

Assessment of Awareness and Knowledge of Mammography and Breast Cancer Among Allied Health Care Professionals and BS Nursing Students in Peshawar

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Abstract

Breast cancer is the most common malignancy among women worldwide, and early detection through screening methods such as mammography, clinical breast examination (CBE), and breast self-examination (BSE) plays a crucial role in reducing mortality and improving survival rates. This study aimed to assess the knowledge and awareness of mammography and breast cancer among female students of Allied Health Sciences and Bachelor of Science in Nursing (BSN), as well as to identify factors contributing to lack of awareness.

A descriptive cross-sectional study was conducted over a period of four months using a convenience sampling technique. A total of 377 female students were included. Data were collected through a self-structured questionnaire and analyzed using SPSS version 22 and Microsoft Excel. The results showed that 92.3% of participants were aware of mammography; however, only 5.0% had ever undergone the procedure. While 75.3% were aware of the signs and symptoms of breast cancer and 70.8% knew its risk factors,

only 32.1% practiced breast self-examination. Knowledge regarding screening mammography was moderate (54.9%), whereas awareness about the appropriate age for first mammography was low (32.4%). Additionally, 63.1% of participants believed that radiation exposure during mammography is harmful, indicating the presence of misconceptions. Awareness of clinical breast examination was also limited (47.7%).

In conclusion, although the participants demonstrated good overall awareness of breast cancer, gaps remain in practical application, screening knowledge, and

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misconceptions regarding mammography. Educational interventions, awareness campaigns, and practical training programs are recommended to improve knowledge, attitudes, and practices among future healthcare professionals.

INTRODUCTION

Mammography is a key diagnostic tool used in the study and early detection of breast cancer, which is the most common cancer among women worldwide. Understanding breast health is essential to recognize the benefits of screening methods such as mammography, clinical breast examination (CBE), and breast self-examination (BSE), all of which help in early detection, improving survival rates, and reducing mortality (1,2). Healthcare students play an important role in promoting awareness, as their knowledge and attitudes can influence the wider community (3).

With increasing life expectancy, the incidence of breast cancer continues to rise globally. According to American Cancer Statistics (2013), approximately 232,340 new invasive breast cancer cases accounted for 29% of all cancers among women (4). Despite the proven benefits of screening, many women do not participate due to lack of awareness. Therefore, assessing knowledge among healthcare students is essential to improve public health outcomes (2,3,4).

The breast is an important organ with both reproductive and physiological functions, composed of glandular tissue, ducts, connective tissue, and lymphatics (5,6). Breast cancer arises from uncontrolled growth of abnormal cells within breast tissue and remains a leading global health concern (6). Several risk factors contribute to its development, including age, gender, family history, genetic mutations (BRCA1/BRCA2), hormonal influences, dense breast tissue, previous breast conditions, and lifestyle factors such as obesity and smoking (2,7,8,9,11).

Early diagnosis through screening methods such as BSE, CBE, ultrasound, MRI, and mammography significantly improves prognosis (3). Mammography, a low-dose X-ray imaging technique, is the most effective method for detecting early-stage breast abnormalities and is recommended annually for women starting at the age of 40 (10,13).

This study aims to assess the knowledge and awareness of mammography and breast cancer among healthcare professional students. Enhancing their understanding is essential for promoting early detection, improving clinical practices, and ultimately reducing breast cancer-related morbidity and mortality.

Methodology: A descriptive cross-sectional survey was conducted over a period of four months using a non-probability convenience sampling technique. The study included female students from Allied Health Sciences and BSN programs, while male students and students of Radiology Technology were excluded. The sample size was calculated using the WHO sample size calculator and was determined to be 377 participants. Data were collected through a self-developed questionnaire, ensuring that all ethical considerations were maintained during the process. As the data collection was conducted outside the parent institute, formal permission was obtained from the respective institutions. The collected data were analyzed using SPSS version 22 and Microsoft

Result:

According to the study over period of (4-6 months) a cross sectional study was conducted over students regarding breast cancer and mammography knowledge and awareness among students. A total number of 377 questionnaire are included in which we have three sections A, B, and C. Section A pertains to demographic data, Section B deals with awareness, and Section C deals with knowledge. All participants are female students. 46.4% of the students from BSN and 53.3% from the Allied Health sciences have the knowledge about Mammography. Majority of the participant's age was 23 years. Most of the participants are aware of Breast Cancer signs, symptoms

and risk factors and have least practices of SBE. Knowledge about mammography is quite good, while the knowledge about CBE and screening mammography is least & the knowledge about the age in which mammogram can be done is very poor. However, half of the students have misconception regarding radiations in mammography. All the variables and their frequencies are discussed below in the tables.

Age of participants:				
participant age	Frequency	Percent	Valid Percent	Cumulative Percent
20	2	.5	0.5	0.5
21	25	6.6	6.6	7.2
22	118	31.3	31.3	38.5
23	152	40.3	40.3	78.8
24	56	14.9	14.9	93.6
25	9	2.4	2.4	96.0
26	11	2.9	2.9	98.9
27	1	.3	.3	99.2
28	2	.5	.5	99.7
40	1	.3	.3	100.0
Total	377	100.0	100.0	

Table 1.1 : Age of Participants

The table 1.1 shows the age distribution of participants in this study. It shows that majority of participants (40.3%) were 23 years old, followed by 22 years old (31.3%). While the least participants (.4%) were 27 and 40 years old.

