby improving prognosis and survival outcomes. This approach is vital in both low- and high-resource settings to combat the global impact of breast cancer effectively [13, 14]. Objectives: to assess the level of awareness and perceptions regarding breast self-examination (BSE) among non-medical female students. And to investigate the association between socio-demographic factors and the practice of breast self-examination.

Method

This descriptive cross-sectional study was conducted at Diyala University, located in the Diyala governorate of Iraq, from March 1 to August 30, 2022. The study aimed to assess the knowledge and attitudes towards breast self-examination (BSE) among non-medical female students at the university. The target population comprised female students from eight colleges within the university, specifically the fourth-grade students from the Colleges of Engineering, Science, Law, Veterinary Medicine, Agriculture, Administration and Economics, Fine Arts, and Education. Exclusion criteria included students with a personal history of breast cancer to ensure the focus remained on prevention and early detection. Data collection was executed using an online questionnaire developed by the researchers after a thorough review of the scientific literature, ensuring relevance and accuracy. The questionnaire, translated into Arabic to enhance understanding and accessibility, was distributed via Google Forms. Study investigators utilized their private social media accounts for posting, advertising, and distributing the questionnaire to reach a broad audience. Over four months, data from 700 eligible students were collected, ensuring a robust sample size for analysis. The questionnaire was divided into three sections. The first part gathered personal data, such as age, marital status, number of children, mother's education level, family history of breast cancer, and previous visits to primary healthcare centers (PHC) for BSE or clinical breast examination. The second section assessed students' knowledge about BSE, including its importance for early detection, the correct age and frequency for performing BSE, appropriate timing and location, detection methods, signs of breast cancer, risk factors, and sources of knowledge. The third part evaluated attitudes towards BSE, including perceptions of embarrassment, time consumption, discomfort, preferences for traditional healing, and concerns about breast cancer, aiming to understand the psychological barriers to BSE practice. Ethical clearance was secured from the Ethical Scientific Committee at the Department of Family and Community Medicine, College of Medicine, University of Baghdad, and the Iraqi Board for Medical Specialization. Additional permissions were obtained from the Diyala education directorate after detailing the study's objectives and rationale. Participants were assured of confidentiality, with data collected under serial identification numbers without revealing identities. Statistical analysis was performed using Microsoft Excel 2016 and IBM SPSS version 26, employing descriptive statistics for categorical data (frequencies and percentages) and mean for normally distributed quantitative data. The chi-square test was used for qualitative variables, with a significance level set at $p<0.05$. Knowledge and attitude scores were quantified, assigning points for correct, uncertain, and incorrect responses, with scoring thresholds established to categorize knowledge and attitudes as negative, neutral, or positive. A pilot study involving 20 female students was conducted to validate the questionnaire's consistency, excluding these participants from the main study. The six-month study plan encompassed data collection, analysis, and the drafting and finalization of the research report.

Results

A total of 700 females had participated in this study; their mean age was 23.12±2.832 years. Most of them were from College of Education 452 (64.6%) then Science 69 (9.9%). There were 480 (68.6%) single females and 207 (29.6%) married. Out of total married females, 93 (42.3%) females had one child while 73 (33.2%) females had no children yet. Family History of breast cancer was found among 64 (9.1%) female students. Most of participants had no previous visits to PHC to do BSE or CBE, 628 (89.7%) and 634 (90.6%) respectively. According to the mothers' education, 362 (51.7%) females had mother with higher education (> secondary school). Negative history of breast cancer was found among 629 (89.9%) females. Health care provider were the source of knowledge about BSE among 156 (22.3%) participants only, while internet was the highest source of knowledge among 283 (40.4%) participants. (Table 1).

