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# “Breast cancer awareness in Asser region”

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**Abstract:**
Breast cancer (BC) is a serious threat to the health of women everywhere. Not surprisingly, it is also the most frequent malignancy in the Kingdom of Saudi Arabia, accounting for the second highest number of cancer-related fatalities there after lung cancer. Now more than ever, individuals are concerned about their health and knowledgeable about the various medical fields. Education has come a long way, but the general people still doesn't seem to understand the complexity of this problem. Numerous studies in a wide range of areas have been undertaken to gauge awareness and understanding of breast cancer. This investigation into people's knowledge of breast cancer and preventative measures is the first of its kind in our area. To the best of our knowledge, no research has quantified public understanding of breast cancer screening methods in the Asir region. Therefore, the purpose of this research is to estimate public awareness of breast cancer and its screening measures, as well as to evaluate participants' knowledge of Breast Self-Examination (BSE) and their perception of BSE's use in the early identification of breast cancer. After obtaining consent, 1046 participants aged 12–80 (male and female) from the Asir region participated in a cross-sectional prospective study in which they were examined by questionnaire. Participants were chosen using a random sampling technique. The majority (56.9%) of the participants were under the age of 30. Nearly half (52.7%) of the participants were male. Sixty-one percent were non-coupled. 74% of them are highly educated (University and more). Only a little over a third of the participants (32.7% to be exact) had jobs directly related to medicine, while almost half (46.6% to be exact) had non-medical jobs. The score of 60.2% on the test of general knowledge indicates above-average understanding in this area. Only 18.8% of our population was found to have above-average knowledge of breast cancer. The overall knowledge score for the residents of this resettlement colony was just 18.8%; this is due to a lack of education on the topic of breast cancer.
**Keywords:** Asir Region, Saudi Arabia, Breast Cancer, Awareness, Assessment, Knowledge, Breast self-examination, and Screening.

**الملخص:**

يشكل سرطان الثدي (BC) تهديدًا خطيرًا لصحة المرأة في كل مكان. ليس من المستغرب أن يكون أيضًا الورم الخبيث الأكثر شيوعًا في المملكة العربية السعودية، حيث يمثل ثاني أكبر عدد من الوفيات المرتبطة بالسرطان هناك بعد سرطان الرئة. الآن أكثر من أي وقت مضى، يهتم الأفراد بصحتهم وعلى دراية بمختلف المجالات الطبية. لقد قطع التعليم شوطًا طويلاً، لكن يبدو أن عامة الناس لا يفهمون مدى تعقيد هذه المشكلة. تم إجراء العديد من الدراسات في مجموعة واسعة من المجالات لقياس الوعي والفهم لسرطان الثدي. هذا التحقيق في معرفة الناس بسرطان الثدي والتدابير الوقائية هو الأول من نوعه في منطقتنا. على حد علمنا، لم يقم أي بحث بتحديد الفهم العام لطرق فحص سرطان الثدي في منطقة عسير. لذلك، فإن الغرض من هذا البحث هو تقدير الوعي العام بسرطان الثدي وإجراءات الفحص الخاصة به، وكذلك لتقييم معرفة المشاركين بالفحص الذاتي للثدي (BSE) وتصورهم لاستخدام مرض جنون البقر في الكشف المبكر عن سرطان الثدي. بعد الحصول على الموافقة، شارك 1046 مشاركًا تتراوح أعمارهم بين 12 و80 عامًا (ذكورًا وإناثًا) من منطقة عسير في دراسة مستقبلية مقطعية تم فحصهم فيها عن طريق الاستبيان. تم اختيار المشاركين باستخدام تقنية أخذ العينات العشوائية. غالبية المشاركين (56.9٪) كانوا تحت سن 30. كان نصف المشاركين تقريبًا (52.7٪) من الذكور. واحد وستون في المئة كانت غير مقترنة. 74٪ منهم متعلمون تعليماً عالياً (جامعات وأكثر). أكثر من ثلث المشاركين بقليل (32.7٪ على وجه الدقة) كان لديهم وظائف مرتبطة مباشرة بالطب، بينما ما يقرب من النصف (46.6٪ على وجه الدقة) كانوا يعملون في وظائف غير طبية. تشير درجة 60.2٪ في اختبار المعرفة العامة إلى فهم فوق المتوسط في هذا المجال. وجد أن 18.8٪ فقط من سكاننا لديهم معرفة أعلى من المتوسط بسرطان الثدي. كانت النتيجة الإجمالية للمعرفة لسكان مستعمرة إعادة التوطين 18.8٪ فقط؛ هذا بسبب نقص التثقيف في موضوع سرطان الثدي.

**الكلمات المفتاحية:** منطقة عسير، المملكة العربية السعودية، سرطان الثدي، توعية، تقويم، معرفة، فحص ذاتي للثدي، فحص.

**Introduction:**

Cancer is currently at the top of the list of concerns regarding the state of global health. It is anticipated that 10 million people will be diagnosed with cancer each year in developing countries, leading to 6 million fatalities. On the other hand, one third of all cancers can be treated if they are detected at an early enough stage. According to these findings, healthcare systems globally, but most specifically those in countries with lower levels of development, should priorities cancer prevention methods.

As a direct consequence of this, the rates of cancer occurrence and mortality have soared to new heights in the most recent decade. It is expected that more than 18.1 million individuals will be diagnosed with cancer all over the world, with 9.6 million people passing away as a direct result of the disease. According to GLOBOCAN, there were 2.08 million newly diagnosed cases of breast cancer and 6.3 lakh deaths caused by the disease. Because it accounts for 24.2% of all malignancies that are identified in women around the world, breast cancer is the most common disease found in women (Alshahrani, S. M., et al. (2019).

One million people are diagnosed with cancer each year in the United States alone. In addition, breast cancer is the second leading cause of death associated to cancer among women. This disease is responsible for thirty percent of all cases of cancer diagnosed in females and twenty percent of all deaths from cancer among females.

