

A COMPARATIVE STUDY OF BREAST CANCER KNOWLEDGE BETWEEN EDUCATED AND UNEDUCATED FEMALES AGED 18-50 YEARS IN A COMMUNITY SETTING

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Abstract

Background: Breast cancer remains a major public health concern and contributes significantly to illness and death among women across the world. Early detection and prevention largely depend on awareness and knowledge regarding risk factors, warning signs, and screening methods. Educational status plays a significant role in influencing health awareness. Therefore, assessing differences in breast cancer knowledge among women with different educational backgrounds is essential.

Objective: To compare breast cancer knowledge among educated and uneducated females aged 18–50 years in a community setting.

Methods: A quantitative, comparative cross-sectional study was conducted in Haji Hoth Chandio, District Tando Muhammad Khan, and Sindh. The total population consisted of 76 eligible

females, out of which 64 participants were selected using simple random sampling. The sample included 32 educated and 32 uneducated females. Data were collected using a structured questionnaire adopted from a previously validated study. Data were analyzed using descriptive statistics (frequencies and percentages) and inferential statistics (Chi-square test). The level of significance was set at $p \leq 0.05$.

Results: The findings indicated that educated females demonstrated a higher level of knowledge regarding breast cancer compared to uneducated females. Educated participants showed better awareness of breast cancer risk factors, early warning signs, and screening methods such as breast self-examination and clinical breast examination. In contrast, uneducated females had comparatively lower awareness regarding these aspects. The statistical analysis revealed a significant association between educational status and knowledge of breast cancer.

Conclusion: The study concluded that educational status significantly influences breast cancer knowledge among females aged 18–50 years. Educated females had better awareness compared to uneducated females.

Recommendations: Community-based health education programs should particularly target uneducated women to improve awareness and promote early detection practices.

1. INTRODUCTION

1.1. Background

Breast cancer is a malignant neoplasm characterized by the uncontrolled proliferation of abnormal cells within the breast glands and/or ducts. Based on the site of origin and the extent of spread to surrounding tissues or distant organs, it is classified into five stages: stage 0, I, II, III, and IV. Stage 0 represents carcinoma in situ, stage I indicates early-stage disease, and stage IV corresponds to the most advanced form of the disease (wayesa, 2025).

Awareness of breast cancer is a critical factor in promoting its early detection. This knowledge enables individuals to mitigate relevant risk factors and supports women in recommended screening protocols. Adherence to such guidelines facilitates earlier diagnosis, which in turn allows healthcare providers to implement strategies and improves patient monitoring. In Pakistan, many studies have explored breast cancer awareness; however, few have compared knowledge levels between educated and uneducated women in community setting, and those that exist have often been confined to single geographical locations or narrow aspects of the issue such as risk factors, symptoms, or examination techniques alone. Consequently, the present study seeks to address these limitations (Hussain et al., 2022).

Considering the increasing burden of breast cancer, one would expect comprehensive and meticulous systems in place to document and promote BC awareness in the Pakistani population. Unfortunately, this is not so. Pakistan faces several challenges in addressing the burden of breast cancer. One major limitation is the incomplete coverage of the National Cancer Registry, which makes it difficult to accurately estimate the actual number of cases. Additionally, national awareness policies related to cancer prevention and early detection remain limited (Rehman et al., 2024).

Breast cancer is currently the most frequently diagnosed cancer among women globally, encompassing both low and middle income countries. It exhibits the highest rates of advanced stage presentation among cancers, resulting in substantial mortality. Comparative analysis reveals lower incidence rates of breast cancer in women from developing regions. Factors such as age (particularly

first childbirth and parity in Children), and genetic variations contribute to these disparities (Preeti et al., 2023).

1.2. Statement of the problem

In the year 2022, the World Health Organization (WHO) reported 2.3 million new breast cancer cases and 670,000 deaths globally; it is the most common cancer among women in 157 out of 185 countries (Mahar et al., 2025).

Pakistan has Asia's highest incidence rate, with one in nine women facing diagnosis in their lifetime and 34,066 new breast cancer cases were reported (IARC, 2018; Adeel et al., 2024).

Increasing knowledge and awareness about breast cancer among women is essential for early detection and prevention, the nature of what is missing and the causes surrounding the same awareness and knowledge should be well comprehended. Early studies have proved that there are so many women who are not aware of the right early symptoms and risk factors of BC and several experts have reported that numerous factors including age, household income and many others influenced the same. The knowledge of women is linked with cancer family history, awareness levels about BC With analysis of the data re concerning the BC awareness levels and literacy among women. This analysis may provide an overview of the primary risk factors of women awareness and knowledge levels. This kind of evidence will come in quite handy designing interventions to sensitize women on BC and empower them cancer awareness (Wang et al., 2021).

So far, the high proportion of literature on the studies that have been conducted regarding breast cancer has given attention to pathogenesis and treatment regimens understand variations across age groups, time periods, and geographical regions. Large international databases, including global disease monitoring systems and population statistics, provide valuable data for assessing incidence patterns and future projections. Such analyses assist policymakers in planning healthcare resources and developing strategies to reduce the overall burden of breast cancer worldwide. In addition, none of the studies have focused on the estimation of the incidence of breast cancer in females on the international and national scales. The Global Burden of GBD database of disease and the United Nations (UN) data of the population provide scholars with the chance of profound analysis and projections (Li et al., 2022).

Although breast cancer cannot be prevented, improved outcomes are possible if it is found at an early, more treatable stage. Treatments for cancers detected early are less expensive, more effective, and yield much better quality of life. Early detection methods, which increase the chances of early diagnosis of breast lumps, include breast self-examination, physical examination by a physician and mammography (Rao et al., 2022).

1.3. RESEARCH OBJECTIVES

- To assess the level of knowledge about breast cancer risk factors among educated and uneducated females aged 18-50 years.

- To determine knowledge regarding breast cancer screening methods such as breast self-examination and mammography among educated and uneducated females.
- To identify sources of information about breast cancer among educated and uneducated females.

1.4. RESEARCH QUESTION

Is there a significant difference in breast cancer knowledge between educated and uneducated females aged 18–50 years in a community setting?

Is there an association between educational status and knowledge of breast cancer?

What is the overall level of knowledge about breast cancer among females aged 18–50 years in the community?

1.5. RESEARCH HYPOTHESIS

Null Hypothesis (H_0)

There is no significant difference in the level of breast cancer knowledge between educated and uneducated females aged 18–50 years in a community setting.

Alternative Hypothesis (H_1)

There is a significant difference in the level of breast cancer knowledge between educated and uneducated females aged 18–50 years in a community setting.

