

**KNOWLEDGE, ATTITUDE & PRACTICE
TOWARDS BREAST CANCER AND CANCER
SCREENING METHODS AMONG WOMEN IN
PUNJAB, INDIA**

Dissertation Submitted to



The IIHMR University, Jaipur

For the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

In

Hospital and Health Management

By

Dr Shiwani Rawat

Under supervision and guidance of

Piyusha Majumdar

2021

DECLARATION BY STUDENT

I hereby declare that this dissertation titled '**Knowledge, Attitude & Practice Towards Breast Cancer and Cancer Screening Methods Among Women in Punjab, India**' is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



Dr Shiwani Rawat

24-06-2021

Date: 02-July-2021

Internship Completion Certificate

To Whom It May Concern

This is to certify that **DR Shiwani Rawat**, student of **Indian Institute of Health Management Research (IIHMR)** has worked as 'Product Analyst- Intern' with Karkinos Healthcare Private Limited, and has successfully completed the internship under the guidance of Mr. Manish Sharma, Chief Product Officer-Karkinos.

Internship Duration: 05th -February-2021 till 30th -April-2021.

We wish all the best.

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Pooja Sharma
Vice President-HR

CERTIFICATE FROM FACULTY GUIDE & SCHOOL DEAN

This is to certify that dissertation titled '**Knowledge, Attitude & Practice Towards Breast Cancer and Cancer Screening Methods Among Women in Punjab, India**' is a record of the research work undertaken by **Dr Shiwani Rawat** in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

Piyusha Majumdar
Assistant Professor
IIHMR University, Jaipur
Date:

Dhirendra Kumar
School Dean
IIHMR University, Jaipur
Date:

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Dr Shiwani Rawat

MBA Healthcare Management

IIHMR University, Jaipur

ABSTRACT

Background

According to IARC, in 2020 India ranked third after China and USA for estimated highest incident cases of breast cancer and second after China for highest number of breast cancer mortality among females of all age groups. Punjab state has also reported increasing number of breast cancer patients in past years. Hence it becomes extremely important to generate awareness in the community women in Punjab state including the capital city Chandigarh. In the light of above context and to fulfil the gaps in Breast Cancer awareness research, the present study attempted to assess women in terms of Knowledge, Attitude and Practices for various aspects of Breast Cancer among the diverse society of women in Punjab, India.

Methods

A cross-sectional community-based survey was conducted using a pretested structured online questionnaire. The questionnaire aimed to assess knowledge, practice and attitude towards breast cancer and its screening methods among women responders between 18-55 years of age from Punjab.

Results

A total of 291 women responded to the questionnaire, out of which 25 were excluded following the exclusion criteria and analysis was performed on 267 respondents. 48% of participants (n=127) were aware about Breast self-examination, 39% of participants (n=102) knew about Clinical breast examination and 61% women (n=163) were aware about mammography. The mean knowledge score calculated was 18 (52.9% knowledge) and hence lies in the average knowledge category. Around 36% women had ever performed BSE and 16% had gone for CBE and Mammography each. Overall attitude of women was positive with >88% women having positive total attitude scores.

Conclusion

This study revealed an average of awareness and comprehensive knowledge about breast cancer but low uptake of cancer early detection services. Though women's attitude was positive. It is recommended that the scaling-up of cancer information, dissemination, and early detection services must be prioritised, including training of local health institutions.

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ABBREVIATIONS

1. AJCC- American Joint Committee on Cancer
2. ANM- Auxiliary Nurse Midwife
3. ASHA- Accredited Social Health Activist
4. BSE- Breast Self-Examination
5. CBE- Clinical Breast Examination
6. GBD- Global Burden of Disease
7. HBREAST CANCERR- Hospital based Cancer Registries
8. IARC- International Agency for Research on Cancer
9. ICMR- Indian Council of Medical Research
10. LMIC- Lower middle-income countries
11. NCCN- National Comprehensive Cancer Network
12. NCDIR- National Centre for Disease Informatics and Research
13. NCRP - National Cancer Registry Programme
14. PBREAST CANCERR- Population based Cancer Registry
15. SPSS- Statistical Package for Social Science
16. TNM- Tumor size, Lymph node involvement, presence of Metastasis

CHAPTER 1- INTRODUCTION

Background- Global cancer burden

The term 'Cancer' finds its origin from a Greek word 'Karkinos' (meaning crab) which refers to a group of non-communicable diseases where body cells grow uncontrollably, form a lump and spread to other parts of the body. Cellular growth in humans typically consists of multiplying (through a process called cell division) and forming new cells on a regular basis. They die as they age or become damaged, and new ones replace them. The orderly process of cancer is disrupted in diseased states, and cancerous cells grow and multiply when they shouldn't. This results in formation of lumps of cancerous cells/ tissue also called a tumour in different parts of the human body. Tumours can be benign (confined to its original location) in early stages but if not detected and treated in time, the cells begin to migrate to other body parts (by a process known as metastasis) and result in malignant form of cancer. Although several forms of cancer have been detected in various parts of the human body, the most common sites are breasts, colorectum, prostate, lung and thyroid.

One in five people worldwide is estimated to contract cancer in their lifetime, and one in eight men and one in eleven women die of it. IARC (International Agency for Research on Cancer) released data for the year 2020 and found that there were 19.3 million cancer cases and 10 million cancer deaths worldwide. According to these estimates, there are currently more than 50 million people living with the aftermath of a cancer diagnosis within the past five years (figure 1.1). According to Globocan 2020, an online database for global cancer statistics, the prevalence (for both sexes) of breast cancer is highest (15.4%) followed by colorectal cancer (10.4%) and prostate cancer (9.8%). In 2020, lung cancer (14.3%) and prostate cancer (14.1%) were the two most common cancer types among men, together accounting for nearly one-third of all incident male cancers cases. At the same time, for women breast cancer alone marked a strong 24.1%, that is one-fourth of all incident female cancer cases, followed by colorectal cancer (9.4%). Figure 1.2 represents a graphical representation of country wise leading cancer types responsible for the maximum number of deaths among the female population in 2020. The present global burden of breast cancer can be estimated by the fact that out of 185 countries, breast cancer is the leading cause of mortality among females in 113 countries which makes it a massive healthcare concern.

Figure 1 Estimated number of prevalent cases of cancer worldwide (5-year) in 2020 for both sexes and all age groups

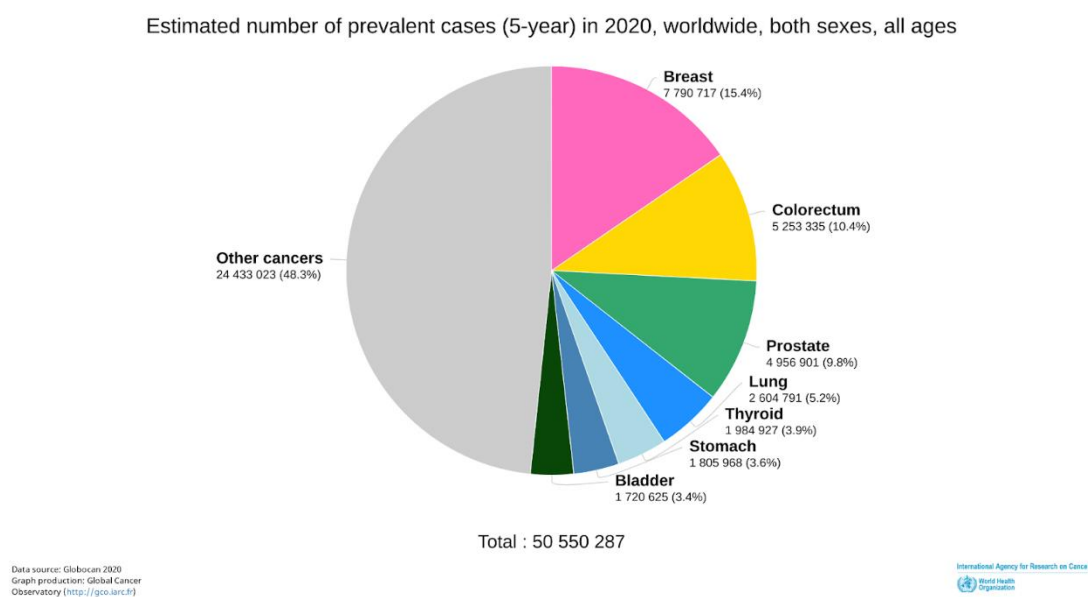
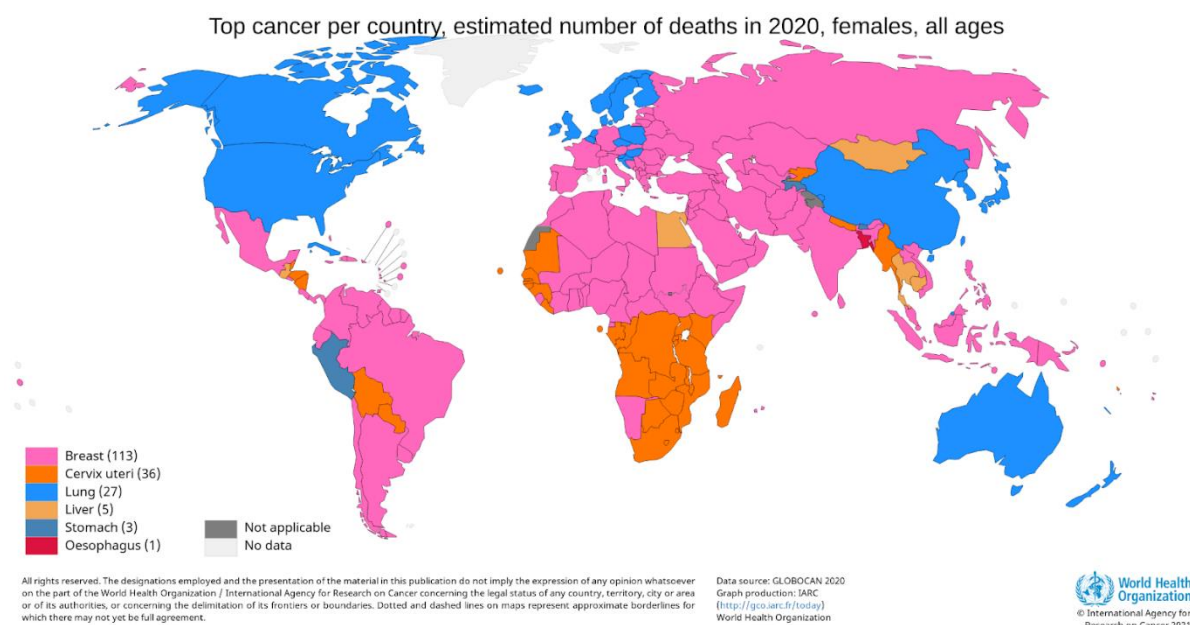


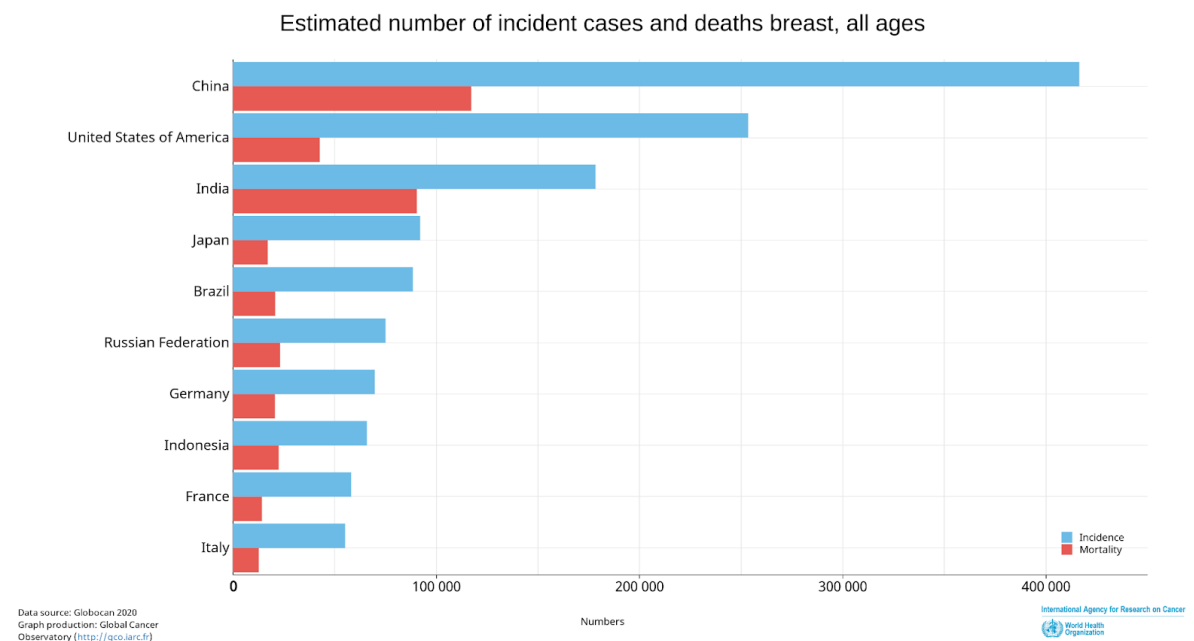
Figure 2 Leading cancer type for maximum number of deaths among females in 2020 around the world



Cancer and other non-communicable diseases were once considered the disease of the rich and developed nations. But lately, developing nations are experiencing a substantial increase owing to factors like lifestyle changes, rapid aging of populations, infectious agents, diet, tobacco & other substance use, etc. As the global burden of disease shifts from infectious diseases to noncommunicable, chronic diseases, cancer prevalence and incidence are on the rise in developing countries. About 70% of cancer deaths are now attributed to low- and middle-income countries, according to the Global Burden of Disease (GBD). In India itself 63% of all the deaths occur due to one or the other non-communicable disease and cancer is the second leading cause (9%).