Table 1: Sociodemographic characteristics of participants

Sociodemographic characteristics		No. (total=700)	Percent (100%)
College/ (Total no. of 4th grade)	Administration and Economics/100	51	7.3
	Education/700	452	64.6
	Engineering/90	32	4.6
	Science/130	69	9.9
	Law/80	32	4.6
	Fine Arts/60	10	1.4
	Agriculture/46	30	4.3
	Veterinary Medicine/22	24	3.4
Marital status	Single	480	68.60

	Married	207	29.60
	Divorced/widowed	13	1.90
Number of children (married/divorced/widowed; n=220)	0	73	33.2
	1	93	42.3
	2	40	18.2
	≥3	14	6.4
Family History of breast cancer	Yes	64	9.1
	No	636	90.9
There was previous visit to PHC to do BSE	Yes	72	10.3
	No	628	89.7
There was previous visit to PHC to do CBE	Yes	66	9.4
	No	634	90.6
Mother education	Illiterate	55	7.9
	Primary	119	17.0
	Secondary	164	23.4
	>secondary	362	51.7
Source of knowledge	Friends	46	6.6
	family	50	7.1
	Health care provider	156	22.3
	Books	28	4.0
	Television	40	5.7
	Internet	283	40.4
	Others (Magazine, Newspaper)	97	13.9

(Table 2) shows the knowledge of participants about BSE. The highest positive knowledge was for (BSE can help in early identification of breast cancer, 568 (81.1%)) then for (BSE important in the early detection of breast cancer, 522 (74.6%)); while the lowest positive knowledge was for (The correct age to initiate BSE is less than 19 years, 79 (11.3%)).

Table 2: Knowledge of participants about BSE

Knowledge		**No. (Total=700)**	**Percent (100%)**
BSE important in the early detection of breast cancer	Yes	522	74.6
	No	14	2.0
	I Don't Know	164	23.4
The correct age to initiate BSE is less than 19 years	Yes	248	35.4
	No	79	11.3
	I Don't Know	373	53.3
BSE should be performed monthly	Yes	267	38.1
	No	117	16.7
	I Don't Know	316	45.1
The appropriate time to perform BSE is a week after menstruation	Yes	200	28.6
	No	23	3.3
	I Don't Know	477	68.1
The appropriate place to perform BSE	While Lying On The Bed Only	56	8.0
	In Front Of The Mirror Only	65	9.3
	While Having A Bath Only	11	1.6
	All Of Above	194	27.7
	Don't Know	374	53.4
The correct method of BSE	Using Of The Opposite Hand For Palpation Of Breasts Only	46	6.6
	Palpate With Palm And Minimum Of Three Fingers Only	30	4.3
	Examine The Armpit While Performing BSE Only	37	5.3
	All Of Above	192	27.4
	Don't Know	395	56.4
BSE can help in early identification of breast cancer	Yes	568	81.1
	No	24	3.4
	I Don't Know	108	15.4
Sign of breast cancer	Lump In The Breast And Around The Armpit Only	151	21.6
	Change In The Shape And Color Of Breast Only	23	3.3
	Nipple Discharge And Retraction Only	7	1.0
	All Of Above	259	37.0
	Don't Know	260	37.1

(Table 3) shows the attitude of participants about BSE. The highest positive attitude was for (I think BSE is a waste of time, 606 (86.6%)) then for (I think all women should do BSE, 579 (82.7%)); while the lowest positive attitude was for (I believe if I feel uncomfortable, I cannot do BSE, 276 (39.4%)) then for (I think If there is a lump, I prefer to get treatment from a traditional healer, 291 (41.6%)).

Table 3: Attitude of participants about BSE

Attitude		Total No.=700	Percent (100%)
I think BSE will be embarrassing to me	Yes	195	27.9
	No	421	60.1
	I Don't Know	84	12
I think BSE is a waste of time	Yes	25	3.6
	No	606	86.6
	I Don't Know	69	9.9
I think performing BSE makes me feel unpleasant	Yes	147	21
	No	447	63.9
	I Don't Know	106	15.1
I think If there is a lump, I prefer to get treatment from a traditional healer	Yes	161	23
	No	291	41.6
	I Don't Know	248	35.4
I believe if I feel uncomfortable, I cannot do BSE	Yes	203	29
	No	276	39.4
	I Don't Know	221	31.6
I think all women should do BSE	Yes	579	82.7
	No	34	4.9
	I Don't Know	87	12.4
I really care about my breast	Yes	518	74
	No	78	11.1
	I Don't Know	104	14.9
I think I am not afraid to think about breast cancer	Yes	359	51.3
	No	210	30
	I Don't Know	131	18.7
I avoid BSE because I worry about having breast cancer	Yes	162	23.1
	No	416	59.4
	I Don't Know	122	17.4
I am interesting in doing BSE	Yes	411	58.7
	No	171	24.4
	I Don't Know	118	16.9

According to the knowledge score, 457 (65.3%) participants have negative knowledge, 164 (23.4%) participants have average knowledge, and only 79 (11.3%) participants have positive knowledge (Figure 1).