According to the findings of epidemiological research, one in eight women in the United States and one in ten women in Europe will be diagnosed with breast cancer at some point throughout their lifetimes. The length of time it takes to receive a cancer diagnosis as well as the absence of effective methods for early detection are key contributors to the rise in mortality. Because of the increased efficacy of treatment choices available when cancer is detected at an earlier stage, the likelihood of a favorable prognosis is improved when it comes to both survival and quality of life (Sharma, R. (2021).

and from 2011 to 2014, 4300 cancer-related deaths were recorded in Saudi Arabia, with 18.7% of the deaths being female breast cancer cases, according to the WHO national profile for cancers. One thousand eight hundred and twenty-six cases of breast cancer were reported among Saudi women in 2014, making up 30.7% of all cancer cases in the country. Females in Saudi Arabia are disproportionately affected by three types of cancer: breast, thyroid, and colorectal. According to the Saudi cancer registry from the year 2014, the eastern part of the country saw the largest number of female cases of breast cancer. Early presentation as localized disease was found in only 36.1% of cases, while the percentages for regional and metastatic disease were 40% and 17.3%, respectively. Stage was not known in 6.6% of cases. Whereas, just 6% of cases in the US are reported to present with distant metastases, as documented by the surveillance epidemiology and end results database report. If you have breast cancer, the stage at which it was diagnosed is the single most critical indicator of how likely you are to survive the disease. Factors that increase exposure to risk and thus the likelihood of developing breast cancer are reviewed. Age, family history, age at menarche, age at menopause, lack of exercise, obesity, history of benign disease (atypical hyplasia), other breast cancer, high-fat diet, excessive alcohol consumption, ionizing radiation exposure, oral contraceptive use, hormone replacement therapy, BRCA1 and BRCA2 gene mutations, and tobacco use are all risk factors for developing breast cancer. The chance of developing breast cancer is reduced in women who breastfeed for more than a year. There are often no warning signs in the early stages of breast cancer. There is a wide variety of symptoms, and they can manifest in a number of different ways depending on the

individual. Breast soreness and swelling, a reddened breast or nipple, discharge from the nipple, erosion of the nipple, and a painless lump in the breast are all symptoms that can indicate a problem. Detecting breast cancer at an early stage is crucial (Alqahtani, T., et al. (2021).

Given the importance of early discovery in the treatment of breast cancer, breast cancer screening is one of the most critical preventative steps that may be taken. Breast self-examination is critical for early detection of breast cancer because the most common symptom of breast cancer is a lump in the breast that is painless. Women who have been diagnosed with breast cancer should perform regular self-examinations of their breasts since this practise has the potential to influence their therapy, the outcome of their treatment, and their prognosis. Because of its low cost, its short time commitment, and the lack of medical competence that is necessary for completion, breast self-examination is considered to be a cornerstone operation in developing countries. In addition to this, it encourages women to take responsibility for their own preventative healthcare. This year, cancer will claim the lives of more than 2 million people worldwide, and a further 3 million people will be diagnosed with the disease.

The second objective is to reduce the total number of fatalities. In Saudi Arabia, there has been a concerted effort made on a national scale to raise awareness of breast cancer among female citizens. Breast cancer screening using mammography is recommended by the Saudi Arabian Ministry of Health (MOH) for women aged 40–49 every two years and for those aged 50–69 every year. If a woman's family has a history of breast cancer, she should begin receiving mammograms at least ten years before the age at which one of her relatives was diagnosed with the disease. This is the minimum amount of time that should pass (Al-Musa, H. M., Awadalla, N. J., & Mahfouz, A. A. (2019).

When compared to those in industrialized nations, the incidence of breast cancer in developing countries is relatively low; nevertheless, the mortality rate for the disease is significantly higher since it is often diagnosed at a later stage. Patients diagnosed at an early stage have a cure rate that ranges from 84 to 98 percent, but persons who have metastases have a cure rate of only 24 percent. Lack of knowledge and awareness about cancer screening, breast self-examination (BSE), and clinical breast inspection may all have a role to play in the late presentation of breast cancer in the Saudi female population. Breast self-examination (BSE) is an acronym for breast self-examination, which stands for breast examination by the patient herself. When women do not have sufficient knowledge about breast cancer, they are more likely to put off getting treatment until the disease has advanced to a point where it will do them little good. Incorrect health behaviors, social barriers, fear, social stigma associated with the disease, a lack of awareness, and level of education were all factors that had a part in keeping people from seeking out screening and early detection services. Researchers in Saudi Arabia asked members of the general public a series of questions in order to measure the level of knowledge they possessed regarding breast cancer and the various screening methods that are now available. A few of the studies that have been conducted on wealthy people have discovered that their participants have a high level of understanding regarding self-examination. Previous studies concentrated their attention primarily on either the female population as a whole or on college students whose studies were unrelated to the medical area. Therefore, the purpose of this research was to raise consciousness about breast cancer in the Aseer area (Ghoncheh, M., Mirzaei, M., & Salehiniya, H. (2016).

**search terms:**

- **Cancer:**

Cancer is a condition in which abnormal cell growth in one part of the body can invade and metastasize to other organs and tissues.
Since the human body is made up of trillions of cells, cancer can arise virtually everywhere. In a healthy human organism, cells divide and proliferate to produce new cells as they are needed. Old or damaged cells die, and new ones take their place as the body repairs itself and continues to function.
It's possible for this methodical process to become disorganized, leading to the uncontrolled proliferation of aberrant or damaged cells. Lumps of tissue, or tumors, may grow from these cells. Some tumors are malignant while others are not (benign).
Tumors with cancer have the potential to metastasize, or spread to other parts of the body and create new tumors there (a process called metastasis). Malignant tumors are another name for cancerous tumors. Contrary to other types of cancer, blood malignancies like leukemia's rarely develop into visible tumors.
It is not possible for a benign tumor to infiltrate or metastasize to other organs. Benign tumors are less likely to return after removal than malignant ones. However, benign tumors have the potential to grow extremely enormous. However, even benign brain tumors can cause debilitating symptoms or can be fatal in certain cases (Patop, I. L., & Kadener, S. (2018).