Geographic variations can be observed in cancer incidence, pathology, mortality, and clinical characteristics. Numerous factors, including socio-cultural and behavioural factors, genetics, the environment, lifestyle, and historical background, play a significant role (1). In 2020, China documented the maximum number of new cases (4.6 million) and highest mortality (approx. 3 million) for all cancer types. India ranked third with approximately 1.3 million new cancer cases and 0.8 million cancer deaths. With the escalating incidence of breast cancer in the developing world and India experiencing a huge burden itself, it becomes important to understand its incidence and mortality trends. According to a study, in China and India, breast cancer rates have increased by up to 30% over the past 10 years. According to IARC, in 2020 India ranked third after China and USA for estimated highest incident cases of breast cancer and second after China for highest number of breast cancer mortality among females of all age groups (figure 1.3).

Figure 3 Top 10 countries with maximum number of incident cases of breast cancers and resultant mortality in 2020 (sorted by incidence trends)



Burden of breast cancer in India

Breast cancer accounts for 14% of cancers in Indian women. Every four minutes, an Indian woman is diagnosed with breast cancer according to reports. In India, cancer registries are a primary source for cancer occurrence related data and is useful in planning National cancer control program. The systematic collection of data on cancer has been performed since 1982 by the population-based cancer registries (PBCRs) and hospital-based cancer registries (HBCRs) under the National Cancer Registry Programme (NCRP)–National Centre for Disease Informatics and Research (NCDIR) of the Indian Council of Medical Research (ICMR; ICMR-NCDIR-NCRP), Bengaluru (4). Presently there are a total of 36 PBCR's and 236 HBCRs registered under NCRP.

According to a study done on NCRP data 2020, the projected incidence of patients with cancer in India among males was 679,421 (94.1 per 100,000) and among females was 712,758 (103.6 per 100,000) for the year 2020. It was observed that 5 of the most common cancers in 2020 for males were lung, mouth, prostate, tongue, and stomach cancers; constituting about 36% of all cancers. While for females' breast, cervix uteri, ovary, corpus uteri, and lung cancers were the top 5 and constituted 53% of all cancers. It revealed that one in 68 males (lung cancer), 1 in 29 females (breast cancer), and 1 in 9 Indians will develop cancer during their lifetime (0-74 years of age) (4). Reports also

suggest that in the next 20 years, the breast cancer incidence rates will double up with more than 3.5 lakh incident cases every year and around 2 lakh women dying out of it (figure 1.5).

Figure 4 Estimated number of new cancer cases among females in India 2020; Source- Globocan 2020

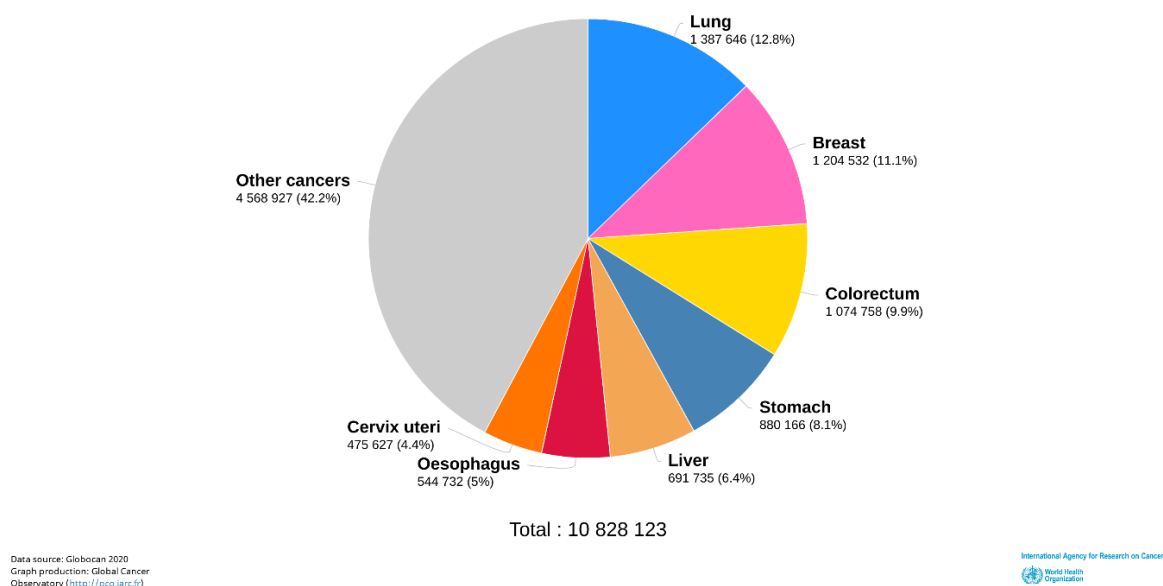
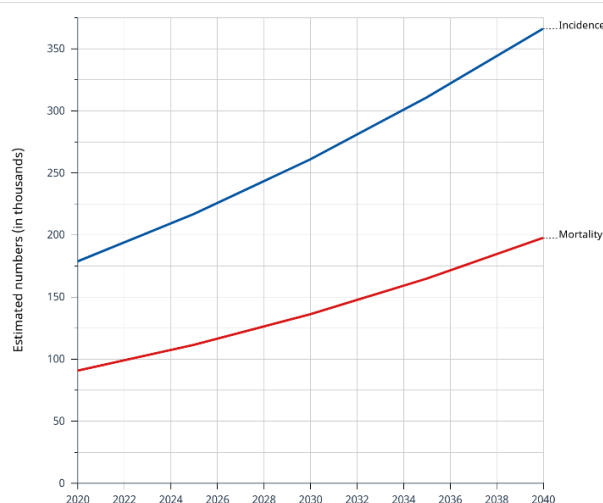


Figure 5 Projected number of breast cancer cases in India among females of all age group in next 20 years (Based on IARC data); Source- Globocan 2020

Estimated numbers from 2020 to 2040, Females, age [0-85+]
India

Annual percentage change: Breast: 1.5%



India being the second most populous country in the world naturally contributes a huge share in the global breast cancer disease burden and hence it becomes very important to understand the epidemiology and level of cancer literacy, especially since the average age at breast cancer diagnosis is 10 years younger in Indian women than women in Western countries.

Punjab state contributes a huge share to the prevalence of breast cancer in our country. In Punjab, majority population resides in the rural part of the state, on top of that low level of awareness, inaccessible healthcare facilities, lack of healthcare workforce and financial burden adds to the misery of women and they are unable to get good quality cancer treatment (5). According to the Population-Based Cancer Registry (PBCR) of Chandigarh (the capital city), the prevalence of breast cancer in Chandigarh is the highest in the country, at 35 per one lakh women. According to an article from one of the leading newspaper firms, “Usually, the prevalence of breast cancer in asymptomatic women is around 30 per one lakh. In Chandigarh, they found 80 women with breast cancer after screening a mere 20,000 women, most of them asymptomatic.” In Punjab, there are 90 cancer patients for every 1 lakh residents, which is higher than the national average of 80 per 1 lakh. According to the Punjab government study, the Malwa region of the state - commonly known as the cancer belt - has the highest average of 136 cancer patients per 1 lakh people. Cancer incidence in the four districts of Malwa that include Sri Muktsar Sahib, Mansa, Bhatinda and Ferozpur was 107 per 100,000 in this area, which raised concerns.

In Punjab, the government pays particular attention to cancer patients with respect to early detection, treatment and prevention. Many programs are available for the benefit and welfare of patients with cancer, including “Mukh Mantri Punjab Cancer Rahat Kosh Scheme” - a program that provides financial assistance to cancer patients for their treatment and investigations. If a person is diagnosed with cancer, all medical care (investigations and treatment) is free in every state-run hospital. But are the beneficiaries aware about Government’s efforts and different schemes and are they actually aware about cancer and its presentation pattern is the big question? Very limited resources were found when we tried to analyse the cancer incidence and mortality trends in Punjab state which indicates the absence of systematic monitoring, reporting and most importantly publishing of data trends.

Breast cancer Epidemiology

Within a country also the risk of breast cancer development among females may vary. According to a study, risk factors of breast cancer may be gender, age, race, family history, genetic factor, personal health history like early menarche and late menopause, reproductive history, certain genome changes, dense breast tissue, lack of physical activity, poor diet, obesity, lack of awareness, alcohol intake, exposure to radiation and nulliparous, poor breastfeeding, oral contraceptive use and life-style changes etc (6). Another study found an association of increased breast cancer risk with literacy and employment level (hence a resultant income level). One study found that the risk (threshold age) for breast cancer susceptibility is between the age of 40s & 50s in Asian countries, a decade earlier, but for western countries the peak age is between 60 & 70 years (7). Research has found that young age is associated with larger tumour size, higher number of metastatic lymph nodes, higher grade of tumour, earlier and more frequent regional recurrences, and poor patient survival.

Table 1 Breast cancer risk factors according to NCCN (National Comprehensive Cancer Network) guidelines

Breast cancer risk factors (according to NCCN guidelines)
a. Prior history of breast cancer b. Women ≥ 35 yrs. of age with 5 yr. risk of invasive breast cancer $\geq 1.7\%$ c. History of LCIS, atypical ductal hyperplasia (ADH)/ atypical lobular hyperplasia (ALH) hence lifetime risk of $>20\%$ d. Family history of breast cancer particularly among first degree relatives hence lifetime risk of $>20\%$ e. Women between age 10-30 years with history of high dose radiotherapy like for treatment of Hodgkin's lymphoma f. Genetic predisposition- BRCA1 or BRCA2 mutation

Staging of breast cancer-

Depending on the size and spread of tumor, breast cancer can be divided into 5 clinical stages. The TNM system of the American Joint Committee on Cancer (AJCC) guides treatment and prognosis. Based on this system, stage groupings can be made according to tumor size (T), node involvement (L), and metastasis presence (M).

Figure 6 TNM staging Breast cancer

Description	
Primary tumor (T)	T1=tumor size ≤ 20 mm T2= >20 mm but ≤ 50 mm T3= >50 mm T4=tumor of any size with direct extension to the chest wall and/or skin
Regional lymph nodes (N)	N0=no regional lymph node metastases N1mi=micrometastases N1=metastases to moveable ipsilateral axillary lymph nodes N2=metastases in ipsilateral axillary lymph nodes that are clinically fixed N3=metastases that are more extensive
Distant metastasis (M)	M0=no evidence of distant metastases M1=distant detectable metastases as determined by clinical and radiographic means
Stage	
0	DCIS
I	IA=T1, N0, M0 IB=T0, N1mi, M0 or T1, N1mi, M0
II	IIA=T0, N1, M0 or T1, N1, M0 or T2, N0, M0 IIB=T2, N1, M0 or T3, N0, M0
III	Larger size tumors with various combinations of lymph node involvement that are more extensive than stage II, but no distant metastases
IV	Distant metastases (M1)

It's common to find breast cancer in India much later, at an advanced stage, which leaves a poor prognosis for the patient. The chances of survival become increasingly difficult as cancer advances. Over half of Indian women are diagnosed with breast cancer during stages three and four. One-half of all patients with breast cancer are examined by a physician during the third stage, and 15 to 20% are examined in the fourth stage. Post-treatment survival rates for breast cancer are 60% for Indian women and 80% for Americans. As a result of delayed presentation to the doctor, cancer is diagnosed at an advanced stage which then becomes difficult to manage. On the contrary if detected in time the patients can lead a healthy and cancer free life.

Breast cancer is well known to be better treated if the abnormalities are detected early. A study found that 85% of the women who were diagnosed early survived five years,

while only 56% survived if they were diagnosed later. In some studies, women who examined their breasts carefully found small tumours of breast cancer, and their prognosis was improved. In fact, NCCN guidelines also suggest that imaging by trained physicians can help reduce the stage of asymptomatic women's breast cancer with regular clinical breast examinations and mammography. But India currently does not have any national breast cancer screening programs. National or regional breast cancer screening program was launched in India in 2015, but it is in its preliminary stage. At present, a dedicated breast cancer screening by clinical breast examination or mammography is neither available nor affordable for general population and especially for women residing in rural areas. In developing countries it's an "Opportunistic Screening" based model.

Thus, in the Indian context, educating women about breast cancer risks is the first step to an early detection program. Breast Health Global Initiative experts recommended that countries with low and low-middle resources prioritize preventing localized cancers by utilizing resource-appropriate approaches (8). These settings may not be suitable for screening mammography programmes, and alternative strategies for this group may include public awareness programs, breast self-examination, and clinical breast examinations (8). In addition, under various public health initiatives such as Health for All and National Rural Mission, a strong emphasis is put on breast awareness and breast self-examinations in order to lay the foundation for a nationwide screening program for breast cancer.

Research gap

Research results indicate that the majority of cancer research conducted in LMICs focuses on treatment, with comparatively little attention paid to prevention, awareness, early detection, and palliation. Specific to India, different studies have been conducted to understand the level of awareness about early signs & symptoms and practices of different breast cancer screening methods like Breast Self-Examination (BSE), Clinical Breast Examination (CBE) and mammography. Studies in this aspect are done in various parts of the country and they show diverse results ranging from poor to good knowledge about breast cancer. But no such study is done for Punjab state. In view of the above context and because of the gaps in Breast Cancer awareness research, the purpose of this study is to investigate knowledge, attitudes, and practices of women in Punjab, India, regarding various aspects of breast cancer.

