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Knowledge and Practices of Breast Self-Examination among Female Students of Bahria University of Health Sciences Karachi

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ABSTRACT

Breast Self-Examination is an efficient approach for investigating physical and visual abnormalities in breast tissue. **Objective:** To evaluate the awareness, knowledge, practice of breast self-examination among female university students in five colleges of Bahria University Health Sciences Karachi. **Methods:** A cross-sectional study at Bahria University Health Sciences Campus Karachi with random sampling among female students from the Dental, Medical, Doctor of Physical Therapy, Nursing sections and Medical Laboratory Technicians. The data were collected using a self-administered google questionnaire form distributed online via WhatsApp. The questionnaire encompassed sections on the socio-demographic characteristics of the participants, as well as their awareness, knowledge, attitude, and practice towards BSE. For data analysis SPSS Software version 25.0 was used. **Results:** 240 female participants were enrolled in study, 77.5% knew the meaning of BSE, while 31.7% had complete knowledge. 5.4% BDS students did it in routine practice, 63% believed, it helps in cancer monitoring, 22.8% performed to detect nodules and 8.7% carried out because of family history. Out of 110 participants from nursing section, 7.3% followed BSE in routine practice, 65.5% believed it's beneficial in the detection of cancer. However, the main reason for performing was detection of cancer 62.9%. Several barriers were encountered such as time constraint, lack of knowledge 46.7%, uncomfortable 6.7%, fear 30.4% and misconception. **Conclusions:** Participants had understanding of BSE but they lacked complete knowledge of breast self-examination due to limited access to health care resources and insufficient understanding about the technique also encounter significant barriers during practicing.

INTRODUCTION

Breast cancers hold a significant global health concern, standing as an important cause of mortality affecting women worldwide. It is characterized by abnormal cell growth forming undifferentiated masses. Symptoms include breast lump, change in shape, size and skin, redness and nipple discharge from it. If left untreated the tumor can metastasize. International prevalence data shown by WHO is 2.3 million cases annually, with 685,000 deaths. Over five years, 7.8 million women have been diagnosed, marking it as the most prevalent global cancer [1, 2]. At national level, breast cancer affects one in four women, with an incidence 4.5 times higher than other cancers [3]. Annually, 1.38 million new cases arise globally, with 0.46 million fatalities. Early detection can render 99% of cases treatable [4]. Moreover, according to the age distribution, 25-49 year was the range in which it was observed with the highest rate of 34.2% in contrast with other age groups. Risk factors such as oral contraceptive usage, cigarette smoking, obesity, high body mass, increasing age, high intake of dairy products and poor nutrition such as vitamin D deficiency are most commonly found in latest literature [5-8]. Additionally, familial history

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of breast cancer imparts a major role in the development of the disease. Also reproductive factors like menopause, early menarche and hormonal therapies contribute to risk [9, 10]. Screening methods recommended by health professionals for breast cancer investigation includes Breast Self-Examination (BSE), clinical breast examination and mammography. BSE is most cost effective and easy procedure for the woman as it ensures breast lump at earliest. It is a basic and efficient approach for investigating any physical and visual abnormalities in the breast tissues [11-13]. Early diagnosis is important for successful treatment and can notably reduce morbidity and mortality associated with breast cancer; particularly in areas where identification of cancer and management is limited. Hence, BSE appears as a more reachable preference for detecting abnormalities [14, 15].

Despite breast cancer being the most prevalent cancer globally and disproportionately affecting Pakistani women at a rate 4.5 times higher than other cancers, there remains a critical research gap regarding the depth of BSE knowledge, attitudinal barriers, and actual practice patterns specifically among female health sciences students in Pakistan, who as future healthcare professionals are expected to advocate for early detection. The problem is particularly concerning given that even students with healthcare exposure demonstrate alarmingly low rates of routine BSE practice, with only 16.3% practicing it regularly despite 96.7% acknowledging its importance, highlighting a significant knowledge-to-practice gap. Therefore, this research aimed to evaluate the awareness, knowledge, and practice of BSE among female university students in various health disciplines at Bahria University Health Sciences Karachi, while also assessing barriers to BSE to provide insights for curriculum integration and targeted educational initiatives.

