A study to assess the Knowledge and Risk Factors of Breast Cancer and evaluate the effectiveness of Multi-interventional Mass Education Strategy on Breast Awareness among urban women of selected areas of Jagdalpur, Bastar District, C.G.

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ABSTRACT
Breast cancer is the most widespread malignancy in women, and the early diagnosis is highly dependent on the health literacy and available screening services. This pre-experimental observational trial assessed knowledge at baseline, prevalence of modifiable risk factors, screening adherence and the ability of multi-interventional mass education approach on 500 urban women in Jagdalpur, Bastar District, Chhattisgarh. One group pretest (baseline knowledge) was compared with a posttest (after 30 days of print-based awareness-interventions) to evaluate the increase of knowledge (hoardings, pamphlets, newspapers); six months compliance (Breast Self-Examination, Clinical Breast Examination and Mammography). Karl Pearson correlation was used to compute behavioral relationships whereas cross-group influence was computed using Chi-square test. Knowledge in post-intervention also increased significantly (mean differences = 9.38, paired $t = 35.10$, $p < 0.001$), which translated to high BSE adoption (95.0%), moderate CBE adoption (79.4%), and low Mammography adoption (1.8%), which is a consequence of access-oriented disparity. Knowledge was positively correlated with compliance ($r = 0.198$, $p = 0.01$) and not risk prevalence ($r = 0.061$, $p = 0.171$). The major obstacles were forgetfulness, unavailability of screening in hospitals and screening cost and the facilitations were affordability and long-term media reinforcement. The research concludes that scalable regulatory awareness models require the incorporation of structured reinforcement and better institutional screening access to maintain early-detection behavior in nursing regulation and patient-safety models.

Keywords: *Breast cancer awareness, BSE adherence, CBE adoption, screening access disparity, nursing regulation, print intervention.*

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1. INTRODUCTION

1.1 Overview of Breast Cancer

Breast cancer is a progressive, multifactorial, and even life-threatening malignancy emanating majorly out of the ductal or lobular epithelium of the breast. It includes the range of biological behaviors, clinical manifestations and prognostic outcomes with genetic mutations (e.g., BRCA1/BRCA2), hormonal exposure (estrogen/progesterone), reproductive history, metabolic status, exogenous factors (alcohol use, diet, inactivity, and environmental carcinogens) [1]. Characteristic early symptoms include a non-regressing breast lump, axillary mass, inversion of the nipple, abnormal discharge, breast asymmetry, peau d orange, and unexplainable focal pains among many others most of which are ignored during an early stage because of poor awareness or socio-cultural reluctance [2].

It is scientifically proven that when patient mortality is detected early, the probability of death is very low since the disease can be treated at its curable stages. Breast Self-Examination (BSE) is the most economical and self-empowering screening and awareness tool among the existing ones and is particularly relevant to low-resource urban and rural populations [3]. Clinical Breast Examination (CBE) is the addition to self-examination and offers professional confirmation, but Mammography is defined as the gold standard of detecting occult and micro- calcific lesions that cannot be discovered in universal examination [4]. The availability of these modalities however does not mean that it will be utilized, awareness, reinforcement, accessibility of health systems, and compliance of behavior will be critical.

1.2 Global Epidemiological Perspective

Breast cancer is the most common cancer that is diagnosed in women worldwide and one of the major causes causing mortality due to cancer. Pathogenesis is related to genetic predisposition, hormonal provocation, sexual activities, metabolic imbalance, and exposure to the environment [5]. The surveillance programs on cancer in different countries highlight the importance of early detection as the strongest factor of prognosis, particularly where the uptake of screening is systematic and the level of awareness is sufficient. It has been demonstrated through global awareness models that multi-channel education based on a structured intervention is highly effective in enhancing health literacy, recognition of symptoms and adherence to breast awareness practices [6].

1.3 Breast Cancer Landscape in India

Indian breast cancer is on the increase because of urbanization, late parity, decreased breast feeding, obesity, lack of exercise and exposure to alcohol and unmonitored use of hormones. Although the incidence is lower, per capita, than in high-income countries, the burden and mortality are large [7]. The key weaknesses are the absence of a structured screening system, limited access to mammography services at government hospitals, economic and barrier to access, and male-clinician-female perception stigma against the use of male clinicians to carry out CBE [8]. Urban Indian studies indicate that knowledge acquisition is rarely useful in enhancing mammography uptake in the absence or unaffordability of services [9]. Thus, multi-channel awareness models that can be scaled with repeated reinforcement and enhanced infrastructures to screen the populace are needed to make the awareness translate into long-term early-detection compliance.

1.4 Regional Importance: Jagdalpur, Bastar District (Chhattisgarh)

The urban areas of Jagdalpur, which is a part of the Bastar district in Chhattisgarh, comprise an important geographic unit where the organized outreach of breast awareness was historically restricted [10]. Low access to screening modalities and mammography complicate the situation of public healthcare systems in these regions, which results in insufficient use despite the increased awareness. Socio-cultural reluctance of male clinicians to Clinical Breast Examination due to a lack of socio-cultural awareness, absence of nearby diagnostic centers and behavioral factors like forgetfulness play a major role in influencing the compliance to screening [11]. Multi-interventional models of mass education that use print media, hoardings, pamphlets, and newspaper publications are used as strategic processes that enhance awareness on a large scale in this resource constrained urban areas.

1.5 STATEMENT OF PROBLEM

The purpose of this research is to examine the knowledge and risk factors of breast cancer, as well as the efficiency of a multi-interventional mass education strategy on breast awareness, among urban women in chosen regions of Jagdalpur, Bastar

District, Central Government.

