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Society's Awareness of the Role of Radiation in Early Detection of Breast Cancer

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ABSTRACT

This research aims to know society's awareness of the role of radiation in the early detection of breast cancer. The questionnaire was compiled by Google Form the English-language version of the questionnaire. The first set included 3 (sex, age, education,). Followed by a set of 11 questions regarding knowledge. Result: Age Groups: The participants' ages ranged from 15 to 75, with the majority (20.9%) in the 36-40 years category. Most respondents were female (78.2%), with males representing 21.8% of the sample. Highest Representation: University graduates (43.2%) formed the largest educational group. Others: Master's holders (11.8%) and individuals from high institutes (15.9%) also had significant representation. Breast Cancer Screening Awareness: 72.3% of respondents were aware of the importance of breast cancer screening. Visits for Screening: Only 14.5% of participants reported visiting a clinic for breast cancer screening, while 83.2% had not. Awareness of Radiation Usage: Nearly half (47.7%) were aware that radiation is used in early breast cancer detection, and 38.6% knew it could also be used for treatment. Knowledge of Dosage Risks: 46.8% recognized that high radiation doses could increase cancer risk. Preferred Methods for Breast Cancer Detection: Best Method: The most commonly preferred option for breast cancer detection was “All the above” (31.4%), encompassing clinical examination, self-inspection, radiation inspection, and medical analysis. The findings indicate a widespread awareness of breast cancer screening; however, they also reveal significant gaps in participation rates and a limited understanding of the associated risks and benefits of radiation.

INTRODUCTION

Breast cancer awareness among women in Egypt is inadequate. Educational background and involvement in caring for a breast cancer patient are important factors influencing knowledge and attitudes toward screening. A national awareness and screening program is necessary to address this issue. Implementing a comprehensive educational campaign can help improve knowledge and attitudes towards breast cancer screening among Egyptian females. This can lead to early detection and better outcomes for those affected by the disease (Abdelaziz et al., 2020), Participants exhibited limited knowledge and awareness of breast cancer (BC), yet they displayed positive attitudes towards BC screening. Therefore, it is imperative to implement impactful educational initiatives, curricular interventions, and awareness campaigns to combat the lack of knowledge about BC and promote appropriate screening practices to mitigate the disease burden. Effective education programs, curricular activities, and awareness campaigns are essential to address the low levels of knowledge and awareness of BC among participants.

Additionally, promoting positive attitudes toward BC screening can help reduce the disease burden (Aga et al., 2024), and the significant negative correlation between knowledge and barrier scores (Spearman’s rho: -0.315, $p < 0.001$). It is recommended to develop target-oriented educational programs for healthcare workers, which

would empower them to educate the community regarding the risk factors and the importance of mammogram screening. Furthermore, a prospective study is warranted in other regions of the Kingdom of Saudi Arabia to understand the region-specific training needs for healthcare workers (Alenezi et al., 2022).

The primary prevention of breast cancer in women with an increased risk involves various strategies, including endocrine prevention and risk-reducing mastectomy (RRM). This study aimed to assess the awareness of different preventive strategies among high-risk subgroups. The findings of this study revealed variations in the awareness of preventive strategies among different high-risk subgroups. The results suggest a need for targeted education and awareness campaigns to improve knowledge and uptake of preventive measures among at-risk women (Alhassan et al., 2024). Public knowledge about breast cancer in Saudi Arabia is limited, indicating a need for various public awareness campaigns utilizing mass media and social media platforms. Specific awareness programs should target locations frequented by a significant number of women, such as educational institutions and healthcare facilities. Overall, there is a lack of public awareness regarding breast cancer in Saudi Arabia, highlighting the necessity for targeted awareness initiatives through various media channels and in strategic locations.

Awareness programs should be designed to reach a large number of women effectively, including those in colleges, universities, and hospitals (Almeshari et al., 2023). The healthcare system in rural areas of Ethiopia requires enhanced capacity for assessing and diagnosing breast diseases. This data can inform resource allocation for addressing immediate healthcare needs and facilitating early detection and treatment of breast cancer (BC). Efforts are needed to strengthen the healthcare system's ability to assess and diagnose breast diseases in rural Ethiopia. This data can guide the allocation of resources to address pressing healthcare needs and improve the early detection and treatment of BC (Ayele et al., 2021).