Research question

1. Do women residing in Punjab have enough knowledge about breast cancer and its attributes like- common signs and symptoms and screening methods like BSE, CBE and Mammography?
2. What is the general perception of women towards breast cancer and are they motivated to gain knowledge? If yes, what is their preferred mode of communication?
3. What percentage of women actually practice self-screening modalities (BSE) or visit a physician for regular clinical assessment (CBE and Mammography)?

Objective of study

To assess the knowledge, attitude and practice of breast cancer and its early detection methods (Breast Self-Examination, Clinical Breast Examination and Mammography) amongst women from diverse sections of society currently residing in Punjab region, between 18- 55 years of age.

CHAPTER 2- LITERATURE REVIEW

The literature review reveals that Indian women do not understand breast cancer risk factors, regardless of their socio-economic or educational background. Furthermore, knowledge of risk factors is not correlated to evidence of those risk factors. Our health system in India remains neglectful of the prevention, awareness and early detection of Breast cancer. The number of community-based studies to assess breast cancer awareness is very weak in comparison to hospital-based studies. In low- and middle-income countries like India, where breast cancer mortality rates are much higher compared to high income countries, it is imperative that cancer awareness and prevention be given due attention.

Table 2 Salient features gathered from literature review

S. No	Title of Study	Authors	Publication year & Type of study	Study location & Sample size	Key findings
1	Knowledge, Attitude & Practice Towards Breast Cancer and Breast Self-Examination Among Indian Women: A Prospective Observation Study	Aysha Khan, Murtaza Akhtar, Arul Vanan, Hitesh Singhavi, Anil Heroor	2021; Cross sectional study	Maharashtra N= 150	1. In this study, knowledge of breast cancer among Indian women is 67%, urban women knowledge is 79.7% as compared to 38.7% in rural participants. 2. 40% of women think that it can be detected by self-examination. 3. 98.5% of women think that a complete cure is possible and there was a 100%

					positive attitude of women towards BSE. 4. Knowledge of BSE among Indian women is 61.2%, among urban women is 78% then rural women only 22%. 56% know that BSE should be done monthly. 5. A multivariate analysis using the Cox proportional hazards model showed that the risk of death for patients detected by BSE was smaller by 0.570 times than that for patients detected by chance, which shows statistical significance (P less than 0.05).
2	Knowledge, attitude, and practice towards breast cancer and its screening among women in India: A	Akanksha Pal, Neha Taneja, Neha Malhotra, Rajashree Shankar, Bhavika Chawla, Aanchal Anant	2021; Systematic review	15 studies; N= 7545 women between the age of 14 and 75 years.	1. Most common risk factor reported by the women was diet and lifestyle which was 51.77%, followed by 46.55% of the women having knowledge about increased age as a risk factor.

	systematic review	Awasthi, Rajiv Janardhan			2. The lowest levels of knowledge were obtained for nulliparity (10.91%), early menarche (16.30%), and late menopause (17.65%) which are the strongest risk factors of breast cancer. 3. On observing the practice of screening methods in study participants, 14 studies reported that only 27.37% of the women practiced BSE, while practice of CBE and mammography was even lower than that, i.e., 16.71% and 7.12%, respectively. 4. 71.10% of the study participants had positive attitude toward breast cancer screening.
3	Impact of Health Education Intervention on Breast Cancer Awareness among Rural	B Nisha, Ramachandran Murali	2020; Quasi experimental study	Kanchipuram district, Tamil Nadu N= 279 women	1. Of the 237 women who participated in the study, 89.1% (237) were familiar with BC, while only 77 (28.5%) were familiar with BSE.

	Women of Tamil Nadu				2. Eight out of 148 women over the age of 40 (5.4%) were screened for mammograms 3. Before the intervention, only 7.14% of the women practiced BSE. The increase in percentage is statistically significant after the intervention at 64.7%. 4. According to the results of the survey, there was an overall increase in awareness by 57.46%. 5. After getting health education, women with higher levels of education had more frequent and appropriate BSE practices than women with lower levels of education.
4	Opportunities and Barriers to Breast Cancer Screening in	Thejas R Kathrikolly , Ranjitha S Shetty, Suma Nair	2020; Qualitative analysis	Udupi taluk, Karnataka	1. “Forgetfulness” and “lack of time” emerged as major constraints in adopting screening

	a Rural Community in Coastal Karnataka, India: A Qualitative Analysis			N= 44 rural women	procedures like breast self-examination (BSE) 2. When queried about screening by mammogram, most of the women mentioned accessibility as a concern as the tertiary care centre that provides the facility is far from their area of residence 3. Participants pointed out that cancer survivors, awareness groups and focus group discussions were the right people to motivate others to talk about the disease. 4. Participants stated that the best way for information dissemination is to use pamphlets and videos in an entertaining fashion. Also, doctors, especially lady doctors are perceived to be the most suitable to spread awareness about breast cancer.
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					5. Notably, participants argued that sensitising men to women's health issues would completely rule out any necessity for women to be hiding such facts from them, thereby ensuring timely care and assistance to prevent and cure the disease.
5	Assessment of Knowledge and Screening in Oral, Breast, and Cervical Cancer in the Population of the Northeast Region of India	Kunal Oswal; Rishav Kanodia; Akash Pradhan; Umakant Nadkar; Mahendra Avhad; Ramachandran Venkataraman; Lakshman Sethuraman; Carlo Caduff; and Arnie Purushotham	2020; Cross sectional study	Assam (n = 1,000), Meghalaya (n = 200), and Nagaland (n = 200) Sample size= 1400	1. Out of total number of participants only 34% of the participants were aware of cancer screening. Major source of information- • Media (71%) • Friends/relatives (47%) • Health workers/nurses/doctors (31%) • Public and social events (19%), • Schools/colleges (17%), • Religious institutions (14%) and • Accredited Social Health Activist (ASHA)/Auxilia

					ry Nurse Midwife (ANM) (8%)- low 2. Out of the participants eligible for the study (n = 910), only six had cancer screenings. 3. ASHA/ANM workers can facilitate communication, leading to a better understanding of the topic. 4. An increased cancer awareness appears to be associated with an increased literacy level and a better socioeconomic status in this study.
6	Community engaged breast cancer screening program in Kannur District, Kerala, India: A ray of hope for early	Neethu Ambali Parambil, Sairu Philip, Jaya Prasad Tripathy, Phinse M Philip, Karthickey	2019; Explanatory mixed methods study- ASWAS project	Kannur, Kerala N= 1,049,410 eligible women above 30 years	1. Upon door-to-door screening for eligible women, a total of 23 (7.4%) were diagnosed to have breast cancer. 2. Out of 23, proportion of early-stage cases (stages 1 and 2) was

	diagnosis and treatment	an Duraisamy, Satheesan Balasubramanian		residing in 81 panchayats were visited door-to-door by 8,200 community volunteers	61% ($n = 14$), and locally, advanced cases (stages 3 and 4) were 39% ($n = 09$). 3. Of those detected in early stages (14), 10 cases were below 70 years and four were above 70 years. 4. 20% did not turn up for the camps because of fear or inhibition. This points to need for counselling and assurance from the volunteers who need be trained on these issues. 5. The involvement of trained community female volunteers facilitated screening, attendance at camps, and helped in overcoming resistance to seek medical help for breast symptoms.
7	Understanding and Practices of Gynaecologists Related to Breast	Gitika N. Singh, Aastha Agarwal, Vinod Jain	2018; Cross sectional study	Uttar Pradesh, India	1. Participants' knowledge of breast cancer risk factors

	Cancer Screening, Detection, Treatment and Common Breast Diseases: A Study from India	& Priti Kumar		N= 152 gynaecologists	· 26.3%- excellent knowledge, · 40.7%- very good knowledge, · 19.2%- good knowledge, · 13.8%- poor knowledge. 2. Of the PGs and UGs, 19.1% and 41.9%, respectively, were unaware of the fact that men are also at risk for breast cancer ($p = 0.07$). 3. In contrast to 6.5% of UGs, 28.1% of PGs were excellent at identifying clinical signs of breast cancer ($p0.05$). 4. 84.9% of participants believed that breast cancer screening reduces breast cancer mortality in the long run. 5. 30.2% participants (32.2% PGs vs. 22.6% UGs; $p = 0.21$) regularly offer breast
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					cancer screening, while 44.1% participants (40.5% PGs vs. 58.1% UGs; $p = 0.21$) offer screening on demand. 6. 22.3% PGs versus 35.5% UGs ($p = 0.04$) preferred mammography as a screening method. 58.5% did not consider screening mammography cost-effective (57.9% PGs vs. 61.3% UGs; $p = 0.72$) for their patients. 7. 47.4% of referrals were made on suspicion of breast cancer to an oncologist.
8	Knowledge and Practises related to screening for breast cancer among women in Delhi, India	Neha Dahiya, Saurav Basu, Megha Chandra Singh, Suneela Garg, Rajesh Kumar, Charu Kohli	2017; Cross sectional study	Delhi; N= 222 women	1. Out of all the respondents- A) 75.7% of participants thought that early detection improved treatment outcomes B) Mammography as an early detection method only known to 48.6% of respondents.

					C) Among 45 participants, only 20.3% (45) knew the recommended age for initiation of screening mammography. D) 109 participants (49%) reported using BSE regularly 2. In reality, only half of the subjects practiced BSE, while the frequency ranged from once a month in 41% to once a year in 15%. 3. BSE helps in the early diagnosis of breast cancer, according to approximately three-fourths of study participants. In contrast, less than half (48.6%) of the participants thought mammography was necessary for early detection of breast cancer
9	Patterns of Cancer: A Study of 500	Manjit Singh Bal, Vijay Kumar	2015; Descriptive study	Patients registered in Mukh	1. Breast was the most common site of cancer in females,

	Punjabi Patients	Bodal, Jaspreet Kaur, Mohanvir Kaur, Swati Sharma		Mantri Punjab Cancer Rahat Kosh Scheme (MMPCRKS), under cancer registry at Rajindra Hospital Patiala from the various districts of Punjab; N= 500 registered patients	followed by Cervix, Ovary, Oesophagus, and Endometrium. 2. Compared to urban population (28%), rural population (72%) has higher cancer rates. 3. Women aged 50-54 had an occurrence of 11.2%, while women aged 60-64 had an occurrence of 10.8%; males aged 65-69 had an occurrence of 5.6%, while those aged 60-64 and 50-54 had an occurrence of 4.8%.
10	Women's Knowledge, Attitudes, and Practices about Breast Cancer in a Rural District of Central India	Nitin Gangane, Nawi Ng, Miguel San Sebastián	2015; Cross sectional study	Wardha district, Maharashtra N= 1000 women (609 rural, 391 urban) aged 13-50	1. Women from rural areas and urban areas practiced breast self-examination at a statistically significant difference of 3.45% and 6.14%, respectively, of the

				years, using stratified cluster sampling.	total 4.5 % whoever did so 2. Mammography was not known to any of the study participants. 3. Almost all women (95.4%) and men (96.4%) were willing to visit a physician as soon as they felt a mass in their breast. 4. Over 93% of women expressed an interest in participating in future breast cancer screening programs
11	A review of breast cancer awareness among women in India: Cancer literate or awareness deficit?	A. Gupta, K. Shridhar, P.K. Dhillon	2015; Systematic review	13 studies; N= 7066 women aged 15–70 years	1.Awareness levels on the strongest risk factors- · age at menarche and age at menopause- 1% to 21% · family history- 13–58%

					· Age at birth of first child- 8–83% and · Age of breast feeding 17–88% · Tobacco smoking- 20–74% 2. 42% of literacy levels on number of children as a risk factor for breast cancer. 3. In spite of breast cancer becoming the most prevalent cancer in India, the study found a relatively low, and wide, variation in awareness of breast cancer risk factors among women in India over the eight years of study publications. 4. There was a lack of awareness by health care professionals (i.e. nurses and nursing students) regarding the risks of breast cancer.
12	Knowledge of Risk Factors &	Vikas Fotedar, Rajeev K	2013;	Nurses working in	1. Across the entire population, 49% of

	Early Detection Methods and Practices towards Breast Cancer among Nurses in Indira Gandhi Medical College, Shimla, Himachal Pradesh, India	Seam, Manoj K Gupta, Manish Gupta, Siddharth Vats, Sunita Verma	Cross sectional study	Indira Gandhi Medical College, Shimla, H.P N=457 nurses	people were familiar with the risk factors associated with breast cancer. · 10.5%- poor knowledge, · 25.2%- good knowledge, · 45%- very good knowledge · 16.3%- excellent knowledge 2. Awareness of screening methods- · BSE- 97% · CBE- 78%, · Mammography - 89% and · Ultrasound- 25.2% 3. Breast cancer screening practices among respondents- · 54% practice BSE at least once every year. · One third of respondent's report having CBE within the past year.
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					A total of 30 participants (7%) had ever undergone a mammogram prior to the study.
13	Breast Self-examination: Knowledge, Attitude, and Practice among Female Dental Students in Hyderabad City, India	Dolar Doshi, B Srikanth Reddy, Suhas Kulkarni, and P. Karunkar	2012; Cross-sectional descriptive study	Dental students at Panineeya Institute of Dental Sciences, Hyderabad, Andhra Pradesh, India N= 203 female students	1. Students in the fourth-year group had the highest mean score (19.98 ± 3.68), having a total knowledge score of 14.22 ± 8.04. 2. Although the attitude score was the highest among all students (mean attitude score of 26.45 ± 5.97), it was very low among students who had the most knowledge. 3. Overall, the average practice score for the third-year students was 13.94 ± 5.31, with the highest mean score recorded at 12.64 ± 5.92. 4. Positive correlation between knowledge and practice (correlation

					coefficient, 0.2129; $P < 0.05$) illustrating population's desire to get correct knowledge regarding BSE
14	Impact of a Health Education Intervention Program Regarding Breast Self-Examination by Women in a Semi-Urban Area of Madhya Pradesh, India	Sanjeev K Gupta, DK Pal, R Garg, R Tiwari, AK Shrivastava, M Bansal	2009; Descriptive intervention study	Jabalpur, Madhya Pradesh N=1000	1. Pre intervention- · 160 (16%) respondents have heard about BSE, but none of them were practicing BSE. · A mere 19 respondents (1.9%) knew the correct facts about BSE (ideal age to begin practicing, frequency, five-step method, etc). 2. Post intervention- · A total of 590 (59.5%) women reported having complete and correct knowledge of BSE and · 410 (41.0 %) were still not (due to lack of interest and not able to understand the importance of BSE.)