1.6 OBJECTIVES OF THE STUDY:

The aim of the study was to ascertain the prevalence of risk factors for prostate cancer as well as the level of breast cancer and breast awareness among metropolitan women. This study sought to ascertain the effectiveness of a multi-interventional mass education method in teaching urban women about breast cancer and breast awareness, as well as whether they followed the recommendations for breast awareness information. The study's goal was to provide a general picture of the factors that support and undermine breast awareness. In addition to assessing whether risk factor prevalence and breast awareness compliance are related, the aim of this study was to ascertain whether urban women's knowledge of breast cancer and breast awareness is correlated with their compliance with breast awareness. Additionally, the study sought to determine how risk factors, compliance with breast awareness, and certain sociodemographic traits were related.

HYPOTHESIS:

H1: The multi-interventional mass education will bring about statistically significant rise in knowledge scores, which will be indicated by higher mean post-test score than the mean pre-test score of breast cancer and breast awareness.

H2: There will be a great relationship between the occurrence of the risk factors of breast cancer and the degree of adherence to the practice of breast awareness.

H3: The positive relationship between the level of knowledge on breast cancer and breast awareness and the level of compliance with breast awareness behaviors will be significant.

H4: The variables of socio-demographic factors chosen would have a significant correlation with adherence to breast awareness practices.

H5: There will be a considerable correlation between the incidence rate of risk factors of breast cancer and the socio-demographic variables choice.

2. REVIEW OF LITERATURE

2.1 Knowledge and Awareness on Breast Cancer

Studies assessing the knowledge level of breast cancer in women reveal that the level of awareness is low at baseline and screening is not consistent. Babu observed that literate women who are Parsi under 68% had average knowledge of pre-intervention, which means that even the literate communities still have knowledge gaps [12]. According to a large cross-sectional study that was conducted by Okobia Michael, there was poor knowledge and low uptake of the BSE and CBE despite favourable attitudes towards early detection [13]. Alshammari Malik study teachers have shown that information about breast cancer was not sufficient to make teachers understand and practice it regularly [14]. All these findings speak in Favor of structured models of mass-education among the urban population.

2.2 Prevalence and Profiling of Risk Factors

The reports of risk factors of breast cancer have noted the prevalence of lifestyle determinants that are subject to change, which include obesity, dietary habits, and sedentary activities. Mir Majid noted a change in serum lipid profiles of breast cancer patients and suggested that the metabolisms take part in carcinogenesis [15]. Mangalore based review of lifestyle by Firdaus stressed obesity, late parity, low breastfeeding and sedentary behaviour as increasing risk factors [16]. It was also reaffirmed in a five-year case study by Opoku Samuel that inactivity, reproductive patterns and obesity are some of the key domains of lifestyle risk [17]. These papers show that mapping prevalence of risk factors is crucial before risk factor awareness design.

2.3 Effectiveness of Educational and Mass-Media Interventions

There is strong evidence to suggest that mass-media and participatory education models are associated with significant increase in the level of knowledge and moderate increase in screening compliance if services are available. A centered intervention study by Okorie Nelson on TV demonstrated that media campaigns have a strong impact on breast-health literacy of low-resource communities [18]. According to Gursoy, peer-education research showed that interactive learning enhances health beliefs and knowledge of BSE with positive behavioural trend [19]. The same results of institutional education were observed in the students-awareness study by Hayam since post-intervention scores increased significantly [20]. All these findings warrant the use of hoardings, pamphlets and newspaper publications as scalable knowledge-enhancement tools.

2.4 Social and System-Level Barriers in

Screening Uptake

Research has documented that behavioural moderators, clinician gender perception, forgetfulness, cost, and inadequate infrastructure of screening systems with the public and hospitals will greatly lower the use of mammography despite an improvement of knowledge. Studies of Latino cohort screening at the border-population found low implementation of CBE and mammography service owing to accessibility and cultural hesitation [21]. The screening adherence profiling based on community belief identified that the perception of risk is not the significant factor in the screen-seeking behavior [22].

2.5 Correlation Between Knowledge, Risk and Compliance with BSE

Analytical studies point in the same direction, that increased knowledge scores positively relate to BSE compliance, and risk-factor prevalence is loosely related, but not significantly related, to screening behavior. Gursoy found the evidence of a considerably high positive correlation between breast-cancer understanding and BSE compliance ($r \approx 0.45$, $p < 0.001$) [12]. On the other hand, risk-perception correlation study by Sharbhatti indicated that there was no significant correlation between risk prevalence and BSE practice ($p > 0.05$) [23], which is in alignment with findings that correlation of risk prevalence alone is not a predictive of compliance behavior.

3. METHODOLOGY

3.1 Study Design

The within-subject change of knowledge and awareness behaviors of breast-cancer after a structured community awareness intervention was evaluated through a pre-experimental one-group pretest-posttest observational study design. The design enabled parallel comparison of baseline knowledge and post-intervention knowledge scores and follow-up screening practices of a real-life urban population.

3.2 Study Setting

It was carried out in six identified urban areas in Jagdalpur: Dharampura, Adawal, Nayapara, Railway Colony, Shantinagar and Nayamunda. The choice of these areas was based on little previous organized outreach of breast-health and dependence on infrastructures of government-based screening.

3.3 Study Population and Sampling

The target group consisted of 500 urban women between the ages of 20 and 60 who had resided in the chosen neighbourhoods for at least six months. Non-probability convenience sampling from home to house was the sample technique used. The following requirements were used to choose the participants: they had to be adults, able to communicate during the interviews, and had freely and in writing provided their informed permission. Participants who had already had breast cancer in their personal or family history were not disqualified and undertook association testing.

3.4 selection criteria

- **Inclusion criteria:** Adult women 20–60 years, residence ≥6 months in study areas, ability to participate in interviews, and provision of voluntary written consent.
- **Exclusion criteria:** Women temporarily visiting (<6 months), severely ill at time of survey, or unable to respond to interview questions.

