Original Research

Assessment of Awareness of Breast Cancer among Adult Women Attending OPD in a Tertiary Care Hospital in Krishnagiri, Tamil Nadu: A Cross-Sectional Study

Manjula M[1], Ponnienselvan Nethaji[2], Gokilapreethi CL[3], Vetriselvan T[4]

[1,4]Assistant Professor, Department of Community Medicine, Government Medical College Krishnagiri, Krishnagiri, [2,3]Assistant Professor, Department of Community Medicine, Government Dharmapuri Medical College Dharmapuri

How to cite this article: Manjula M, Ponnienselvan Nethaji, Gokilapreethi CL et. al. Assessment of Awareness of Breast Cancer among Adult Women Attending OPD in a Tertiary Care Hospital in Krishnagiri, Tamil Nadu: A Cross-Sectional Study. Indian Journal of Public Health Research and Development / Vol. 16 No. 3, July-September 2025.

Abstract

Background: Breast cancer is the most common cancer affecting women worldwide. Early detection through awareness and screening can help lower death rates significantly. However, in many areas, awareness and knowledge about breast cancer are still low, leading to delayed diagnosis and treatment.

Objectives: This study aimed to assess the knowledge of breast cancer and its screening methods among adult women attending the OPD of a tertiary care hospital and to identify factors influencing this knowledge.

Materials and Methods: This hospital-based cross-sectional study was conducted among 400 adult women visiting the OPD of a tertiary care teaching hospital in Krishnagiri, Tamil Nadu. Data were collected on socio-demographic details, awareness of breast cancer symptoms, risk factors, and screening methods using a semi-structured questionnaire administered by an interviewer.

Results: The average age of the participants was 42.3 years. Around 68.3% of women had heard of breast cancer, but only 55.7% were aware of screening methods. Better awareness was significantly linked to having a family history of breast cancer and higher education levels. Despite this, only 17.8% of women had undergone any screening, and 96.7% had poor overall knowledge of breast cancer based on composite scoring.

Conclusion: The study highlights a significant gap in breast cancer awareness, stressing the need for targeted education for rural and less-educated women to improve early detection.

Keywords: Breast cancer, Awareness, Knowledge, Screening, Risk factors, Self-breast examination.

Introduction

Breast cancer, now the most common cancer in women globally, surpassed lung cancer in 2020 with 2.3 million cases (11.7% of all cancers).[1] In India, it's the second most common cancer among women, accounting for 20% of female cancers and 7% of the

Corresponding Author: Vetriselvan T, Assistant Professor, Department of Community Medicine, Government Medical College Krishnagiri, Krishnagiri,

E-mail: tmil009@gmail.com

Submission date: October 18, 2024 **Revision date:** December 6, 2024 **Published date: June 7,2025**

global breast cancer burden.[2]

The National Cancer Registry Program's data from 1988 to 2013 shows a notable increase in breast cancer cases in Indian cities like Bhopal, Chennai, and Delhi.[3]Breast cancer remains a major cause of death among Indian women, with cases and mortality rates rising, particularly among younger women.[4]

The outlook for Indian patients is less favorable compared to Western countries, largely due to the disease's earlier onset, delayed reporting, and fragmented treatments.[5]However, regular screening and early detection can significantly reduce the burden and improve survival rates, highlighting the need for enhanced awareness and access to healthcare.

Justification

Screening is vital in reducing cancer-related illness and mortality. The WHO targets reducing premature deaths from non-communicable diseases, including cancer, by one-third by 2030 (SDG Target 3.4).[6]Early detection improves prognosis, survival, and quality of life for breast cancer patients.[7]Despite effective screening methods, uptake in Tamil Nadu is low—only 5.6% of women aged 30-49 have undergone screening (NFHS-5).[8]This low uptake is likely due to a lack of awareness about breast cancer risk factors, symptoms, and screening options.

Despite advances in breast cancer treatment, early detection and awareness remain essential to improving outcomes. This study evaluates breast cancer awareness, knowledge gaps, and attitudes toward screening and prevention among adult women visiting the OPD of a tertiary hospital in Krishnagiri, Tamil Nadu. It also explores how socio-demographic factors influence awareness. Insights from this research may guide the development of targeted health education programs that empower women to take early action, potentially reducing advanced breast cancer cases within the local cultural and healthcare context.