1.6. Significance of the study

By comparing educated and uneducated women within the reproductive and economically active age group of 18 to 50 years, this research highlights potential knowledge gaps that may affect early detection practices such as breast self-examination, clinical screening, and timely medical consultation knowledge about breast cancer. Understanding these differences is essential for developing targeted health education programs. If disparities in knowledge are identified, healthcare providers, policymakers, and public health organizations can design culturally appropriate and literacy-sensitive awareness campaigns to ensure that all women, regardless of educational background, have access to life-saving information.

1.7. Operational Definition

Breast Cancer

Breast cancer refers to a malignant tumor that develops from the cells of the breast. In this study, breast cancer is considered in terms of participants' knowledge regarding its risk factors, signs and symptoms, screening methods, and preventive measures.

Knowledge of Breast Cancer

Knowledge of breast cancer refers to the level of understanding of participants about risk factors, warning signs, early detection methods, and prevention of breast cancer. It will be measured using a structured, self-administered questionnaire developed by the researcher.

Educated Females

Educated females refer to women aged 18–50 years who have completed at least completed primary education or above at the time of data collection.

Uneducated Females

Uneducated females refer to women aged 18–50 years who have no formal education.

Age (18–50 Years)

Age refers to the completed years of life of the respondent at the time of data collection. Only females between 18 and 50 years were included in the study.

Community Setting

Community setting refers to the selected rural or urban residential area where the study participants live and where data collection is conducted outside hospital or institutional settings.

Breast Self-Examination (BSE)

Breast Self-Examination is a method by which a woman examines her own breasts regularly to detect lumps or abnormalities. In this study, it is assessed as part of participants' knowledge regarding early detection practices.

2. LITERATURE REVIEW**2.1. Global Burden of Breast Cancer**

Breast cancer continues to be a major health concern particularly in low- and middleincome countries where early detection systems are limited. Although medical advancements have improved treatment outcomes in developed nations, survival rates remain significantly lower in resource-constrained settings. This difference is largely influenced by delayed diagnosis, limited awareness, and socioeconomic inequalities.

Breast cancer is one of the most frequently diagnosed cancers among women worldwide and remains a major public health concern. It affects women in both developed and developing countries and is associated with high morbidity and mortality rates. Although the incidence varies across regions, several factors such as reproductive history, genetic predisposition, and lifestyle characteristics contribute to these differences. Early detection and timely treatment play a significant role in reducing mortality and improving survival outcomes among affected women. Reports indicate that nearly one-fourth of all female cancer cases are breast cancer, with thousands of new cases diagnosed annually. Many women are diagnosed at an advanced stage due to limited screening services, poor access to healthcare facilities, and inadequate awareness regarding early symptoms and preventive practices. Cultural beliefs and delayed health-seeking behavior also contribute to poor survival rates. Strengthening early detection strategies such as breast self-examination and improving

community awareness can significantly reduce mortality and improve treatment outcomes (wayesa, 2025).

2.2 Risk Factors of Breast Cancer

Breast cancer can develop due to a combination of genetic, hormonal, and environmental factors. Age is considered one of the most important risk factors, as the probability of developing breast cancer increases with advancing age (Siegel et al., 2022).

Family history is another significant risk factor. Women who have close relatives diagnosed with breast cancer have a higher likelihood of developing the disease themselves (Desantis et al., 2022).

Hormonal factors such as early menarche, late menopause, and prolonged exposure to estrogen are also associated with increased risk of breast cancer (Sung et al., 2021).

Lifestyle-related factors including obesity, lack of physical activity, smoking, and alcohol consumption may further increase the risk of breast cancer development (Bray et al., 2021)

2.3 Signs and Symptoms of Breast Cancer

Early recognition of breast cancer symptoms is essential for timely diagnosis and treatment. The most common symptom of breast cancer is a painless lump or thickening in the breast tissue (ACS, 2023).

Other symptoms may include changes in breast shape or size; skin dimpling, redness, nipple inversion, or abnormal nipple discharge (Siegel et al., 2022). Awareness of these warning signs encourages women to seek medical consultation at an earlier stage, which can improve treatment outcomes and survival rates (Desantis et al., 2022).

2.4 Breast Cancer Screening

Screening is an important strategy for detecting breast cancer before symptoms appear. Common screening methods include breast self-examination (BSE), clinical breast examination (CBE), and mammography (ACS, 2023).

Breast self-examination allows women to regularly check their breasts for unusual changes, while clinical breast examination is conducted by trained healthcare professionals. Mammography is considered one of the most effective imaging techniques for early detection of breast cancer (Sung et al., 2021).

Despite the availability of screening methods, many women in developing countries do not participate in regular screening due to lack of awareness and limited access to healthcare services (Bray et al., 2021).

2.5. Breast Cancer Knowledge among Women

A cross-sectional study conducted online showed that participant had insufficient knowledge about breast cancer. After excluding ineligible participants, more than 400 responses were analyzed. The majorities of participants were young adults between 20 and 30 years of age, and most were

unmarried and had no children. More than half had completed or were pursuing undergraduate education and a large proportion were students. The findings revealed that overall knowledge regarding breast cancer risk factors and screening practices was inadequate, indicating the need for structured educational interventions even among educated populations (Shahid et al., 2023).

2.6. Knowledge and Screening Behavior among Students

A cross-sectional study conducted among university students in Nigeria evaluated their knowledge, attitudes, and screening behaviors related to breast cancer. The results showed that although breast cancer cannot always be prevented, early detection significantly improves treatment outcomes and survival rates. Screening methods such as breast self-examination (BSE), clinical breast examination (CBE), and mammography help in identifying abnormalities at an early stage and are widely recommended for improving early diagnosis. The study highlighted the importance of educational exposure in improving awareness and preventive behaviors (Yusuf et al., 2022).

2.7. Delayed Presentation and Barriers to Care

A cross-sectional study analysis of data from a prospective cohort of breast cancer patients revealed the most common reasons for delayed presentation were lack of awareness about the cause of symptoms (41.5%), low perceived severity of symptoms (27.7%), and fear of surgical intervention (26.2%). Nearly half of the breast cancer patients in our setting delayed seeking medical care, and 64.7% experienced a delay in diagnosis. These delays were associated with a higher likelihood of presenting at a more advanced stage of the disease (Hutajulu et al., 2022).