Patients undergoing medical imaging procedures exhibit a general lack of knowledge regarding medical radiation. Implementing interventions to enhance patient awareness of radiation risks associated with medical procedures could prove advantageous. Enhancing patient awareness of radiation risks related to medical imaging procedures is crucial, as patients often have limited knowledge in this area. Implementing interventions to improve patient education on the topic may be beneficial (Bastiani et al., 2021). The study emphasized the importance of implementing proactive approaches to raise awareness about breast cancer among both educated and uneducated women in Pakistan. Efforts should be made to develop and implement effective strategies to increase knowledge and understanding of breast cancer among women in Pakistan, regardless of their literacy level (Hussain et al., 2022).

The understanding of BC has advanced when compared to past evidence. Awareness campaigns are valued for educating non-health college students, and new sources like the internet and electronic media are now being utilized to provide information on this disease. Efforts are required to further empower non-health college students through these mediums to enhance their understanding of BC (Islam et al., 2022), most of the members had been ignorant of the blessings, appropriate timing, and techniques of doing a breast self-exam. Fitness technological know-how students had better attention & practice of breast self-examination than non-fitness science college students. Skilled fitness specialists ought to focus on giving fitness records regarding chance elements of breast cancer and techniques for early detection of breast cancer to the public & their customers (Mehiret et al., 2022). The extent of cognizance and attitude of Fasa excessive school girls concerning breast cancer and screening methods is not appropriate. Therefore, it's miles advocated those instructional applications be implemented to grow the notice of college students in schools so that the range of screenings increases with the institutionalization of these statistics. Likewise, by transferring data from students to their families, the level of focus inside the whole society will with any luck boom as properly (Mohebi et al., 2023).

The BCAM (Breast Cancer Focus Month) has efficiently advanced the general public focus on breast cancer in the U.S. compared to other representative fitness observances, probably due to the powerful involvement of non-scientific industries, influencers suffering from breast cancers, and a conscious image (Nishimura &

Acoba, 2022). North Jordanian girls are nicely informed approximately breast cancer and its capacity causes. To enhance females' expertise in breast cancer, however, we advise the want for ongoing scientific training packages (Oglat et al., 2024). Even though understanding becomes insufficient in nearly all fields of the questionnaire, the maximum outstanding gap becomes determined regarding threat elements and signs and symptoms and signs and symptoms of BC both in laywomen and, abruptly, screening attendees. Maximum laywomen lacked information on screening protocol. These results urge breast health and BC information interventions in Hungary. (Reményi Kissné et al., 2021), 61% of the surveyed HCWs had the right BC expertise. However, there is nevertheless room for improvement in terms of expertise dissemination. Consequently, it's miles critical to implement continuing clinical training packages that focus on elevating recognition and improving BC expertise amongst HCWs (Sulu et al., 2024). Next-technology breast cancer screening in Japan needs to include breast consciousness campaigns for improving breast cancer literacy and supplemental breast ultrasonography to address the hassle of false-terrible mammograms as a consequence of dense breasts (Uematsu, 2024). Breast cancer (BC) focus levels continue to be low. Enhancing BC cognizance is important, especially in growing nations (Wang et al., 2022). Therefore, this study aims to determine public awareness of the role of radiation in early detection of breast cancer.

METHODS

Data was collected using a questionnaire that was compiled using the English version of Google Forms from the English questionnaire. As the first step of production, our team of epidemiologists indicated the main areas of interest and phrased index questions accordingly. The English-language version of the questionnaire is provided in the Appendix as an Additional file. The first set included 3 (sex, age, education). Followed by a set of 11 questions regarding knowledge including multiple-choice questions about information sources. In the Statistical analysis by SPSS 27.0 statistical software, we use Correlation, Frequency, Percentage, and P-value.

RESULTS AND DISCUSSION

Table 1 Frequency and Percentage of age the Highest age ratio between 36 - 50 Years by 36 - 40 Years 46(20.9%), 41 - 45 Years 32(14.5%), 46 - 50 Years 33(15.0%).