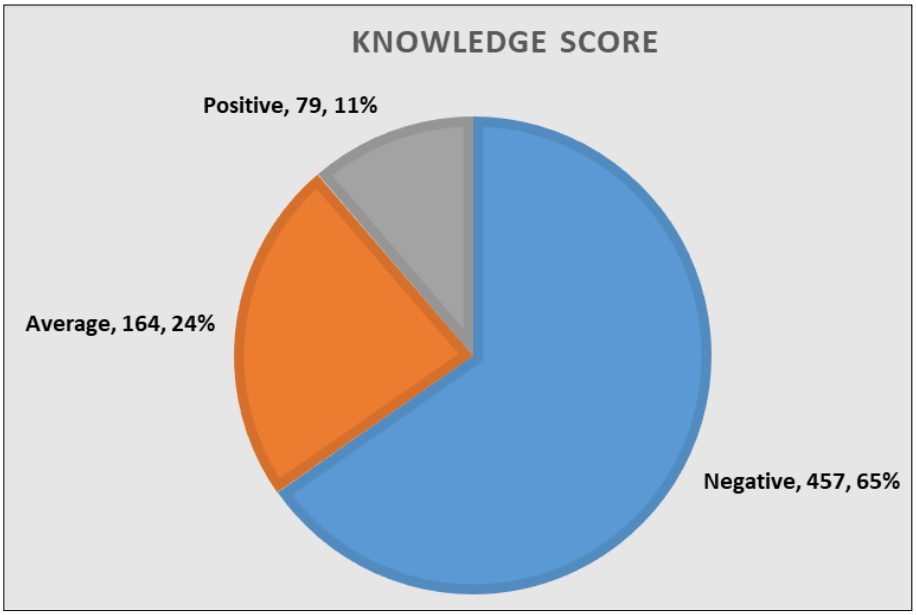

Fig 1: Knowledge score.

According to the attitude score, 127 (18.10%) participants have negative attitude, 283 (40.4%) participants have average attitude, and 290 (41.4%) participants have positive attitude (Figure 2).

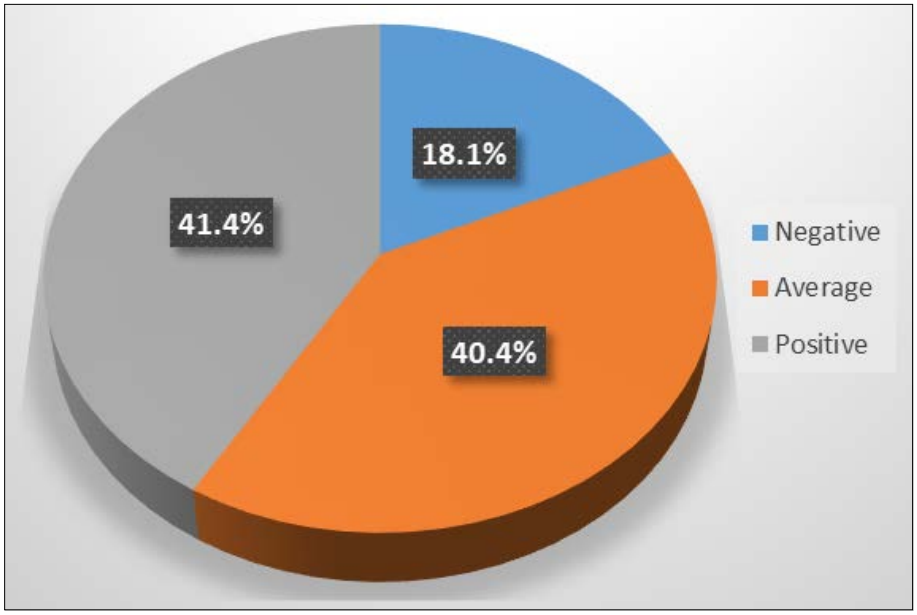

Fig 2: Attitude score.