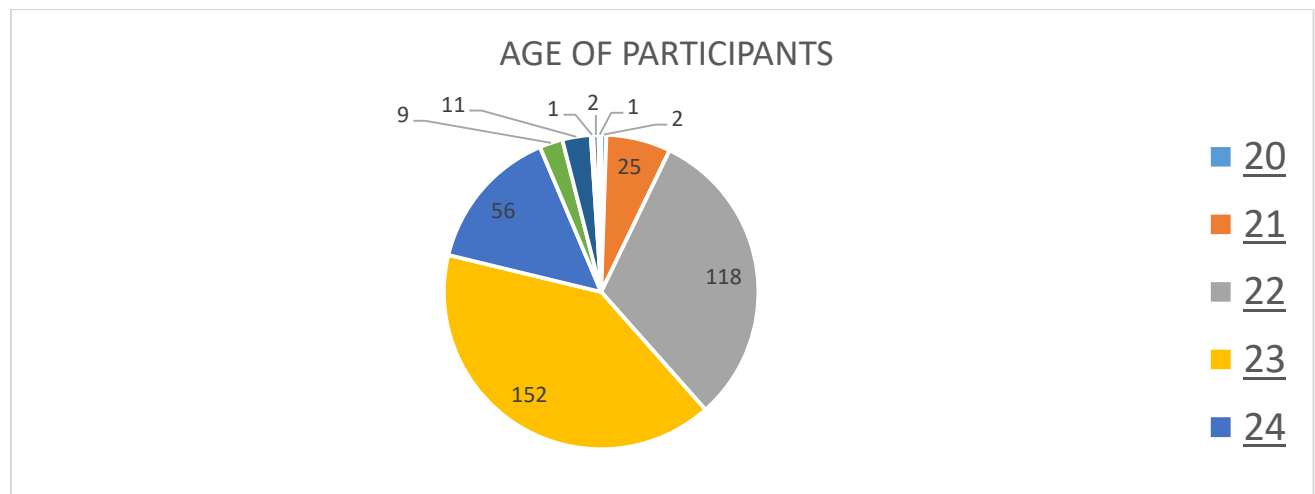


Figure 1.1: Age of Participants

The figure 1.1 shows the age of distribution of participants in this study. It shows that the majority of participants (40.3%) were 23 years old, followed by 22 years old (31.3%). While the least participants (.4%) were 27 and 40 years old.

Do you know mammography?

Do you know mammography?	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	348	92.3	92.3	92.6
No	28	7.4	7.4	100.0
Total	377	100.0	100.0	

Table 1.2 : List of People Who Know About Mammography

This table 1.2 shows that out of 377 participants, 92.3% (348) were aware of mammography, while 7.4% (28) were not the respondents, including that a majority of them are familiar with it.

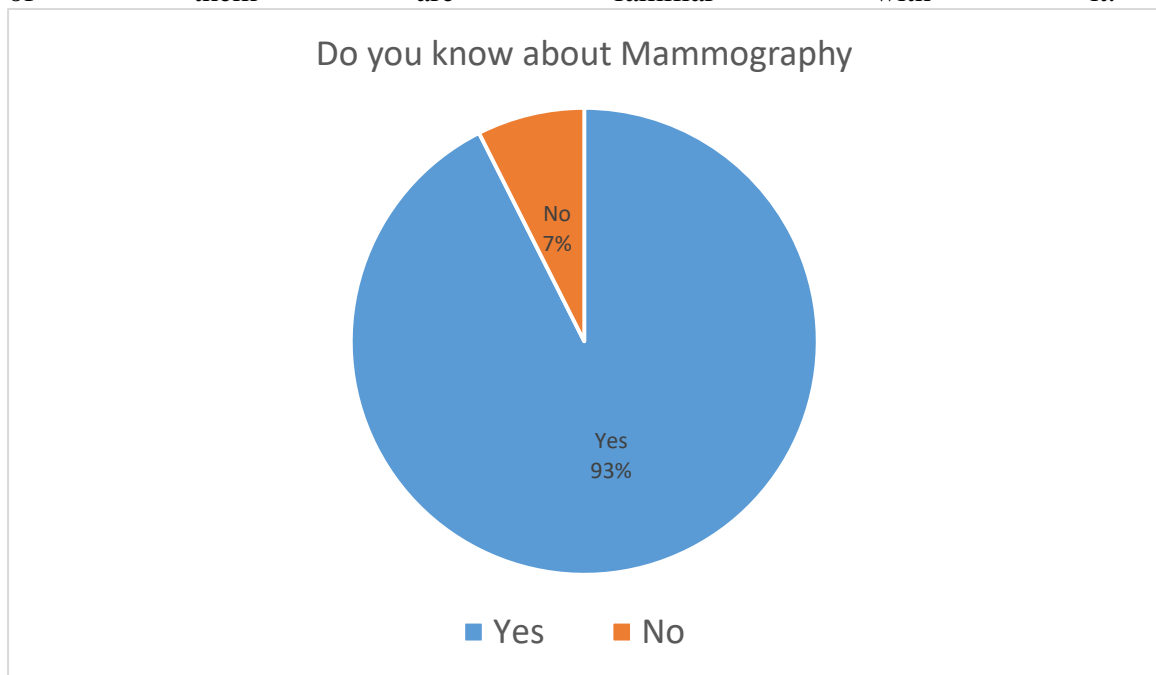


Figure 1.2 : Asking if Women already know about Mammography or Not?

This figure 1.2 shows that out of 377 participants, 92.3% (348) were aware of mammography, while 7.4% (28) were not the respondents, including that a majority of them are familiar with it.