Table 1. Frequency and Percentage of Age

Age	Frequency	Percentage %
15 - 20 Years	8	3.6
21 - 25 Years	14	6.4
26 - 30 Years	27	12.3
31 - 35 Years	31	14.1
36 - 40 Years	46	20.9
41 - 45 Years	32	14.5
46 - 50 Years	33	15.0
51 - 55 Years	17	7.7
56 - 60 Years	7	3.2
61 - 65 Years	3	1.4
66 - 70 Years	1	0.5
71 - 75 Years	1	0.5
Total	220	100.0

Figure 1. Frequency and Percentage of Gender, Male 48(21.8%), Female 172(78.2%)

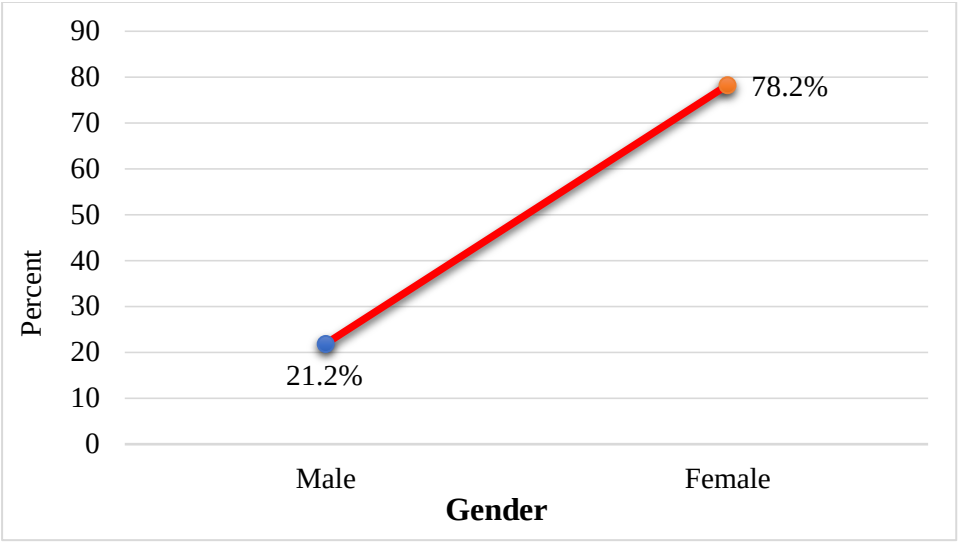

Figure 2. Frequency and Percentage of Educational Level, the high level for university 95(43.2%), followed by High Institute 35(15.9%), Master 26(11.8%), Intermediate Institute 27(12.3%)