Average knowledge was significantly higher among female students of Science college, $p<0.001$. Negative knowledge was significantly higher among female students with negative family history of breast cancer, and with those who didn't visit PHC previously to do BSE or CBE, $p<0.001$ (Table 4).

Table 4: Association between sociodemographic features of participants and their knowledge of BSE

Sociodemographic features		Knowledge score						P* value
		Negative		Average		Positive		
		No.	%	No.	%	No.	%	
College/ (Total no. of 4th grade)	Administration & Economics/100	37	72.5	12	23.5	2	3.9	<0.001
	Education/700	323	71.5	98	21.7	31	6.9	
	Engineering/90	9	28.1	8	25.0	15	46.9	
	Science/130	2	2.9	66	95.7	1	7.2	
	Law/80	12	37.5	6	18.8	14	43.8	
	Fine Arts/60	9	90.0	1	10.0	0	0.0	
	Agriculture/46	28	93.3	2	20.0	0	0.0	
	Veterinary Medicine/22	7	29.2	5	20.8	12	50.0	
Marital status	Single	308	64.2	120	25.0	52	10.8	0.303
	Married	142	68.6	39	18.8	26	12.6	
	divorced/widowed	7	53.8	5	38.5	1	7.7	
Number of children (married/divorced/widowed; n=220)	0	52	71.2	16	21.9	5	6.8	0.142
	1	61	65.6	15	16.1	17	18.3	
	2	24	60.0	11	27.5	5	12.5	
	≥3	12	85.7	2	14.3	0	0.0	
Mother education	Illiterate	37	67.3	12	21.8	6	10.9	0.55
	Primary	81	68.1	28	23.5	10	8.4	
	Secondary	100	61.0	39	23.8	25	15.2	
	>Secondary	246	68.0	90	24.9	26	7.2	
Family History of breast cancer	Yes	28	43.8	20	31.3	16	25.0	<0.001
	No	429	67.5	144	22.6	63	9.9	
There was previous visit to PHC to do BSE	Yes	35	48.6	10	13.9	27	37.5	<0.001
	No	422	67.2	154	24.5	52	8.3	
There was previous visit to PHC to do CBE	Yes	27	40.9	12	18.2	27	40.9	<0.001
	No	430	67.8	152	24.0	52	8.2	

*Chi2 square test

Poor attitude was significantly higher among female students of Science college, P=0.009. Inspite of that the single female and married with one child, mothers with more than secondary education, and personal history of breast cancer have neutral attitude, but no significant association was found, $p>0.05$. (Table 5).

Table 5: Association between sociodemographic and attitude of BSE

Sociodemographic features		Attitude score						P* value
		Negative		Neutral		Positive		
		No.	%	No.	%	No.	%	
College/ (Total no. of 4th grade)	Administration & Economics/100	13	25.5	12	23.5	26	51.0	0.001
	Education/700	123	27.2	190	42.0	139	30.8	
	Engineering/90	5	15.6	14	43.8	13	40.6	
	Science/130	43	62.3	18	26.1	8	11.6	
	Law/80	7	21.9	15	46.9	10	31.3	
	Fine Arts/60	6	60.0	2	20.0	2	20.0	
	Agriculture/46	7	23.3	11	36.7	12	40.0	
	Veterinary /22	5	20.8	13	54.2	6	25.0	
Marital status	Single	120	25.0	196	40.8	164	34.2	0.97
	Married	48	23.2	84	40.6	75	36.2	
	Divorced/widowed	3	23.1	5	38.5	5	38.5	
Number of children(married)	0	24	32.9	27	37.0	22	30.1	0.311
	1	18	19.4	38	40.9	37	39.8	
	2	8	20.0	17	42.5	15	37.5	
	≥3	1	7.1	7	50.0	6	42.9	
Mother education	Illiterate	14	25.5	31	56.4	10	18.2	0. 08
	Primary	31	26.1	52	43.7	36	30.3	
	Secondary	36	22.0	65	39.6	63	38.4	
	>Secondary	90	24.9	137	37.8	135	37.3	
Family History of breast cancer	Yes	16	25.0	23	35.9	25	39.1	0.68
	No	155	24.4	262	41.2	219	34.4	
Previous visit to PHC to do BSE	Yes	12	16.7	30	41.7	30	41.7	0.21
	No	159	25.3	255	40.6	214	34.1	
Previous visit to PHC to do CBE	Yes	10	15.2	29	43.9	27	40.9	0.17
	No	161	25.4	256	40.4	217	34.2	