					· 535 (53.5 %) respondents were regularly practicing BSE · Overall, 43% increase in the awareness was observed in study group after intervention
15	Breast Cancer Care in India: The Current Scenario and the Challenges for the Future	Gaurav Agarwal, Pooja Ramakant	2008; Review article	Data from the various cancer registries, publications/ presentations from individual institutions, and the data from SGPGIMS Lucknow	1. In Indians, breast cancer is reported to occur a decade earlier than in their western counterparts. In western countries, women are mostly postmenopausal and in their 60's and 70's. India - premenopausal patients account for approximately 50% of all patients (SGPGIMS Lucknow data) 2. Indian breast cancer patients are disproportionately younger than 35 years of age. It varies between 11% (Tata Memorial Hospital (TMH)

					Mumbai) [10] to 26% (SGPGIMS Lucknow). 3. TNM stage at presentation at 4 major cancer centres in India- Stage 1- approx. 5% Stage 2b and large inoperable mass- 16% Stage 3a- 27% Stage 3b- 35% Stage 4- 8-10% 4. No existing national or regional breast cancer screening programs. Public health initiatives such as 'Health for All' and the National Rural Health Mission emphasize breast self-examination as a first step in establishing a nationwide breast cancer screening program.
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CHAPTER 3- METHODOLOGY

We conducted a descriptive cross-sectional study at a community level using a structured self-administered online questionnaire with women residing in any city of Punjab region. Due to existing COVID-19 pandemic and restrictions, we limit the sampling technique to a consecutive sampling method. Consecutive sampling method is one where every subject meeting the criteria of inclusion is selected until the required sample size is achieved.

Sample Size-

The sample size for this study is estimated using Epi-info Version 7.2.4. Based on a previous study by Khan et al, 2021 (9) where 22% participants from rural areas had knowledge about breast self-examination, the sample size at 95% confidence levels, and 5% margin of error was calculated to be 264. Hence the online questionnaire was circulated and was open till the desired sample size had reached.

Inclusion criteria-

Women residing in Punjab including the capital city Chandigarh between 18- 55 years of age.

Exclusion criteria-

1. Women who are already diagnosed with breast cancer and are under treatment, or pregnant women or lactating women will be excluded from the study.
2. Women from outside Punjab state
3. Women less than 18 or more than 55 years of age

Study tool-

The tool used is a structured questionnaire which is divided into four sections-

- a) Socio-economic background of the participants
- b) Knowledge about breast cancer signs & symptoms and various modes of early detection i.e., Breast self-examination, Clinical breast examination and Mammography
- c) Practice of early detection methods
- d) Perception/ attitude towards breast cancer

The socio-economic background section focused on collecting individual level information like age, education, religion, marital status, occupation and monthly family income of the participants. Subsequent sections were used to assess the women's knowledge regarding breast cancer, sign and symptoms, BSE, CBE and Mammography, attitude towards cancer and practise of screening methods using a structured questionnaire.

Women participants were asked whether they were confident if they will be able to observe and check for any changes in their breasts. Using closed-ended questions, they were asked to describe their knowledge of signs and symptoms of breast cancer. In preparing the questionnaire, existing literature was consulted. In order to serve participants more conveniently, the tool has been translated into both Hindi and Punjabi language. Pilot testing was conducted with 20 women participants. This pilot test results were used to modify the words to facilitate understanding. The study tool was distributed and responses were collected via online mode using Microsoft forms at platforms like WhatsApp and Facebook.

Scoring criteria

The questionnaire comprised of 28 items (17 items on knowledge, 5 items on attitude and 6 items on practice) and rest 8 on sociodemographic details. In the knowledge section items, suitable categorical responses were provided and the respondents had to select an option which they felt was the correct response. If the user selects 'Yes' 2 mark was awarded, 'Maybe' 1 mark was awarded and for 'No' response 0 marks was awarded. The total score ranged from 0-34 for knowledge on breast cancer signs & symptoms and early detection methods respectively. Further, we calculated the knowledge score separately for 'knowledge of breast cancer symptoms' and 'knowledge of breast cancer screening methods.' The scores were transformed into percentages of correct answers. Those having less than 40% (<14) were considered to have poor knowledge, between 40-60% (14-20) had average knowledge, between 60-80% (20-27) good knowledge and more than 80% (>27) had excellent knowledge. Attitudes and practices about breast cancer section had 11 questions that covered attitudes of participants towards breast cancer and practices in relation to breast cancer awareness and screening. In the practise section, scoring was not given and analysis was done to see whether women were practising or had ever used the three screening methods under consideration or not.

Finally for the attitude section, total attitude score was calculated using sum of responses against 6 questions in the attitude section. Every positive response was awarded a '+2' score, while every negative response was given a '-2' score. Also, for a neutral response of 'Maybe/ I am not sure' '0' mark was awarded. Hence the possible score range was -10 to +10 points. Respondents with a negative score were categorised in 'Negative attitude' category and vice versa. While those with a score of 0 were in 'Neutral attitude' category.

Univariate and bivariate analysis was then performed using frequency, percentage and mean/median to know the profile of study participants, proportion of women who were aware of symptoms and screening methods etc. Statistical test chi square was used. The data was analysed using IBM SPSS Version 22.0.

CHAPTER 4- RESULTS

A total of 291 women responded to our online questionnaire. 168 out of these used the English language form to submit their responses, 111 women used Punjabi language form while 12 filled the questionnaire in Hindi language. Out of the total women respondents 25 women were found to be either pregnant, lactating or already diagnosed with breast cancer and hence they were excluded from the study. Finally, 266 responses were included in the analysis.

Sociodemographic characteristics

Out of 266 women responders, most participants (38%) belonged to the age group of 26- 35 years followed by 28% from 18-25 years age group. The mean age of the respondents was 32 years and median age was 30 years. Most respondents were either Hindus (47.7%) or Sikhs (46.2%) while women from other religious background constituted a small group (6%). Married women constituted more than half (53%) of the respondents. Almost 40% of the respondents were single women. In our study group we observed an almost 50-50 representation where almost half of our women had received a college education (graduation and post-graduation). In the other half around 3.4% women were illiterate, 28.2% were at least primary level educated (till class 10th) and 18.4% were secondary level educated (class 12th pass). Most of the study participants were housewives (34.2%) followed by students (16.2%). Most respondents (31.2%) reported their average monthly family income as less than 10,000 rupees (Rs.) per month and equal number (31.2%) reported income between 10,000 to 50,000. (Table-3)

Table 3: Participant sociodemographic characteristics (n=266)			
Socio-demographic characteristic	Number of respondents	Valid Percentage	Cumulative percentage
Respondent's age^			
18- 25 years	58	27.6	27.6
26- 35 years	79	37.6	65.2
36- 45 years	43	20.5	85.7
46-55 years	30	14.3	100.0
Marital status^			
Married	141	53	53
Single	107	40.2	93.2
Divorced/ Separated	7	3.4	96.6

Widowed	9	3.4	100.0
Religion[^]			
Hindu	127	47.7	47.7
Sikh	123	46.2	93.9
Other	16	6.1	100.0
Education			
Illiterate	9	3.4	3.4
Primary level	66	24.8	28.2
Secondary level	49	18.4	46.6
Graduate	82	30.8	77.4
Post graduate	60	22.6	100.0
Occupation			
Student	43	16.2	16.2
Housewife	91	34.2	50.4
Self employed	33	12.4	62.8
Currently unemployed	27	10.2	72.9
Employed (Govt. or private job)	72	27.1	100.0
Average monthly family income[^]			
Less than 10,000	82	31.2	31.2
10,000- 50,000	82	31.2	62.4
50,000- 1 lakh	57	21.7	84.0
>1 lakh	42	16.0	100.0
[^] Missing values found in these sections and hence the second column 'Valid percentage' is percentage calculated for the available responses only			

Knowledge of breast cancer symptoms and screening methods

Table 4 represents the univariate analysis of knowledge level of women in Punjab area. It is observed that that knowledge level of women was suboptimal with 37.6% women getting a poor total score. The score range obtained was from 0 to 34, with 3 participants getting a perfect score of 34. The mean score calculated was 18 (52.9% knowledge) and hence lies in the average knowledge category. Only 12.4% participants (n=33) had an excellent knowledge about breast cancer, its symptoms and screening methods.

48% of participants (n=127) were aware about Breast self-examination and out of these 65% (n=82) knew how it is performed. While 39% of participants (n=102) knew about Clinical breast examination. Out of these 39% women only 45% knew how CBE is performed. At the same time, 61% women (n=163) were aware about mammography. We went ahead to calculate the knowledge score for different sections and observed that the knowledge of breast cancer symptoms was average, with 120 women (45.1%) getting a score between 40 to 60%. At the same time 13.9% women had excellent knowledge regarding breast cancer symptoms. But the knowledge of breast cancer screening methods was again poor with 46.2% women getting a <40% score in this section. Only 11.3% women has excellent knowledge about screening methods of BSE, CBE and Mammography.

Table 5 shows the results of bivariate analysis between socio-demographic factors and outcome variables. Statistical significance was calculated using p value (probability value). Knowledge of breast cancer symptoms and screening methods correlated significantly with education level of respondents (p=0.00), occupation (p=0.009) and average monthly family income (p=0.00). While age, marital status and religion were not significant. In terms of education level, it was observed that 47% of participants scoring a poor knowledge score belonged to the illiterate and primary school level category. At the same time, 88% of participants with excellent knowledge score were graduates or post graduates. Occupation was significant and showed that participants with maximum poor scores were housewives (51%) and maximum excellent scores were employed women (36.4%). It is also observed that around 49% women who were employed had a better knowledge score (good and excellent combined) as compared to those who were currently unemployed with 36% having a good or excellent score. Our results also suggest that an average monthly family income also had some influence on the total knowledge score. While 61% of women getting poor knowledge, scores were

from the least economic group earning less than 10,000 rupees a month, most of the women earning excellent scores i.e., 39.4% were from uppermost economic strata with average income of more than Rs 1 lakh.

Table 4: Knowledge of breast cancer symptoms and screening methods among women in Punjab (n=266)				
Parameter	Poor knowledge (<40%)	Average knowledge (40-60%)	Good knowledge (60-80%)	Excellent knowledge (>80%)
1. Total knowledge score				
Frequency	100	67	66	33
Percentage	37.6	25.2	24.8	12.4
2. Knowledge of breast cancer symptoms				
Frequency	49	120	60	37
Percentage	18.4	45.1	22.6	13.9
3. Knowledge of breast cancer screening methods				
Frequency	123	54	59	30
Percentage	46.2	20.3	22.2	11.3

Table 5: Bivariate analysis of total knowledge score against sociodemographic characteristics of women in Punjab (n=264)							
			Total knowledge score				
			Poor	Average	Good	Excellent	Total
Age of respondent	18-25 yr.	Count	16	17	18	7	58
		Percentage	26.2%	31.5%	29.0%	21.2%	27.6 %
	26- 35 yr.	Count	20	21	22	16	79
		Percentage	32.8%	38.9%	35.5%	48.5%	37.6 %
	36-45 yr.	Count	19	10	11	3	43
		Percentage	31.1%	18.5%	17.7%	9.1%	20.5 %
	46-55 yr.	Count	6	6	11	7	30
		Percentage	9.8%	11.1%	17.7%	21.2%	14.3 %
Marital Status	Married	Count	59	35	33	14	141
		Percentage	59.6%	53%	50%	42.4%	53.4
	Single	Count	32	27	30	18	107
		Percentage	32.3%	40.9%	45.5%	54.5%	40.5 %
	Divorced/ Separated	Count	3	2	1	1	7
		Percentage	3%	3%	1.5%	3%	2.7%
	Widowed	Count	5	2	2	0	9
		Percentage	5.1%	3%	3%	0%	3.4%
Religion	Hindu	Count	53	35	26	13	127
		Percentage	53%	52.2%	39.4%	40.6%	47.9 %
	Sikh	Count	38	29	39	17	123
		Percentage	38%	43.3%	59.1%	53.1%	