2.8. Breast Cancer Awareness in Pakistan

Despite the increasing burden of breast cancer in Pakistan, systematic documentation and nationwide awareness efforts remain limited. Although cancer registries exist, they do not fully represent the actual disease burden due to incomplete reporting and limited coverage. National-level awareness campaigns regarding early warning signs of cancer have been rare. As a result, many women remain unaware of early symptoms and available screening options. Improving organized awareness programs and strengthening public health policies are essential to promote early diagnosis and reduce mortality rates in the country (Qasim et al., 2025).

Breast cancer is a progressive disease that can advance from a small localized abnormality to a life-threatening condition if not diagnosed early. Timely detection and appropriate management greatly improve survival outcomes and quality of life. In Pakistan, socioeconomic challenges and limited healthcare funding contribute to delayed diagnosis. Many women seek medical care only when symptoms become severe. Therefore, promoting awareness about early warning signs and encouraging screening practices such as (BSE), (CBE) and mammography are critical steps toward reducing late-stage presentation (Qasim et al., 2025).

2.9. Research Gap

Although numerous studies have explored breast cancer awareness among students and community populations, limited research has directly compared knowledge levels between educated and uneducated females in a community setting.

There is a need for community-based comparative research focusing on women aged 18–50 years to identify educational disparities in awareness. Understanding these differences will help develop targeted public health strategies aimed at reducing late-stage presentation and improving survival outcomes.

Addressing these gaps requires multi-faceted approaches that combine health education, professional training, and policy interventions tailored to specific populations and settings

2.10. Conceptual framework

The conceptual framework of this study shows the relationship between the independent variables and the dependent variable. In this study, age and educational level are considered independent variables that may influence women's knowledge related to breast cancer. Differences in age and level of education can affect access to health information, awareness, and understanding of breast cancer. The dependent variable is knowledge related to breast cancer, which includes awareness about its risk factors, signs and symptoms, and methods of early detection. The arrows in the framework indicate that age and educational level may influence the level of knowledge regarding breast cancer among women.

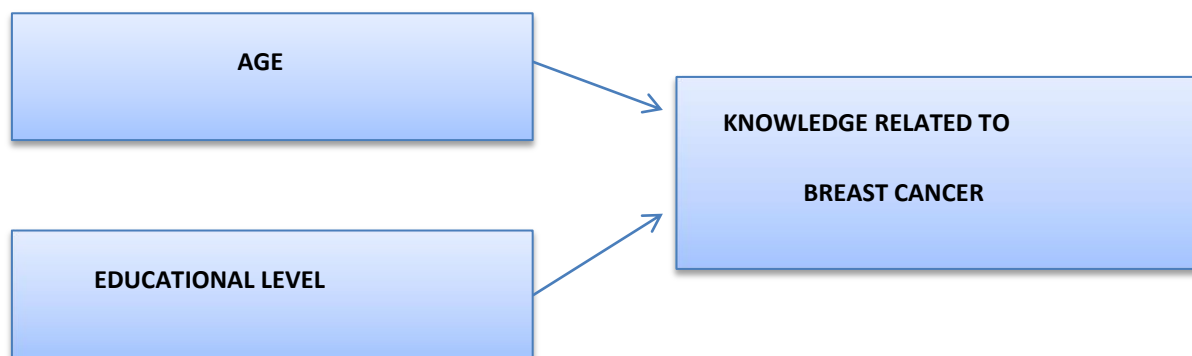


Figure 2.1: Conceptual framework showing the relationship between age, educational level, and knowledge related to breast cancer.

3. METHODS AND MATERIALS

3.1. Study Design

A quantitative comparative cross-sectional study design was used to assess and compare breast cancer knowledge among educated and uneducated females aged 18-50 years in a community setting.

3.2. Study Setting

The study was conducted in Haji Hoth Chandio, District Tando Muhammad Khan, and Sindh, Pakistan.

Haji Hoth Chandio is a community consisting of women from different educational and socio-economic backgrounds. The setting was selected because it provided access to both educated and uneducated females within required age group.

3.3. Study Population

The study population of the study consisted of 76 females aged 18-50 years residing in Haji Hoth Chandio.

3.4. Sample Size

Sample size was calculated by using Raosoft sample size calculator. The Total population of females aged 18-50 years in the haji hoth chandio was 76.

The following parameters were used for calculation:

Confidence Level: 95%

Margin of Error: 5%

Response Distribution: 50%

Population Size (N): 76

A 95% confidence level was selected to ensure a high degree of certainty in the results. A margin of error of 5% was considered acceptable for social science research. The response distribution was set at 50% because it provides the maximum sample size when the true proportion is unknown.

Based on these parameters, the minimum recommended sample size was 64 participants.

The sample was equally divided into:

32 Educated females

32 Uneducated females

3.5. Sampling Technique

A probability simple random sampling technique was used to select participants from the total population of 76 females.

A list of all eligible females was prepared. Each individual was assigned a number, and 64 participants were selected using the lottery method. This ensured that every individual in the population had an equal chance of being selected.

3.6. Inclusion and Exclusion Criteria

Inclusion Criteria

Females aged 18-50 years

Residents of Haji Hoth Chandio

Provided informed consent

Exclusion Criteria

Females aged less 18 and above 50 years
Healthcare professionals (as they may have higher medical knowledge)
Those who refuse to participate

3.7. Data Collection Tool

Data were collected using a structured questionnaire adopted from a previously published and validated study conducted by Acharya et al. (2023), titled “A Comparative Study of Breast Cancer Awareness in Urban and Rural Females” published in the Journal of Clinical and Diagnostic Research.

The instrument consisted of two sections:

Section A: Demographic information

- Age
- Educational level

Section B: General awareness of breast cancer

Section C: Knowledge of risk factors

Section D: Knowledge of:

- Sign and Symptoms
- Screening methods
- Breast Self Examination Awareness
- Source of information

The questionnaire included multiple-choice and close-ended questions.

3.8. Validity and Reliability**Validity**

The questionnaire was adopted from a previously validated study by Acharya et al. (2023), ensuring content validity. The instrument was further reviewed by subject experts to ensure appropriateness for the local community. Necessary modifications were made based on expert recommendations.

Reliability

A pilot study was conducted on 6 participants (10% of the sample size), who were not included in the final study, to assess clarity, feasibility, and consistency of the questionnaire.

Feedback from the pilot study indicated that the questions were clear and understandable. Minor adjustments were made to improve clarity. The tool was therefore considered reliable for the main study.

3.9. Study variables

Independent Variable

Educational Status (Educated and Uneducated Females)

Educational status is considered the independent variable because the level of education may influence the knowledge of breast cancer.

Dependent Variable

Knowledge of Breast Cancer

Knowledge level regarding risk factors, signs and symptoms, screening methods, and prevention of breast cancer is the dependent variable. It will be measured using a structured questionnaire and categorized into good, moderate, and poor knowledge based on the scoring criteria.