**breast cancer:**

Cancer of the breast is a kind of invasive ductal carcinoma. Beginning in either one or both breasts is possible.
It is the unchecked division of cells that marks the beginning of cancer.
While women are the most common victims of breast cancer, guys are not immune to the disease.
Most breast lumps are not cancer, and this is an important fact to keep in mind (malignant). Breast tumors that aren't cancerous are also aberrant growths, but they don't metastasize. Though not usually fatal, some benign breast tumors have been linked to an increased risk of breast cancer in women. If you notice a lump or change in your breast, it's important to get it looked out by a doctor to determine whether the lump is benign or malignant (cancer) and whether it will alter your future risk of developing breast cancer. To find out about the various breast conditions that are not malignant, go here (Waks, A. G., & Winer, E. P. (2019).

**the study Problem:**

As a result of a lack of education and publicity about breast cancer and screening methods, many women do not receive the benefit of catching the disease at an early stage when it is most treatable. As a result, many women are diagnosed when the cancer has progressed to a more severe level due to a lack of information, understanding, and awareness of early detection measures. Although early identification of breast cancer is crucial, studies show that few women perform self-examinations for this purpose.

**Purpose of the study:**

The purpose of this research is to examine the breast cancer-related knowledge, beliefs, and practices of Saudi women and men, specifically with regard to I risk factors associated with the disease, (ii) causes (including myths and folklore), (iii) early detection, and (iv) existing and preferred sources of information. The ultimate purpose of this research is to help in the creation of helpful educational tools for Saudi women dealing with breast cancer, with the aim of reducing obstacles to interventions based on scientific evidence for early diagnosis and

prevention. For this reason, we set out to conduct this survey to gauge public understanding of breast cancer.

**the importance of studying:**

This study came to demonstrate the great importance as well as the need to spread awareness and sufficient knowledge among all women of society about breast cancer awareness in a region, so that this disease can be controlled faster, which confirms the possibility of treatment and recovery from it in large proportions.

**Time table:**

| Topic | 24 Dec 22 | 26 Dec 22 | 28 Dec 22 | 29 Dec 22 | 31 Dec 22 | 31 Dec 23 | 05 Jan 23 | 12 Jan 23 | 19 Jan 23 | 26 Jan 23 | 02 Feb 23 | 09 Mar 23 | 16 Mar 23 | 28 Apr 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Ethics Application | ■ | | | | | | | | | | | | | |
| Project Proposal & Plan | | ■ | ■ | ■ | | | | | | | | | | |
| Research background | | | | | ■ | ■ | | | | | | | | |
| Research questions, aims and objectives | | | | | | | ■ | | | | | | | |
| Literature review and theoretical framework | | | | | | | | ■ | ■ | | | | | |
| Study design and methodology | | | | | | | | | | ■ | ■ | | | |
| Results and Conclusion | | | | | | | | | | | | ■ | ■ | ■ |
| Final Project Report | | | | | | | | | | | | | | ■ |

**Previous studies:**

- **Study of (Al-Shahrani, S. T. A., et al). Beliefs and behavior of Saudi women in Aseer region toward breast self-examination practice.**

The causes of breast cancer are yet unknown. Multiple studies have been conducted on breast cancer prevention, yet there is still a lack of effective procedures or tactics. Self-examination of the breast has the potential to affect the care, quality of life, mortality, and prognosis of breast cancer in any population. The purpose of this research was to learn more about Saudi women's breast self-examination practices and attitudes toward health. Using a self-created online questionnaire distributed through Google forms, researchers in the Aseer region of Saudi Arabia

conducted a cross-sectional observational survey study. The Aseer region's female citizens and locals were all asked to participate. Frequencies (the total number of respondents) and reliable percentages (the proportion of true cases) were used to depict the data for categorical variables. The means of distinct groups were compared using an analysis of variance test. Statistical significance was defined as a p-value less than 0.05. The final tally from the survey is 473 responses. The average grade for knowledge questions was 114.51 36.33, while the average rating for behavior questions was 2.85 1.47. Women between the ages of 50 and 60, those who had been divorced, and those who had completed high school scored significantly (p 0.001) higher on the knowledge scale. Divorced women between the ages of 31 and 35 with a college degree exhibited significantly improved attitudes concerning breast cancer and self-examination (p 0.001). Females in the Aseer region of Saudi Arabia were found to have a low level of knowledge, as well as bad practices and behaviors, related to breast self-examination. Research in other parts of the country is needed to have a more complete picture of the knowledge and behavior levels there, so that the root causes of this observed bad practise can be determined.

- **Study of (Sindi, R. A., et al. (2019). Awareness Lev-el, Knowledge and Attitude towards Breast Cancer between Medical and Non-Medical University Stu-dents in Makkah Region.**

To provide some context, breast cancer is the most prevalent form of the disease found in Saudi Arabian females, followed by cancers of the thyroid and colorectum. The goal of this study is to determine the level of awareness, the knowledge, and the attitude of female university students in the Makkah region who are not studying medicine.

- **Study of (Mahfouz, A. A., et al. (2013). Breast cancer knowledge and related behaviors among women in Abha city, southwestern Saudi Arabia.**

In Saudi Arabia, the majority of female cancer patients have breast cancer as their primary diagnosis. In Abha City, located in the southwestern region of Saudi Arabia, researchers conducted a cross-sectional study on 1,092 women who attended urban primary health care institutions to learn more about breast cancer knowledge, attitudes, and related behaviors. Mammography was only mentioned by 22.0% of respondents, but breast self-examination was mentioned by 41.5% (BSE). More than half of the women who participated in the study were able to recognize the symptoms that are associated with breast cancer as well as the risk factors. Only 8.3% of women had a clinical breast examination (CBE), 6.2% had a mammogram, and 29.7% had a breast self-examination (BSE). According to the findings of the study, women have inadequate knowledge and practise low rates of breast self-examination, clinical breast examination, and mammography. It is important to increase public awareness through any and all possible ways, such as through the use of mass media, schools, social events, and waiting areas at primary health care centers. Concerning breast cancer, there is an immediate need for continuing medical education programmers to be made available to medical professionals working in the region.