							46.4 %
	Others	Count Percentage	9 9%	3 4.5%	1 1.5%	2 6.3%	15 5.7%
Education*	Illiterate	Count Percentage	6 6%	1 1.5%	2 3%	0 0%	9 3.4%
	Primary level	Count Percentage	41 41%	15 22.4%	8 12.1%	2 6.1%	66 24.8 %
	Secondary level	Count Percentage	24 24%	14 20.9%	9 13.6%	2 6.1%	49 18.4 %
	Graduate	Count Percentage	19 19%	20 29.9%	26 39.4%	17 51.5%	82 30.8 %
	Post graduate	Count Percentage	10 10%	17 25.4%	21 31.8%	12 36.4%	60 22.6 %
Occupation*	Student	Count Percentage	13 13%	11 16.4%	14 21.2%	5 15.2%	43 16.2 %
	Housewife	Count Percentage	51 51%	21 31.3%	13 19.7%	6 18.2%	91 34.2 %
	Self employed	Count Percentage	9 9%	8 11.9%	9 13.6%	7 21.2%	33 12.4 %
	Currently unemployed	Count Percentage	7 7%	10 14.9%	7 10.6%	3 9.1%	27 10.2 %

	Employed (Govt. or private job)	Count Percentage	20 20%	17 25.4%	23 34.8%	12 36.4%	72 27.1%
Average monthly family income*	Less than 10,000	Count Percentage	61 61%	13 20.3%	5 7.6%	3 9.1%	82 31.2%
	10,000- 50,000	Count Percentage	21 21%	26 40.6%	24 36.4%	11 33.3%	82 31.2%
	50,000- 1 lakh	Count Percentage	14 14%	16 25%	21 31.8%	6 18.2%	57 21.7%
	>1 lakh	Count Percentage	4 4%	9 14.1%	16 24.2%	13 39.4%	42 16%
*p value<0.05 Percentage mentioned are column percentages							

Practise of breast cancer screening methods

Overall practise of breast cancer screening was found to be very low among the women participants. Only 35.7% women had ever performed a breast self-examination while 62% women never did a BSE for themselves. The practise of CBE and Mammography was much lower with only around 16% participants reporting that they had ever performed a CBE or Mammography for themselves. (Table 6)

Practise of screening methods was also analysed against socioeconomic characteristics and it was observed that both age of respondents and marital status were not significant for BSE practise but they were for CBE and mammography practise. (Table 7) Overall it was observed that most of the women who had ever done BSE were those from 26-35 yr. age group (32.6%), were married (51%), were Sikh (58.5%), were graduates (44.2%), were employed (31.6%) and belonged to middle income group strata (average

monthly income between 10-50 thousand) (41.1%). Women practising CBE or ever done it were middle age women, were married (78.2%), were Sikh (66.7%), were graduate & above (56%), were housewives (40%) and belonged to middle income group strata (35.7%). Similarly, women who had ever taken a mammographic examination were mostly from 36-45 year age group (35.9%), were married (81%), were Sikh (78.6%), were either graduate or primary level educated (33.3%), were housewives (33.3%) and belonged to middle income group strata (45.2%).

Table 6 Practise of breast cancer screening methods among women in Punjab (n=266)			
Parameter	Yes	No	Not responded
Practise Breast self-examination			
Frequency	95	165	6
Percentage	35.7	62.0	2.3
Practise Clinical breast examination			
Frequency	42	222	2
Percentage	15.8	83.5	0.8
Practise Mammography			
Frequency	42	222	2
Percentage	15.8	83.5	0.8

Table 7: Bivariate analysis of practise of screening methods against sociodemographic characteristics (n=266)								
			Practise BSE		Practise CBE		Practise Mammography	
			Yes	No	Yes	No	Yes	No
Age of respondent	18-25 yr.	Count	23	34	4*	53*	3*	54*
		Percentage	25%	30.4%	9.8%	31.7%	7.7%	32%
	26- 35 yr.	Count	30	47	13*	66*	9*	70*
		Percentage	32.6%	42%	31.7%	39.5%	23.1%	41.4%
	36-45 yr.	Count	20	21	13*	29*	14*	28*
		Percentage	21.7%	18.8%	31.7%	17.4%	35.9%	16.6%
	46-55 yr.	Count	19	10	11*	19*	13*	17*
		Percentage	20.7%	8.9%	26.8%	11.4%	33.3%	10.1%
Marital Status	Married	Count	48	89	30*	110*	34*	106*
		Percentage	51.1%	54.3%	73.2%	49.8%	81%	48.2%
	Single	Count	42	63	9*	97*	5*	101*
		Percentage	44.7%	38.4%	22%	43.9%	11.9%	45.9%
	Divorced/ Separated	Count	2	5	1*	6*	1*	6*
		Percentage	2.1%	3%	2.4%	2.7%	2.4%	2.7%
	Widowed	Count	2	7	1*	8*	2*	7*
		Percentage	2.1%	4.3%	2.4%	3.6%	4.8%	3.2%
Religion	Hindu	Count	36*	88*	12*	113*	7*	118*
		Percentage	38.3%	53.3%	28.6%	51.1%	16.7%	53.4%
	Sikh	Count	55*	65*	28*	95*	33*	90*
		Percentage	58.5%	39.4%	66.7%	43%	78.6%	40.7%
	Others	Count	3*	12*	2*	13*	2*	13*
		Percentage	3.2%	7.3%	4.8%	5.9%	4.8%	5.9%
Education	Illiterate	Count	2*	7*	1	8	1	8
		Percentage	2.1%	4.2%	2.4%	3.6%	2.4%	3.6%

	Primary level	Count	12*	54*	9	57	14	52
		Percentage	12.6%	32.7%	21.4%	25.7%	33.3%	23.4%
	Secondary level	Count	13*	33*	8	40	8	40
		Percentage	13.7%	20%	19%	18%	19%	18%
	Graduate	Count	42*	39*	16	66	14	68
		Percentage	44.2%	23.6%	38.1%	29.7%	33.3%	30.6%
	Post graduate	Count	26*	32*	8	51	5	54
		Percentage	27.4%	19.4%	19%	23%	11.9%	24.3%
Occupation	Student	Count	17*	26*	4	39	3	40
		Percentage	17.5%	15.8%	9.5%	17.6%	7.1%	18%
	Housewife	Count	21*	68*	17	74	14	77
		Percentage	22.1%	41.2%	40.5%	33.3%	33.3%	34.7%
	Self employed	Count	17*	15*	6	26	8	24
		Percentage	17.9%	9.1%	14.3%	11.7%	19%	10.8%
	Currently unemployed	Count	10*	15*	4	22	5	21
		Percentage	10.5%	9.1%	9.5%	9.5%	11.9%	9.5%
	Employed (Govt. or private job)	Count	30*	41*	11	61	12	60
		Percentage	31.6%	24.8%	26.2%	27.5%	28.6%	27%
Average monthly family income	Less than 10,000	Count	8*	72*	4*	76*	1*	79*
		Percentage	8.4%	44.4%	9.5%	34.7%	2.4%	36.1%
	10,000-50,000	Count	39*	41*	15*	67*	19*	63*
		Percentage	41.1%	25.3%	35.7%	30.6%	45.2%	28.8%
	50,000- 1 lakh	Count	23*	32*	14*	43*	15*	42*
		Percentage	24.2%	19.8%	33.3%	19.6%	35.7%	19.2%
	>1 lakh	Count	25*	17*	9*	33*	7*	35*
		Percentage	26.3%	10.5%	21.4%	15.1%	16.7%	16%
*p value<0.05								
Percentage mentioned are column percentages								

Further, women were asked about the reason why they never went for a mammographic examination and it was observed that 42.38% women felt that they were not old enough for a mammographic examination followed by almost 30% of them stating they were unaware of the nearest place where mammography could be done (Figure 7). We also observe that 95% of women who responded small age as a reason for not getting a mammography done were less than 45 years of age, and mammography is usually indicated for women above 45-50 years of age based on different guidelines. Hence, this observation can be taken as a positive indicator that women were aware when mammography should be started. 12% women said that financial burden was the reason of never getting a mammography and 6.6% never felt the need for it. Other reasons were like careless attitude and women not knowing what mammography is.

Also, 88.9% women participants (n=235) reported that if they ever detect any recent abnormalities or changes in breast tissue, they will consult a doctor and get it checked as opposed to 5% women (n=13) suggesting they will prefer to use home remedies to treat the symptoms. The remaining 6.1% women (n=16) said that they would do nothing because these symptoms will fade away with time. (Figure 8)

Figure 7 Reasons for never getting a mammographic examination according to women participants

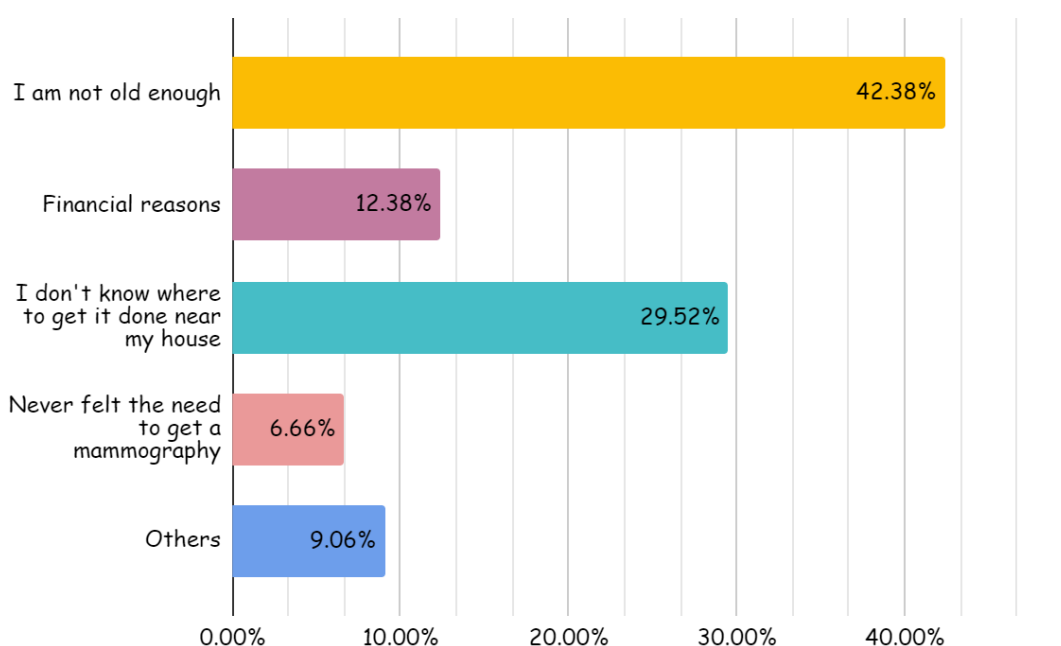
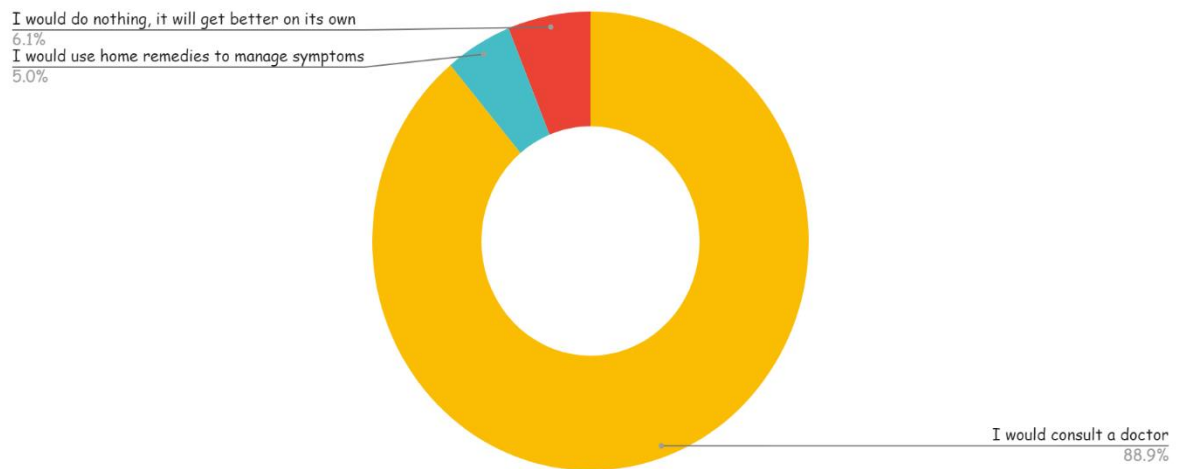


Figure 8 Participant responses for steps which they will take if any abnormality is detected in their lungs



Attitude towards breast cancer

Women were asked different questions related to attitude towards breast cancer and a total score was calculated. As depicted in figure 9, 64% women agreed that breast cancer is not a disease of elderly women only while 17% women still thought the opposite. A majority 75% participants were of the opinion that early detection and screening methods are beneficial and they help to identify cancer in its early stages while 19% thought otherwise. 55% women felt that cancer is not a death sentence and help can be provided but a significant 25% participants still feel that getting cancer diagnosis is a death sentence and nothing much can be done to help the patient. An interesting outcome was observed where almost 59% women were not embarrassed to talk about cancer with their friends and families. Further, 75% of them were willing to learn more about breast cancer, it's symptoms, risk factors and mode of prevention in future. The mean total attitude score was found to be 3.82 which is on the positive side (Table 8). Majority of the women 77.3% had a positive attitude towards breast cancer while 11.4% women each had either neutral or negative attitude (Figure 10).