Objectives

To assess the knowledge about breast cancer and its screening methods and their determinants among adult women attending OPDin a tertiary care hospital.

Methodology

This hospital-based cross-sectional study was conducted among adult women visiting the OPD of a tertiary care teaching hospital in Krishnagiri district, Tamil Nadu. The study included women who had been married and consented to participate, while unmarried women were excluded.

To determine the sample size, we assumed 50% variability with 5% precision and added a 5% buffer for non-responses, resulting in a total of 400 participants. Systematic random sampling was employed, selecting every 50th woman from the OPD who met the inclusion criteria. If the selected woman was ineligible, the next qualified individual was chosen.

Data was collected using the Epicollect5 tool through an interviewer-administered, semi-structured questionnaire which was validated by a gynecologist, a general surgeon, a clinician, and a community physician. We performed agreement analysis using kappa statistics and included questions with good or perfect agreement. The data was then extracted into MS Excel and analyzed using SPSS-16.

Approval was obtained from the Institutional Ethics Committee of GMCHK.After collecting data, all the participants were given IEC on breast cancer, its symptoms, risk factors, screening methods, diagnostic modalities, treatment methods, and preventive measures.

Results

Sociodemographic profile

This study involved 400 adult women visiting the OPD. Their average age was 42.3± 12.5 years, with ages ranging from 18 to 85. About 70.8%, were between 30 to 60 years of age, while 22% were under 30 and 7.3% were above 60.29.3% were illiterate, while 15.3% studied up to primary school, 20.3% finished middle school, and 18.5% completed high school. A smaller group, 7%, had diplomas, and 9.5% had higher education. Professionally, most women (53.5%) were unemployed, housewives, or retired. Casual laborers made up 20.8%, self-employed women accounted for 15.5%, and 10.3% were salaried employees.

In terms of residence, 57.5% lived in urban areas, while 42.5% were from rural regions. Socioeconomically, 27.3% belonged to Class IV, followed by 22% in Class III, and the remaining belonged to Class V (16.3%), Class II (19.8%), and Class I (14.8%).Table 1 depicts the socio-demographic profile of the study participants.

Table 1: Socio-demographic details of the study participants (n=400)

Socio-demographic variable	Category	Frequency (n)	Percentage (%)
Age in years	<30	88	22.0
	30-60	283	70.8
	>60	29	7.3
Educational status	Illiterate	117	29.3
	Primary school	61	15.3
	Middle school	81	20.3
	High school	74	18.5
	Diploma	28	7.0
	Graduate	38	9.5
	Professional	1	.3
Occupation	Unemployed / Housewife / Retired	214	53.5
	Casual laborer/Daily wage worker	83	20.8
	Self-employed (Business/Agriculture)	62	15.5
	Salaried	41	10.3
Residence	Rural	170	42.5
	Urban	230	57.5
SES as per Modified B.G.Prasad classification	Class 1	59	14.8
	Class 2	79	19.8
	Class 3	88	22.0
	Class 4	109	27.3
	Class 5	65	16.3

Risk profile

The mean age at menarche among the study participants was 13.7± 1.4 years, ranging from 11-18 years. They got married at an average age of 19.1 ± 3.3years, ranging from 14 to 39 years, and had their first child around 20.8 ± 3.6years, with a range between 15 - 40 years. Menopause occurred around 46.3 ± 4.8yearsvarying from 35 to 59 years. About 46.5% of the women had two children, while 25.8% had three, 13.3% had one child, 7.8% had four children and fewer had more than four children. Only 6% reported long-term use of oral contraceptives (OCP). 6% of study participants had a family history of breast cancer, 0.8% and 3% had a family history of ovarian cancer and colon cancer respectively.

Breast Cancer Knowledge and Awareness

Around 68.3% of women had heard about breast cancer, but 31.8% had not. The most recognized symptoms were breast lumps (57.8%) and nipple discharge (19%). Symptoms less commonly known were changes in breast size/shape (13.5%) and skin or nipple changes (10.3%).As for risk factors, 41.5% linked avoiding breastfeeding to breast cancer, 18% mentioned prolonged OCP use as a risk factor and 15% recognized Obesity as a risk factor for cancer breast. 38% learned about cancer breast from friends and family, while 34.6% heard it from health workers.