- **Study of (Alam, N. E., et al. (2021). Evaluation of knowledge, awareness and attitudes towards breast cancer risk factors and early detection among females in Bangladesh.**

Background: In women, breast cancer represents the most prevalent neoplastic transformation. There is a 1 in 5 chance of developing breast cancer in one's lifetime. Breast cancer affects 5.8 out of every 1,000 Saudi women over the age of 40, according to results from a recent screening

mammography. Saudi women experience an earlier onset of breast cancer than their counterparts in developed countries. However, as most cases are not discovered until a more advanced stage, the likelihood of a full and sustainable recovery is diminished. Cases that are diagnosed and treated quickly have a recovery rate that can approach or even surpass 90%. The purpose of this research was to calculate the rate of breast cancer among Saudi Arabian women and to identify the factors that put them at risk. The level of awareness of breast cancer among the general public is also evaluated.
Tools & Techniques: Following informed consent, a questionnaire was administered to a random sample of 496 female educators in the Aseer region. These educators teach at elementary, middle, and high schools and range in age from 22 to 64. To fill teaching positions, a multi-stage random sampling process was used. A questionnaire was used to compile this information, and it included questions about the respondent's demographics, their familiarity with the benefits of self- and clinical breast examination, and their views on screening mammography. The study was approved by the Research Ethical Committee at King Khalid University. Statistical analysis was performed on the information gathered.
Results: The participants were 496 female educators ranging in age from 22 to 64. Participants' median number of children in marriage was 3 (Interquartile range: 2-5), and their mean age was 37.6 10.1 (range: 15-64) years. The average age of a woman when she had her first kid was 24.5 years old, with a standard deviation of 4.7 years. Fifty-six percent of women said they had breastfed before, whereas 38 percent said they had taken oral contraceptives, 32 percent were overweight, and 3 percent were smokers. Almost three-quarters (73%) of respondents said they would see a doctor if they felt a lump or found anything else out of the ordinary during a breast inspection. A clinical breast exam is necessary before seeing a doctor, according to 62% of respondents. Sixty-seven percent also said they knew how to check their own breasts for lumps. Eighty-two percent of patients learned how to do self-exams from their doctors. Respondents were evenly split on whether BSE should be performed during puberty (21%), after 20 years (21%), after 30 years (31%), or at some other time (27%).
Conclusions: These middle-aged women have a strong understanding of breast cancer and the importance of both self- and professional breast exams. But some patients said they'd never done a self-breast exam to check for lumps. Breast cancer early detection is an area that needs further attention in the future.

- **Study of (Alsareii, S. A., et al. (2020). Awareness of breast cancer among female students and faculty from Najran university, Najran, Saudi Arabia.**

In Najran, Saudi Arabia, the most common form of cancer seen in female residents is breast cancer, often known as BC. On the other hand, there is a lack of information regarding the public's awareness of BC. The purpose of this research was to investigate the general understanding, early warning symptoms, risk factors, and sources of information regarding BC.
Methods: During the months of March and April 2019, an online study was carried out that consisted of anonymous self-ratings, cross-sectional questionnaires, and cross-sectional research. The research was conducted in the College of Medicine at Najran University in Najran, Saudi Arabia, and it included the participation of three hundred female students and/or faculty members. The findings of the study revealed that a total of 232 students (77.3%) and 68 faculty members (22.7%) participated in the survey. According to the results of our research, the two obstetric risk factors that were most relevant for BC were a lack of previous births (83.8% of cases) and an onset of menarche before the age of 12 (29.7% of cases). On the other hand, the most significant non-obstetric risk factors of breast cancer were a lack of physical activity

(66.3% of cases) and a family history of breast cancer (18% of cases). Although the research subjects surveyed exhibited "excellent" general knowledge about breast cancer (75.3%), they unfavorably exhibited "poor" awareness about the warning signals of breast cancer (94.3%). This is in accordance with the criteria that were established in advance. Age, marital status, educational level, and family background were found to be significant predictors of "excellent" overall knowledge (general knowledge plus signs information about British Columbia; all p-values below than 0.05; Chi-square test with two tails). In addition to the educational materials provided by the campaigns, the internet was cited as the most reliable source of information regarding BC (33%), while healthcare professionals (11.3%) and training workshops (7.3%) were cited as the least reliable sources. Conclusions: the research individuals who were surveyed had risk factors for breast cancer and displayed "poor" awareness about the warning early indications of breast cancer. We are making a call for educational programmers that are rigorous and well-crafted, with the goal of increasing the level of knowledge about BC among women in the province of Najran.

**Materials and Methods:**

After obtaining informed consent, 1046 participants (both male and female) in the Asir region were surveyed using a questionnaire for this cross-sectional prospective study. Individuals were chosen at random using a basic sampling technique. After explaining the study's goals and procedures to each participant, we obtained their signatures on the consent form. Those who choose not to participate were not included. We asked them to fill out a 31-question survey about their feelings, thoughts, and knowledge about breast cancer and preventative care. Statistics about the participants' ages, genders, and locations were also requested. A strict code of confidentiality was maintained regarding the students' personal data. The research was conducted between November 2018 and March 2019. While no public, private, or non-profit organizations provided direct support for this study, the King Khalid University Ethics Committee did accept the study's protocol.

**Statistical Analysis:**

The information was cleaned, coded, and entered into IBM SPSS version 20 for analysis. All of the charts and graphs here were made in Excel. Two-tailed tests with a significance level of 0.05 were used throughout all statistical analysis. Statistical significance was defined as a p value of 0.05 or less. Each correct response was awarded a score of one point, and the final score for the knowledge domain was calculated by adding up the points for each question in the test. In order to convert the score into a percentage of the possible maximum, we divided it by the total score and multiplied the result by 100. A low score was defined as less than 60% of the maximum possible, whereas a high score was considered excellent. Fisher's exact test and the Chi-square/Monte Carlo exact test were used to examine the correlation between the patients' demographics and their level of education. If the frequency was too low for the chi-square test to be valid, then an exact test was employed instead. Adjusted effects of diverse participant data on knowledge level were estimated using multiple logistic regression models.