Figure 9 Participant responses against different questions for the attitude towards breast cancer

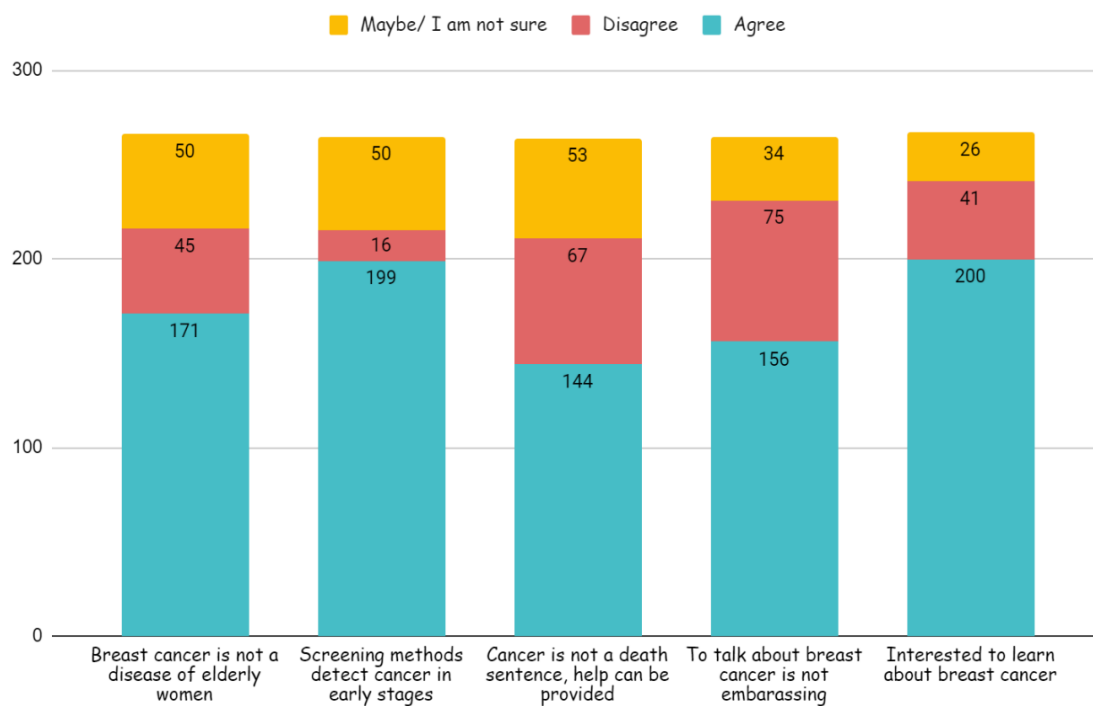
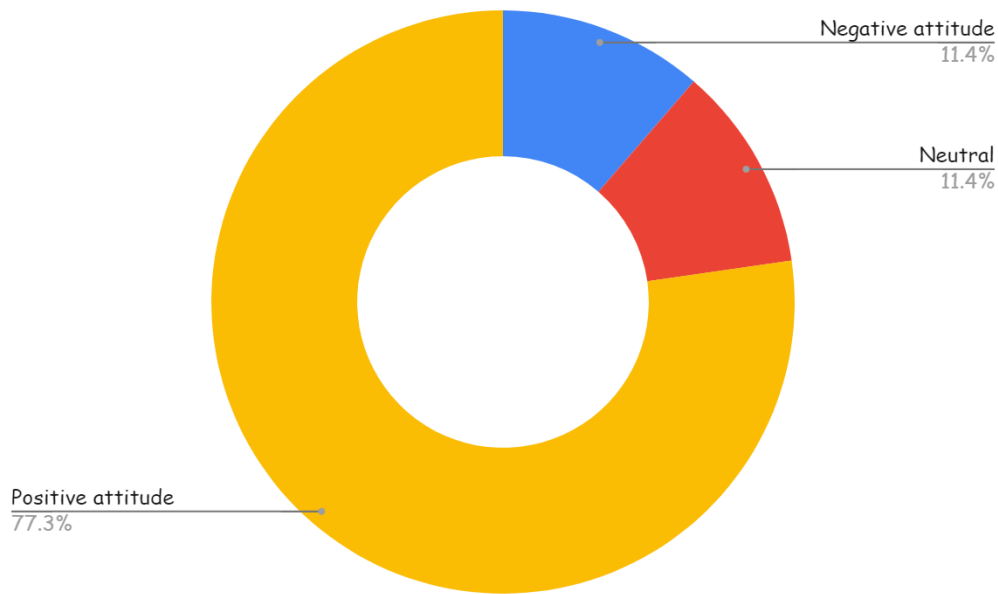


Table 8: Total attitude score of women participants towards breast cancer in Punjab (n=266)		
Total attitude score	Frequency	Percentage
Positive attitude (Score +10 to +2)	204	77.3
Neutral (Score 0)	30	11.4
Negative attitude (Score -2 to -10)	30	11.4

Figure 10 Participant's attitude levels towards breast cancer



Further, on performing the bivariate analysis it was observed that education, occupation and average monthly family income were significant for total attitude score (p value-0.00). In terms of level of education, 63% of women with negative attitude were from the lower educational level category (10% illiterate and 53% primary level educated). On the other hand, among the group of women with positive attitude, a majority 61% of them had a good educational background (34% graduate and 27.5% post graduate). Majority 43% of women with neutral scores were also from the primary level education category. Based on occupation, majority women 73.3% with negative scores were housewives but majority with positive scores 31.9% were currently employed in a government or private organisation. In terms of family income, women with average monthly income of less than 10,000 had a major share of negative score holder participants 83.3%. With an increase in average monthly income the proportion of negative responses were decreasing and positive responses were increasing. Hence women from a higher economic stratum showed better attitude and positive attitude scores. A total of 46% women with positive attitude score were from a higher (50,000 to 1 lakh average family income pm) and highest (>1 lakh average family income) economic stratum (Table 9).

Women were also asked about their preferred mode of communication regarding breast cancer information and it was observed that a majority 55% women preferred information from healthcare practitioners directly. Second most common mode of communication was social media (22%). (Figure 11)

Figure 11 Preferred mode of information dissemination among women respondents from Punjab (n=222)

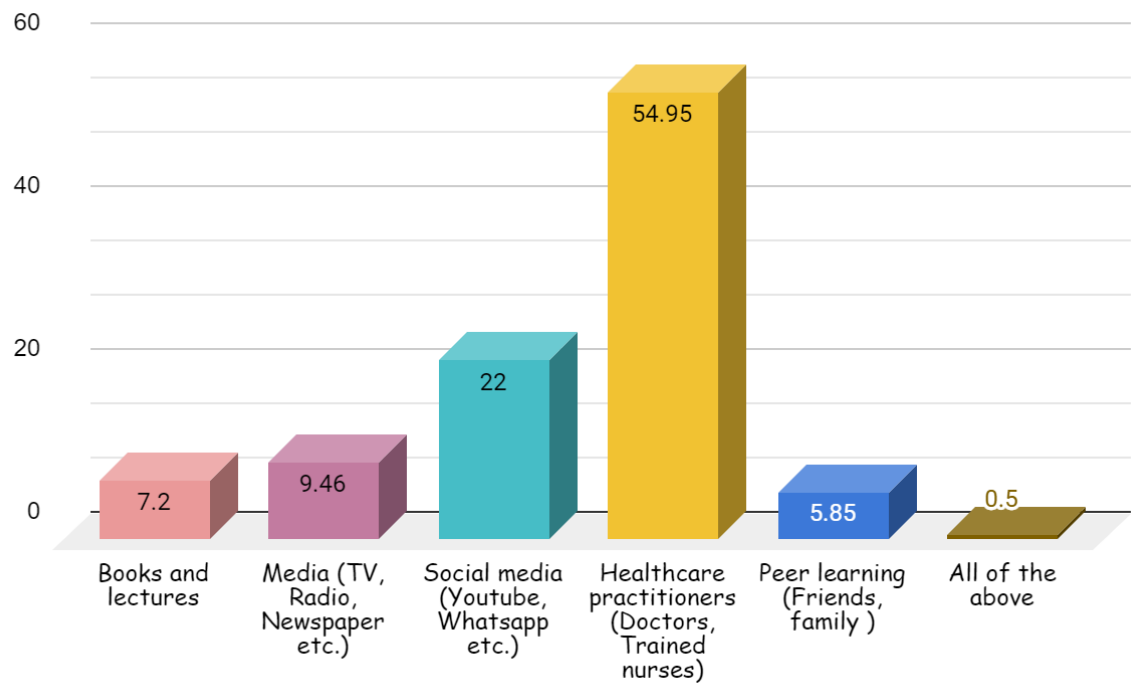


Table 9: Bivariate analysis of total attitude score across sociodemographic characteristics of women in Punjab (n=266)

			Total attitude score		
			Negative attitude	Neutral	Positive attitude
Age of respondent	18-25 yr.	Count	3	7	47
		Percentage	15%	38.9%	27.6%
	26- 35 yr.	Count	10	5	64
		Percentage	50%	27.8%	37.6%
	36-45 yr.	Count	6	4	32
		Percentage	30%	22.2%	18.8%
	46-55 yr.	Count	1	2	27
		Percentage	5%	11.1%	15.9%
Marital Status	Married	Count	20	14	106
		Percentage	66.7%	48.3%	52.2%
	Single	Count	7	13	86
		Percentage	23.3%	44.8%	42.4%
	Divorced/ Separated	Count	0	1	6
		Percentage		3.4%	3%
	Widowed	Count	3	1	5
		Percentage	10%	3.4%	2.5%
Religion	Hindu	Count	14	14	97
		Percentage	46.7%	46.7%	47.8%
	Sikh	Count	13	14	96
		Percentage	43.3%	46.7%	47.3%
	Others	Count	3	2	10
		Percentage	10%	6.7%	4.9%
Education*	Illiterate	Count	3	0	6
		Percentage	10%		2.9%
	Primary level	Count	16	13	37
		Percentage	53.3%	43.3%	18.1%

	Secondary level	Count	4	9	35
		Percentage	13.3%	30%	17.2%
	Graduate	Count	4	8	70
		Percentage	13.3%	26.7%	34.3%
	Post graduate	Count	3	0	56
		Percentage	10%		27.5%
Occupation*	Student	Count	5	5	33
		Percentage	16.7%	16.7%	16.2%
	Housewife	Count	22	15	54
		Percentage	73.3%	50%	26.5%
	Self employed	Count	1	1	30
		Percentage	3.3%	3.3%	14.7%
Currently unemployed	Count	1	3	22	
	Percentage	3.3%	10%	10.8%	
Employed (Govt. or private job)	Count	1	6	65	
	Percentage	3.3%	20%	31.9%	
Average monthly family income*	Less than 10,000	Count	25	19	36
		Percentage	83.3%	65.5%	17.8%
	10,000- 50,000	Count	3	7	72
		Percentage	10%	24.1%	35.6%
	50,000- 1 lakh	Count	1	3	53
		Percentage	3.3%	10.3%	26.2%
>1 lakh	Count	1	0	41	
	Percentage	3.3%		20.3%	
*p value<0.05					
Percentages mentioned are in terms of column percentage					

CHAPTER 5- DISCUSSION

Breast cancer education, breast awareness, and self-examination could lead to an increase in early reporting of symptoms and better survival rates among women. Research has established that cancer awareness deficit is associated with late reporting and higher mortality. Hence it becomes extremely important to educate our women under risk to identify early signs, report them in time and get complete treatment. However, the road to educational intervention starts from having a good idea about the present level of awareness among women, their attitude towards the disease and understanding what all factors influence their knowledge and practise of early detection methods.

Our study indicated that about 42% of women from Punjab were confident that they will be able to examine their breasts for any recent change or abnormality. But when asked about the specific symptoms, many were not aware of some of the most common symptoms of the disease like three-fourth women were not able to identify a redness, ulcer or peeling skin over breast as a symptom. Only one fourth of the women were sure that an inward turned nipple is a sign and knowledge about lump in the breast which is the most common presentation was also absent in half of the women. Almost half of the women responders were not able to correctly identify a family history of breast cancer as a risk factor.

At the same time, we found almost three fourths of the enrolled participants felt that regular screening and methods like breast self-examination, clinical breast examination and mammography helps to detect cancer in early stages. This observation is in line with earlier findings reported by Dahiya, 2018 where 75% women were aware about the benefits of early diagnosis and initiation of treatment (10). The average score against knowledge of symptoms and screening methods of breast cancer in our study was 18 out of 34 (53%) is almost similar to that reported by Fotedar in 2013 in their study conducted on Nurses in a hospital in India, who revealed an average score of 49% (11). But an alarming 40% women had poor knowledge which is a matter of concern. Abundant literature can be found linking knowledge to practise which can be established from our study as well. It was observed that 66% women who were aware about Breast self-examination were actually practising it. But the practise of CBE and Mammography was much lower with only one out of four women aware about the

methods and actually practising them as well. The development of community-based programs aimed at selected small groups of women at the local level should be promoted, in order to not only disseminate information and techniques about BSE under supervision, but also ensure privacy and comfort. The perception of BSE could also be improved by peer interaction.

Within the population, the knowledge of breast cancer was found to be related with the level of schooling where women with higher schooling had better scores. Similarly, women who were employed had better scores. Housewives who made a major portion of our sample, were actually found to have poor knowledge scores. It is an indication for the policy makers to target this section of society and try to include them in prevention campaigns. It was also observed that more than half of the women would prefer their mode of cancer knowledge to be a trained healthcare professional like a doctor or a nurse. For a disease as deadly as cancer, people usually prefer to take advice from experts. Previous qualitative study has also highlighted the importance of mode of information dissemination where participants stated that the best way for information dissemination is to use pamphlets and videos in an entertaining fashion. Also, doctors, especially lady doctors were perceived to be the most suitable to spread awareness about breast cancer (12). Notably, participants argued that sensitising men to women's health issues would completely rule out any necessity for women to be hiding such facts from them, thereby ensuring timely care and assistance to prevent and cure the disease (12). Although, 60% participants in our study agreed that talking about breast cancer is not embarrassing but sensitizing male counterparts about the subject will definitely make the process easier. Studies have found a significant escalation of up to 50% and more in breast cancer awareness after educational intervention was given. (13, 14) Authorities should try to plan and implement gender neutral awareness campaigns for the community especially the lower socioeconomic strata and housewives with increasing age.