Figures 1, 2 & 3, depict the proportion of study participants who were aware of cancer breast, symptoms, and risk factors the study participants were aware of respectively.

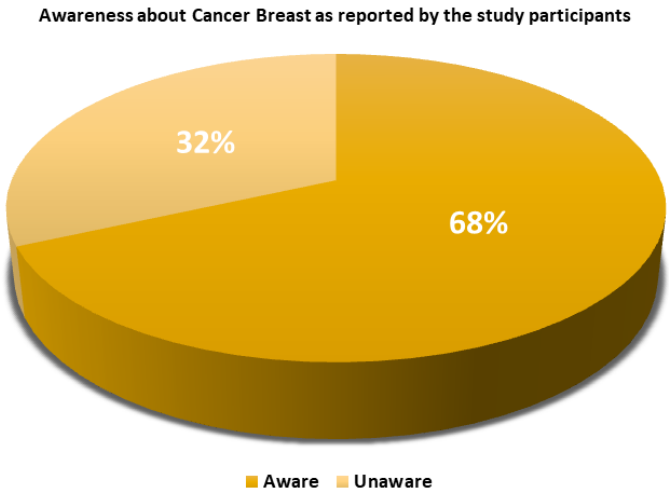

Figure 1: Proportion of study participants who reported as aware of Cancer Breast (n=400)

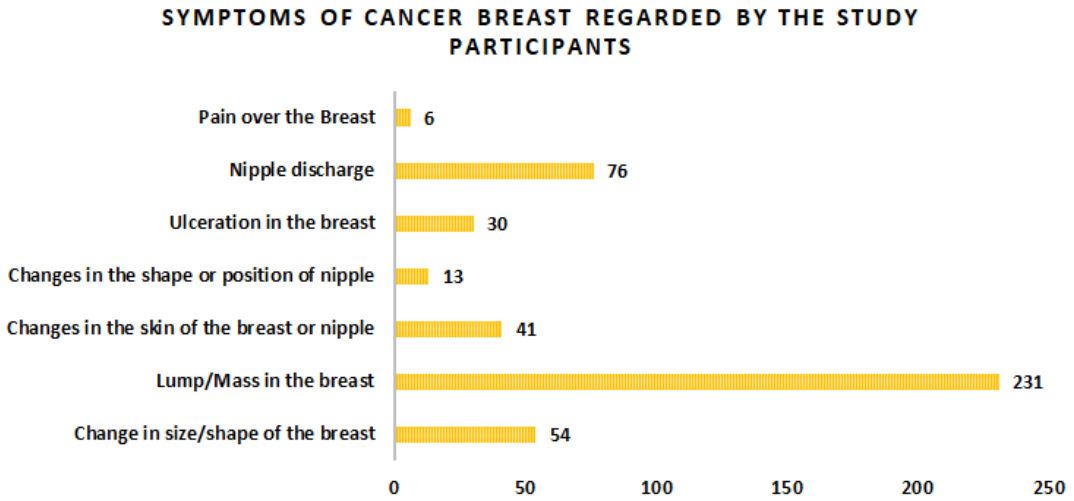

Figure 2: Symptoms regarded by the study participants as they are aware of Cancer Breast