Any family history of Breast Cancer:

Any family history of breast cancer?	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	90	23.9	23.9	23.9
No	286	75.9	75.9	99.7
Total	377	100.0	100.0	

This tables 1.3 provides information about the family history of breast cancer among the participants. It shows that 23.9% of the participants having a family history of

Table 1.3 : Do You Have Family History of Breast Cancer

breast cancer, while the majority 75.9% did not have a family history.

Have you ever done mammography?	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	19	5.0	5.0	5.0
No	358	95.0	95.0	100.0
Total	377	100.0	100.0	

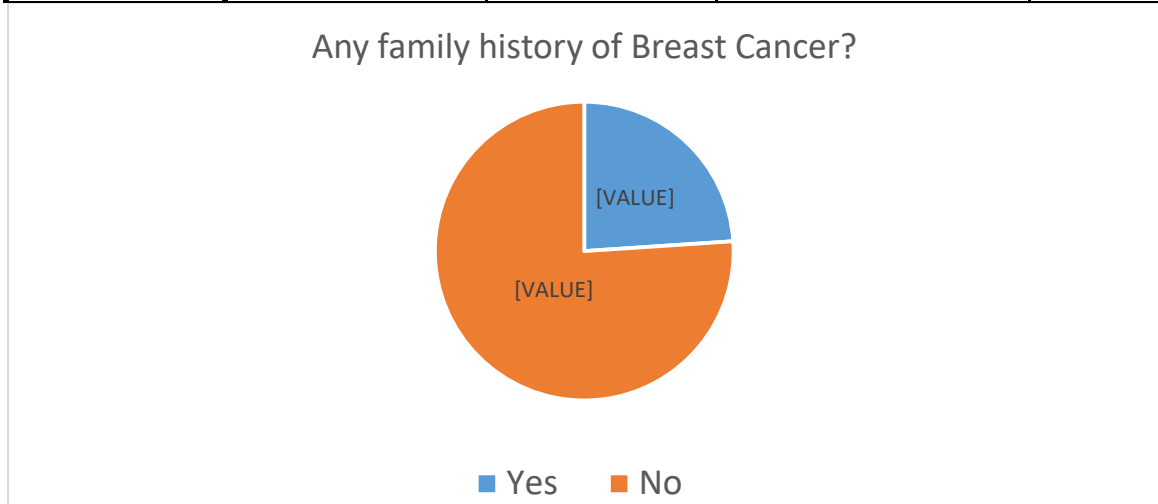


Figure 1.3: Do you have family history of breast cancer?

This figure 1.3 provides information about the family history of breast cancer among the participants. It shows that 23.9% of the participants having a family history of breast cancer, while the majority 75.9% did not have a family history.

Have you Ever Done Mammography?

According to table 1.4(5.0%) of the participants reported having done mammography, while the majority (95.0%) had not undergone mammography.

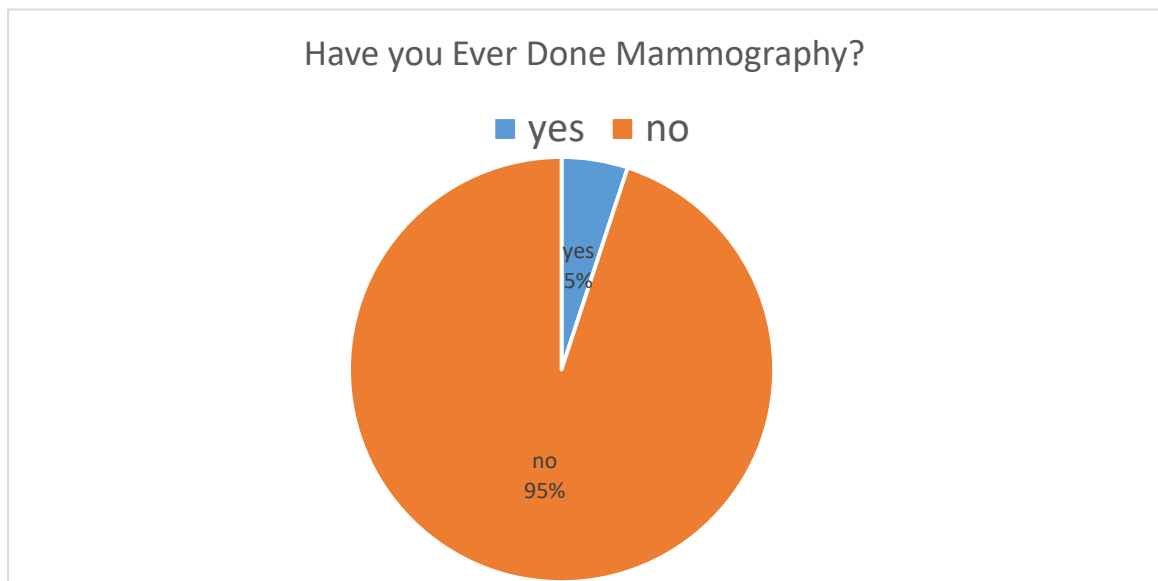


Figure 1.4: Have You Ever Done Mammography?

According to figure 1.4(5.0%) of the participants reported having done mammography, while the majority (95.0%) had not undergone mammography.
Do you know screening mammography?

Do you know screening mammography?	Frequency	Percent	Valid Percent	Cumulative Percent
yes	207	54.9	54.9	54.9
no	170	45.1	45.1	100.0
Total	377	100.0	100.0	

Table1.5: Do you know screening mammography?

