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BREAST CANCER AWARENESS AND SELF-EXAMINATION PRACTICES AMONG WOMEN IN KARNATAKA AND KERALA, INDIA: A CROSS-SECTIONAL ANALYSIS.

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Abstract

Breast cancer is the most common cancer in women and the second leading cause of cancer-related deaths in the United States. It usually begins in the breast tissue, most often in the milk ducts or lobules that produce milk. It is the second most common non-skin cancer globally, accounting for 10.4% of all cancers in women and ranking as the fifth leading cause of cancer deaths worldwide. In 2004, it caused 519,000 deaths, accounting for 7% of all cancer deaths. Like other cancers, it is named according to the abnormal growth of cells in the breast tissue. Early detection of breast cancer is important because it significantly improves treatment outcomes and survival rates. Awareness of risk factors and self-examination practices can aid in early detection. A study undertaken in Karnataka and Kerala, India, of 450 women with regard to their awareness and practice regarding breast cancer, self-examination was reported. In Kerala, better access to healthcare and increased public health campaigns might explain the relatively higher awareness found among these women. Women in Karnataka

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had low awareness, and SBE was even less practiced by them. Socio- demographic factors like age, education, and income were influential for knowledge and adoption of preventive practices. The growing burden of breast cancer notwithstanding, less than 40% of the women in both states could perceive the significance of early detection. Targeted education programs in the rural sectors should be provided to bring out more awareness and encourage practices for early detection.

1 Introduction

Breast cancer is the most frequent female cancer and one of the most frequent causes of cancer-related death. It typically begins in the milk ducts or lobules of the breast. Early detection is important because it enhances survival. Awareness and self-breast examination (SBE) are important in early detection. A Karnataka and Kerala, India study revealed that the women in Kerala were more aware due to better access to healthcare, whereas women in Karnataka had poorer awareness and practice of SBE. Socio-demographic variables such as income, education, and age had an effect on knowledge and preventive behavior. Rural area education should be specifically targeted to improve awareness and early detection activities.[1–3]

Breast cancer constitutes 14% of all cancers among Indian women, with one case being diagnosed every four minutes. More than 50% of the patients present at advanced stages, resulting in lower survival rates—60% in India and 80% in the U.S. Perpetual lack of awareness, combined with fewer early screenings, causes the disease to be diagnosed late. In major cities, breast cancer constitutes 25–32% of cancers among women, with several cases identified in women between the ages of 25–50. Increasing incidence of cancers underscores the need for early detection that is critical now. Hopeful approaches are non-invasive biomarker screening through blood, e.g., the identification of autoantibodies and tumor-specific DNA methylation.[4–6]

Clinical breast examination (CBE) aids in the early detection of breast cancer in women

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not undergoing regular screening or younger than 40 years. Although its importance has diminished in the era of widespread mammography, CBE remains of utility. A study of 468 women demonstrated sensitivity for CBE rising with increasing tumor size (17% for tumors ≤0.5 cm to 58% for ≥2.1 cm) but falling with increasing body weight (48% in lowest weight group compared to 23% in highest), indicating its performance varies by size of the tumor and body weight.[7]

Breast self-examination (BSE) is heavily promoted for the detection of early breast cancer, yet no studies have shown it lowers mortality. Its sensitivity is poor (20–30%) and decreases with increasing age. Training enhances detection of small lumps but increases false positives, reducing accuracy. The psychological impact and cost of introducing BSE are still unknown. Although BSE is promising, further research is necessary to validate its use as a useful screening method.[8]

Risk factors for breast cancer are genetics (family/personal history), early menarche, late menopause, and age. Lifestyle risk factors are alcohol, smoking, high-fat diet, obesity, low physical activity, and late age at first pregnancy. Other risk factors are failure to breastfeed, use of hormones, radiation, and pollution, indicating a complex interconnection between lifestyle, environment, and genetics. The Pradhan Mantri Jan Arogya Yojana provides Rs. 5 lakh per year health cover to more than 10.74 crore poor families. It enhances the availability of cancer care, such as affordable treatment, and seeks to enhance cancer data integration and monitoring throughout India. [9-10] [9]

2 Experimental Procedure

2.1 Survey Design

This descriptive cross-sectional study proposes to evaluate awareness, early detection, and efficacy of breast cancer control measures in college students and women aged 18–50 and >50 in Karnataka and Kerala in the 2024–2025 academic year.