3.10. Data Collection Procedure

Prior to data collection, permission was obtained from the community authorities of Haji Hoth Chandio.

Participants were informed about the purpose and objectives of the study. Written informed consent was obtained from each participant. Data were collected through face-to-face interviews using the structured questionnaire.

Confidentiality and anonymity were strictly maintained throughout the data collection process.

3.11. Duration of Study

Study was conducted over a period of 04 Month December to March.

3.12. Ethical Considerations

Participants were informed about the purpose of the study.

Participation in the study was voluntary.

Informed consent was obtained from all participants.

Confidentiality and privacy were ensured.

Participants were informed of their right to withdraw at any time without any consequences.

3.13. Data Analysis Plan

Data were coded and entered into SPSS for analysis.

Descriptive statistics (frequency and percentage) were used to describe demographic variables and knowledge levels.

Inferential statistics such as the Chi-square test were used to compare knowledge levels between educated and uneducated females.

A p-value of less than 0.05 was considered statistically significant.

RESULTS

The data were analyzed using Statistical Package for Social Sciences (SPSS) version 23. Both descriptive and inferential statistics were applied. Frequencies and percentages were used to

describe demographic variables and knowledge-related responses. The chi-square test was applied to determine the association between educational status and knowledge of breast cancer. A total of 64 questionnaires were distributed yielding a response rate of 100%. Nearly half of the respondents (46.9%) were aged 18–30 years, while 26.6% were aged 31–40 years and 26.6% were between 41–50 years.

4.1 DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

4.1.1 Age Variable

Nearly half of the respondents, 30 (46.9%), were aged between 18 and 30 years. A similar proportion of participants were aged 31–40 years and 41–50 years, each representing 17 (26.6%) of the total sample. This indicates that the majority of participants belonged to the younger age group as shown in [Table 4.1].

Table 4.1 Shows the distribution of participants according to age group (N=64)

| AGE | FREQUENCY | PERCENT |
|-------|-----------|---------|
| 18-30 | 30 | 46.9% |
| 31-40 | 17 | 26.6% |
| 41-50 | 17 | 26.6% |

4.1.2 Educational Status

Nearly half of the respondents were uneducated (50.0%, n = 32). About 26.6% (n = 17) were graduates, while 10.9% (n = 7) had completed high school. Similarly, 10.9% (n = 7) had primary education or below, and only 1.6% (n = 1) had completed middle school. The total number of valid responses was 64 as shown in [Table 4.2].

Table 4.2 shows the distribution of participants according to their level of education.

| Level of Education | Frequency | Percent |
|--------------------|-----------|---------|
| Graduate | 17 | 26.6% |
| High school | 07 | 10.9% |
| Middle school | 01 | 1.6% |
| Primary or Below | 07 | 10.9% |
| Uneducated | 32 | 50.0% |

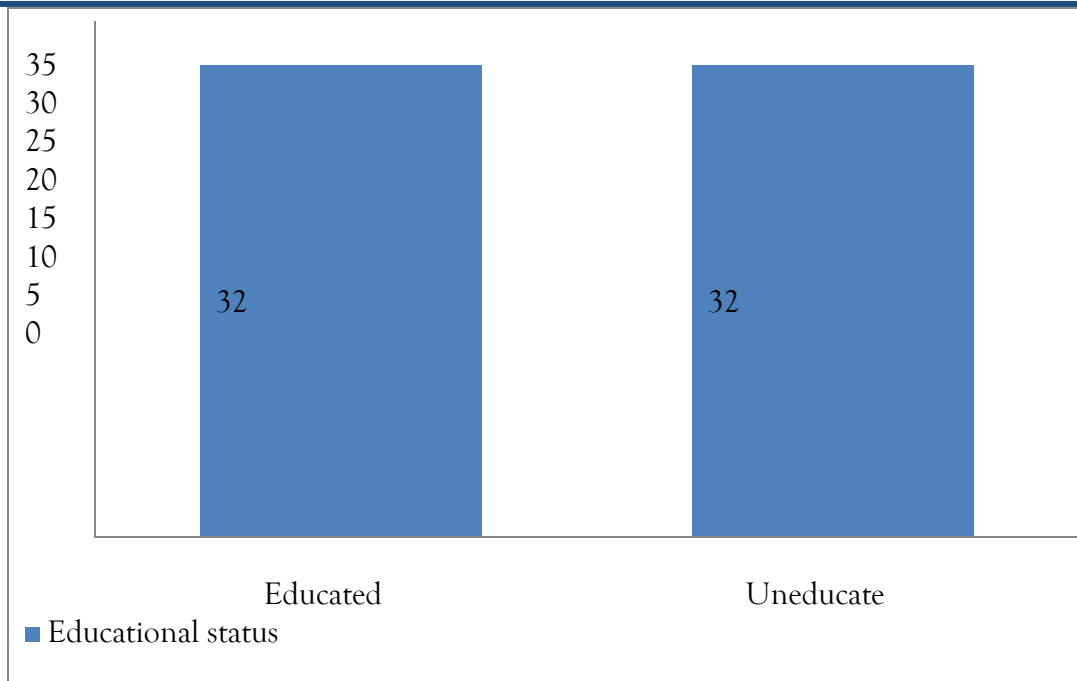


Figure 4.2: Shows participants were equally divided into educated (50%) and uneducated (50%)

For comparison purposes, participants were categorized into two groups: educated and uneducated. Those who had completed primary education or above were classified as educated (n = 32, 50%), whereas those with no formal education were classified as uneducated (n = 32, 50%) as shown in [figure2].

4.2 KNOWLEDGE OF BREAST CANCER

To examine the difference in breast cancer knowledge between educated and uneducated females, cross-tabulation and Chi-square analysis were conducted. The findings highlight variations in awareness, perception of disease commonness, and knowledge of risk factors across groups.