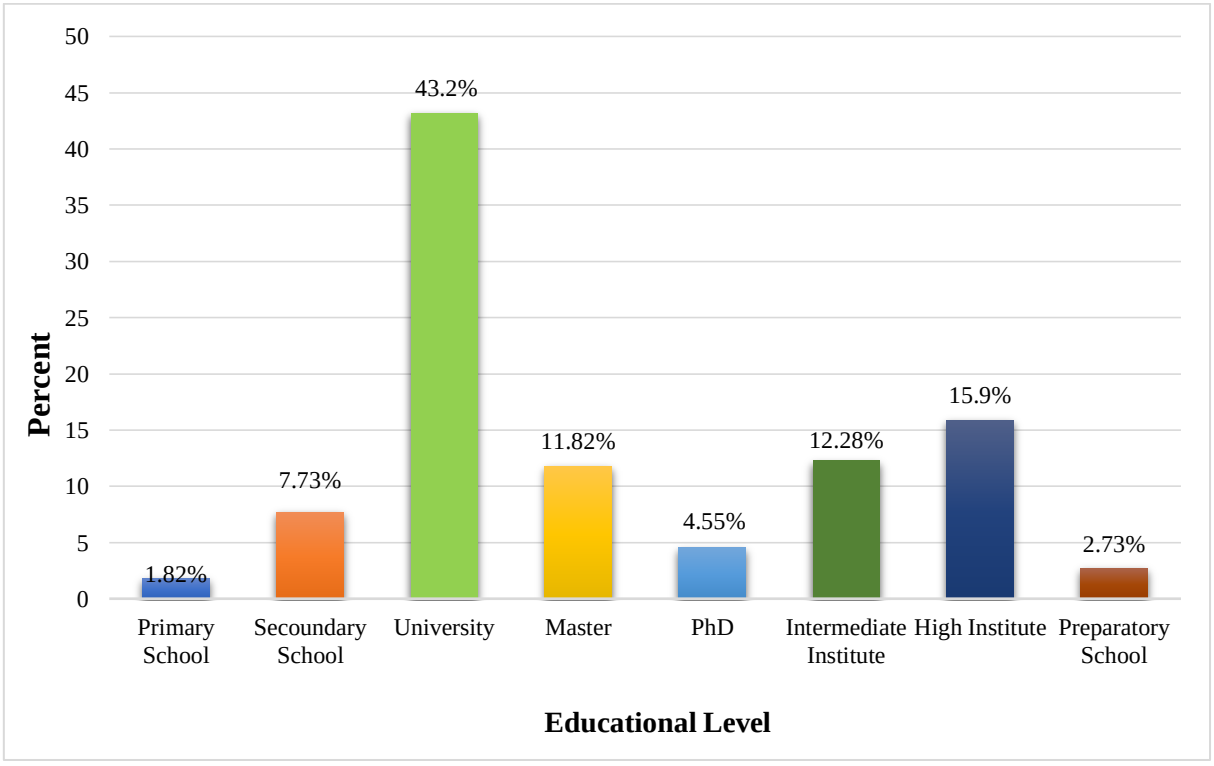

Table 2 Clinic Visits and Awareness: Clinic Visits: Only 14.5% of respondents have visited a clinic for breast cancer screening, with a substantial 83.2% having not visited one. Screening Importance Awareness: A majority (72.3%) are aware of the importance of breast cancer screening. Knowledge of Radiation: Types of Radiation: 94.5% do not know the types of radiation used for breast cancer detection. Radiation for Detection: About half (47.7%) are aware that radiation is used for early detection, while 46.4% are not. Radiation as a Treatment: 38.6% are aware radiation is used to treat breast cancer, with 57.3% not aware. Perceived Risks and Benefits: High-Dose Radiation Risks: Nearly half (46.8%) understand that high-dose radiation can be carcinogenic. Mammogram Effectiveness: Only 23.6% know that mammograms can reduce cancer prevalence by up to 90%.

Preventive Perceptions: Early Diagnosis: 55% believe early diagnosis can prevent disease progression. Awareness Program Sufficiency: Just 30% think that current awareness programs are sufficient.

Table 2. The responses to questions about breast cancer awareness

Question \ Answer	Yes N (%)	No N (%)	Maybe N (%)	Mean	St.D	P-Value
Have you or a family ever visited the clinic for breast cancer screening?	32(14.5)	183(83.2)	5(2.3)	1.88	0.392	0.360
Are you aware of the importance of screening for breast cancer?	159(72.3)	42(19.1)	19(8.6)	1.36	0.637	0.602
Do you know the types of radiation used to detect breast cancer?	-	208(94.5)	12(5.5)	2.05	0.228	0.642
Do you know that radiation is used for early detection of breast cancer?	105(47.7)	102(46.4)	13(5.9)	1.58	0.603	0.159
Do you know that radiation is also used to treat breast cancer?	85(38.6)	126(57.3)	9(4.1)	1.65	0.556	0.031
Do you know that using radiation with high doses can cause many types of cancer?	103(46.8)	117(53.2)	-	1.53	0.500	0.069
Do you know that the use of mammograms for breast cancer reduces the prevalence of cancer by 90%?	52(23.6)	154(70.0)	14(6.4)	1.83	0.521	0.475
Does early diagnosis of breast cancer protect the patient from the development of the disease and its treatment?	121(55.0)	87(39.5)	12(5.5)	1.50	0.601	0.003
Do you know how breast cancer is detected in a subjective way?	67(30.5)	137(62.3)	16(7.3)	1.77	0.570	0.212
Do you think breast cancer awareness programs are sufficient to prevent the disease?	66(30.0)	120(54.5)	34(15.5)	1.85	0.660	0.379
Did you know that the dose used to detect breast cancer is too small?	43(19.5)	154(70.0)	23(10.5)	1.91	0.541	0.595
*. Correlation is significant at the 0.05 level (p-value). **. Correlation is significant at the 0.01 level (p-value).						

Table 3 The frequency and percentage of the best way to check for breast cancer and Mean, St.D and P-Value, Radiation Inspection 52(23.6%), followed by Clinical Examination 48(21.8%), Medical Analysis 9(4.1%), Self – Inspection 8(3.6%), All the above69(31.45), and I don't know. 34(15.5%), the Mean (3.66), St. D (1.782). P-Value (0.000).

Table 3. The frequency and percentage of the best way to check for breast cancer

The best way to check for breast cancer is?	N (%)	Mean	St.D	P-Value
Clinical Examination	48(21.8)	3.66	1.782	0.000
Self - Inspection	8(3.6)			
Radiation Inspection	52(23.6)			
Medical Analysis	9(4.1)			
All the above	69(31.4)			
I don't know.	34(15.5)			
Total	220(100.0)			

In fact, breast cancer can be definitively cured in case of early detection by self-examination or by the use of diagnostic radiation (Mammogram device), as the Mammogram device emits ionizing low-dose radiation to detect breast cancer and has no side effects. In this study, 220 questionnaires

were distributed 220 participants were mobilized and each questionnaire contained 15 questions to know the role of diagnostic radiation in the early detection of breast cancer.