A poor practice score was attributable to a lack of knowledge, inadequate emphasis by the doctor, poor regard for one's own health and underestimation of cancer's risk. As a solution to this problem, we can introduce the 'BSE charting' method, similar to menstrual cycle charting, which will ensure that the BSE is conducted each month after menstruation. Digital technology is also an important factor that should be leveraged when it comes to BSE reminder applications (15). BSE acts as a convenient self-screening method for women to identify any changes and it is not physically harmful to

the lady in any way. Hence, with regular practise, one can ensure that women can keep a track of any changes, if found, she can consult a doctor on time and get proper treatment for the same.

Several studies summarizing barriers to breast cancer care were conducted at the Global Summit on Breast Health (BHGI) in 2010, which concluded that women in developing countries face a lack of or very limited access to treatment, as well as limited health professionals' knowledge of cancer prevention and detection. The lack of informed coverage by different forms of media, including TV and newspapers, also contributes to low levels of awareness of risk factors. Most media publicity and policy efforts on cancer in India have been centred around the reduction and dangers of tobacco use; little attention has been paid to other important risk factors such as alcohol, family history, reproductive history, and nulliparity.

Additionally, there is no regular screening program in place. According to another study, currently in India only 30% physicians (PG's and UG's) prefer to provide regular breast cancer screening while around 44% offer it on demand. This situation needs to be improved, we need to encourage doctors and other healthcare workforce to educate incoming patients and make them aware about breast cancer. Screening should not be considered an opportunistic activity but a regular practise. Unlike India, most developed nations have structured preventive health care programs, which include mammograms for women above the age of 35 years which is probably the reason behind better management and lower mortality rate. Thus, in a resource poor, third world country like India, BSE becomes singularly important and can serve as a simple, cost-effective, and self-sufficient tool for the early detection of breast cancer.

Special initiatives by Health department Punjab

Punjab government has invested in establishing various cancer treatment centres and hospitals and worked to provide cashless treatment, medication at subsidized rates in different parts of the state like Bathinda, Sangrur, New Chandigarh. Apart from that regular training related to chemotherapy is provided at district hospitals. Statewide house-to-house awareness campaigns for early detection and awareness were conducted in 2012-13 by ASHA workers. Breast and oral cancer screening at sub-centre level, as well as early detection and treatment, is being carried out by trained ANMs.

Additionally, screening is on offer at every community health center under the Free annual preventive health check program. As per the Cancer Registry, phase 1 of the

vaccination of girls against cervical cancer has been completed in the two districts with the highest incidence of cervical cancer (Bathinda and Mansa), phase 2 has begun in next five districts. A mobile van equipped with the latest screening facilities has been launched by the state government under its flagship Tandarust Punjab Mission and will provide world class preventive medical care to women in Malwa for early detection of the symptoms of deadly diseases.

Future scope for improvement

Our study revealed that women in Punjab are somewhat aware about the disease breast cancer and its symptoms. Although there is scope for improvement as well. But on the brighter side, the attitude of women towards cancer as a disease is positive and encouraging. Women are dedicated to learn about the disease. Though the current practise of detection methods is low but it can be improved with time if they are taught about it. Educating women about BSE should be mandatory. In addition to educating about the correct technique of BSE, campaigns and movements promoting a healthy attitude and practice should be held at regular intervals. Women should feel empowered to participate with their partners and parents. Although the practise of mammography was observed lower in our case, but it can be due to the fact that a small part of our sample was eligible to actually undergo the exam. When asked about the reason why mammography was never performed, most of the respondents replied that they were not old enough, which can be considered a positive indicator that women were actually aware that mammography is usually performed after a certain age.

Policymakers should leverage positive attitude of women and organise community awareness programs. Social media like Facebook, WhatsApp and other media sources (TV, radio) could be leveraged to share breast cancer awareness among masses. Additionally, doctors (including dentists, ayurvedic and homeopathic practitioners) and nurses should be provided regular training about cancer, its detection and treatment. There is also a need to address the fact that more than half of women wanted healthcare practitioners to be their source of information, so do we have enough workforce to cater to them is an important concern.

Limitations

This is a cross-sectional study and therefore causal conclusions cannot be drawn. Since we have used convenience sampling these findings might not be generalised to the entire population of Punjab, but it sure does give a solid foundation and further work can be done around it to get a clear picture. Even though we emphasize the importance of literacy in this review, higher levels of awareness may not always translate to better outcomes for Indian women. Despite their socio-economic status, some evidence suggests women are less likely to follow up after breast cancer screenings for abnormal findings, suggesting other factors related to fear, stigma, discrimination, denial, and mistrust of the health care system. Even though breast cancer increases with age, this study does not include a significant number of senior citizens possibly due to decreased use of smart phones and computers by which this survey was circulated. Even though this study presents a picture of women's knowledge and practice of BSE, it is difficult to elicit the reasons why a large segment of women is unaware of BSE. A lot of research should also be conducted in rural areas where two-thirds of the Indian population resides, and the health care facilities are less than adequate.

CHAPTER 8 CONCLUSION

Despite being a growing economy, India has not yet developed the infrastructure and resources that allow early detection of breast cancer to be readily available across the country. Moreover, the prohibitive cost makes it out of reach for the average woman. Thus, BSE becomes of particular importance in resource-poor, third world countries like India and can serve as an easy, cost-effective, and self-sufficient method for the early detection of breast cancer. Eventually training manpower to disseminate awareness and generate knowledge among women will definitely prove to be a step in the right direction.

9. REFERENCES-

1. Kanavos P. The rising burden of cancer in the developing world. *Annals of Oncology*. 2006 Jul;17:viii15–23.
2. GLOBOCAN 2020: New Global Cancer Data | UICC [Internet]. [cited 2021 Jun 14]. Available from: <https://www.uicc.org/news/globocan-2020-new-global-cancer-data>
3. National Cancer Registry Programme . Consolidated report of the population based cancer registries 1990–1996. New Delhi: Indian Council of Medical Research; 2001
4. Cancer Statistics, 2020: Report From National Cancer Registry Programme, India | JCO Global Oncology [Internet]. [cited 2021 Jun 17]. Available from: <https://ascopubs.org/doi/10.1200/GO.20.00122>
5. Singla D, Singla A, Kaur M, Walia DS. Incidence of Malignant Diseases in Punjab: A Retrospective Study in a Tertiary Level Government Hospital in Punjab. *JCDR* [Internet]. 2021 [cited 2021 Jun 24]; Available from: https://jcdr.net/article_fulltext.asp?issn=0973-709x&year=2021&volume=15&issue=3&page=XC01&issn=0973-709x&id=14594
6. McPherson K, Steel CM, Dixon JM. Breast cancer—epidemiology, risk factors, and genetics. *BMJ*. 2000 Sep 9;321(7261):624–8.
7. Leong SPL, Shen Z-Z, Liu T-J, Agarwal G, Tajima T, Paik N-S, et al. Is breast cancer the same disease in Asian and Western countries? *World J Surg*. 2010 Oct;34(10):2308–24.
8. Anderson BO, Cazap E, El Saghir NS, Yip C-H, Khaled HM, Otero IV, et al. Optimisation of breast cancer management in low-resource and middle-resource countries: executive summary of the Breast Health Global Initiative consensus, 2010. *Lancet Oncol*. 2011 Apr;12(4):387–98.
9. Khan A, Akhtar M, Vanan A, Heroor A, Singhvi H. Knowledge, Attitude & Practice Towards Breast Cancer and Breast Self- Examination Among Indian Women: A Prospective Observation Study. 2021 Apr 22;

10. Dahiya N, Basu S, Singh MC, Garg S, Kumar R, Kohli C. Knowledge and Practices Related to Screening for Breast Cancer among Women in Delhi, India. *Asian Pacific Journal of Cancer Prevention*. 2018 Jan 1;19(1):155–9.
11. Fotedar V, Seam RK, Gupta MK, Gupta M, Vats S, Verma S. Knowledge of Risk Factors & Early Detection Methods and Practices towards Breast Cancer among Nurses in Indira Gandhi Medical College, Shimla, Himachal Pradesh, India. *Asian Pacific Journal of Cancer Prevention*. 2013;14(1):117–20.
12. Kathrikolly TR, Shetty RS, Nair S. Opportunities and Barriers to Breast Cancer Screening in a Rural Community in Coastal Karnataka, India: A Qualitative Analysis. *Asian Pac J Cancer Prev*. 2020 Sep;21(9):2569–75.
13. Nisha B, Murali R. Impact of Health Education Intervention on Breast Cancer Awareness among Rural Women of Tamil Nadu. *Indian J Community Med*. 2020;45(2):149–53.
14. Gupta SK, Pal D, Garg R, Tiwari R, Shrivastava A, Bansal M. Impact of a Health Education Intervention Program Regarding Breast Self Examination by Women in a Semi-Urban Area of Madhya Pradesh, India. :6.
15. Sachdeva S, Mangalesh S, Dudani S. Knowledge, Attitude and Practices of Breast Self-Examination Amongst Indian Women: A Pan-India Study. 1. 2021 May 6;6(2):141–7.
16. Agarwal G, Ramakant P. Breast Cancer Care in India: The Current Scenario and the Challenges for the Future. *Breast Care*. 2008;3(1):21–7.
17. Assessment of Knowledge and Screening in Oral, Breast, and Cervical Cancer in the Population of the Northeast Region of India | *JCO Global Oncology* [Internet]. [cited 2021 Jun 12]. Available from: <https://ascopubs.org/doi/full/10.1200/JGO.19.00257>
18. Bal MS, Bodal VK, Kaur J, Kaur M, Sharma S. Patterns of Cancer: A Study of 500 Punjabi Patients. *Asian Pacific Journal of Cancer Prevention*. 2015 Jul 13;16(12):5107–10.
19. Doshi D, Reddy BS, Kulkarni S, Karunakar P. Breast Self-examination: Knowledge, Attitude, and Practice among Female Dental Students in Hyderabad City, India. *Indian J Palliat Care*. 2012;18(1):68–73.
20. Gangane N, Ng N, Sebastian MS. Women's Knowledge, Attitudes, and Practices about Breast Cancer in a Rural District of Central India. *Asian Pacific Journal of Cancer Prevention*. 2015 Nov 4;16(16):6863–70.

21. Gupta A, Shridhar K, Dhillon PK. A review of breast cancer awareness among women in India: Cancer literate or awareness deficit? *European Journal of Cancer*. 2015 Sep 1;51(14):2058–66.
22. Himes DO, Root AE, Gammon A, Luthy KE. Breast Cancer Risk Assessment: Calculating Lifetime Risk Using the Tyrer-Cuzick Model. *The Journal for Nurse Practitioners*. 2016 Oct 1;12(9):581–92.
23. Knowledge, attitude, and practice towards breast cancer and its screening among women in India: A systematic review. 2001 [cited 2021 Jun 12]; Available from: <https://www.cancerjournal.net/preprintarticle.asp?id=314513>
24. Oeffinger KC, Fontham ETH, Etzioni R, Herzig A, Michaelson JS, Shih Y-CT, et al. Breast Cancer Screening for Women at Average Risk: 2015 Guideline Update From the American Cancer Society. *JAMA*. 2015 Oct 20;314(15):1599–614.
25. Okonkwo QL, Draisma G, der Kinderen A, Brown ML, de Koning HJ. Breast Cancer Screening Policies in Developing Countries: A Cost-effectiveness Analysis for India. *JNCI: Journal of the National Cancer Institute*. 2008 Sep 17;100(18):1290–300.
26. Panigrahi SK, Pal A, Singh S, Thakur P. Assessment of community inquisitive insight towards carcinoma breast and cervix among adolescent girls in a city of Chhattisgarh, India: A qualitative study. *J Family Med Prim Care*. 2020 Feb 28;9(2):619–25.
27. Parambil NA, Philip S, Tripathy JP, Philip PM, Duraisamy K, Balasubramanian S. Community engaged breast cancer screening program in Kannur District, Kerala, India: A ray of hope for early diagnosis and treatment. *Indian Journal of Cancer*. 2019 Jul 1;56(3):222.
28. Paul S, Solanki PP, Shahi UP, Srikrishna S. Epidemiological Study on Breast Cancer Associated Risk Factors and Screening Practices among Women in the Holy City of Varanasi, Uttar Pradesh, India. *Asian Pacific Journal of Cancer Prevention*. 2016 Jan 11;16(18):8163–71.
29. Prusty RK, Begum S, Patil A, Naik DD, Pimple S, Mishra G. Knowledge of symptoms and risk factors of breast cancer among women: a community based study in a low socio-economic area of Mumbai, India. *BMC Women's Health*. 2020 May 18;20(1):106.