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2.2 Population Analysis

The study included 450 participants—205 from Kerala and 245 from Karnataka. All participants, including college students and women, completed the questionnaires, providing comprehensive data on their knowledge and practices regarding breast cancer prevention and screening.

2.3 Data Collection

Information was gathered using a socio-demographic survey form and documented in Microsoft Excel.

2.4 Socio demographic Characteristics data form

The socio-demographic questionnaire collected data on age, education level, awareness about breast cancer, knowledge about self-examination, sources of information, and allied health insurance.

2.5 Microsoft excel

Microsoft Excel was used to gather, store, and analyze responses, aiding the evaluation of awareness and practices of breast cancer among participants.

2.6 Data Analysis

Data were examined employing Microsoft Excel and descriptive statistics to evaluate participants' opinions regarding breast self-examination, early detection, professional screening tests, and knowledge regarding health insurance associated with breast cancer.

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3 Result and Discussion

3.1 Result

This project, done in 2025, will seek to determine women's knowledge, awareness, and self-examination behaviors for early detection of breast cancer. It will also determine the efficiency of these behaviors in detecting breast cancer.

In Karnataka, it is largely dominated by the youth population (18–24 years), who primarily live in the urban areas, followed by rural and sub-urban areas.

Figure 3.1.1: Age and Location Distribution in Karnataka

Kerala also experiences the same, with a predominantly urban-based young population. Nonetheless, older ages are more widely spread in the rural areas, reflecting a broader age distribution over regions.

Figure 3.1.2: Age and Location Distribution in Kerala

The results indicate an increase in incidence of menopause with age, the lowest in 40–45 years and sharply rising in the 45–50 and 50+ years groups. This is consistent with the common menopause age range of 45–55 with a peak over 50 years of age.

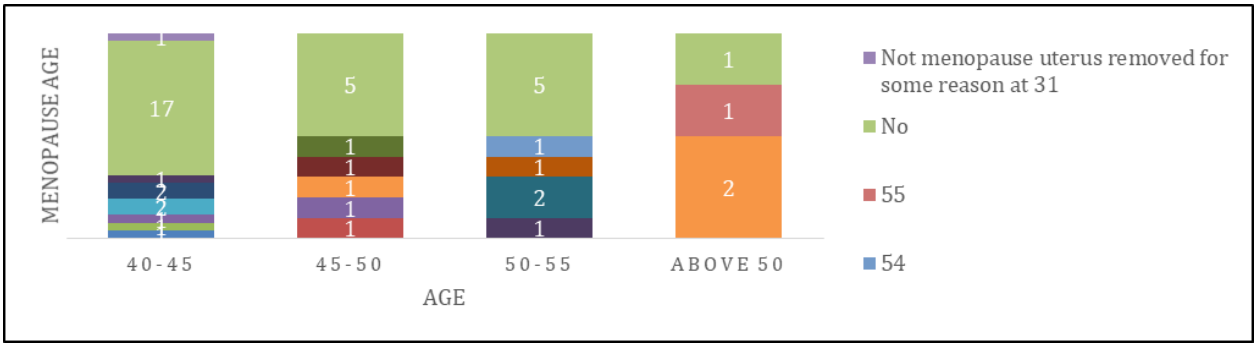

Figure 1:

3.1.1

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Figure 3.1.3: Distribution of Menopause Age When it comes to breast cancer awareness, the most aware (77%) are in the 18–24 age group. This is most probably attributed to targeted campaigns at schools, colleges, and on social media, which exhibits the power of such campaigns in educating young people.

Figure 3.1.4: Sources of Breast Cancer Awareness by Age Group

Younger females (18–34) exhibit increased levels of clinical breast examinations (CBEs), possibly as a result of focused awareness campaigns and improved health education access. Yet, numerous individuals in the 18–24 age bracket indicate not doing breast self-examinations (BSE), suggesting a shortfall in routine self-checking behavior. Older groups are more likely to practice CBE and BSE consistently, perhaps because there is greater health awareness with advancing age.

Figure 3.1.5: Comparative Analysis of Clinical Breast Examination

Awareness of breast cancer insurance and policies varies by age group, with younger people showing more uncertainty, while older groups tend to have clearer—though still limited—awareness.

Figure 3.1.6: Knowledge of breast cancer insurance and policies in India

The graph is an illustration of breast changes by age group and symptoms such as changes and nipple discharge. The majority of women reported no visible changes, implying either absence of symptoms or minimal self-monitoring.