Table 4.3 show the comparison of general knowledge regarding breast cancer between educated (n = 32) and uneducated (n = 32) females.

| Variable | Categories | Educated (n=32) f (%) | Uneducated (n=32) f (%) | Total f (%) | P-value |
|----------------------------------------------------------------|---------------------------------------|-----------------------------|----------------------------|-------------|---------|
| Have you ever heard about breast cancer? | Yes | 28 (87.5%) | 26 (81.3%) | 54 (84.4%) | 0.17 |
| | No | 3 (9.4%) | 1 (3.1%) | 4 (6.3%) | |
| | Don't know | 1 (3.1%) | 5 (15.6%) | 6 (9.4%) | |
| What do you think about breast cancer? How common is it? | Rare disease among women | 9 (28.1%) | 6 (18.8%) | 15 (23.4%) | 0.05 |
| | Relatively common disease among women | 21 (65.6%) | 19 (59.4%) | 40 (62.5%) | |
| | Don't know | 2 (6.3%) | 7 (21.9%) | 9 (14.1%) | |
| Is the history of breast lump a risk factor for breast cancer? | Yes | 15 (46.9%) | 23 (71.9%) | 38 (59.4%) | 0.04 |
| | No | 6 (18.8%) | 4 (12.5%) | 10 (15.6%) | |
| | Don't know | 11 (34.4%) | 5 (15.6%) | 16 (25.0%) | |

4.2.1 General information of breast cancer

The majority of respondents in both groups reported that they had heard about breast cancer. Among educated females, 28 (87.5%) were aware of breast cancer compared to 26 (81.3%) among uneducated females. A small proportion of participants reported that they had not heard about breast cancer, including 3 (9.4%) educated females and 1 (3.1%) uneducated female. Additionally, 1 (3.1%) educated female and 5 (15.6%) uneducated females reported that they did not know about breast cancer. The Chi-square test showed no statistically significant association between educational status and having heard about breast cancer ($p = 0.17$) as shown in [Table 4.3].

4.2.2 Knowledge related to risk factors

A large proportion of respondents from both groups correctly identified no breastfeeding as a risk factor, including 28 (87.5%) educated females and 27 (84.4%) uneducated females, and this difference was not statistically significant ($p = 0.96$). Regarding early menarche, 6 (18.8%) educated females and 4 (12.5%) uneducated females identified it as a risk factor, while a considerable number

of participants in both groups were unsure. The difference between the groups was statistically significant ($p = 0.04$). For late menopause, 12 (37.5%) educated females recognized it as a risk factor compared to 8 (25.0%) uneducated females. The association was statistically significant ($p = 0.05$). Similarly, knowledge about use of oral contraceptive pills as a risk factor was limited in both groups, with 16 (50.0%) educated females and 15 (46.8%) uneducated females reporting that they did not know. The association between education and knowledge was statistically significant ($p = 0.01$). Regarding exposure to X-rays, half of the educated females 16 (50.0%) identified it as a risk factor compared to 9 (28.1%) uneducated females, and the difference approached statistical significance ($p = 0.05$). Both groups demonstrated very high awareness regarding lump or pain in the breast, with 31 (96.9%) educated females and all 32 (100%) uneducated females identifying it as a possible risk indicator. Similarly, nipple discharge was identified as a risk indicator by 29 (90.6%) educated females and 31 (96.8%) uneducated females. Knowledge regarding alcohol consumption and obesity showed statistically significant differences between the groups ($p = 0.01$), with educated females demonstrating slightly better awareness. Overall, although some participants were aware of certain risk factors, a considerable proportion in both groups lacked adequate knowledge about several scientifically recognized risk factors as shown in [Table 4.4].

Table 4.4 Shows the comparison of participant’s knowledge of significant risk factors (which of these do you think a reason or not a reason of breast cancer?)

| REASON FOR BREAST CANCER | Educated f (%) | Uneducated f (%) | Total f (%) | P- value |
|--------------------------|-------------------|---------------------|----------------|-------------|
|--------------------------|-------------------|---------------------|----------------|-------------|

| | | | | | |
|---------------------------------|--------------|------------|------------|------------|------|
| Early menarche | Is a reason | 06 (18.8%) | 04 (12.5%) | 10 (15.6%) | 0.04 |
| | Not a reason | 08 (25.0%) | 08 (25.0%) | 16 (25.0%) | |
| | No relation | 11 (34.4%) | 09 (28.1%) | 20 (31.3%) | |
| | Don't know | 07 (21.9%) | 11 (34.4%) | 18 (28.1%) | |
| Late menopause | Is a reason | 12 (37.5%) | 08 (25.0%) | 20 (31.3%) | 0.05 |
| | Not a reason | 09 (28.1%) | 08 (25.0%) | 17 (26.6%) | |
| | No relation | 10 (31.3%) | 08 (25.0%) | 18 (28.1%) | |
| | Don't know | 01 (3.1%) | 08 (25.0%) | 09 (14.1%) | |
| No breastfeeding | Is a reason | 28 (87.5%) | 27 (84.4%) | 55 (85.9%) | 0.96 |
| | Not a reason | 04 (12.5%) | 03 (9.4%) | 07 (10.9%) | |
| | No relation | 00 (0%) | 00 (0%) | 00 (0%) | |
| | Don't know | 00 (0%) | 02 (6.3%) | 02 (3.1%) | |
| Use of oral contraceptive pills | Is a reason | 03 (9.4%) | 02 (6.3%) | 05 (7.8%) | 0.01 |
| | Not a reason | 03 (9.4%) | 07 (21.9%) | 10 (15.6%) | |
| | No relation | 10 (31.3%) | 08 (25.0%) | 18 (28.1%) | |
| | Don't know | 16 (50.0%) | 15 (46.8%) | 31 (48.4%) | |
| Hormone replacement therapy | Is a reason | 07 (21.9%) | 05 (15.6%) | 12 (18.8%) | 0.12 |
| | Not a reason | 05 (15.6%) | 07 (21.9%) | 12 (18.8%) | |
| | No relation | 11 (34.4%) | 09 (28.1%) | 20 (31.3%) | |
| | Don't know | 09 (28.1%) | 11 (34.4%) | 20 (31.3%) | |