**Results:**

The demographics of the 1046 participants are broken down in Table1. About half of them (56.9%) were in that age range, between 20 and 29. There were somewhat more men than women there (52.7%). Most of the population (61.2%) consists of single people. The vast majority of them (74.0%) have advanced degrees (University and more). Only a little more than a third (32.7%) of them were employed in health care, while almost half (46.6%) were working in non-health related sectors. All but two were Saudi (92.6%), and around half of them came

from middle-class families with monthly incomes of between 5,000 and 15,000 Saudi Riyals (51.9%). The vast majority (98.1%) of them have no family history of breast cancer. Only 13.4% of the individuals reported having a personal history of breast cancer.

***Table 1:Personal and family data of general population participants from the Asir region, Saudi Arabia.***

| **Personal data** | | **No.** | **%** |
|---|---|---|---|
| Age in years | < 20 years | 124 | 11.9 |
| | 20− | 595 | 56.9 |
| | 30− | 168 | 16.1 |
| | 40+ | 159 | 15.2 |
| Gender | Male | 551 | 52.7 |
| | Female | 495 | 47.3 |
| Marital status | Single | 639 | 61.1 |
| | Married | 391 | 37.4 |
| | Divorced/widow | 16 | 1.5 |
| Educational level | Below university | 272 | 26.0 |
| | University/more | 774 | 74.0 |
| Work field | Not working | 217 | 20.7 |
| | Non-medical field | 487 | 46.6 |
| | Medical field | 342 | 32.7 |
| Nationality | Saudi | 1031 | 98.6 |
| | Non-Saudi | 15 | 1.4 |
| Monthly income | Less than 5000 S.R | 199 | 19.0 |
| | 5000–15,000 S.R | 543 | 51.9 |
| | 15,000–30,000 S.R | 243 | 23.2 |
| | More than 30,000 S.R | 61 | 5.8 |
| History of breast cancer | Yes | 11 | 1.1 |
| | No | 1035 | 98.9 |
| Family history of breast cancer | Yes | 140 | 13.4 |
| | No | 906 | 86.6 |

The percentage of respondents who are aware of breast cancer risk factors and BSE problems is shown in Table 2. Sixty-two percent is a respectable mark on a test of general knowledge. Concerning familiarity with BSE, its symptoms, and risk factors. Poor knowledge was shown in the ratings of 51.4%, 31.8%, and 49.8%.

*Table 2:Breast cancer knowledge domains as recorded by the general population in the Asir region, Saudi Arabia.*

| Knowledge domain | Poor | | Good | | Score (%) |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| Typical information. | 592 | 56.6% | 454 | 43.4 | 60.2 |
| Sensitivity to the warning indications that need medical attention. | 539 | 51.5% | 507 | 48.5 | 51.4 |
| The ability to recognize potential dangers. | 944 | 90.2% | 102 | 9.8 | 31.8 |
| A familiarity with BSE. | 688 | 65.8% | 358 | 34.2 | 49.8 |

- Scored less than 60%: very poorly.
- 60-100% is a good percentage.
- Self-examination of the breasts (BSE).

Overall, only 18.8% of our group reported having strong knowledge of breast cancer.
Table Table3.3 displays the correlations between demographics and BC knowledge scores. There were statistically significant correlations between BC knowledge and age, gender, education, occupation, and income (p = 0.001, 0.002, 0.002, 0.001, and 0.018, respectively). Males (15.2%), those under the age of 20, those with less than a university education (12.5%), those working in fields other than medicine (12.5%), and those with incomes of less than 5000 SR (13.6%) had the lowest rates of good knowledge. On the other hand, those with a higher income (more than 30,000 SR), higher education level (university or greater), medical profession, and younger age group all had higher percentages of participants who scored well on the knowledge question.

*Table 3:Distribution of breast cancer knowledge of the general population by their personal and family data, Asir region, Saudi Arabia.*

| Factors | | Overall knowledge | | | | *p* |
|---|---|---|---|---|---|---|
| | | Poor | | Good | | |
| | | No. | % | No. | % | |
| Age in years | < 20 years | 114 | 91.9 | 10 | 8.1 | .001* |
| | 20− | 448 | 75.3 | 147 | 24.7 | |
| | 30− | 147 | 87.5 | 21 | 12.5 | |
| | 40+ | 140 | 88.1 | 19 | 11.9 | |
| Gender | Male | 467 | 84.8 | 84 | 15.2 | .002* |
| | Female | 382 | 77.2 | 113 | 22.8 | |
| Marital status | Single | 508 | 79.5 | 131 | 20.5 | .208 |
| | Married | 327 | 83.6 | 64 | 16.4 | |

| Factors | | Overall knowledge | | | | *p* |
|---|---|---|---|---|---|---|
| | | Poor | | Good | | |
| | | No. | % | No. | % | |
| | Divorced/widow | 14 | 87.5 | 2 | 12.5 | |
| Educational level | Below university | 238 | 87.5 | 34 | 12.5 | .002* |
| | University/more | 611 | 78.9 | 163 | 21.1 | |
| Work field | Not working | 180 | 82.9 | 37 | 17.1 | .001* |
| | Non-medical field | 426 | 87.5 | 61 | 12.5 | |
| | Medical field | 243 | 71.1 | 99 | 28.9 | |
| Monthly income | less than 5000 S.R | 172 | 86.4 | 27 | 13.6 | .018* |
| | 5000-15,000 S.R | 446 | 82.1 | 97 | 17.9 | |
| | 15,000–30,000 S.R | 187 | 77.0 | 56 | 23.0 | |
| | More than 30,000 S.R | 44 | 72.1 | 17 | 27.9 | |
| History of breast cancer | Yes | 8 | 72.7 | 3 | 27.3 | $^{FE}P = .472$ |
| | No | 841 | 81.3 | 194 | 18.7 | |
| Family history of breast cancer | Yes | 106 | 75.7 | 34 | 24.3 | .076 |
| | No | 743 | 82.0 | 163 | 18.0 | |

- FEP Fisher's precise probability, P Pearson's 2 test.
- *$p < 0.05$ (significant) (significant).