3.5 Data Collection Instruments

Five structured tools were used:

1. **Risk-factor interview schedule** — the cumulative process of scoring the reproductive and lifestyle determinants classified the risks.
2. **Socio-demographic proforma** — age, marital status, education, occupation, income, and sources of information.
3. **Knowledge questionnaire** — measured in seven areas, incidence/definition, breast anatomy-physiology, risk factors, signs/symptoms, BSE awareness, CBE understanding and mammography knowledge.
4. **Screening and Awareness Compliance Schedule**
   - **Type:** Interviewer checklist (6-month follow-up)
   - **Assesses:** BSE frequency, CBE uptake, mammography attempt/completion
   - **Scoring:** 0 = Not done, 1 = Irregular, 2 = Regular, 3 = Highly regular
   - **Output:** Poor (0), Average (1), Good (2), Very good (3)
5. **Barriers and Facilitators Assessment Inventory (BFAI)**

- **Type:** Structured interviewer questionnaire
- **Measures:**
  Barriers: forgetfulness, cost, transport, time, clinician-gender preference, no hospital screening, no accompaniment, stigma
  Facilitators: affordable/free screening, TV/print media reinforcement, professional guidance, family support
- **Rating scale:** 0 = none, 1 = low, 2 = moderate, 3 = high influence
- **Output:** % frequency + impact level of barriers & enablers

3.6 Intervention: multi-interventional mass education strategy

A 30-day large-scale awareness campaign (02 October – 30 October 2016) was implemented using scalable community print-based and participatory channels, including:

- Public hoardings
- Distributed pamphlets/flyers
- Localized newspaper awareness articles
- Breast-awareness messaging integrated into public meetings/seminars

The intervention emphasized importance and technique of BSE, benefits of CBE, symptom recognition, and limitations of mammography uptake when services are unavailable.

3.7 Post-test knowledge assessment

The post-intervention knowledge test was conducted on Day 31, using the same questionnaire and administration method as the pretest to maintain measurement uniformity.

3.8 Screening compliance follow-up

Behavioral compliance to breast-awareness and screening practices was assessed **6 months post-intervention** through interviewer follow-up. Compliance evaluation included:

- Practice and frequency of **Breast Self-Examination (BSE)**
- Utilization of **Clinical Breast Examination (CBE)**
- Attempt or completion of **mammography**
- Mapping of **major barriers and facilitators** to screening compliance

3.9 Outcome measures

Primary outcomes included:

- Knowledge change (mean, SD, mean difference, paired *t*)
- Screening utilization rates (BSE, CBE, mammography)
- Correlation between knowledge–compliance and risk–compliance
- Associations with socio-demographic variables
- Frequency of barriers and facilitators influencing compliance

3.10 Statistical analysis

- Correlations were computed using Karl Pearson's correlation.
- Knowledge comparison was tested using paired sample t-test ($p < 0.001$ significant threshold).
- Associations were examined using Chi-square test ($p < 0.05$ and $p < 0.01$).
- Data were expressed using frequencies and percentages.

3.11 Ethical considerations

It was voluntary and in writing. None of these identifiers were made to preserve confidentiality and anonymity to allow blinded review. Women were able to back off at will. The information was safely stored and was only utilized in research with a little bit of advice on the BSE to maintain the safety of the community patients.

4. RESULTS

Table 1: Frequency and percentage distribution of demographic variables of urban women (N = 500)

Variable	n	%
Age 20–30	438	87.6
Age 31–40	37	7.4
Age 41–50	11	2.2
Age 51–60	14	2.8
Unmarried	281	56.2
Married	215	43.0
Graduate & above	401	80.2
Hindu	352	70.4
Employed	192	38.4
Have information on Breast Cancer	303	60.6
Source: Newspaper/Print	263	86.8
Think every woman should do BSE	330	66.0

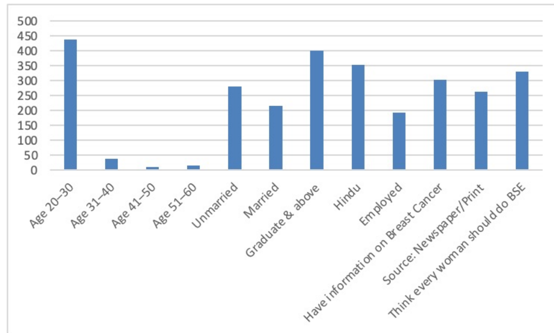

Fig.- 1 Major Socio-Demographic Characteristics of Study Participants

Table 1 (Fig.–1) reveals that many urban women 438 (87.6%) belonged to the age group of 20–30 years, whereas only a small proportion fell into the higher age categories. It also shows that 281 (56.2%) of the participants were unmarried and 215 (43%) were married. With respect to education, most women 401 (80.2%) were graduates and above. The table further indicates that 352 (70.4%) were Hindus and 192 (38.4%) were employed. It is also evident that 303 (60.6%) had prior information about Breast Cancer, predominantly from newspapers and print media 263 (86.8%). Moreover, 330 (66%) believed that every woman should practice Breast Self-Examination.

Table 2: Frequency and percentage distribution of level of Risk Factors of Breast Cancer among urban women.

N = 500

Variable	Risk Factors	
	No.	**%**
Low Risk (0 – 7)	495	99.0
High risk (8 – 16)	5	1.0

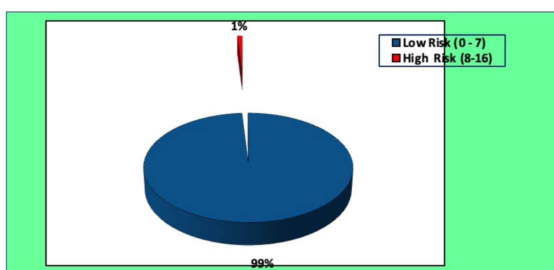

Fig.- 2 Pie diagram depicting frequency distribution of level of Risk Factors of Breast Cancer among urban women

The table **2 (fig.-2)** depicts that majority 495(99%) had low risk and only 5(1%) had moderate risk of suffering from Breast Cancer among urban women.