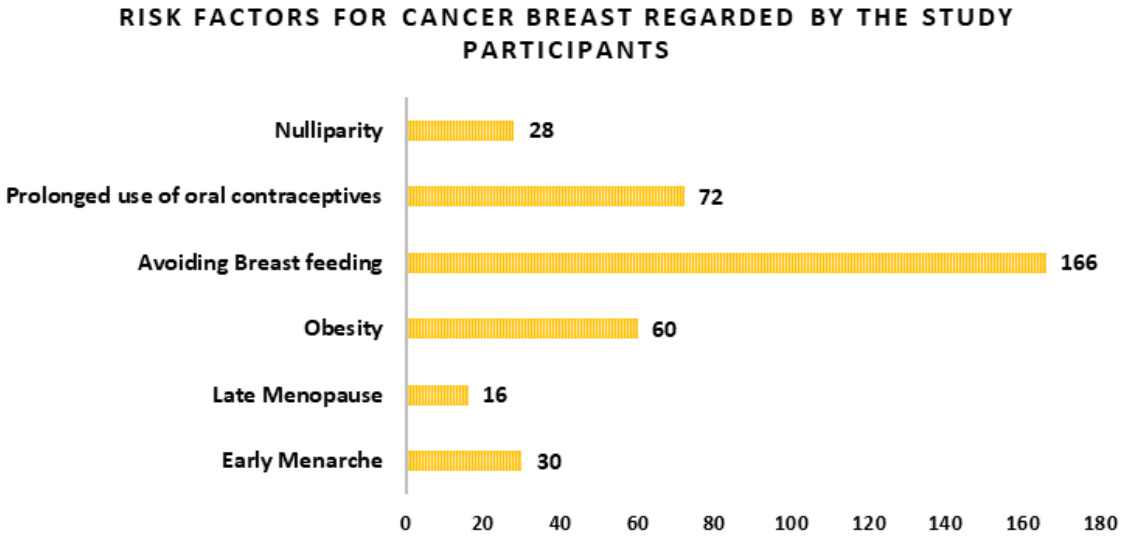

Figure 3: Risk factors regarded by the study participants as they are aware of Cancer Breast

Determinants of Awareness

A few factors influenced the awareness about breast cancer significantly. Awareness was notably higher among educated women (p=0.0001) and salaried or self-employed individuals had a higher level of awareness compared to housewives and daily wage laborers (p=0.0001). Women from higher socioeconomic classes (Class I and II) were more informed than those from lower classes (p=0.02). A family history of breast cancer was also a significant determinant in increased awareness (p=0.001).

Screening and its determinants

Of those who knew about breast cancer (n=273), 55.7% were aware of screening tests, and 78.9% knew government facilities provided free screening services for cancer breast. However, only 17.8% had undergone any screening, of which 48.1% opted for screening from government institutions. Awareness of screening was higher among educated women (p=0.002) and salaried individuals (p=0.004). Women with no children had a lower awareness of screening tests for cancer breast (p=0.009).

Table 2: Association between Socio-demographic variables and awareness about Cancer Breast among the study participants (n=400)

Variable		Aware about cancer Breast (n=400)		p-Value
		Yes	No	
Age category (in years)	<30	65	23	0.085
	30-60	193	90	
	>60	15	14	
Education	Illiterate	56	61	0.0001
	Upto schooling	155	61	
	>schooling	62	5	
Occupation	Unemployed / Housewife / Retired	126	88	0.0001
	Casual laborer /Daily wage worker	53	30	
	Self-employed (Business/Agriculture)	55	7	
	Salaried	39	2	
Residence	Rural	115	55	0.824
	Urban	158	72	
SES	Class I	47	12	0.019
	Class II	59	20	
	Class III	57	31	
	Class IV	75	34	
	Class V	35	30	
Age at Menarche	<13 years	130	80	0.04
	>13 years	143	47	
Age at Marriage	<18 years	125	80	0.001
	>18 years	148	47	
Age at birth of first child (n=389)	<18 years	60	41	0.035
	18-30 years	197	85	
	>30 years	6	0	
Parity	Nulliparity	11	2	0.001
	≤ 2	177	62	
	>2	85	63	

Continue.....

Age at Menopause (n=142)	< 45 years	32	33	0.071
	45-50 years	35	17	
	>50 years	11	14	
Long-term use of OCP	Yes	17	7	0.779
	No	256	120	
Family H/o Ca Breast	Yes	24	0	0.001
	No	249	127	
Family H/o Ca Ovary	Yes	2	1	0.953
	No	271	126	
Family H/o Ca Colon	Yes	11	1	0.077
	No	262	126	

p<0.05-statistical significance

Knowledge Scores

A composite scoring system quantified breast cancer awareness by assigning points based on response accuracy. Participants earned 1 point for each correct symptom (6 points max) and 0.5 points per correct risk factor (e.g., early menarche, late menopause, obesity) for a total of 3 points. Screening awareness included 1 point for knowing about screening, an additional point for specific tests (CBE, ultrasound, mammography), 1 point for knowing the starting age to screen and recommended frequency, and 1 point if aware that screenings are free at government facilities. Additional points were given for personal screening or Self-Breast Examination (SBE).