In table 4, we see the results of an investigation using logistic regression to predict how much people knew about breast cancer and how those probabilities changed with different sets of controls. When controlling for other factors, the likelihood of developing breast cancer was shown to be higher among college-educated women, those who worked in the medical sector, those with higher incomes, and those with lower perceived mental health barriers.

*Table 4:Asir region, Saudi Arabia, general population breast cancer knowledge using a multivariate logistic regression model.*

| Factor | *B* | SE | *P* | AOR | 95% C.I. for OR | |
|---|---|---|---|---|---|---|
| | | | | | Lower | Upper |
| Age in years | − .267 | .144 | .064 | .766 | .58 | 1.02 |
| Female | 1.013 | .185 | .000 | 2.76 | 1.92 | 3.96 |
| Married | .111 | .254 | .661 | 1.12 | .68 | 1.8 |
| High education | .089 | .043 | .040 | 1.09 | 1.01 | 1.19 |
| Medical field work | .666 | .141 | .000 | 1.95 | 1.48 | 2.56 |
| Income | .249 | .104 | .017 | 1.28 | 1.05 | 1.57 |
| History of BC | .785 | .727 | .281 | 2.17 | 0.52 | 9.09 |
| Family history of BC | .389 | .228 | .088 | 2.33 | 0.94 | 2.42 |
| Constant | − 2.696 | 1.536 | .079 | .068 | | |
| Model pseudo $R^2$; significance | 12.3%; .003* | | | | | |
| Model fit | 81.5% | | | | | |

- CI confidence interval, AOR adjusted odds ratio, and standard error.

More than half of our people learned about BC from the media, 18.4 percent from family, 17.1 percent from conferences, 7.2 percent from books, and 1.3 percent from doctors (Fig. 1).

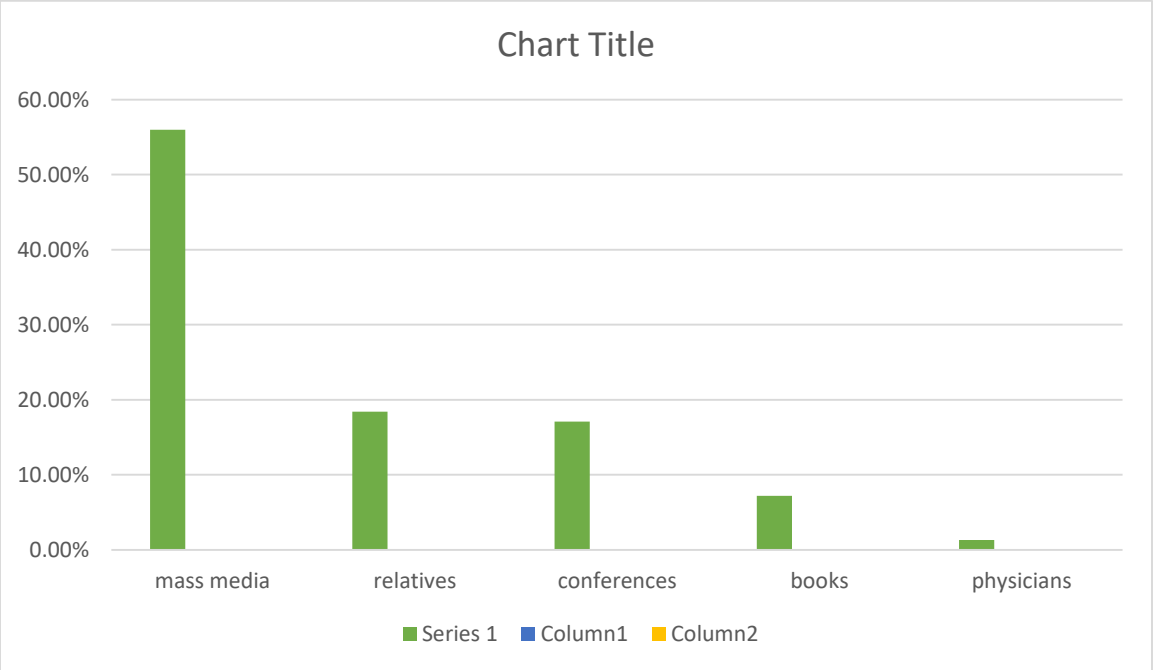


*Figure 1:Sources of breast cancer knowledge among the general population in the Asir region, Saudi Arabia.*

The consumption of BSE by our population is detailed in table 5. Repeat BSE patients made up 52.5% of the total number of people affected by this outbreak. It was discovered that just 4.2% of people received BSE on a weekly basis, 17.3% on a monthly basis, and the remaining 39.6% and 38.8% received it on a less frequent basis. 14.2% of those who were diagnosed with BSE were found to have breast changes.

***Table 5:Breast self-examination practice recorded among the general population in the Asir region, Saudi Arabia.***

| **Practice regarding BSE** | **No.** | **%** |
|---|---|---|
| Previously undergone BSE | | |
| Yes | 260 | 52.5 |
| No | 235 | 47.5 |
| If yes, frequency ($n = 260$) | | |
| Rarely | 103 | 39.6 |
| Sometimes | 101 | 38.8 |
| Weekly | 11 | 4.2 |
| Monthly | 45 | 17.3 |
| Did you find breast changes ($n = 260$) | | |
| Yes | 37 | 14.2 |
| No | 223 | 85. |

- Breast Self-Examination, or BSE

Age (56.1%), radiation exposure (39.3%), not breastfeeding (57.6%), a history of breast precancerous lesions (49.4%), being an old primipara (over the age of 30) (60%), breast injuries (40.5%), menopause (late) (42.4%), being overweight (47.2%), smoking (34.3%), a tight bra (50.2%), being inactive and sedentary (39%), and not exercising (39%) were all thought to increase the (Table6).