METHODS

A cross-sectional study was carried out at Bahria University Health Sciences Karachi, from June to December 2023. Ethical approval was obtained from Committee of the PNS SHIFA (ERC/2023/DENTAL/67). The study focused on female students from the Dental, Medical, Doctorate of Physical Therapy, Nursing sections and Medical Laboratory Technicians. Inclusion criteria involved, females who were 17 years of age and older, who were studying in Bahria University Health Sciences and those who gave consent, whereas exclusion criteria focused on those females who were not agree to participate. Questionnaire was utilized as the primary data collection method, with a total of 240 female students. It was a self-administrative questionnaire; validity of questionnaire was checked using Cronbach's alpha test via SPSS. Alpha value was observed to be 0.81(good). Participants were selected through simple random sampling and the data were collected using a self-administered google questionnaire form distributed online via WhatsApp. The questionnaire encompassed sections on the socio-demographic characteristics of the participants, as well as their awareness, knowledge, attitude and practice towards BSE [16]. Calculation of the sample size was done using OpenEpi software. Sample size was determined at a 95% confidence level to achieve a balance between precision and confidence in estimating the proportion of interest. The assumed prevalence for larger sample was considered as 50%. The required sample was found to be 218 ± 10%. However, we considered 240 subjects as sample. For data collection, the collected data were entered into Microsoft Excel for organization and further analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 25.0. Continuous variables were analyzed using mean and standard deviation, while categorical variables were presented as frequency and percentages. Further data variables were showed using stacked bar chart.

RESULTS

The study involved 240 females, 113 (47%) were aged between 17-20 years, while 111(46%) were aged between 21-24 years. In terms of discipline, 92(38.3%) were from Dental section, 110 (45.8%) were from Nursing Department, 26 (10.8%) from Doctor of Physical Therapy (DPT), 3(1.3%) from Medical Laboratory Technician (MLT) and 9 (3.8%) participants from MBBS. In addition, 78(32.5%) were in first year, 44 (18.3%) were in second year, 48 (20%) from third year, 40 (16.7%) from fourth year and 30 (12.5%) from final year. Sources of information of participants regarding BSE: such as books 8.3%, social media/ print media 35.4%, from hospital 10% and 40.8% from class/workplace. Data revealed that 10.8% subjects were aware of the maternal predilection of breast cancer in their family. However, only 5% expressed paternal familial history. But a major percentage of 82.5% participants were completely unaware (Table 1).

Table 1: Base Line Characteristics of Participants (N=240)

Variables	Responses	N (%) / Mean ± SD
Age Group	17-20	113 (47.1%)
	21-24	111 (46.3%)
	> = 25	16 (6.7%)
Discipline	MBBS	9 (3.8%)
	BDS	92 (38.3%)
	Nursing	110 (45.8%)
	DPT	26 (10.8%)
	MLT	3 (1.3%)
Academic Year	1st Year	78 (32.5%)
	2nd Year	44 (18.3%)

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	3rd Year	48 (20%)
	4th Year	40 (16.7%)
	5th Year	30 (12.5%)
Source of Information	Books	20 (8.3%)
	Social/Print Media	85 (35.4%)
	Hospital	24 (10.0%)
	Friends	13 (5.4%)
	Class/Workplace	98 (40.8%)
Familial Breast Cancer History	Maternal Side	26 (10.8%)
	Paternal Side	12 (5.0%)
	None	202 (84.6%)
Do you know at what age it's important to start BSE?		
Mean ± SD (Years)		21.39 ± 8.11
Range		(12-50 Years)

Awareness of participants regarding Breast Self-Examination (BSE) is documented in table 2. Participants were asked about the awareness and their responses were recorded as "Yes ", "No" and "Don't Know. Following questions were asked as written in table. Out of 240 participants, 77.5% knew what BSE stands for whereas 54.2% were able to perform BSE, 28.7% had answered no regarding the performance. Moreover 31.7% had complete knowledge about breast self-examination and majority 47.5% lacked complete knowledge. Additionally, majority participants 96.7% consider BSE as an essential practice. Whereas only 16.3% practiced BSE routinely however during practicing only 7.9% found a mass during self-examination. Likewise, 77.1% consider it essential and 62.5 % responders had been taught about BSE in their medical school (Table 2).