For treatment, 1 point was given for knowing one or two methods and 2 points for listing all three (surgery, radiotherapy, chemotherapy). Preventive measures earned 1 point for fewer than three methods and 2 points for three or more. Scores ranged from 0 to 20, with 16+ as good knowledge, 12-15 as moderate, and below 12 as poor. Most participants (96.7%) demonstrated poor knowledge, with only 1.5% scoring high and 1.8% had moderate knowledge.

Figure 4 shows the overall knowledge scores of the study participants about Cancer Breast.

The educational status of the participants was a significant determinant of the knowledge levels (p=0.043), with illiterate participants showing the poorest understanding. Those who belong to higher socioeconomic status (Class I and II) exhibited better knowledge, although this was not statistically significant.

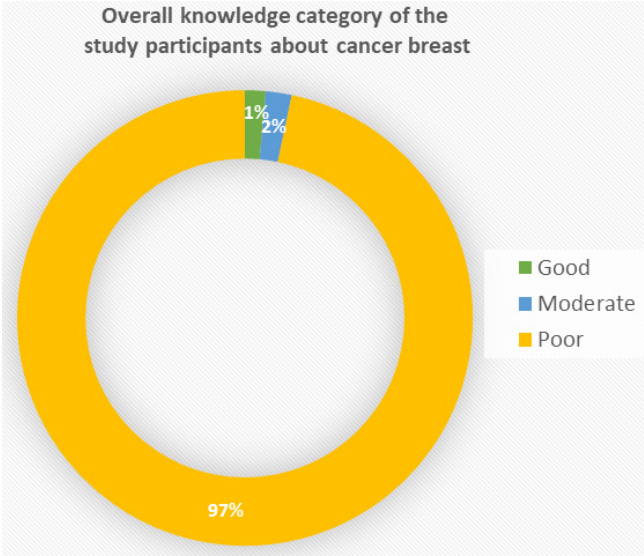

Figure 4: Overall knowledge category of the study participants about Cancer Breast.

Discussion

The majority of the study participants in our study belonged to the age group 30-60 (70.8%) and the Mean age is 42.3 ± 12.5 years, which is quite on the lower side when compared to similar work done by Shrivastava et. al[9] but significantly higher when compared to the work done by Mahalakshmi selvan et.al[10].

The socio-demographic profile of the study participants provides important insights into the determinants of breast cancer awareness. This

study also identified significant socioeconomic and educational disparities in awareness and knowledge levels. Illiterate women had far less knowledge than those who were more educated echoing Ramachandra Kamath[11], who states that women with higher levels of education were more aware of the risk factors for breast cancer. Given that they are more likely to be unaware of breast cancer and its prevention, women from lower socioeconomic backgrounds and those with less formal education should be the focus of health education initiatives.

Family history was a significant factor in breast cancer awareness, with participants having a familial connection to the disease showing much greater awareness, aligning with global trends of proactive health behavior among those with a cancer history.

Breast lump was the most commonly regarded symptom of breast cancer and most other signs or symptoms were not regarded by the study participants which is consistent with the findings of Kumarasamy et.al[12] where almost 1/4th of the participants were not aware of even a single sign for breast cancer. The same work had 8.5% of the participants with a family history of cancer breast which is again comparable to 6% in this study.

Regarding risk factors, participants in this study were more likely to identify avoiding breastfeeding (41.5%) and prolonged oral contraceptive use (18%) as risks, but fewer were aware of early menarche or obesity as risk factors. These results are in line with findings of Madhu et.al[13]. A systematic review by Gupta et.al[14]also echoes the state of low literacy levels on risk factors for cancer breast among Indian women.