***Table 6: Risk factor awareness among the general population in the Asir region, Saudi Arabia.***

| | **Yes** | **No** | | | **Do not know** | |
|---|---|---|---|---|---|---|
| | **Count** | **Row *N* %** | **Count** | **Row *N* %** | **Count** | **Row *N* %** |
| Prevalent good fortune in one's ancestry | 139 | 13.3 | 331 | 31.6 | 576 | 55.1 |

| | Yes | No | | Do not know | |
|---|---|---|---|---|---|
| | **Count** | **Row *N* %** | **Count** | **Row *N* %** | **Count** | **Row *N* %** |
| Aspects of Growing Older | 587 | 56.1 | 257 | 24.6 | 202 | 19.3 |
| Race/ethnicity | 310 | 29.6 | 417 | 39.9 | 319 | 30.5 |
| Toxic effects of radiation exposure | 411 | 39.3 | 294 | 28.1 | 341 | 32.6 |
| Putting off having a baby by not nursing | 603 | 57.6 | 158 | 15.1 | 285 | 27.2 |
| Existence of a breast precancerous lesion in the past | 517 | 49.4 | 223 | 21.3 | 306 | 29.3 |
| The Primipara's Old Age (above age of 30 years) | 628 | 60.0 | 100 | 9.6 | 318 | 30.4 |
| Several-Sidedness and Gravity | 203 | 19.4 | 342 | 32.7 | 501 | 47.9 |
| Having no equal value | 118 | 11.3 | 534 | 51.1 | 394 | 37.7 |
| Rapid onset of puberty (below age of 11 years) | 174 | 16.6 | 430 | 41.1 | 442 | 42.3 |
| Use of oral contraceptives on a regular basis. | 158 | 15.1 | 375 | 35.9 | 513 | 49.0 |
| Broken breasts | 424 | 40.5 | 164 | 15.7 | 458 | 43.8 |
| Menopause that occurs late in life | 443 | 42.4 | 196 | 18.7 | 407 | 38.9 |
| Treatment with synthetic hormones | 228 | 21.8 | 319 | 30.5 | 499 | 47.7 |

| | Yes | No | | Do not know | |
|---|---|---|---|---|---|
| | **Count** | **Row *N* %** | **Count** | **Row *N* %** | **Count** | **Row *N* %** |
| Obesity | 494 | 47.2 | 128 | 12.2 | 424 | 40.5 |
| Smoking | 359 | 34.3 | 239 | 22.8 | 448 | 42.8 |
| Breasts clenched in a tight bra | 525 | 50.2 | 189 | 18.1 | 332 | 31.7 |
| Physical inactivity and a sedentary way of life | 415 | 39.7 | 238 | 22.8 | 393 | 37.6 |
| Witchcraft | 281 | 26.9 | 304 | 29.1 | 461 | 44.1 |
| Underweight | 496 | 47.4 | 247 | 23.6 | 303 | 29.0 |

As can be seen in Table 7, the level of general knowledge possessed by the typical resident of our nation is quite impressive. The vast majority, which comprised 95.7% of respondents, had heard of breast cancer. The majority of respondents (59.8%) thought that breast cancer was quite common, and only 12% believed that having breast cancer once could reduce the risk of developing further malignancies in the future.

***Table 7:General knowledge among the general population in the Asir region, Saudi Arabia.***

| | | Count | Column N % |
|---|---|---|---|
| **I'm wondering whether you're familiar with breast cancer.** | Yes | 1002 | 95.8 |
| | No | 44 | 4.2 |
| **I was wondering what your thoughts were on breast cancer.** | Rare | 52 | 5.0 |
| | Somewhat prevalent | 625 | 59.8 |
| | Highly prevalent | 369 | 35.3 |
| **One case of breast cancer can protect against getting it again.** | Yes | 125 | 12.0 |
| | No | 447 | 42.7 |
| | Do not know | 474 | 45.3 |

**Discussion:**

Overwhelmingly (95.9%), survey participants were aware of breast cancer. When compared to samples of women in Ghana (95%), Malaysia (81.2%), and Iran (64%), this is significantly higher. Nonetheless, this figure is significantly lower than the 100% found among female medical students in Harar, Ethiopia, and the 98.7% found among female students at the University of Ibadan, Nigeria (Shehata, S. F., et al. (2020).

In addition, there is a great deal of familiarity with and understanding of breast cancer early detection methods like the BSE. Results showed that around half of respondents were aware of BSE as a means of early detection, but that only a small percentage actually used it. While some surveys showed widespread use of BSE, others found that knowledge and awareness were minimal (Chokoev, A., et al. (2022).

The results of our study show that there is a widespread lack of knowledge and inaccurate assumptions about breast cancer risk factors. Over half of respondents named age, not breastfeeding, being an old primipara (over 30), and wearing a tight brassier as possible risk factors for breast cancer; over a third named exposure to radiation, a history of precancerous lesions on the breast, breast injuries, late menopause, obesity, smoking, inactivity, sedentary lifestyle, underweight, and obesity (Al Bshabshe, A., et al. (2021). Less than a third of them recognized racial/ethnicity, parity, having more than one child, having no children, having menarche before the age of using oral contraceptives frequently, using hormone replacement therapy, and even witchcraft as possible risk factors for breast cancer. These findings could be contrasted to others showing a lack of knowledge and incorrect assumptions about causes, symptoms, preventative measures, and therapeutic options. Over two-thirds of respondents did not recognize gender, growing age, race/ethnicity, having a favorable family history, having a late first child, early menarche, late menopause, a positive personal history, or null parity as potential risk factors. University students in Angola, female medical students in Saudi Arabia, nurses in Pakistan, and female teachers in Malaysia and Kuwait have all identified knowledge gaps about risk factors (Alalawi, Y. S., et al. (2022).