| | | | | | |
|---------------------------------------------|--------------|------------|------------|------------|------|
| Exposure to X-rays | Is a reason | 16 (50.0%) | 09 (28.1%) | 25 (39.1%) | 0.05 |
| | Not a reason | 05 (15.6%) | 04 (12.5%) | 09 (14.1%) | |
| | No relation | 04 (12.9%) | 02 (6.3%) | 06 (9.4%) | |
| | Don't know | 07 (21.9%) | 17 (53.1%) | 24 (37.5%) | |
| Having children at a young age | Is a reason | 01 (3.1%) | 03 (9.4%) | 04 (6.3%) | 0.79 |
| | Not a reason | 16 (50.0%) | 17 (53.1%) | 33 (51.6%) | |
| | No relation | 14 (43.8%) | 10 (31.3%) | 24 (37.5%) | |
| | Don't know | 01 (3.1%) | 02 (6.3%) | 03 (4.7%) | |
| Having first child/ Pregnancy at higher age | Is a reason | 02 (6.3%) | 02 (6.3%) | 04 (6.3%) | 0.26 |
| | Not a reason | 12 (37.5%) | 16 (50.0%) | 28 (43.8%) | |
| | No relation | 15 (46.9%) | 12 (37.5%) | 27 (42.2%) | |
| | Don't know | 03 (9.4%) | 02 (6.3%) | 05 (7.8%) | |
| Having more children | Is a reason | 01 (3.1%) | 05 (15.6%) | 06 (9.4%) | 0.39 |
| | Not a reason | 18 (56.3%) | 17 (53.1%) | 35 (54.7%) | |
| | No relation | 12 (37.5%) | 10 (31.3%) | 22 (34.4%) | |
| | Don't know | 01 (3.1%) | 00 (0%) | 01 (1.6%) | |
| Frequent Abortion | Is a reason | 03 (9.4%) | 05 (15.6%) | 08 (12.5%) | 0.51 |
| | Not a reason | 04 (12.5%) | 08 (25.0%) | 12 (18.8%) | |
| | No relation | 13 (40.6%) | 06 (18.8%) | 19 (29.7%) | |
| | Don't know | 12 (37.5%) | 13 (40.6%) | 25 (39.1%) | |

| | | | | | |
|-----------------------------|--------------|------------|------------|------------|------|
| Lump/ Pain in the breast | Is a reason | 31 (96.9%) | 32 (100%) | 63 (98.4%) | 0.08 |
| | Not a reason | 00 (0%) | 00 (0%) | 00 (0%) | |
| | No relation | 00 (0%) | 00 (0%) | 00 (0%) | |
| | Don't know | 01 (3.1%) | 00 (0%) | 01 (1.6%) | |
| Nipple Discharge | Is a reason | 29 (90.6%) | 31 (96.8%) | 60 (93.8%) | 0.60 |
| | Not a reason | 00 (0%) | 00 (0%) | 00 (0%) | |
| | No relation | 00 (0%) | 00 (0%) | 00 (0%) | |
| | Don't know | 03 (9.4%) | 01 (3.1%) | 04 (6.3%) | |
| Alcohol Consumption | Is a reason | 12 (37.5%) | 04 (12.5%) | 16 (25.0%) | 0.01 |
| | Not a reason | 05 (15.6%) | 11 (34.4%) | 17 (26.6%) | |
| | No relation | 04 (12.5%) | 13 (40.6%) | 13 (20.3%) | |
| | Don't know | 11 (34.4%) | 04 (12.5%) | 18 (28.1%) | |
| Obesity | Is a reason | 07 (21.9%) | 04 (12.5%) | 11 (17.2%) | 0.01 |
| | Not a reason | 04 (12.5%) | 10 (31.3%) | 14 (21.9%) | |
| | No relation | 09 (28.1%) | 05 (15.6%) | 22 (34.4%) | |
| | Don't know | 12 (37.5%) | 06 (18.8%) | 17 (26.6%) | |
| Use of Tight inner garments | Is a reason | 29 (90.6%) | 26 (81.3%) | 55 (85.9%) | 0.83 |
| | Not a reason | 00 (0%) | 01 (3.1%) | 01 (1.6%) | |
| | No relation | 00 (0%) | 02 (6.3%) | 02 (3.1%) | |
| | Don't know | 03 (9.4%) | 03 (9.4%) | 06 (9.4%) | |

| | | | | | |
|--------------------------------|--------------|------------|------------|------------|------|
| Excessive Exposure to Sunlight | Is a reason | 06 (18.8%) | 00 (0%) | 06 (9.4%) | 0.03 |
| | Not a reason | 09 (28.1%) | 09 (28.1%) | 18 (28.1%) | |
| | No relation | 04 (12.5%) | 08 (25.0%) | 12 (18.8%) | |
| | Don't know | 13 (40.6%) | 15 (46.9%) | 28 (43.8%) | |

4.2.3 Knowledge Related to early warning signs.

The results indicate that most participants in both groups recognized pain in one breast as a possible warning sign, including 31 (96.9%) educated females and 30 (93.7%) uneducated females. However, the association between education and knowledge was not statistically significant ($p = 0.58$). Similarly, a high proportion of respondents correctly identified lump in the neck or armpit as a warning sign, with 30 (93.8%) educated females and 31 (96.9%) uneducated females responding “yes”. Regarding nipple discharge in nonpregnant females, awareness was higher among educated females (31; 96.9%) compared to uneducated females (23; 71.8%), although the difference was not statistically significant ($p = 0.09$). For skin changes of the breast, 29 (90.6%) educated females and 24 (75.0%) uneducated females recognized it as a warning sign.

All participants from both groups correctly identified breast lump as an early sign of breast cancer (100%). However, knowledge regarding cyclical breast pain and breast asymmetry since childhood was comparatively lower in both groups. Overall, the findings suggest that although many participants were aware of the common warning signs such as breast lumps and pain, knowledge regarding other early signs remained limited as shown in [Table 4.5].

Table 4.5 Shows the comparison of participant’s knowledge of early warning signs of breast cancer (which of following do you think is an early sign of breast cancer?)

| EARLY WARNING SIGNS OF BREAST | | Educated f (%) | Uneducate d f (%) | Total f (%) | P-value |
|-------------------------------|-----|----------------|-------------------|-------------|---------|
| Pain in one breast | Yes | 31 (96.9%) | 30 (93.7%) | 61 (95.3%) | 0.58 |
| | No | 01 (3.1%) | 02 (6.3%) | 03 (4.7%) | |

| | | | | | |
|------------------------------------------|-----|------------|------------|------------|------|
| Cyclical/Monthly pain in both breast | Yes | 10 (31.3%) | 05 (15.6%) | 15 (23.4%) | 0.20 |
| | No | 22 (68.8%) | 27 (84.4%) | 49 (76.6%) | |
| Nipple Discharge in non-pregnant females | Yes | 31 (96.9%) | 23 (71.8%) | 54 (84.4%) | 0.09 |
| | No | 01 (3.1%) | 09 (28.1%) | 10 (15.6%) | |
| Lump in Neck/Armpit | Yes | 30 (93.8%) | 31 (96.9%) | 61 (95.3%) | 0.33 |
| | No | 01 (3.1%) | 01 (3.1%) | 02 (3.1%) | |
| Skin changes of breast | Yes | 29 (90.6%) | 24 (75%) | 53 (82.8%) | 0.26 |
| | No | 03 (9.4%) | 08 (25.0%) | 11 (17.2%) | |
| Breast Lump | Yes | 32 (100%) | 32 (100%) | 64 (100%) | |
| | No | 00 (0%) | 00 (0%) | 00 (0%) | |
| Asymmetry of breast since childhood | Yes | 06 (18.8%) | 03 (9.4%) | 09 (14.1%) | 0.22 |
| | No | 26 (81.3%) | 19 (59.4%) | 45 (70.3%) | |