Table 2: Describe the Awareness of Breast Self-Examination (BSE) among Participants (N=240)

Awareness of Participants	Yes N (%)	No N (%)	Don't Know N (%)
Do you know what BSE stands for?	186 (77.5%)	39 (16.3%)	15 (6.3%)
Are you able to perform BSE?	130 (54.2%)	69 (28.7%)	41 (17.1%)
Do you have complete knowledge about BSE?	76 (31.7%)	114 (47.5%)	50 (20.8%)
Do you think BSE is important?	232 (96.7%)	3 (1.3%)	5 (2.1%)
Is Breast Self-Examination in your routine practice?	39 (16.3%)	182 (75.8%)	19 (7.9%)
Did you ever Found a mass or lump while performing BSE?	19 (7.9%)	197 (82.1%)	24 (10%)
Is it appropriate to perform BSE?	185 (77.1%)	30 (12.5%)	25 (10.4%)
Have you heard or been taught in university about BSE?	150 (62.5%)	83 (34.6%)	7 (2.9%)

Figure 1 depicted the correlation of participants enrolled in different discipline and the barriers encountered while practicing BSE. Majority participants lacked information and anxious about the results. Among 92 participants who were enrolled in BDS: 46 (50%) lacked basic knowledge, 7 (7.6%) were uncomfortable with the process where as 26 (28.3%) apprehended about the results and 13 (14.1%) took it as a misconception. Out of 110 from Nursing: 44 (40%) had insufficient knowledge about BSE, 8 (7.3%) were uncomfortable, 38 (34.5%) were frightened by the outcome and 20 (18.2%) had misconception about it.

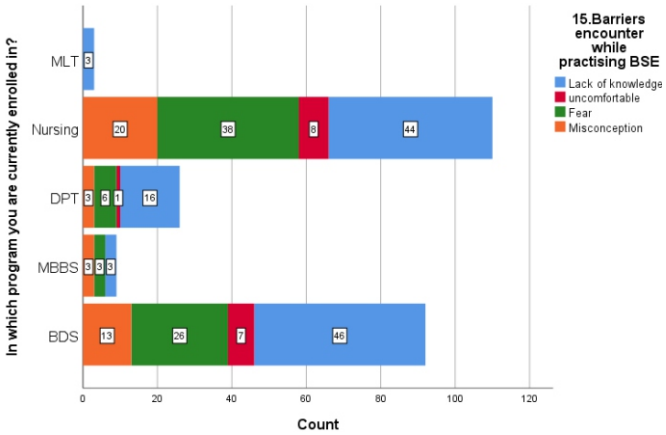

Figure 1: Correlation of Participants and Barriers Encounter during Practicing BSE

Table 3 illustrated knowledge and practice of participants regarding BSE. This section inquired about knowledge related to BSE through the following questions. Out of 240 participants, the majority 83.8% self-monitored themselves while 24% reported to the doctor for the BSE evaluation, 5.8% reported to the trained nurses, and 4% sought advice from their mother. Besides, 89.6% participants were renowned that it could be done manually, 3.3% responders familiar that it could be done through CT scan, 2.5% via ultrasound and 2.5% using specialized instruments. Concerning how BSE is performed 77% participants mentioned it could be done by palpating or feeling the breast manually, 15.8% individuals supposed by observing oneself in the mirror. As far as significance of BSE is concerned 82.5% participants considered that it helps in detection of early breast cancer, only 12.5% believed an important part of routine. After finding a mass/lump 95.4% participants had knowledge that they would report it to physician. The vast majority 94.2% were familiar that it could transform into cancer. However, 5.8% were heedless to fact. Also 69.6% responders assumed that the best time to carry out BSE is after menstruation, 2.9% after post pregnancy, 3.8% during first trimester, and 7.1% during lactation. Almost two thirds of the participants 69.8% agreed that BSE is a time taking procedure. Furthermore, the best age to start BSE as a routine practice, half of the responders 70% believed it should be initiated as soon as puberty starts. Only 35.7% deem that they had sufficient knowledge about BSE. This section inquired about practice related to BSE as mentioned in table. Almost half of the participants 49.6% examined their breasts for any abnormalities. 69% considered that it's a prolonged procedure. Barriers encountered while performing BSE includes the following: 46.7% lacked basic Knowledge of BSE, 6.7% were uncomfortable with the

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procedure and 16.3% considered it a misconception and 30.4% feared about the results.

Table 3: Knowledge and Practice routine of participant regarding Breast Self-Examination(BSE)(N=240)