Table 3: Frequency and percentage distribution of pretest and post-test level of knowledge regarding Breast Cancer and Breast Awareness among urban women.

N = 500

Knowledge	Poor (0 – 25%)		Average (26 – 50%)		Good (51 – 75%)		Very Good (76 – 100%)	
	No.	%	No.	%	No.	%	No.	%
Incidence & definition								
Pretest	0	0	280	56.0	0	0	220	44.0
Post test	0	0	144	28.8	0	0	356	71.2
Anatomy & Physiology								
Pretest	89	17.8	153	30.6	126	25.2	132	26.4
Post test	27	5.4	111	22.2	167	33.4	195	39.0
Risk factors								
Pretest	326	65.2	174	34.8	0	0	0	0
Post test	146	29.2	193	38.6	108	21.6	53	10.6
Signs & symptoms								
Pretest	413	82.6	87	17.4	0	0	0	0
Post test	204	40.8	296	59.2	0	0	0	0
BSE								
Pretest	242	48.4	256	51.2	2	0.4	0	0
Post test	30	6.0	148	29.6	182	36.4	140	28.0
Clinical BSE								
Pretest	362	72.4	138	27.6	0	0	0	0
Post test	73	14.6	188	37.6	0	0	239	47.8
Mammogram								
Pretest	454	90.8	46	9.2	0	0	0	0
Post test	90	18.0	168	33.6	0	0	242	48.4
Overall Pretest	**229**	**45.8**	**257**	**51.4**	**14**	**2.8**	**0**	**0**
Overall Post test	**9**	**1.8**	**83**	**16.6**	**280**	**56.0**	**128**	**25.6**

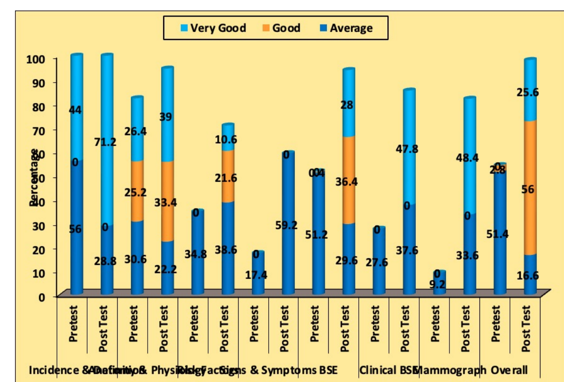

Fig.-3 Cylindrical diagram showing percentage distribution of pretest and posttest level of knowledge regarding Breast Cancer and Breast Awareness among urban women

Table 3 (Fig. 3) demonstrates that the level of information regarding breast cancer and breast awareness has greatly enhanced following the training. The post test scores were markedly elevated in the high knowledge categories across all domains, including incidence and definition, anatomy and physiology, risk factors, signs and symptoms, breast self-examination (BSE), clinical breast examination

(CBE), and mammography. The pretest results indicated a predominance of inadequate and mediocre knowledge across most areas, but the post test results revealed significant levels of proficient and exceptional knowledge. Prior to the intervention, the average knowledge was 257 (51.4) and weak knowledge was 229 (45.8); after the intervention, good knowledge was recorded at 280 (56) and very good knowledge at 128 (25.6). This result clearly demonstrates that the multifaceted intervention of mass education effectively enhanced the understanding of breast cancer and breast awareness among metropolitan women.

Table 4: Comparison of pretest and post-test level of knowledge regarding Breast Cancer and Breast Awareness among urban women.

N = 500

Knowledge	Mean	S.D	Mean Diff.	Paired 't' Value
Incidence & definition			**0.27**	**t = 9.779 p = 0.0001, S*** **
Pretest	1.44	0.49		
Post test	1.71	0.45		
Anatomy & Physiology			**0.46**	**t = 8.098 p = 0.0001, S*** **
Pretest	1.60	1.06		
Post test	2.06	0.91		
Risk factors			**1.01**	**t = 17.895 p = 0.0001, S*** **
Pretest	1.02	0.81		
Post test	2.03	1.10		
Signs & symptoms			**0.42**	**t = 15.937 p = 0.0001, S*** **
Pretest	1.17	0.37		
Post test	1.59	0.49		
BSE			**4.95**	**t = 29.374 p = 0.0001, S*** **
Pretest	4.88	2.19		
Post test	9.83	3.14		
Clinical BSE			**1.06**	**t = 29.106 p = 0.0001, S*** **
Pretest	0.27	0.44		
Post test	1.33	0.71		
Mammogram			**1.21**	**t = 34.635 p = 0.0001, S*** **
Pretest	0.09	0.28		
Post test	1.30	0.75		
OVERALL			**9.38**	**t = 35.104 p = 0.0001, S*** **
Pretest	**10.49**	**4.20**		
Post test	**19.87**	**4.91**		

***p<0.001, S – Significant

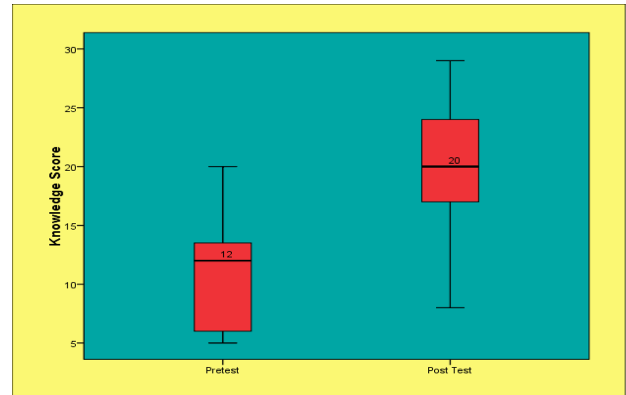

Fig.-4 Stock diagram showing comparison of overall pretest and post- test level of knowledge regarding Breast Cancer and Breast Awareness among urban women

Table 4 (Fig.-4) indicates that there was a great enhancement in knowledge in all the domains using Multi-interventional Mass Education strategy. Incidence and definition, anatomy and physiology, risk factors, and signs and symptoms mean scores significantly improved between pretest and posttest, and the paired-t values are highly significant (p<0.001). Knowledge gains of BSE, CBE and mammography also were of substantial significance and statistically significant. Total knowledge was found to increase to 19.87 ± 4.91; t = 35.104, p<0.001, which is a clear indication that the intervention had been effective in increasing the Breast Cancer and Breast Awareness among urban women.