The findings related to screening uptake were also concerning in this study. Although 55.7% of women were aware of screening tests, only 17.8% of those had undergone screening. This is in line with C. Saran, who noted that only 17.58% of women had adequate knowledge about screening options for breast cancer[15]Kelambakkam, Kancheepuram District, Tamil Nadu, India. The sample of the study was chosen by purposivesampling technique, which includes 256 womens who are in hospital. The data collection was validated and reliability was determined and pilot study was conducted, followingwhich the data collection was carried out. Data procured was interpreted by descriptive and inferentialstatistics. Analysis of data was executed in terms of frequency percentage distribution, mean and standarddeviation, chi-square test for the assessment of knowledge on breast self-examination among women.The study finding was revealed that 17.58% had inadequate knowledge, 56.64% had moderate knowledgeand 25.78% had adequate knowledge. Most of the women had a moderate level of knowledge on breastself examination practices. In assessing associate the level of knowledge on breast self-examination withthe selected demographic variables among women with age 30-50 years it shows various frequency andpercentages and it is very important to do find the association of level of knowledge . In regarding to anyhistory of level of knowledge on breast self-examination among women with age 30-50 years is significantassociation between age, number of childrens, education and occupation (p value =<0.05.

The low uptake of screening highlights the necessity for improved accessibility and education, particularly at government facilities that provide free services. In this study, 48.1% of women screened utilized government facilities, yet many were unaware of the availability of free screenings, indicating a crucial communication gap that must be resolved.

According to Mohan et al[16], 85.7% of Kerala women were aware of breast self-examination, and this study also demonstrates that women with higher levels of education had a markedly higher screening awareness. Merely 17.8% of the population had received screening, indicating a low usage of screening programs, especially mammography. This is alarming, but it is in line with data at the national level, where mammography access and uptakeremain limited due to a combination of various factors including cost, lack of availability, accessibility and cultural barriers as highlighted by Soumedusen et.al s[17].

The results of this study are in line with what has been found in other research on breast cancer awareness and screening practices among women in India. In this study, 68.3% of women knew about

breast cancer, which matches the findings of AG Lathishna[18], where 68.3% of women were aware that breast cancer is the second most common cancer among women. This indicates that general awareness about breast cancer is moderately high in tertiary care hospital settings, but significant gaps in understanding the specifics of screening methods remain, as evidenced by the fact that only 55.7% of participants were aware of screening tests.

When it comes to breast self-examination (SBE), the knowledge is quite low, with only 29.3% of women having actually done it. This is in line with other Indian studies. For example, R. Gupta[19] found that awareness of SBE ranged anywhere from 2% to 69.8%. This wide range shows the need for more targeted health education, especially since SBE is a simple, affordable, and accessible way to detect breast cancer early.

Even though general awareness levels were moderate, this study showed that a whopping 96.7% of participants had poor knowledge about breast cancer, which is quite concerning. This big gap between awareness and actual knowledge points to the superficial nature of many educational efforts, as highlighted by S. Keerthana[20], who found that women from lower socioeconomic backgrounds lacked awareness of important symptoms like changes in skin texture and nipple discharge.

In the current context of the awareness-knowledge gap, Interventions like Makkalai Thedi Maruthuvam (MTM)[21] which employs Women Health Volunteers to create awareness and increase uptake of cancer screening are expected to bridge the gap in the near future.

Conclusion

The study reveals gaps in women's understanding of breast cancer risk, symptoms, and screening, emphasizing the need for targeted awareness efforts, especially for less educated, unemployed, and rural women, to aid early detection and prevention.

Limitation

This hospital-based cross-sectional study may not fully represent the wider community, and its quantitative nature limits insight into psychological, social, and cultural reasons behind screening avoidance.

Funding Sources: NIL

Ethical Clearance: Institution Ethics Commiti'ee Government Medical College Krishnsgiri- Ec Reg No (COSCO): EC/NEW/INST/2023/15250, Approval No. 23012024, dated 05.02.2024