*Chi^2 square test

Discussion

Breast cancer, the second most common cancer globally, emphasizes the critical need for early detection to improve outcomes and survival rates. This study assessed the knowledge and attitude towards breast self-examination (BSE) among non-medical female students at Diyala University, highlighting the importance of BSE in identifying breast disease early [15]. The study revealed that radiation exposure and lack of breastfeeding were commonly recognized as risk factors for breast cancer by more than half of the participants, aligning with findings by Kharaba Z *et al.* [16] and Rahman SA *et al.* [17], and supported by Rafique S *et al.* [18] and Farhat S *et al.* [19]. However, less awareness was noted regarding risk factors such as late menopause and early menarche, with results echoing those from Radi SM *et al.* [20] but differing from Farhat S *et al.* [19], suggesting variability in knowledge based on the study population. In terms of BSE knowledge, the internet emerged as the primary information source, followed by healthcare workers, mirroring trends noted by Ahmed AA *et al.* [21] and contrasting with sources identified by Shahani MP *et al.* [15]. This digital inclination underscores the potential of online platforms in enhancing breast cancer awareness. Despite recognizing BSE's utility in early detection, as supported by studies from AL Junaibi R.M. *et al.* [22] and research at the University of Buea [8], a significant portion of students lacked essential knowledge on BSE initiation and technique, similar to findings from an Egyptian study [23]. The overall insufficient BSE knowledge among participants indicates a pressing need for educational interventions, as corroborated by Ahmed AA *et al.* [21] and Ali AN *et al.* [24], and highlights the gap in public health education, particularly among younger demographics and those without a family history of breast cancer. Attitudinally, the study found a general consensus against viewing BSE as time-wasting, with a majority acknowledging its importance for all women, aligning with findings by Alomair AN *et al.* [25] and Ayed A, *et al.* [26]. A notable portion exhibited openness to BSE over traditional healing methods, reflecting a positive shift towards medical consultation for breast abnormalities. Socio-demographic analysis indicated a significant correlation between a family history of breast cancer and BSE knowledge, with students from the Science College displaying a more positive attitude towards BSE. This association suggests that scientific education may influence health-related attitudes and practices, echoing sentiments on the interplay between science education and health awareness [27]. Contrary to expectations, marital status showed no significant impact on BSE knowledge, diverging from findings by Hassan MR *et al.* [28], and highlighting varied influences on health literacy. Furthermore, students who had not visited a primary healthcare center (PHC) for BSE or clinical breast examination (CBE) exhibited notably lower knowledge levels, suggesting that direct healthcare engagement could enhance awareness and screening practices, as supported by Bawazir A *et al.* [29]. This study underscores the imperative for targeted educational programs to bolster breast cancer awareness and BSE practices among young women, leveraging digital platforms for wider outreach and incorporating health education into various academic curricula to foster a well-informed and proactive approach to breast health.

Conclusion

Two-thirds of female students at Diyala University displayed poor knowledge of breast self-examination (BSE) and associated risk factors, with radiation acknowledged by half as a risk, but lactation benefits were overlooked. The internet was the main source of BSE information, yet a comprehensive understanding remained lacking. Despite this, a majority acknowledged BSE's significance for early cancer detection and believed in its necessity for all women. However, less than half exhibited a fully positive attitude

towards BSE, highlighting the need for more effective educational efforts.

Conflict of Interest
Not available

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Not available

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