Table 5: Frequency and percentage distribution of compliance of Breast Awareness among urban women.

N = 500

Utilization of screening	Utilized		Not Utilized	
	No.	%	No.	%

behavior				
Breast Self-Examination	475	95.0	25	5.0
Clinical Breast Examination	397	79.4	103	20.6
Mammogram	9	1.8	491	98.2

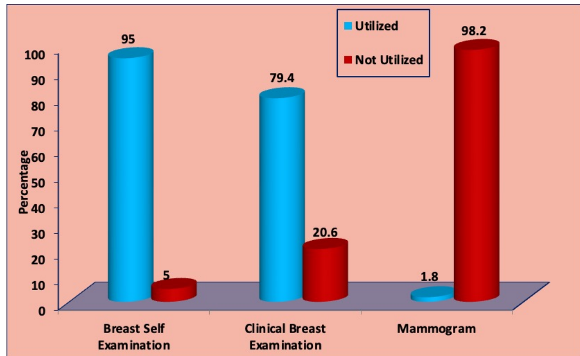

Fig.-5 Cylindrical diagram showing percentage distribution of compliance to Breast Awareness among urban women

Table **5 (fig.-5)** reveals that majority 475(95%) had practiced BSE and 25(5%) had not practiced BSE. It also reveals that, majority 397(79.4%) had utilized CBE and 103(20.6%) had not utilized CBE. It is also clear from the presentation that, majority 491(98.2%) had not utilized Mammogram and 9(1.8%) had utilized Mammogram.

Table 6: Frequency and percentage distribution of level of compliance among urban women.

N = 500

Variable	**Poor (0)**		**Average (1)**		**Good (2)**		**Very Good (3)**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Compliance	23	4.6	82	16.4	386	77.2	9	1.8

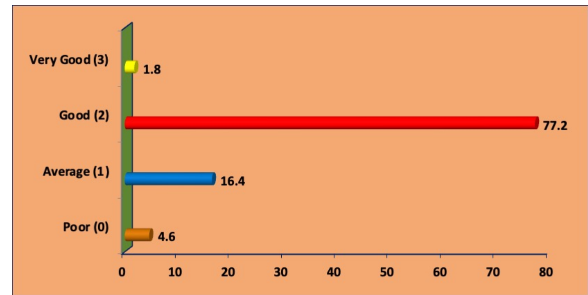

Fig.-6 Cylindrical diagram showing percentage distribution of level of compliance to Breast Awareness among urban women.

Table **6 (fig.-6)** depicts that majority 386(77.2%) had good level of compliance, 82(16.4%) had average level of compliance, 23(4.6%) had poor level of compliance and 9(1.8%) had very good level of compliance to Breast Awareness.

Table 7: Correlation of risk factors with compliance to Breast Awareness among urban women.

N=500

Variables	**Mean**	**S.D**	**'r' Value**
Risk Factors	4.78	1.46	r = -0.061
Compliance	1.76	0.56	p = 0.171, N.S

**p<0.01, S – Significant, N.S – Not Significant

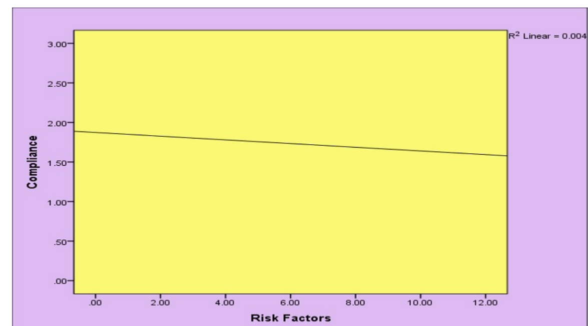

Fig.-7 Line diagram showing correlation of risk factors of Breast Cancer with compliance to Breast Awareness among urban women

Table **7 (fig.-7)** reveals that the mean score of risk factors was 4.78 ± 1.46 and the mean score of compliance was 1.76 ± 0.56. The computed Karl Pearson's Correlation value of r = -0.061 shows a negative correlation and was not observed to be

statistically substantial. This clearly indicates that when prevalence of predisposing factors declines the compliance with breast awareness increases.

Table 8: **Correlation of pretest knowledge score of Breast Cancer and Breast Awareness with compliance to Breast Awareness among urban women.**

N = 500

Variables	Mean	S.D	'r' Value
Knowledge	10.49	4.20	**r = 0.198**
Compliance	1.76	0.56	**p = 0.0001, S****

**p<0.01, S – Significant, N.S – Not Significant

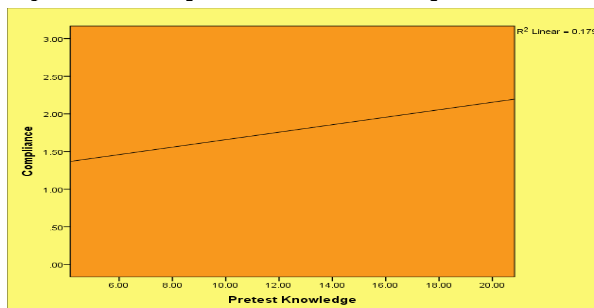

Fig.-8 Line diagram showing correlation of pretest knowledge score with compliance to Breast Awareness among urban women

Table **8 (fig.-8)** shows that the mean count of compliance was 1.76 ± 0.56 and the mean score of knowledge on the pretest was 10.49 ± 4.20. At the p<0.01 level, the calculated Karl Pearson's Correlation value of r = 0.198 indicates a positive correlation and was found to be statistically significant. This clearly shows that as understanding grows, so does adherence to breast awareness.