4.2.4 Knowledge of Breast Cancer Screening Tool

Table 4.6 Shows the comparison of participant's knowledge of breast cancer screening tools

| Questions | Educated | Uneducated | Total f (%) | f (%) | f (%) | Pvalue |
|-----------|----------|------------|-------------|-------|-------|--------|
|-----------|----------|------------|-------------|-------|-------|--------|

Are you aware of detection methods for breast cancer? Yes 08 (25.0%) 02 (6.3%) 10 (15.6%) No 11 (34.4%) 20 (62.5%) 31 (48.4%)

Don't know 13 (40.6%) 10 (31.3%) 23 (35.9%)

Have you heard of mammogram? Yes 05 (15.6%) 01 (3.1%) 06 (9.4%) No 27 (84.4%) 31 (96.9%) 58 (90.6%)

Do you think are an effective method? Yes 07 (21.9%) 04 (12.5%) 11 (17.2%) No 02 (6.3%) 00 (0%) 02 (3.1%) Don't know 23 (71.9%) 28 (87.5%) 51 (79.7%)

Do you know any other screening method for breast carcinoma? Yes 08 (25.0%) 00 (0%) 08 (12.5%) No 05 (15.6%) 18 (56.3%) 23 (35.9%) Don't know 19 (59.4%) 14 (43.75%) 33 (51.6%)

Do you know how to perform breast self-examination (BSE)? Yes 10 (31.3%) 01 (3.1%) 11 (17.2%) No 22 (68.8%) 31 (96.9%) 53 (82.8%)

Do you feel BSE is performing important? Yes 29 (90.6%) 30 (93.8%) 59 (92.2%) No 03 (9.4%) 02 (6.3%) 05 (7.8%)

| | | | | | |
|------------------------------------------------------------------|-------------------------------------------|------------|------------|------------|------|
| Have you ever examined your breast? | Yes , Monthly | 01 (3.1%) | 00 (0%) | 01 (1.6%) | 0.59 |
| | Yes , but sometimes | 05 (15.6%) | 03 (9.4%) | 08 (12.5%) | |
| | No | 26 (81.3%) | 29 (90.6%) | 55 (85.9%) | |
| Your reason for not performing BSE I have not heard of it before | Never felt necessary | 05 (15.6%) | 01 (3.1%) | 06 (9.4%) | 0.39 |
| | Don't know how to do | 16 (50.0%) | 11 (34.4%) | 27 (42.2%) | |
| | I feel shy to do it | 03 (9.4%) | 01 (3.1%) | 04 (6.3%) | |
| | Unaware of proper technique | 02 (6.3%) | 04 (12.5%) | 06 (9.4%) | |
| | I don't think young people can get cancer | 00 (0%) | 00 (0%) | 00 (0%) | |
| Your source of information | TV | 23 (71.9%) | 23 (71.9%) | 46 (71.9%) | 0.38 |
| | Newspaper / Magazine | 01 (3.1%) | 01 (3.1%) | 02 (3.1%) | |
| | Friend or relative with cancer | 05 (15.6%) | 08 (25.0%) | 13 (20.3%) | |
| | Medical Professionals | 03 (9.4%) | 00 (0%) | 03 (4.6%) | |
| | Previous Screening Camps | 00 (0%) | 00 (0%) | 00 (0%) | |
| | School Curriculum | 00 (0%) | 00 (0%) | 00 (0%) | |

| Your Response | Do nothing | 00 (0%) | 00 (0%) | 00 (0%) if 0.10 |
|----------------------------------------------------------------|------------------------------|------------|------------|-----------------|
| you find a breast lump | Inform a friend | 22 (68.8%) | 24 (75%) | 46 (71.9%) |
| Consult an 03 or (9.4%) 00 (0%) female family member 03 (4.7%) | Consult an ayurvedic doctor | 07 (21.9%) | 08 (25.0%) | 15 (23.4%) |
| | Consult an allopathic doctor | | | |

Only a small proportion of respondents were aware of breast cancer detection methods, including 8 (25.0%) educated females and 2 (6.3%) uneducated females. The association between education and awareness was statistically significant ($p = 0.02$). Awareness about mammography was very low in both groups. Only 5 (15.6%) educated females and 1 (3.1%) uneducated female reported having heard of mammography. Similarly, knowledge regarding the effectiveness of mammograms was limited, with the majority of participants in both groups indicating that they did not know. Regarding other screening methods, 8 (25.0%) educated females reported awareness compared to none of the uneducated females. This difference was statistically significant ($p < 0.001$). Knowledge of breast self-examination (BSE) was also significantly higher among educated females, where 10 (31.3%) reported knowing how to perform BSE compared to only 1 (3.1%) uneducated female ($p < 0.001$). Despite limited knowledge, most participants from both groups believed that performing BSE is important, including 29 (90.6%) educated females and 30 (93.8%) uneducated females. However, the majority of respondents reported not performing BSE regularly, with 26 (81.3%) educated females and 29 (90.6%) uneducated females indicating that they had never examined their breasts. The most common reasons for not performing BSE included lack of knowledge about how to perform the technique and lack of awareness about breast self-examination. The most common source of information about breast cancer for both groups was television, reported by 23 (71.9%) participants in each group as shown in [Table 4.6].

4.3 SUMMARY

The results of the study conducted to compare breast cancer knowledge among educated and uneducated females aged 18–50 years in a community setting. A total of 64 participants were included in the study, with equal representation of educated ($n = 32$) and uneducated females ($n = 32$). Regarding demographic characteristics, the majority of participants were aged between 18–30 years (46.9%), followed by participants aged 31–40 years and 41–50 years, each representing 26.6% of the sample. In terms of educational status, half of the respondents had no formal education, while