The age group participating in this questionnaire is between 15 and 75 years old It has been noted that the most participating age group is between 36 and 40 years old. By 20.9%, followed by (46-50) by 15% and (41-45) by 14.5%, (31-35) by 14.1%, (26-30) by 12.3%, (51-55) by 7.7%, (20-25) by 6.4%, and the rest of the age groups range from 3.6% to 0.5%. Women's participation in this research was very large, 78.2%, while men's participation reached 21.8%. The scientific qualification for participants in this study was 43.2% for those with university qualifications, followed by 15% for higher institutes and 12.3% for intermediate institutes.

Since diagnostic radiation plays an essential role in the detection of breast cancer, we put a question on going for a radiological examination of cancer that you or a family member, so the answer was B (No) by 83.2% and answer B (Yes) by 14.5% and answer by perhaps 2.3%, as all participants have sufficient knowledge of the importance of breast cancer screening by 72.3%.

As for the type of radiation used to detect breast cancer, so 94.5% of those who didn't know what type of radiation was used and none of the participants had an idea of what types of radiation were used. While 5.5% believe to know the type of radiation, 47.7% of participants know that radiation is used for the early detection of breast cancer and 46.4% do not know, the remainder believes the knowledge is 5.9%. Staffing, as radiology plays a key role in the early detection of breast cancer, radiology has a key role in the treatment of breast cancer, the proportion of participants who know that radiology has a role in the treatment of breast cancer was 38.6%, 57.7% do not know and 4.1% think so.

Since the dose of radiation used to detect breast cancer is very small and has no effect, and high doses of radiation may cause cancer, the number of participants with knowledge that high doses of radiation have caused cancer 103 participants by 46.8%, and those without knowledge of 117 participants by 53.2%. The number of participants with knowledge that the radiation used to detect breast cancer is very small, 43 participants with 19.5, 154 (70%) do not know that the dose of the radiation used is very small, and 23 participants with 10.3% believe it.

The device used in the early detection of breast cancer is called Maoist, the use of this device reduces the risk of breast cancer by a very large proportion. Participants with up to 52 participants at 23.6% know the importance of the Maoist device and course in early detection and injury reduction. 154 participants don't know and 14 participants by 6.4 think so.

The early detection and diagnosis of breast cancer certainly protect the patient from the progression of the disease. The answer was 121 participants of 55% know that early detection and diagnosis of breast cancer protects the patient from the progression of the disease, 87 participants of 39.5% have no knowledge of it and 12 participants of 5.5% believe it. Self-screening is a type of screening that detects breast cancer, but what method is used to self-detect breast cancer, 67 of the 30.5% of participants know how to self-test while 137 participants do not know and 16 participants believe it.

Participation in attending scientific seminars increases the community's awareness, holding scientific seminars and medical conferences on the risk of breast cancer and how to detect it early increases society's awareness about that disease to the extent that it can reduce the spread of that disease in varying proportions. 66 participants at 30% believe that breast cancer awareness programs increase the prevalence reduction rate. And 120 participants 54.5 don't think so, while 23 participants by 10.5 say maybe the establishment of awareness programs has a significant impact on raising community awareness and reducing this disease.

Finally. There are several ways to detect breast cancer such as clinical screening, Self-examination, diagnostic radiology, and medical analysis, where participants were questioned about the best way to detect breast cancer, The answer was as follows, participants who said clinical examination is the best way to detect 48% breast cancer at 21.8%. While 8(3.6%) participants believe self-detection is the best way to detect breast cancer, as for the method of detection using diagnostic radiation, the number of participants who agreed that diagnostic radiation was the best way to detect breast cancer.

52 participants with 23.6%. The medical analysis received 4.1% with 9 participants. Who thought all the aforementioned tests had a key role in the early detection of breast cancer with 69 participants at 31.4%, and 34 participants at 15.5% had no knowledge of the aforementioned test.

CONCLUSION

The data underscores a general awareness of breast cancer screening but highlights gaps in actual screening participation and understanding of radiation's risks and benefits. Efforts to increase clinic visits for screenings and to provide detailed education on detection methods and radiation could further improve screening rates and informed health decisions. The preference for a multi-faceted detection approach also supports the development of comprehensive screening programs that incorporate varied methods to increase accessibility and acceptance among the population.

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