Conflicts of interest statement: NIL

References

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021 May;71(3):209–49.
2. Kumar P, Bolshette NB, Jamdade VS, Mundhe NA, Thakur KK, Saikia KK, et al. Breast cancer status in India: An overview. Biomedicine & Preventive Nutrition. 2013 Apr 1;3(2):177–83.
3. Takiar R, Srivastav A. Time trend in breast and cervix cancer of women in India - (1990-2003). Asian Pac J Cancer Prev. 2008;9(4):777–80.
4. Madhav MR, Nayagam SG, Biyani K, Pandey V, Kamal DG, Sabarimurugan S, et al. Epidemiologic analysis of breast cancer incidence, prevalence, and mortality in India. Medicine (Baltimore). 2018 Dec 28;97(52):e13680.
5. Maurya AP, Brahmachari S. Current Status of Breast Cancer Management in India. Indian J Surg. 2021 Jun 1;83(2):316–21.
6. Monica, Mishra R. An epidemiological study of cervical and breast screening in India: district-level analysis. BMC Women's Health. 2020 Oct 7;20(1):225.
7. Kulkarni SV, Mishra GA, Dusane RR. Determinants of Compliance to Breast Cancer Screening and Referral in Low Socio-Economic Regions of Urban India. Int J Prev Med. 2019 May 17;10:84.
8. National Family Health Survey (NFHS-5) [Internet]. [cited 2023 Dec 28]. Available from: http://rchiips.org/nfhs/Factsheet_Compendium_NFHS-5.shtml
9. Shrivastava SR, Sowbha C, Shrivastava PS. A cross-sectional descriptive study to assess the awareness ... : Indian Journal of Community and Family Medicine. [cited 2024 Oct 10];
10. Selvam M, Sundaram S. Breast self-examination practices among young rural women... : Journal of Cancer Research and Therapeutics. [cited 2024 Oct 10];

11. R K, Ks M, L A, Ts S. A study on risk factors of breast cancer among patients attending the tertiary care hospital, in udupi district. PubMed [Internet]. [cited 2024 Oct 10]; Available from: https://pubmed.ncbi.nlm.nih.gov/23878422/

12. Kumarasamy H, Veerakumar AM, Subhathra S, Suga Y, Murugaraj R. Determinants of Awareness and Practice of Breast Self Examination Among Rural Women in Trichy, Tamil Nadu. J Midlife Health. 2017;8(2):84–8.

13. B M, Shankar P. Awareness and screening behaviors of breast cancer among urban women in Mysuru, India- need for breast health education program | International Journal Of Community Medicine And Public Health. 2017 Jul 22 [cited 2024 Oct 10]; Available from: https://www.ijcmph.com/index.php/ijcmph/article/view/1506

14. Gupta A, Shridhar K, Dhillon PK. A review of breast cancer awareness among women in India: Cancer literate or awareness deficit? Eur J Cancer. 2015 Sep;51(14):2058–66.

15. C.1 S, S.k.1 S, S.1 Y, T.1 V, Manjula2 J. Assessment of the Knowledge on Breast Self-examination among Women in Selected Tertiary Hospital at Kelambakkam, Kancheepuram District, Tamil Nadu, India | Medico Legal Update. 2022 Sep 7 [cited 2024 Oct 10]; Available from: https://ijop.net/index.php/mlu/article/view/1094

16. R M, Jv T. Awareness of risk factors, symptoms and screening of breast cancer: A cross-sectional survey among 35-65-year-old women in Alappuzha district, Kerala, India. PubMed [Internet]. [cited 2024 Oct 10]; Available from: https://pubmed.ncbi.nlm.nih.gov/38074240/

17. Sen S, Khan PK, Wadasadawala T, Mohanty SK. Socio-economic and regional variation in breast and cervical cancer screening among Indian women of reproductive age: a study from National Family Health Survey, 2019-21. BMC Cancer. 2022 Dec 7;22(1):1279.

18. Lathishna AG, Kamal VS. Breast Cancer Screening Awareness, Practice and Knowledge among Women Attending Out Patient in Tertiary Care Centre. [cited 2024 Oct 10]; Available from: https://journaljpri.com/index.php/JPRI/article/view/4505

19. R G, S G, R M, P S. Risk factors of breast cancer and breast self-examination in early detection: systematic review of awareness among Indian women in community and health care professionals. PubMed [Internet]. 2020 [cited 2024 Oct 10]; Available from: https://pubmed.ncbi.nlm.nih.gov/30608560/

20. Keerthana S, Rekha A. Awareness of Breast Cancer in Lower Socioeconomic Status Women Attending the Surgery Outpatient Department of a Tertiary Care Teaching Institution. Case Reports in Clinical Medicine. 2019 Aug 9;8(8):205.

21. R T, H S, B K, V G. "Makkalai Thedi Maruthuvam" scheme in Tamil Nadu: an intersectionality-based analysis of access to NCD care. PubMed [Internet]. [cited 2024 Nov 4].