Table 1.5 (54.9%) of the participants reported knowing about screening mammography, while 45.1% did not have knowledge about it.

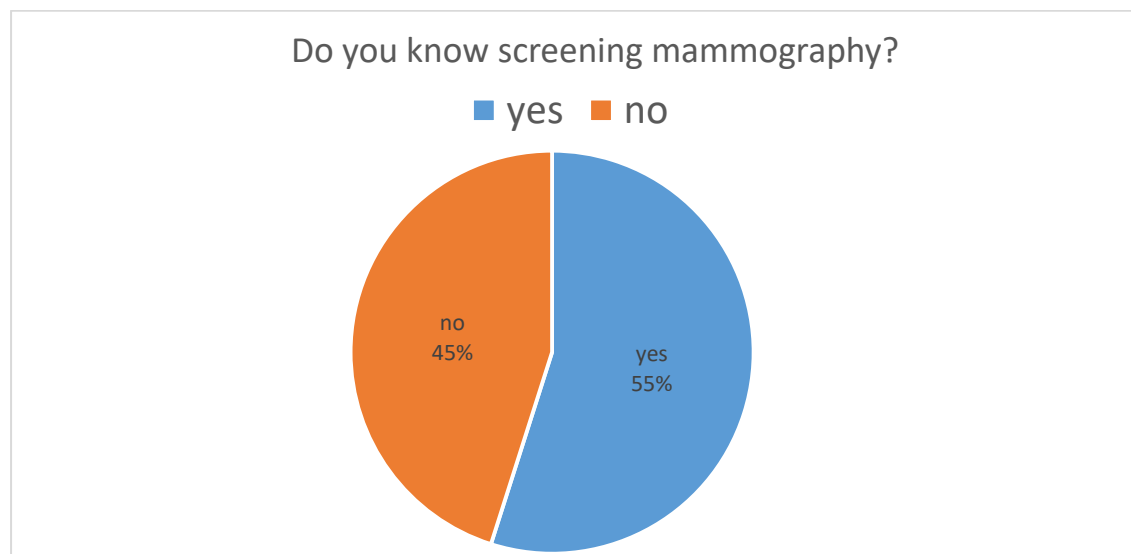


Figure 1.5: Do you know screening mammography

Figure 1.5 (54.9%) of the participants reported knowing about screening mammography, while 45.1% did not have knowledge about it

Have you ever done Breast Self-Examination?	Frequency	Percent	Valid Percent	Cumulative Percent
yes	121	32.1	32.1	32.1
no	256	67.9	67.9	100.0
Total	377	100.0	100.0	

Have you ever done Breast Self-Examination?

Table 1.6 shows that the majority 256(67.9%) have not done BSE, while 121(32.1%) have done.

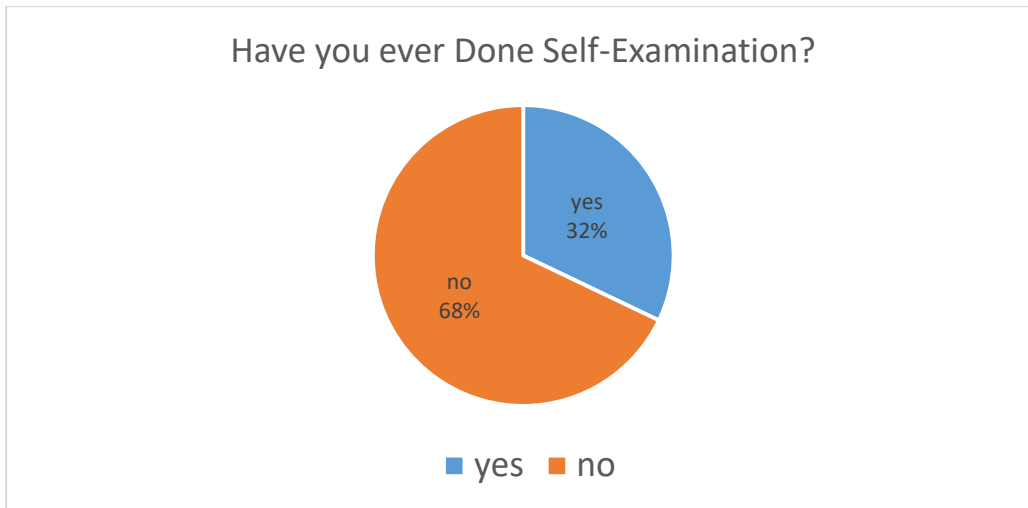


Figure 1.5: this pie chart is the visual representation and percentage of Women out of total who has done self-examination of their Breasts for Breast-Cancer

Figure 1.6 shows that the majority 256(67.9%) have not done BSE, while 121(32.1%) have done.

Did you know use of radiation in mammography harmful?

Did you know use of radiation in mammography harmful?	Frequency	Percent	Valid Percent	Cumulative Percent
yes	238	63.1	63.1	63.1
no	139	36.9	36.9	100.0
Total	377	100.0	100.0	

Table 1.6: This table shows that how many Women knew whether Radiation in Mammography Harmful for them or not?

Table 1.7 show that majority of participants 63.1% respond that radiation is use in mammography are harmful while 36.9% show that radiation in mammography are not harmful.