Table 9: Association of posttest level of knowledge regarding Breast Cancer and Breast Awareness with practice of BSE among urban women.

N = 500

Level of Post Test Knowledge	Utilization of Screening Services (BSE)				Chi-Square Value
	Utilized		Not Utilized		
	No.	%	No.	%	
Poor (0 – 25%)	9	1.8	0	0	**χ^2=10.101**
Average (26 – 50%)	79	15.6	5	1.0	**d.f=3 p = 0.018 S***
Good (51 – 75%)	280	52.0	20	4.0	
Very Good (76 – 100%)	128	25.6	0	0	

N.S – Not Significant

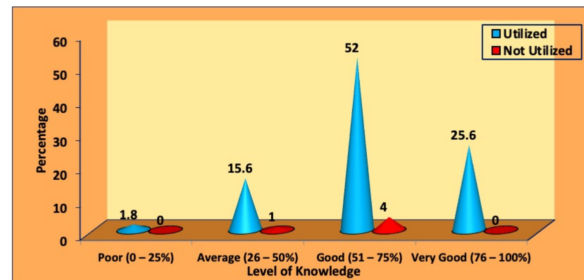

Fig.-9 Column diagram association of posttest level of knowledge regarding Breast Cancer and Breast Awareness with practice of BSE among urban women

The table **9 (Fig.-9)** shows that 9(1.8%) of urban women who had poor knowledge utilized the screening services (BSE), 79(15.6%) with average knowledge utilized screening services (BSE) and 5(1%) had not utilized screening services (BSE), 280(52%) with good knowledge had utilized screening services (BSE) and 20(4%) had not utilized screening services (BSE), 128(25.6%) with very good knowledge utilized screening services (BSE). The calculated chi-square value was χ^2 = 10.101 was established to be statistically substantial at p<0.05 level. This visibly implies that post-test level of comprehension on Breast Carcinoma and Breast Awareness influence the habit of Breast Self-Examination among urban women.

Table 10: Association of posttest level of knowledge regarding Breast Cancer and Breast Awareness with utilization of CBE among urban women.

N = 500

Level of Post Test Knowledge	Utilization of Screening Services (CBE)				Chi-Square Value
	Utilized		Not Utilized		
	No.	%	No.	%	

Poor (0 – 25%)	4	0.8	5	1.0	**χ^2=11.383 d.f=3 p = 0.010 S****
Average (26 – 50%)	60	12.0	23	4.6	
Good (51 – 75%)	225	45.0	55	11.0	
Very Good (76 – 100%)	108	21.6	20	4.0	

**p<0.01, S – Significant

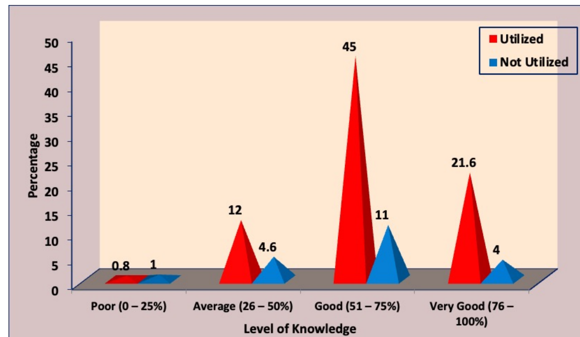

Fig.- 10 Column diagram showing association of posttest level of knowledge regarding Breast Cancer and Breast Awareness with utilization of CBE among urban women.

The table **10 (fig.-10)** shows that 5(1%) of urban women with poor knowledge had not utilized CBE and 4(0.8%) had utilized CBE, 60(12%) with average knowledge utilized CBE and 23(4.6%) had not utilized CBE, 225(45%) with good knowledge had utilized CBE and 55(11%) had not utilized CBE, 108(21.6%) with very good knowledge utilized CBE and 20(4%) had not utilized CBE. The calculated chi-square value was χ^2 = 11.383 and was observed to be statistically substantial at p<0.01 level. This visibly implies that posttest level of understanding on Breast Cancer and Breast Awareness influence the utilization of screening services (CBE) among urban women.

Table 11: Association of posttest level of knowledge regarding Breast Cancer and Breast Awareness with utilization of Mammogram among urban women.

N = 500

Level of Post Test Knowledge	**Utilization of Screening Services (Mammogram))**				**Chi-Square Value**
	Utilized		**Not Utilized**		
	No.	**%**	**No.**	**%**	
Poor (0 – 25%)	0	0	9	1.8	χ^2=1.821 d.f=3 p = 0.610 N.S
Average (26 – 50%)	1	0.2	82	16.4	
Good (51 – 75%)	4	0.8	276	55.2	
Very Good (76 – 100%)	4	0.8	124	24.8	

N.S – Not Significant

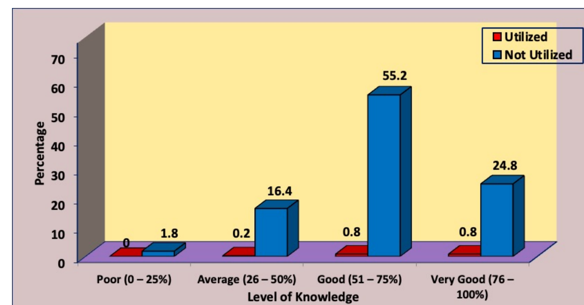

Fig.-11 Column diagram showing association of posttest level of knowledge regarding Breast Cancer and Breast Awareness with utilization of Mammogram among urban women

The table **11 (fig.-11)** shows that 9(1.8%) of urban women with poor knowledge had not utilized Mammogram, 82(16.4%) with average knowledge had not utilized Mammogram and one (0.2%) had utilized Mammogram, 276(55.2%) with good knowledge had not utilized Mammogram and 4(0.8%) had utilized Mammogram, 124(24.8%) with very good knowledge had not utilized Mammogram and 4(0.8%) had utilized Mammogram. The calculated chi-square value was χ^2 = 1.821 was not found to be statistically substantial. This visibly implies that posttest level of comprehension on Breast Carcinoma and Breast Awareness does not influence the utilization of Mammogram among urban women.