the remaining participants had varying levels of education ranging from primary to graduate level. The findings indicated that overall awareness of breast cancer was relatively high among both groups. Most respondents reported that they had heard about breast cancer, including 87.5% of educated females and 81.3% of uneducated females. However, uncertainty regarding the disease was more common among uneducated participants. With regard to knowledge of breast cancer risk factors, the results showed varying levels of awareness between the two groups. A large proportion of participants correctly identified lack of breastfeeding as a risk factor. However, knowledge regarding other risk factors such as early menarche, late menopause, oral contraceptive use, obesity, alcohol consumption, and exposure to X-rays was limited, particularly among uneducated females. Several associations between educational status and knowledge of specific risk factors were found to be statistically significant. In terms of knowledge of early warning signs, most participants recognized breast lump, breast pain, nipple discharge, and lump in the armpit as possible warning signs of breast cancer. However, knowledge regarding other symptoms such as cyclical breast pain and breast asymmetry was comparatively lower in both groups. Knowledge regarding breast cancer screening methods was generally low among the participants. Only a small proportion of respondents were aware of mammography and other detection methods. Awareness and knowledge of breast self-examination (BSE) were significantly higher among educated females compared to uneducated females. Despite limited knowledge about the technique, the majority of participants believed that performing breast self-examination is important. Furthermore, most participants reported that they had never practiced breast self-examination. The most common reasons for not performing BSE included lack of knowledge about the correct technique and lack of awareness about breast cancer screening practices. Television was identified as the most common source of information about breast cancer among both groups. Overall, the findings suggest that although general awareness of breast cancer exists within the community, detailed knowledge regarding risk factors, early warning signs, and screening practices remains inadequate. Educational status appeared to influence knowledge levels in several areas, indicating the need for targeted health education programs to improve awareness and promote early detection practices among women.

DISCUSSION

5.1 DISCUSSION

The present study was conducted to assess and compare the level of knowledge regarding breast cancer among educated and uneducated females aged 18–50 years in a community setting. The findings of the study indicate that although general awareness of breast cancer exists among women in the community, the level of detailed knowledge regarding risk factors, warning signs, and screening practices remains inadequate, particularly among uneducated females.

The results showed that the majority of participants had heard about breast cancer. However, awareness was slightly higher among educated females compared to uneducated females. This suggests that Educational level significantly influences women's ability to obtain health information and improves their understanding of diseases such as breast cancer. Women with higher educational

levels are more likely to receive health information through formal education, media, and healthcare services. Similar findings were reported in previous studies, which indicated that educational status significantly influences women's awareness and understanding of breast cancer and its prevention.

Regarding knowledge of breast cancer risk factors, the study revealed varying levels of awareness among participants. While a large proportion of women correctly identified certain risk factors such as lack of breastfeeding and breast lumps, knowledge regarding other scientifically recognized risk factors such as early menarche, late menopause, obesity, alcohol consumption, and use of oral contraceptive pills was relatively limited. Educated females demonstrated slightly better knowledge of these factors compared to uneducated females. This finding is consistent with earlier studies which reported that women with higher educational backgrounds tend to have better understanding of health-related issues due to increased exposure to information sources.

The findings related to early warning signs of breast cancer showed that most participants were able to recognize common symptoms such as breast lumps, pain in the breast, nipple discharge, and lumps in the armpit. However, awareness of other early signs such as skin changes of the breast and breast asymmetry was comparatively lower. These results indicate that although women may recognize some common symptoms, comprehensive knowledge of breast cancer warning signs remains limited.

The study also highlighted a significant lack of awareness regarding breast cancer screening methods. Only a small proportion of participants had knowledge about mammography and other detection methods. Similarly, knowledge about breast self-examination (BSE) was limited, especially among uneducated females. Although many participants believed that performing breast self-examination is important, the majority reported that they had never practiced it. The most common reasons included lack of knowledge about the correct technique and lack of awareness regarding the importance of regular screening. Similar trends have been reported in several studies from developing countries, where knowledge and utilization of breast cancer screening methods are still limited.

Furthermore, the study identified television as the most common source of information about breast cancer among participants. This suggests that Media platforms such as television, radio, and the internet serve as major sources for spreading health information to the community. However, reliance on media alone may not be sufficient to provide comprehensive knowledge. Therefore, community-based education programs and health promotion activities are necessary to improve awareness and encourage preventive practices.

Overall, the findings of this study demonstrate that educational status significantly influences the level of knowledge about breast cancer among women. Educated females generally exhibited better awareness of risk factors, symptoms, and screening practices compared to uneducated females. These results highlight the importance of targeted health education programs aimed particularly at women with lower educational backgrounds in order to improve awareness and promote early detection of breast cancer.

CONCLUSION

This study aimed to assess and compare the level of knowledge regarding breast cancer among educated and uneducated females aged 18–50 years. The findings of the study indicate that although general awareness about breast cancer exists among women, the overall level of detailed knowledge regarding its risk factors, warning signs and early detection methods remains inadequate.

The results showed that educated females demonstrated a relatively higher level of knowledge about breast cancer compared to uneducated females. Education appeared to play a significant role in improving women's understanding of breast cancer, its symptoms, risk factors, and the importance of early detection. Educated participants were more likely to recognize warning signs and had better awareness regarding screening practices.

However, despite the presence of some awareness, important gaps in knowledge were identified, particularly among uneducated females. Limited knowledge about breast self-examination, screening methods such as mammography, and certain risk factors may contribute to delayed diagnosis and treatment of breast cancer.

Overall, the study highlights that educational status has a strong influence on women's awareness and understanding of breast cancer. Increasing community-based education and awareness programs is essential to improve knowledge, promote early detection practices, and reduce the burden of breast cancer among women.

STRENGTHS OF THE STUDY

This study has several strengths. First, it focused on comparing awareness levels between educated and uneducated females, which provided valuable insight into how education influences health knowledge. Second, the study used a structured questionnaire to collect data directly from participants, ensuring consistency in responses. Third, the use of statistical analysis helped in identifying differences between the two groups and strengthened the validity of the findings.

LIMITATIONS OF THE STUDY

Despite its strengths, the study has certain limitations. The sample size of the study was relatively small, which may limit the generalizability of the findings. In addition, the study was conducted in a limited geographic area, and therefore the results may not represent the awareness level of all women in the wider population. Another limitation is that the data were based on self-reported responses from participants, which may be influenced by recall bias or personal perceptions.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are suggested:

Health education programs should be organized in communities to increase awareness about breast cancer, particularly targeting women with low educational backgrounds.

Nurses and community health workers should actively participate in educating women about breast cancer risk factors, early warning signs, (BSE), and available screening methods.

Mass media campaigns through television, radio, and social media should be utilized to disseminate accurate information about breast cancer and encourage women to seek early medical consultation. Community awareness workshops and seminars should be conducted in schools, colleges, and community centers to improve knowledge and promote preventive health behaviors.

Breast cancer screening programs and health camps should be organized by healthcare institutions to facilitate early detection and timely treatment.

Future research should include larger sample sizes and multiple geographic locations to provide more comprehensive data regarding breast cancer awareness among women.

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