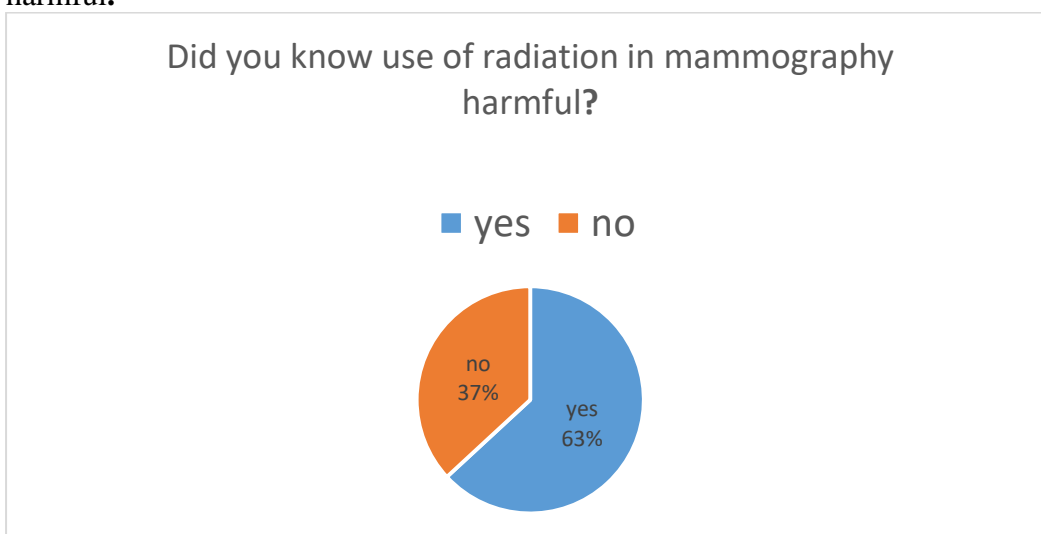


Figure 1.6: This pie chart shows the visual representation of women are educated about mammography and who knew whether doing Mammography Harmful for them or not?

Figure 1.7 show that majority of participants 63.1% respond that radiation is use in mammography are harmful while 36.9% show that radiation in mammography is not harmful

Did you know age of first mammography?

Did you know age of first mammography?	Frequency	Percent	Valid Percent	Cumulative Percent
yes	122	32.4	32.4	32.4
no	255	67.6	67.6	100.0
Total	377	100.0	100.0	

Table 1.7 : this table shows the number of women who knew the age to do first mammography.

This table shows the frequency and percentage of participants who reported their knowledge about the age of their first mammography. About 32.4% of participants answered "yes" indicating that they know the age, while the majority (67.6%) answered "no".

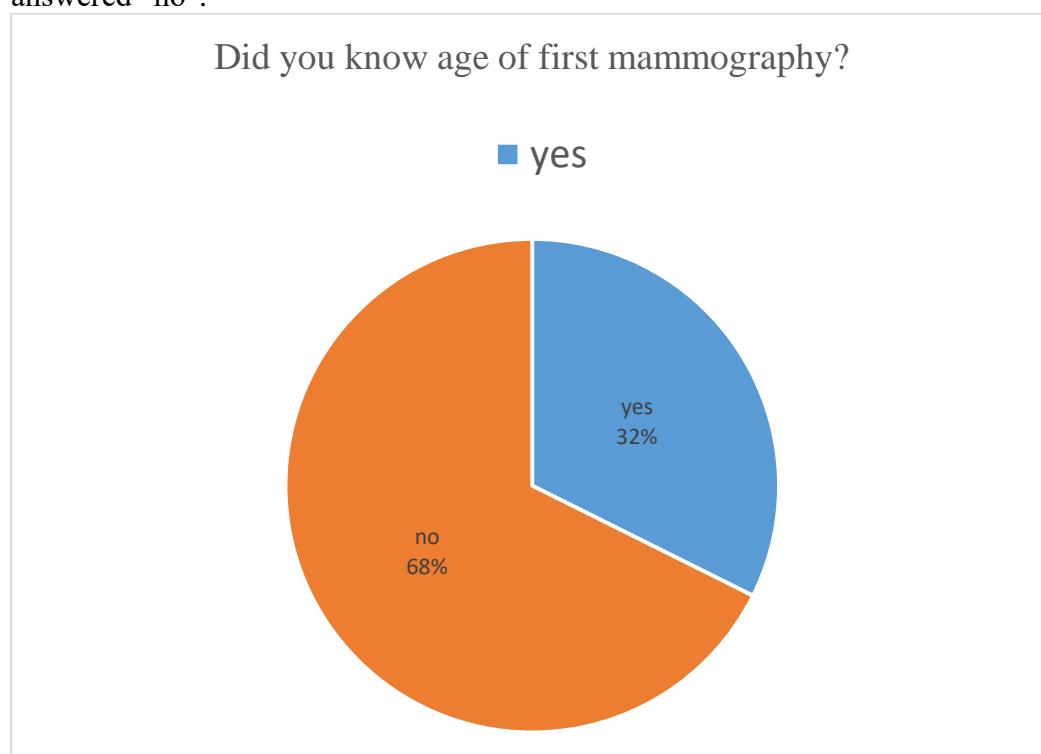


Figure 1.7: This Pie Chart shows the visual representation of women who knew the age for first Mammography.

This figure shows the frequency and percentage of participants who reported their knowledge about the age of their first mammography. About 32.4% of participants answered "yes" indicating that they know the age, while the majority (67.6%) answered "no".

Do you ever attend seminar on Breast Cancer?