Regarding false beliefs, 26.9% of interviewees mentioned witchcraft when asked about causes of breast cancer. Findings from a community survey in semi-urban Cameroon corroborate those from research on rural women and market women in Ibadan, Nigeria, and those from female medical students in Ethiopia, all of which indicate that women continue to attribute the prevalence of breast cancer to a mystical origin (Sabgul, A. A., et al. (2021). They blamed everything from God's curse to a "attack from the adversary" on this phenomenon. When compared to reports from a more developed setting, this finding was not dissimilar: female teachers in Saudi Arabia attributed breast cancer to God and a belief in the evil eye, while 96.8% of Arab-speaking women in Qatar attributed it to fate/destiny and less than 1/5 to God's punishment and bad luck (Alyami, H. S., et al. (2021).

Researchers in Saudi Arabia, Lebanon, Nigeria, and Iran have all found similar findings about the importance of the media in spreading awareness about breast cancer. This highlights the importance of paying more attention to this informational channel in order to disseminate accurate information to the intended audience (Al Fayi, M. S. (2021).

**Conclusion:**

On average, the people who took part in this resettlement colony were only able to achieve a score of 18.8% on a test that measured their awareness of breast cancer risk factors, symptoms, and early detection methods. In light of this, it is absolutely necessary to initiate community-based educational and awareness programmers in order to raise people's levels of consciousness,

educate the general public, and debunk the fallacies that go hand in hand with ignorance. Training future medical professionals is another important step. We also need to keep in mind that putting all of our faith in the media is not going to be enough; the information needs to be disseminated in a way that strikes a chord with the people who live in the area.

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**Appendicitis:**
**Questionnaire**

1. **Personal and family data of general population participants from the Asir region, Saudi Arabia.**

**Age in years:**

- < 20 years
- 20–
- 30–
- 40+

**Gender:**

- Male
- Female

**Marital status:**

- Single
- Married
- Divorced/widow

**Educational level:**

- Below university
- University/more

**Work field:**

- Not working
- Non-medical field
- Medical field

**Nationality:**

- Saudi
- Non-Saudi

**Monthly income:**

- Less than 5000 S.R
- 5000–15,000 S.R
- 15,000–30,000 S.R
- More than 30,000 S.R

**History of breast cancer:**

- Yes
- No

**Family history of breast cancer:**

- Yes
- No

**2. Breast cancer knowledge domains as recorded by the general population in the Asir region, Saudi Arabia.**

**Knowledge domain**

- Typical information.
- Sensitivity to the warning indications that need medical attention.
- The ability to recognize potential dangers.
- A familiarity with BSE.

**3. Breast self-examination practice recorded among the general population in the Asir region, Saudi Arabia.**

**Previously undergone BSE**

- Yes
- No

**If yes, frequency (n = 260)**

- Rarely
- Sometimes
- Weekly
- Monthly

**Did you find breast changes (n = 260)?**

- Yes
- No

**4. Risk factor awareness among the general population in the Asir region, Saudi Arabia.**

**Do you have knowledge by Prevalent good fortune in one's ancestry?**

- Yes
- No

**Do you have knowledge by Aspects of Growing Older?**

- Yes
- No

**Do you have knowledge by Race/ethnicity?**

- Yes
- No

**Do you have knowledge by Toxic effects of radiation exposure?**

- Yes
- No

**Do you have knowledge by Putting off having a baby by not nursing?**

- Yes
- No

**Do you have knowledge by Existence of a breast precancerous?**

- Yes
- No

**Do you have knowledge by lesion in the past?**

- Yes
- No

**Do you have knowledge by The Primipara's Old Age (above age of 30 years)?**

- Yes
- No

**Do you have knowledge by Several-Sidedness and Gravity?**

- Yes
- No

**Do you have knowledge by Having no equal value?**

- Yes
- No

**Do you have knowledge by Rapid onset of puberty (below age of 11 years)?**

- Yes
- No

**Do you have knowledge by Use of oral contraceptives on a regular basis?**

- Yes
- No

**Do you have knowledge by Broken breasts?**

- Yes
- No

**Do you have knowledge by Menopause that occurs late in life?**

- Yes
- No

**Treatment with synthetic hormones.**

- Yes
- No

Do you have knowledge by Obesity?

- Yes
- No

**Do you have knowledge by Smoking?**

- Yes
- No

**Do your Breasts clench in a tight bra?**

- Yes
- No

**Do you have knowledge by Physical inactivity and a sedentary way of life?**

- Yes
- No

**Do you have knowledge by Witchcraft?**

- Yes
- No

**Do you suffer from Underweight?**

- Yes
- No

## 5. General knowledge among the general population in the Asir region, Saudi Arabia.

**I'm wondering whether you're familiar with breast cancer.**

- Yes
- No

**I was wondering what your thoughts were on breast cancer.**

- Rare
- Somewhat prevalent
- Highly prevalent

**One case of breast cancer can protect against getting it again.**

- Yes
- No
- Do not know

**Exclusion criteria:**
**Women with:**

- Pre-existing breast cancer.
- Clinically significant BRCA 1/2 mutations.
- Li-Fraumeni syndrome.
- Cowden syndrome.
- Hereditary diffuse gastric syndrome.
- Other familial breast cancer syndromes.
- High-risk breast lesions (DCIS, LCIS, ADH, ALH).
- Previous doses of chest radiation (>20Gy) before age 30.
- Undergoing diagnostic or surveillance mammography.

**Inclusion criteria:**

- Women primarily aged 40 years and older receiving screening mammography (digital or film)
- Women primarily aged 20 years and older undergoing screening mammography or who had a negative mammogram and found to have dense breasts. Dense breasts defined as BI-RADS 3 or 4, c or d, or “heterogeneous” or “extremely” dense.

**Methods:**
The questionnaire was distributed to the required research sample.