Table 12: (Major Barriers)

Barrier (label as in document)	**Frequency (n)**	**% / Note**
Forgetfulness — Great Barrier (Table 17.5)	500	100.0%

Non-availability of services in hospital — Great Barrier (17.21)	500	100.0%
Male obstetrician — Great Barrier (17.17)	499	99.8%
Cost of examination — Great Barrier (17.20)	346	69.2% (great barrier)
Lack of knowledge of benefits of CBE & Mammography (17.6)	432	86.4% (great barrier)
Lack of knowledge of BSE (17.1) — Great Barrier	476	95.2%
No one to accompany to health services (17.9) — Moderate Barrier	500	100.0% (document classifies as moderate)
Non-availability of transport (17.10) — Moderate Barrier	500	100.0% (document classifies as moderate)
Lack of time (17.11) — Moderate Barrier	500	100.0% (document classifies as moderate)
Stigma (17.22) — Moderate Barrier	500	100.0% (document classifies as moderate)

According to **Table 12**, several significant barriers had an influence on the compliance rate to Breast Awareness among urban women. All respondents (100%) reported forgetfulness and non-availability of services in hospital as some of the greatest barriers and closely after them was the availability of a male obstetrician (99.8%), and the unaffordable examination price (69.2%). Ignorance (95.2 and 86.4 on BSE and benefits of CBE and mammography) proved to be significant obstacles as well. Also, lack of accompaniment, unavailability of transport, lack of time and stigma were mentioned among all the women (100 percent) as moderate barriers that further deterred the uptake of screening practices. These results show that the knowledge-related and accessibility-related barriers have a strong influence on the compliance of women to the Breast Awareness measures.

Table 13: (Facilitators)

Facilitator (label as in document)	Frequency (n)	% / Note
Affordability of examination cost — Great Extent (18.5)	500	100.0%
TV/Radio programs on breast cancer — Great Extent (18.7)	500	100.0%
Participation in teaching programs/seminars/public meetings (18.9) — Great Extent	500	100.0%
Medical/Nursing professionals — Great Extent (18.11)	411	82.2% (great extent)
Knowledge regarding severity of breast cancer — Great Extent (18.1)	415	83.0% (great extent)
Newspaper/magazine articles (18.8) — Great Extent	334	66.8%

Table 13 shows several strong facilitators have helped to enhance compliance to Breast Awareness among the urban women. All participants (100 percent) identified affordability of examination cost, TV and radio shows on breast cancer, and involvement in teaching programs or public meetings as facilitators to a great extent. Medical and nursing (82.2) and knowledge on how serious breast cancer is (83) support also contributed significantly to encouraging the women to take part in the screening practices. Also, the newspaper and magazine articles were found to be significant informational facilitators to 66.8 percent of women. These results suggest the existence of a positive response to accessible health education, media exposure, professional guidance, and perceived seriousness of the disease in relation to increasing the willingness of women to adhere to Breast Awareness behaviors.

Table 14: (Associations of demographic variables with Risk Factors)

Demographic variable	Association with Risk Factors (as reported)
Age (20–60)	Not significant (χ^2 = 0.715, p = 0.870)
Marital status	Not significant (χ^2 = 1.171, p = 0.760)
Educational qualification	Not significant (χ^2 = 0.212, p = 0.976)
Religion	Not significant (χ^2 = 0.925, p = 0.819)
Family income	Not significant (χ^2 = 0.391, p = 0.942)
Employment status	Not significant (χ^2 = 3.695, p = 0.055)
Source of information, felt need, practice of BSE, CBE, mammography, personal history	All reported as not significant in the listed sub-tables (Tables 19.1–19.16)

Table 14 indicates that all the demographic variables chosen showed no significant relationship with the degree of risk factors of Breast Cancer in urban women. All the factors such as age, marital status, educational qualification, religion, family income and employment status had non-significant relationships with risk levels ($p > 0.05$). In the same manner, the variables of source of information, perceived need of BSE or CBE, actual practice of BSE, use of CBE and mammography and personal history of breast cancer did not have a significant relationship with the risk factor groups in respective sub-tables. Such results imply that the occurrence of Breast Cancer risk factors did not depend on the demographic features and the variables related to screening in this population.

Table 15: (Associations of demographic variables with Compliance)

Demographic variable	Reported association with level of Compliance (Table & p)
Age	Significant (χ^2 = 210.40, p = 0.0001)
Marital status	Significant (χ^2 = 72.93, p = 0.0001)
Educational qualification	Significant (χ^2 = 85.54, p = 0.0001)
Religion	Significant (χ^2 = 40.98, p = 0.0001)
Family income	Significant (χ^2 = 21.884, p = 0.009)
Occupation	Significant (χ^2 = 17.042, p = 0.001)
Source of information	Highly significant (χ^2 = 85.679, p = 0.00001)
Practice of BSE	Significant (χ^2 = 54.665, p = 0.0001)
CBE screening practice	Significant (χ^2 = 54.665, p = 0.0001)
Mammography screening practice	Significant (χ^2 = 54.665, p = 0.0001)
Felt need for CBE & Mammography	Significant (χ^2 = 34.409, p = 0.0001)
Personal history of Breast Cancer	Significant (χ^2 = 54.665, p = 0.0001)

Table 15 indicates that there were several demographic and screening related variables that were statistically significant with the level of compliance with Breast Awareness among urban women. All the socio-demographic factors (age, marital, education, religion, family income, and occupation) showed significant relationships ($p < 0.01$) and showed that there were differences in compliance with different socio-demographic groups. In a similar vein, information sources demonstrated a very significant association ($p = 0.00001$), indicating that it has a very strong impact on the compliance behavior. There were also strong associations with screening-related practices, including BSE, CBE, and mammography use as well as the perceived necessity of CBE and mammography and self-history of breast cancer. These results indicate that both the demographic features and previous exposure to breast health information and practices have a strong influence on compliance.