Do you ever attend seminar on Breast Cancer?	Frequency	Percent	Valid Percent	Cumulative Percent
yes	202	53.6	53.6	53.6
no	175	46.4	46.4	100.0
Total	377	100.0	100.0	

Table 1.8: this tables shows about how many women of the total have ever attended any seminar or some sort of awareness session on Breast Cancer

This table shows that 53.6% of participants have attended a seminar on breast cancer, while 46.4% have not.

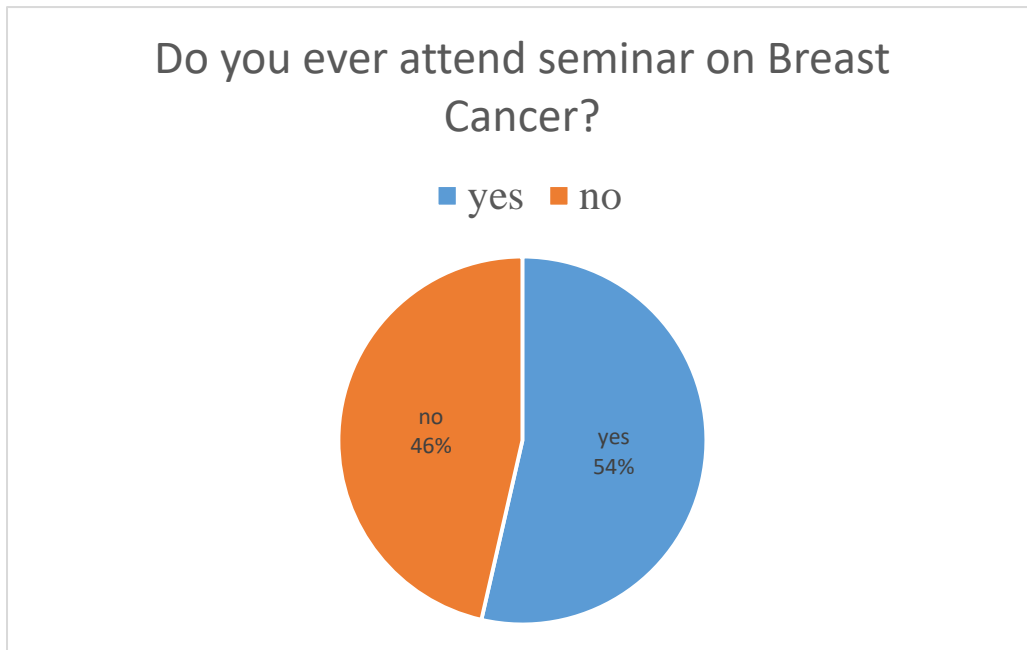


Figure 1.8: The pie chart shows percentage of women who ever attended some sort of seminar on breast Cancer.

This table shows that 53.6% of participants have attended a seminar on breast cancer, while 46.4% have not.

Are you aware of sign and symptoms of Breast Cancer?

Are you aware of sign and symptoms of Breast Cancer?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	284	75.3	75.3	75.3
	no	93	24.7	24.7	100.0
	Total	377	100.0	100.0	

Table 1.9: This table show the number of women who are aware with the signs and symptoms of Breast Cancer

This table shows that 75.3% of participants are aware of the signs and symptoms of breast cancer, while 24.7% are not aware.

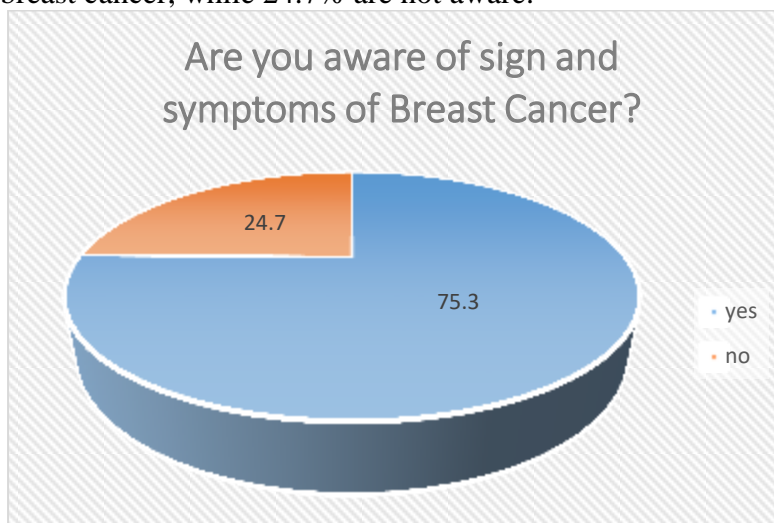


Figure 1.9: This Pie Chart shows the Percentage of aware and unaware Women about the signs and symptoms of Breast Cancer

This figure shows that 75.3% of participants are aware of the signs and symptoms of breast cancer, while 24.7% are not aware.

Early-stage detection can prevent cancer?

Early-stage detection can prevent cancer?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	296	78.5	78.5	78.5
	no	81	21.5	21.5	100.0
	Total	377	100.0	100.0	

Table 1.10: This table shows the Women who thinks whether Early Detection of Breast Cancer can or cannot prevent Cancer.

This table shows that 78.5% of participants recognize the importance of early detection, while 21.5% may not be aware of its significance.