Variables	Responses	N (%)
BSE is performed by?	Doctor	24 (10%)
	Trained Nurse	14 (5.8%)
	Mother	1(.4%)
	Yourself	201 (83.8%)
BSE is performed with?	CT Scan	8 (3.3%)
	Ultrasound	6 (2.5%)
	Manually	215 (89.6%)
	Specialized Instrument	6 (2.5%)
	None	5 (2.1%)
BSE is Performed as?	Observing the radiograph	8 (3.3%)
	Palpating/Feeling the Breast Manually	185 (77.1%)
	Observing Yourself in Front of Mirror	38 (15.8%)
	Inspection by a nurse	2 (.8%)
	Don't know	7 (2.9%)
What is Significance of BSE?	Diagnostic Criteria by Doctors	8 (3.3%)
	Helps in Detection of Early Breast Cancer	198 (82.5%)
	Important Part of Routine Medical Checkup	30 (12.5%)
	Don't know	4 (1.7%)
What Action You'll Take After Finding a Mass/Lump During BSE?	Visit a Doctor	229 (95.4%)
	Go to a Laboratory	4 (1.7%)
	Do Home Remedies	3 (1.3%)
	Nothing	4 (1.7%)
Can a Mass/Lump have Transformed into Cancer?	Yes	226 (94.2%)
	No	14 (5.8%)
What is the Best Time to Perform BSE?	After Menstruation	167 (69.6%)
	Post Pregnancy	7 (2.9%)
	During First Trimester	9 (3.8%)
	During Lactation	17 (7.1%)
	Don't Know	40 (16.7%)
What is the Best Age to Start BSE as a Routine?	Beginning of Puberty	169 (70.4%)
	From 25 Years	33 (13.8%)
	From 35 Years	9 (3.8%)
	In late 40s after Menopause	3 (1.3%)
	Don't Know	26 (10.8%)
Do you Think you have Appropriate Knowledge about BSE	Yes	85 (35.4%)
	No	86 (35.8%)
	Don't Know	69 (28.7%)
Practicing Breast Self-Examination		
Do you examine Breast for any Abnormalities?	Yes	119 (49.6%)
	No	121 (50.4%)
BSE is time Taking Procedure?	Agree	165 (69.8%)
	Disagree	75 (31.3%)
Reason for Practice BSE	Routine Practice	13 (5.4%)
	Early Detection of Cancer	151 (62.9%)
	Presence of Nodule	42 (17.5%)
	Family History	34 (14.2%)
Barrier Encounter while Performing BSE	Lack of Knowledge	112 (46.7%)
	Uncomfortable	16 (6.7%)
	Fear	73 (30.4%)
	Misconception	39 (16.3%)

Figure 2 depicted the correlation between participants enrolled in different discipline and their reason for practicing BSE. The majority performed BSE as it would help in early detection of cancer and nearly half did due to presence of a nodule. Among 92 participants who were enrolled in BDS: 5(5.4%)considered it a routine practice, 58 (63%) believed it would help in monitoring of cancer whereas 21 (22.8%) performed to detect nodules and 8 (8.7%) supposed it would be carried out because of family history. Out of 110 participants from Nursing section 8 (7.3 %) considered it should be implemented it in practice routine, 72 (65.5%) believed it would be beneficial in the detection of cancer whereas 13 (11.8%) deemed it should be executed to find out nodules and 17 (15.5%) supposed it should be performed of because of familial history as shown in figure 2.

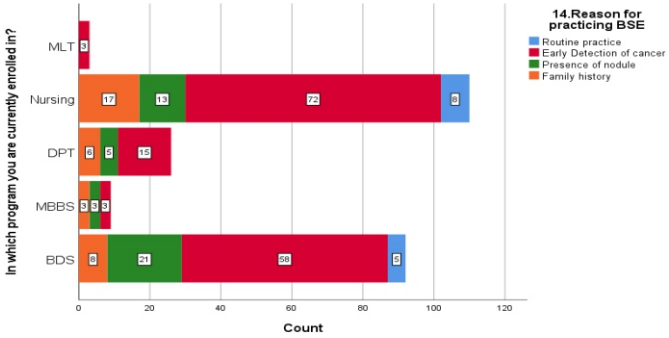

Figure 2: Correlation of Participants and Reason for practicing Breast Self-Examination

DISCUSSION

Breast Cancer is second leading cause of death. Early detection through routine screening can significantly reduce mortality and morbidity rates. Breast Self-Examination is a convenient approach for identifying breast abnormalities. According to Workineh et al., BSE is recommended for women aged of 20 and above, preferred monthly for 20 minutes, between the 7th and 10th days of the menstrual cycle (2–3 days' post-menses) [12, 17]. On the contrary, Ferdowsy, highlighted that women are still unmindful to the term BSE. It concludes that there is a substantial lack in comprehensive knowledge about BSE. Besides, some participants understood the definition and technique however they lacked comprehension of its significance, clinical relevance, and outcomes, leading to scarce execution of routine BSE [19]. Approximately 75.8% of women did not perform BSE due to insufficient understanding, inadequate guidance and not prioritizing it and considering themselves at low risk of cancer. Similar