Figure 3.1.7: Distribution of Noticed Changes in the Brest

3.2 Discussion

3.2.1 Socio-Demographic Characteristics of Study Participants

In this sample of 450 women, 245 were from Karnataka and 205 from Kerala. In Karnataka, the majority of women resided in urban settings (55.91%), of whom 9% had never experienced menopause and 5% had experienced menopause. In Kerala, urban dwellers accounted for 47.32%, of whom 5% were not menopausal and 3% were menopausal

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3.2.2 Awareness of Brest cancer and source of information

The research indicates that the majority of women know about breast cancer, learning about it mainly through schools (38.88%) and media (31.55%), with fewer learning from family or health campaigns. Although 72.4% know that early detection can cure, and many know about breast self-exams, practice is low. This is indicative of a knowledge-action gap, reinforcing the importance of paying more attention to encouraging practical health behaviors.

3.2.3 Challenges and Importance of Breast Cancer Screening Practices: A Global Perspective

Breast cancer screening practices like BSE, CBE, and mammography show low awareness and participation among women globally. Education, symptoms, and family history significantly influence the likelihood of performing BSE or undergoing CBE. Strengthening awareness, healthcare guidance, and structured education is essential to improve early detection and screening practices.

3.2.4 Early Breast Cancer Detection: Addressing the Knowledge and Practice Gaps in BSE & CBE

More women reported no changes in their breasts or were unaware, and only a few perceived or reacted to symptoms such as lumps or shape alteration. Although awareness about simple symptoms such as lumps is moderate, knowledge of risk factors and operative BSE education is severely inadequate. This serves to highlight the pressing need for specific education in breast health, symptom awareness, and early detection procedures to instill timely consultation with a medical professional.

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3.2.5 Improving Awareness and Access to Health Insurance Policies for Breast Cancer Treatment in India

Indian women are yet to develop much awareness about breast cancer insurance policies, even as a number of government schemes such as PMJAY and Vajpayee Arogyashree exist. Most still bear the brunt of finances spent on treatment and associated costs, with most preventive care, mental health, and alternative therapies left uncovered. In order to mitigate this cost burden, greater education, greater access to insurance, and synergistic health efforts need to improve outcomes.

4 Conclusion

Breast cancer continues to be a serious public health problem in India, with wide disparities in awareness, screening, early detection, and financial readiness. Although awareness improves, particularly among educated and urban populations, there continues to be a gap between knowledge and practice. There are numerous women, especially those in rural settings, who do not perform breast self-examinations (BSE) or clinical examinations because of poor education, absence of symptoms, and socio-cultural factors. Fixing this needs experiential education, enhanced healthcare access, and enhanced insurance coverage. Media, schools, and social media play important roles in raising awareness, but efforts through communities need to be intensified. Many women are also ignorant about health insurance, and the available schemes lack provisions for covering the cost of preventive care and treatment. A more inclusive, accessible, and affordable healthcare system is essential to reduce mortality and improve outcomes across all socio-economic groups.

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References

(1) Sharma, G. N.; Sanadya, D. R.; J, Various types and management of breast cancer: an overview Adv. *Pharm Techno Res* **2010**, *1*, 109–126.

(2) Akram, M.; Iqbal,; Daniyal, Awareness and current knowledge of breast cancer. *Biological research* **2017**, *50*, 1–23.

(3) Karayurt, Ö.; Özmen, D.; Çakmakçiçetinkaya, A. Awarenessofbreast cancer risk factors and practice of breast self-examination among high school students in Turkey. *BMC public health* **2008**, *8*, 1–8.

(4) Mcguireandandrew, *Effectsofageonthedetectionandmanagementofbreastcancer Cancers* **2015**, *7*, 908–929.

(5) Williams, F.; Stephenjeanetta,; James, Geographicallocationand stage ofbreast cancer diagnosis: a systematic review ofthe literature. *JHCPU* **2016**, *27*, 1357–1383.

(6) Levenson, V. 2007.

(7) Oestreicher, N. Predictors of sensitivity of clinical breast examination (CBE). *Breast Cancer Res Treat* **2002**, *76*, 73–81.

(8) Benel-Fakirandmalika, Awareness about Breast Cancer and Breast Self-Examination among Undergraduate Female Students at the University of Agadir. A Cross- Sectional Descriptive Study, Epidemiologia. 2024; pp 385–401.

(9) Surakasula, A.; Charynagarjunapu, G.; Raghavaiah, A comparative study of pre- and post-menopausal breast cancer: Risk factors, presentation, characteristics and management. *J. Res. Pharm* **2014**, *3*, 12–18.

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