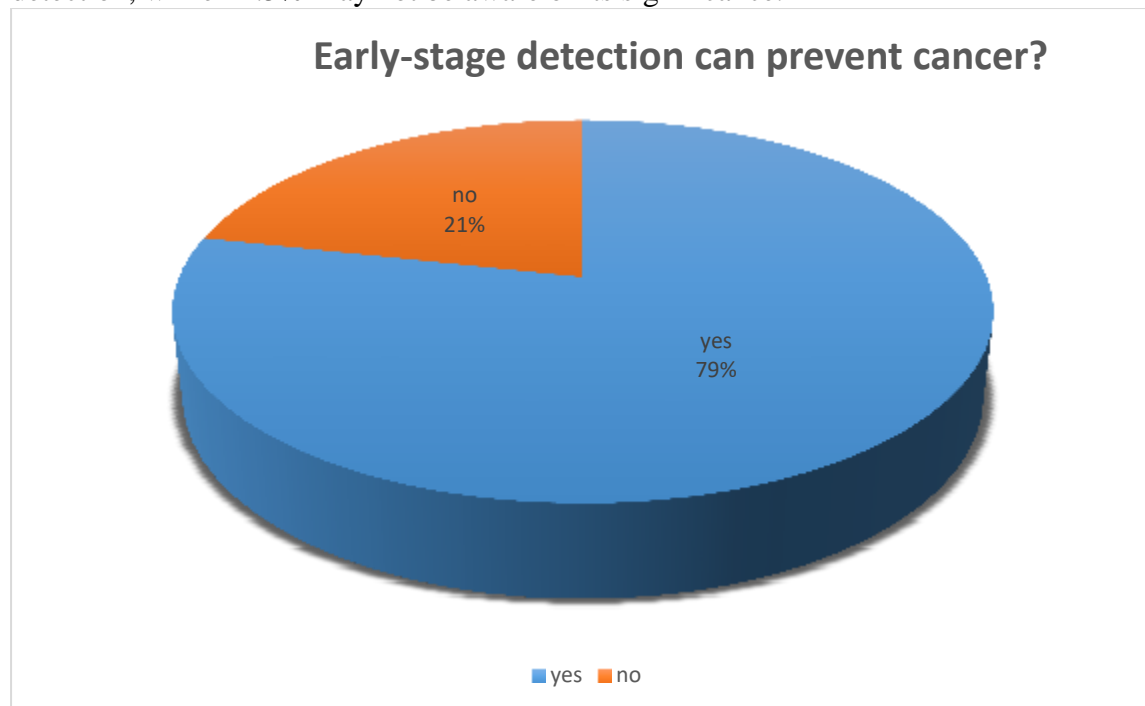


Figure 1.10: This Figure shows that if Early Figuring out of Cancer can be Beneficial or not?

This figure shows that 78.5% of participants recognize the importance of early detection, while 21.5% may not be aware of its significance.

You know Clinical Breast Examination?

You know Clinical Breast Examination?	Frequency	Percent	Valid Percent	Cumulative Percent
yes	180	47.7	47.7	47.7
no	196	52.0	52.0	99.7
Total	377	100.0	100.0	

Table 1.11: This Table shows the consent of Women if they know about Clinical Breast Cancer Examination?

This table shows that 47.7% of participants are aware of clinical breast examinations, while 52.0% may not be familiar with them.

You know Clinical Breast Examination?

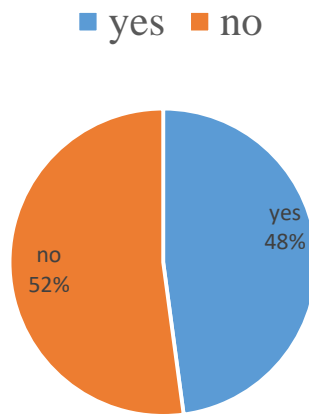


Figure 1.11: This Pie Chart shows the consent of Women that if they know about the clinical Examination of Breast Cancer or not?

This figure shows that 47.7% of participants are aware of clinical breast examinations, while 52.0% may not be familiar with them.

Did you know risk factors of Breast Cancer?

Did you know risk factors of Breast Cancer?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	267	70.8	70.8	70.8
	no	110	29.2	29.2	100.0
	Total	377	100.0	100.0	

Table 1.12: This Table shows AWARENESS of Women about the Risk Factors of Breast Cancer.

This table shows that 70.8% of participants are aware of the risk factors of breast cancer, while 29.2% may not be familiar with them.

Did you know risk factors of Breast Cancer?

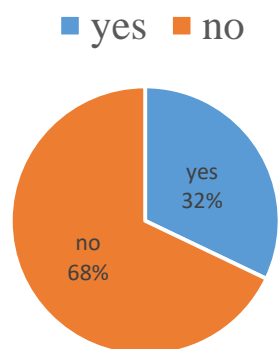


Figure 1.12: This Pie Chart shows the number of Women who knew the risk factors of Breast Cancer and also of those who are unaware with it.

This figure shows that 70.8% of participants are aware of the risk factors of breast cancer, while 29.2% may not be familiar with them.

Should mammography perform annually?

Should mammography perform annually?	Frequency	Percent	Valid Percent	Cumulative Percent
yes	263	69.8	69.8	70.0
no	113	30.0	30.0	100.0
Total	377	100.0	100.0	

Table 1.13: This Table shows about the idea of women that if they consider doing Mammography annually or not?

This table shows that 69.8% of participants agree with the annual frequency, while 30.0% may not be aware of this recommendation.