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findings were observed in studies conducted in Nigeria, Ethiopia and Cameroon [20-24]. In comparison to this, study conducted by Ogunkayode and Ajuwon found only 9.5% females had good knowledge and practice of BSE [25]. In this study, (50%) BDS and (40%) Nursing women's had insufficient BSE knowledge. Despite being in healthcare fields, their curriculum may lack emphasis on breast health education, indicating barriers to effective health promotion training. Most of the participants of this study stated that time constraints and fear were common barriers to performing BSE. This Fear can notably discourage women in executing BSE regularly; may be because the participants were young and had insufficient knowledge and experience of BSE. This study highlighted the sources of knowledge about BSE among participants, the most familiar being social/print media and university (40%). This aligns with a study conducted in Baghdad that highlighted significant role of mass media's in disseminating BSE knowledge by using diverse medium such as social media (Instagram, Facebook and YouTube) print media (Newspaper, magazines, brochures). Whereas, this study showed that the best source of information observed in the data were found primarily to be the curriculum followed by the health campaigns organized by University management in campus. Despite this, a significant knowledge gap persists regarding risk factors, particularly familial predisposition, which needs more emphasis. On the contrary literature has shown studies where participant had substantial knowledge about family history regarding breast cancer [26]. Attitude regarding BSE adoption in routine is not much appreciable, significantly observed attributes to this pattern includes knowledge gap among females regarding its prevalence and alarmingly increasing ratio, neither they are internally motivated to follow BSE until pain or mass is felt in mammary glands [19]. Regarding maneuvers to execute BSE, this study participant was aware that it could be done by palpating or feeling breast manually, consistent with the female Ethiopian study. A surprise finding was participants were aware that BSE should be done after menstrual cycle, breast show abnormal change and a study by KSU students showed similar results which could be due to different source of information and education level of participants [27]. Early Detection of cancer was the main reason reported by participants for performing BSE. This aligns with the research done by Hijrah H *et al.*, resulted as only 22% understood breast self-examination helps in early detection [23]. Hence organization should incorporate detail awareness programs into dental, nursing, medical and allied health programs. This will increase significance of early detection and emphasize self-examination as a preventive tool. Practice of BSE was found difficult by the participants due to anxiety of detecting abnormalities is a common barrier often associated with low health literacy and fear about cancer [28]. Addressing these barriers through counseling, emotional support, and hands-on training as part of the curriculum could improve outcomes. Practicing BSE was limited also due to discomfort and misconception, this finding of the study was found coherent with latest literature [29]. Health care professionals should provide accurate guideline during hands-on practice which might ease discomfort and anxiety. Regarding misconception that BSE is ineffective it could be due to uncertainty and ambiguity about its purpose. Accurate guidance during health campaigns can alleviate these issues, improve compliance, and promote early breast cancer detection. Similar barriers such as lack of knowledge, fear, time management and privacy issue were identified in studies conducted in Malaysia, Emirati students and Jordanian female university students [30]. Interestingly studies, found that participants had information that breast masses are self-detected by women. Obvious identification of breast cancer signs is significant for early prognosis and intervention though few respondents seek advice from health professionals as they are efficient in self-examination or they inadequate access to health services. Regarding BSE examination 89.6% individuals of this study had understanding that it could be done manually while the rest had no proper information regarding imaging such as CT and Ultrasound. These results points out insufficient information could lead to ineffective BSE practice. However, according to Alomair AN *et al.*, they reported that BSE approach has insufficient efficacy[30].

This cross-sectional study conducted at a single private university in Karachi carries notable limitations, including restriction to one institution limiting generalizability across Pakistan's diverse population, reliance on self-administered online questionnaires susceptible to response and recall bias, exclusion of male participants and older women, and the inability to establish causal relationships due to the cross-sectional design. Future research should employ multi-institutional, longitudinal study designs across both public and private universities in urban and rural settings, while incorporating hands-on clinical assessments rather than self-reported data, and evaluating the effectiveness of structured BSE training modules integrated into health sciences curricula to bridge the gap between knowledge and practice.

CONCLUSIONS

In this study participants had understanding of BSE and their primary reason for performing BSE is cancer detection but they lacked complete knowledge and inconsistent practice due to limited access to health care resources and insufficient understanding about the technique also encounter significant barriers while practicing.

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Authors' Contribution

Conceptualization: FT
Methodology: TB, MG
Formal analysis: AR
Writing and Drafting: FT, AR, BI, NH, MG, MFF
Review and Editing: FT, AR, BI, NH, MG, MFF

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

The authors declare no conflict of interest.

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