30. Rafique S, Sheerin F, Waseem Z. Breast cancer awareness, attitude and screening practices among university students: intervention needed. 2018 May 22;4.
31. Reddy N, Ninan T, Tabar L, Bevers T. The Results of a Breast Cancer Screening Camp at a District Level in Rural India. *Asian Pacific Journal of Cancer Prevention*. 2012;13(12):6067–72.
32. Sachdeva S, Mangalesh S, Dudani S. Knowledge, Attitude and Practices of Breast Self-Examination Amongst Indian Women: A Pan-India Study. 1. 2021 May 6;6(2):141–7.
33. Sayed S, Ngugi A, Ochieng P, Mwenda AS, Salam RA. Training health workers in clinical breast examination for early detection of breast cancer in low- and middle-income countries. *Cochrane Database Syst Rev* [Internet]. 2017 Jan 24 [cited 2021 Jun 12];2017(1). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6464726/>
34. Sharma K, Ganguly E, Nagda D, Kamaraju T. ORIGINAL ARTICLE Knowledge, attitude and preventive practices of South Indian women towards breast cancer.
35. Sim H-L, Seah M, Tan S. Breast cancer knowledge and screening practices: A survey of 1,000 Asian women. *Singapore medical journal*. 2009 Mar 1;50:132–8.
36. Singh GN, Agarwal A, Jain V, Kumar P. Understanding and Practices of Gynaecologists Related to Breast Cancer Screening, Detection, Treatment and Common Breast Diseases: A Study from India. *World J Surg*. 2019 Jan;43(1):183–91.
37. Singh S, Shrivastava JP, Dwivedi A. Breast cancer screening existence in India: A nonexistent reality. *Indian J Med Paediatr Oncol*. 2015;36(4):207–9.
38. Somdatta P, Baridalyne N. Awareness of breast cancer in women of an urban resettlement colony. *Indian Journal of Cancer*. 2008 Oct 1;45(4):149.
39. Thakur. Urban–rural differences in cancer incidence and pattern in Punjab and Chandigarh: Findings from four new population-based cancer registries in North India [Internet]. [cited 2021 Jun 12]. Available from: <https://www.ijncd.org/article.asp?issn=2468-8827;year=2017;volume=2;issue=2;spage=49;epage=55;aulast=Thakur>
40. Wu T, Scheffer B, Lee C. Asian Indian women.

41. Zapka JG, Stoddard AM, Costanza ME, Greene HL. Breast cancer screening by mammography: utilization and associated factors. *Am J Public Health*. 1989 Nov 1;79(11):1499–502.

8. ANNEXURES

8.1 Study tool

BREAST CANCER AWARENESS TOOL- QUESTIONNAIRE

This study is being conducted to understand breast cancer awareness and practices among women residing in Punjab state. Against every question, different options are provided. Only one response can be selected. Kindly select the option which you feel is the correct answer.

Your responses will be kept confidential and your honest answer will be appreciated. Participation is not compulsory and there is no incentive to participate in the study, but your responses will help in successful completion of this study. We request a total of 10-12 minutes of your time.

Thank you for responding and for your time.

1. Are you pregnant, lactating or already diagnosed with breast cancer?

- Yes
- No

(If YES, end form)

SECTION A: SOCIO-DEMOGRAPHIC FACTORS

2. What is your age?

3. Can you provide name of the city in Punjab state where you live in?

4. Specify your marital status.

- Single/ Never married

- Married
- Divorced/ Separated
- Widowed

5. Specify your religion.

- Sikh
- Hindu
- Muslim
- Christian
- Other

6. Specify your level of education.

- Uneducated
- Middle school (Class 1 to 7th)
- Secondary school (Class 8th to 10th)
- Senior secondary school (12th pass)
- Graduate
- Post graduate and above

7. Specify your occupation.

- Student
- Housewife
- Employed
- Unemployed
- Self employed

8. Can you please provide a range of your monthly family income?

- Less than 10,000
- 10,000- 50,000
- 50,000- 1,00,000
- >1 lakh

**SECTION B: KNOWLEDGE OF BREAST CANCER SYMPTOMS
AND EARLY DETECTION METHODS (Max 17 points)**

9. Are you confident that you will be able to observe and check for any changes in your breast?
- Yes
 - No
 - Maybe
10. Do you think that a recently developed painless palpable mass or lump in one or both the breasts can be a sign of breast cancer?
- Yes
 - No
 - Maybe
11. Do you think that a recent change in shape/ size of breast or swelling in a part or whole of the breast can be a sign of breast cancer?
- Yes
 - No
 - Maybe
12. Do you think that breast pain or soreness in one or both the breasts can be a sign of breast cancer?
- Yes
 - No
 - Maybe

13. Do you think that an inward turned nipple in one or both of the breasts can be a sign of breast cancer?
- Yes
 - No
 - Maybe
14. Do you think that pus or blood discharge from the nipple can be a sign of breast cancer?
- Yes
 - No
 - Maybe
15. Do you think that any skin deformity like redness, ulcer or peeling skin can be a sign of breast cancer?
- Yes
 - No
 - Maybe
16. According to you, if anyone has a positive family history of breast cancer, will it affect their chances of getting breast cancer as well?
- It increases their chances of breast cancer
 - It decreases their chances of getting breast cancer
 - It does not affect them in any way
 - Maybe, I am not sure

KNOWLEDGE OF BREAST SELF EXAMINATION (BSE)

17. Have you ever heard of Breast Self-Examination (BSE)?
- Yes
 - No

18. If yes, do you know how Breast Self-Examination is performed?

- Yes
- No

19. Who do you think should perform Breast Self-Examination?

- The person themselves
- Doctor
- Trained nurse
- Any other (Specify) _____

KNOWLEDGE OF CLINICAL BREAST EXAMINATION

20. Have you ever heard of Clinical Breast Examination (CBE)?

- Yes
- No

21. If yes, do you know how Clinical Breast Examination is performed?

- Yes
- No

22. Who do you think should perform Clinical Breast Examination?

- The person themselves
- Doctor
- Trained nurse
- Any other (Specify) _____

KNOWLEDGE OF MAMMOGRAPHY

23. Have you ever heard of Mammography?

- Yes
- No

24. Do you know how frequently Mammography should be done?

- Once every week
- Once every month
- At least once in a year
- Twice in a year or more
- I am not sure

25. Who do you think should perform Mammography?

- The person themselves
- Doctor
- Trained nurse
- Any other (Specify) _____

SECTION C: PRACTICE OF EARLY DETECTION METHODS

(Max 4 points)

26. If you ever observe any recent abnormalities or changes in your breast, what would you do?

- I would visit a doctor and get it checked
- I would use home remedies to treat the symptoms
- I would do nothing because it will get better in some days

27. Have you ever performed a Breast Self-Examination for yourself?

- Yes
- No

28. Have you ever done a Clinical Breast Examination for yourself?

- Yes

- No

29. Have you ever done a mammography for yourself?

- Yes
- No

30. If you have never got a mammogram, can you tell the reason why?

- Not old enough
- Financial reasons
- I don't know where to get it done near my house
- Never felt the need for getting a mammogram
- Others (Specify) _____

***SECTION D: PERCEPTION TOWARDS BREAST CANCER (Max
5 points)***

31. Do you think that breast cancer is a disease of elderly women?

- Agree
- Disagree
- Maybe

32. Do you think that regular screening and methods like breast self-examination, clinical breast examination and mammography helps to detect cancer in early stages?

- Agree
- Disagree
- Maybe

33. Do you think that getting breast cancer is a death sentence and there is not much that can be done to help the patient?

- Agree
- Disagree
- Maybe

34. Do you feel talking to friends/ family members about breast cancer is embarrassing?

- Agree
- Disagree
- Maybe

35. Will you be interested to learn about breast cancer, its symptoms, risk factors and modes of prevention in future?

- Yes, I am interested
- Not interested
- Maybe

36. Which mode of communication will you prefer to get more knowledge about breast cancer?

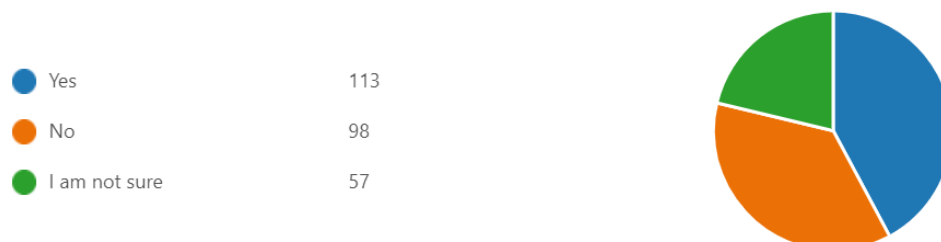
- Books and lectures
- Media (TV, Radio, Newspaper, etc)
- Healthcare practitioners (doctors, trained nurses)
- Peer learning (friends and family)
- Others (pls. specify) _____

.....**THANKYOU**.....

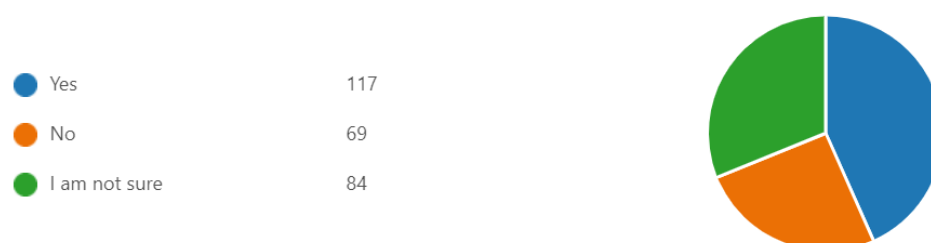
8.2 Additional study results

Responses in terms of frequency

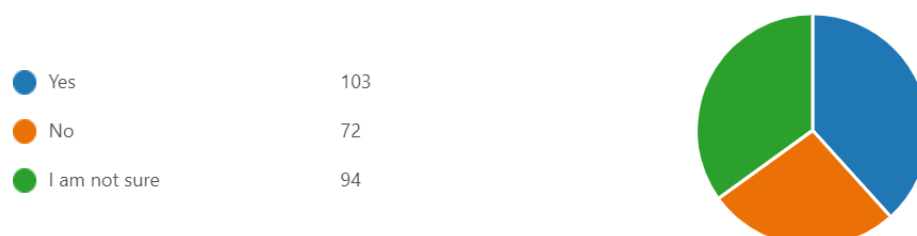
Are you confident that you will be able to observe and check for any changes in your breast?



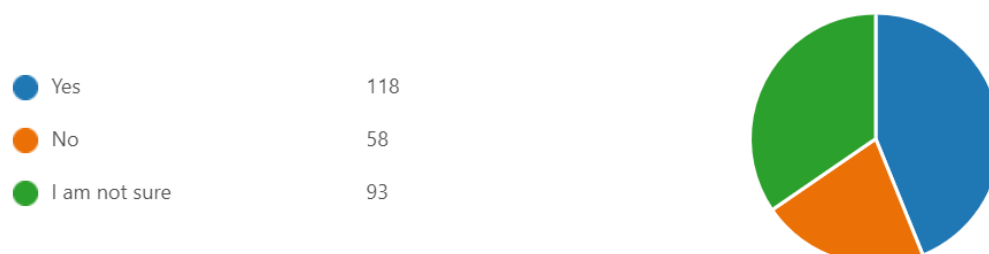
. Do you think that a recently developed painless palpable mass or lump in one or both breasts can be a sign of breast cancer?



l. Do you think that a recent change in shape/ size of the breast or swelling in a part or whole of the breast can be a sign of breast cancer?



. Do you think that breast pain or soreness in one or both breasts can be a sign of breast cancer?



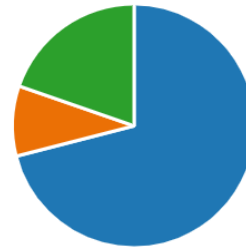
Do you think that an inward-turned nipple in one or both of the breasts can be a sign of breast cancer?

Yes	67
No	78
I am not sure	124



. Do you think that pus or blood discharge from the nipple can be a sign of breast cancer?

Yes	191
No	25
I am not sure	53



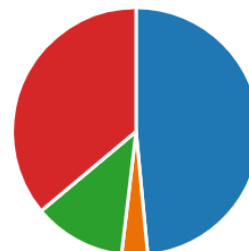
i. Do you think that any skin deformity like redness, ulcer, or peeling skin can be a sign of breast cancer?

Yes	78
No	78
I am not sure	114



. According to you, if anyone has a positive family history of breast cancer, will it affect their chances of getting breast cancer as well?

It increases their chances of br...	129
It decreases their chances of g...	9
It does not affect them in any ...	32
I am not sure	96



. Have you ever heard of Breast Self-Examination (BSE)?

● Yes	127
● No	136



. If yes, do you know how Breast Self-Examination is performed?

● Yes	82
● No	44



Who do you think should perform Breast Self-Examination?

● Person themselves	127
● Doctor	111
● Trained nurse	16
● Other	5



). Have you ever heard of Clinical Breast Examination (CBE)?

● Yes	102
● No	161



. If yes, do you know how Clinical Breast Examination is performed?

● Yes	45
● No	56



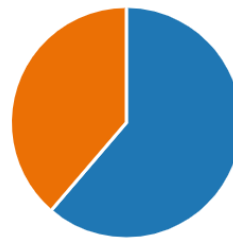
2. Who do you think should perform a Clinical Breast Examination?

Person themselves	20
Doctor	217
Trained nurse	22
Other	3



3. Have you ever heard of Mammography?

Yes	163
No	103



4. Do you know how frequently Mammography should be done?

Once every week	2
Once every month	37
Once every year	55
Biannually	26
I am not sure	146



5. Who do you think should perform Mammography?

Person themselves	11
Doctor	224
Trained nurse	29
Other	2