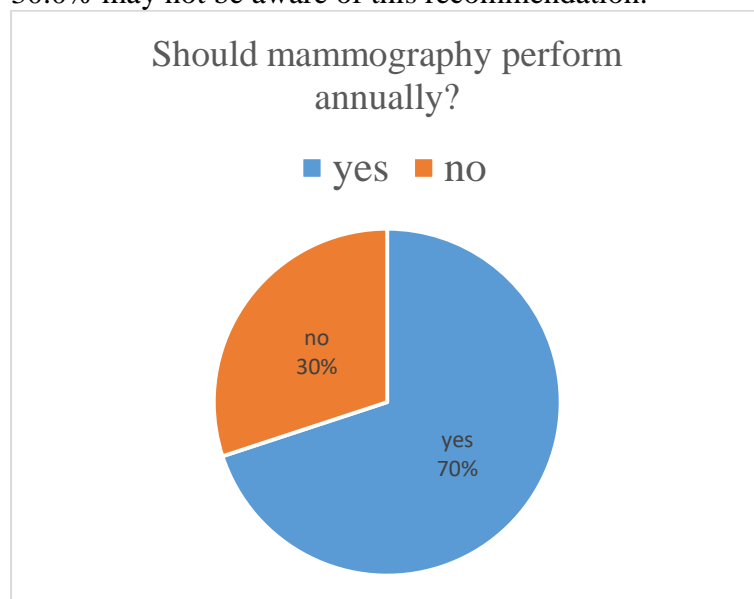


Figure 1.13: This Pie Chart shows about the idea of women that if they consider doing Mammography annually or not?

This figure shows that 69.8% of participants agree with the annual frequency, while 30.0% may not be aware of this recommendation

Discussion:

In many nations, especially Asia, breast cancer is becoming a serious health threat (15). As per the 2021 global report on cancer, 25.2% of women worldwide who receive cancer are diagnosed with breast cancer; however, in Pakistan, this ratio stands at 40.2% (11). According to this study, 23 was the average participant age (40.3%), followed by 22 years (31.3%). It is exciting to observe that a completely small percentage (.4%) of participants fell into the 27 and 40-year-old age groups. This distribution of ages provides a snapshot of the demographics of the focus on the awareness of mammography among the participants which are quite similar to the study that was conduct in the University of (Maiduguri) (7). Out of the 377 participants, 92.3% (348) were aware of mammography which are higher than study conduct in Jordan students (59.8%) (10), while 7.4% (28) were not. This indicates that a significant majority of respondents were familiar with mammography, which an encouraging finding is considering the importance of early detection in breast cancer. The breast cancer history of the participants' families. Of the participants, 23.9% reported a family history of breast cancer, whereas 75.9% did not. Which lower 57.35% then research conduct in Singapore (20) this data provides valuable information about the potential risk factors in the study population, which is crucial for exploring the link between family history and breast cancer prevalence. The focus shifts towards participants who reported having undergone mammography. The records well-known

shows that simplest 5.0% of participants had done mammography, indicating a relatively low uptake of this screening method among the study population. Conversely, the majority (95.0%) had not undergone mammography, highlighting the need for further investigation into the reasons behind this trend examines participants' knowledge of screening mammography. It shows that 54.9% reported knowing about screening mammography, this rate is lower than study conducted in Karachi 85.2% while 45.1% did not have knowledge about it. This data suggests that there is still room for improvement in raising awareness about the importance and benefits of screening mammography among the study participants. Focuses on participants who are reported to perform Breast Self-Examination (BSE). The findings indicate that 32.1% of the participants had performed BSE this rate is higher than the students in Kirkuk university Iraq where 42.6% practices BSE (19), while the majority (67.9%) had not. This data highlights the need for education and advocacy efforts to promote regular BSE practices among the students the participants' knowledge of whether radiation in mammography is harmful. The majority (63.1%) of participants responded that radiation used in mammography is harmful, while 36.9% expressed that it is not harmful. This finding suggests a potential knowledge gap or misconception among the participants regarding the safety of radiation in mammography, which warrants further investigation and education on radiation in mammography the number of women who know the appropriate age to undergo their first mammography. 32.4% of participants responded positively, this rate is lower than 67.8% in medical students of Karachi (11) On the other hand, the majority of participants, accounting for 67.6%, answered negatively, implying that they do not know the appropriate age of breast examinations, 47.7% of participants are aware of CBE which is higher 15.4% than study conducted in medical students in Pakistan Karachi (11, 15) examinations, while 52.0% may not be familiar with them. This finding implies that there is a significant proportion of participants who lack knowledge regarding clinical breast examination the participants' awareness of risk factors of the breast cancer. Researchers Omotara et al (17) and Inure et al (18) found that knowledge of risk factors was 21.4% and 36.7%, respectively. In contrast, 70.8% of participants are aware of these risks. This indicates that a considerable portion of respondents possess knowledge about the risk factors associated with breast cancer. Lastly, the participants' agreement with the annual frequency of mammograms. It demonstrates that 69.8% of participants agree with the recommended annual frequency, while 30.0% may not be aware of this recommendation. This finding suggests that a majority of participants were aware of the recommended frequency for mammograms.

Conclusion:

Based on our current study, we found that female undergraduate students demonstrated good awareness and knowledge on breast cancer, including its signs, symptoms, and risk factors. They also had satisfactory knowledge about early detection through mammography. However, the majority of participants had poor practice of self-breast examination (SBE). On the other hand, their knowledge of clinical breast examination (CBE) was considerably good. Only two out of four respondents were aware of screening mammography, and most participants had misconceptions about the age at which to start mammograms. Additionally, there were negative attitudes towards mammography, with about two out of four participants expressing concerns about the harmful effects of radiation. It was also found that approximately one out of three respondents had a positive family history of breast cancer. Furthermore, it was observed only a third of the participants had attended a seminar on breast cancer.

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