5. FINDINGS AND DISCUSSION

The inquiry revealed that 495(99%) had low risk and only 5(1%) had moderate threat of suffering from Breast Carcinoma among urban women.

The results are in harmony with the inquiry done by **Balasubramaniam, Rotti and Vivekanandam (2013)** on risk factors of female breast carcinoma at Pondicherry [25]. The results stated that majority of the study participants, 127 (83.6%) gave a breast-feeding history exceeding six months and most 132 (86.8%) showed no familial account of Breast

Malignancy.

The present inquiry findings corresponding to understanding of Breast Carcinoma and Breast Awareness amongst urban women revealed that in the pre-intervention assessment majority 229 (45.8%) of the subjects had poor comprehension concerning Breast Carcinoma and Breast Awareness but the post-intervention assessment uncovered that 280 (56.0%) had good knowledge and 128 (25.6%) had very good comprehension of Breast Carcinoma and Breast Self-Examination.

The above findings stand supported by an inquiry done by **Babu (2005)** amongst women of selected Parsi community of Mangalore on knowledge of Breast Cancer and Breast Self-Examination [26]. The study results revealed that majority (68%) had average scores on the test.

The findings of the inquiry to gauge the efficacy of intervention put forward a mean pretest knowledge score of 10.49+4.20 which increased to 19.87 + 4.91 after the intervention. The paired t-test proved that the Multi-interventional Mass Education strategy was effective ($p<0.001$) in enhancing the understanding of urban women regarding Breast Carcinoma and Breast Awareness.

An inquiry undertaken by **Okorie Nelson.et.al (2014)** in Ghana to evaluate the effective use of mass media sources supports the findings of this study which states "Mass media channels are the primary sources of information and can significantly influence Breast Cancer care" [27].

The outcomes of the study related to compliance to Breast Awareness regimen showed that majority 475(95%) had practiced BSE and 397(79.4%) had utilized CBE but a very low 9(1.8%) utilization of Mammogram. The study findings stand supported by an investigation accomplished by Ali and associates in Tehran in 2008 on 1402 women to examine their stance on Breast Carcinoma and their exercise of screening practices. Results showed that 214(22.9%) performed BSE and 32(18.2%) underwent CBE.

The major barriers experienced by urban women for utilization of screening services were 500 (100%) forgetfulness, 500(100%) non-availability of services in hospital and 499(99.8%) male obstetricians. The other barriers were lack of knowledge of BSE 476 (95.2%), 433 (86.6%) lack of confidence to practice BSE, 432 (86.4%) lack of knowledge regarding benefits of CBE & Mammography, 433 (86.6%) no one to accompany to health services and 346(69.2%) cost of examination.

On the other hand, the major facilitators verbalized were 500(100%) affordable cost of examination and motivation through 500(100%) TV programs. Other contributing facilitators were 415 (83%) knowledge regarding severity of Breast Cancer, 410(82.8%) motivation from family member, 334(66.8%) Newspaper and 411(82.2%) Medical/Nursing professional, 286(57.2%) fear of developing Breast Cancer and 270 (54%) history of Breast Cancer in family.

The study findings stand reinforced by an inquiry accomplished by **Matthew.et.al. (2012)** on "Breast Cancer Knowledge, attitudes and early detection practices in United States" [28]. The study uncovered that the subjects had good understanding of Breast Malignancy but had barriers of utilizing Mammography/Breast Ultrasound services ($p<0.001$) and CBE services owing to shortage of units. It also revealed that CBE are often left out during routine clinical examinations by health personnel.

A negative correlation between prevalence of risk factors and compliance to Breast Awareness regimen among urban women was revealed by the calculated Karl Pearson's Correlation value of $r = -0.061$ and it was not found to be statistically significant.

An inquiry affected by **Shatha Saed Al- Sharbatti et.al.** to examine the Breast Self-Examination mannerism and Breast Carcinoma threat discernment among female university scholars in Ajman in **2012** supports the findings of the present study which showed no significant correlation amid Breast Self-Examination practice and risk factors [29].

The estimated Karl Pearson's association value of $r = 0.198$ indicated a positive association between urban women's understanding of breast cancer and their adherence to the Breast Awareness regimen, and it was judged to be significantly significant at the $p<0.01$ level.

The study findings stand supported by an investigation accomplished by **Ayla Akkas Gursoy.et.al., (2009)** in Turkey to appraise the outcome of peer education on 180 university scholars regarding understanding on Breast Self-Examination and health beliefs [30]. The calculated Karl Pearson's Correlation value ($r=0.45$, $p<0.001$) suggested a positive correlation between comprehension of Breast Carcinoma and exercise of Breast Self-Examination.

The Chi-square value analysis showed that none of the demographic variables had shown any lineage with level of risk factors of Breast Carcinoma amongst urban women. The Chi-square value analysis for association between demographic variables and compliance to Breast Awareness regimen showed that age, marital status, educational qualification, religion, occupation, type of occupation, source of information, practice and frequency of BSE, history of CBE and Mammogram, felt need for CBE and Mammogram, previous history of Breast Cancer had shown statistically significant association at $p<0.001$ level.

The present inquiry outcomes are reinforced by the results of a study conducted by **Wasileh and Blanche (2001)** to explore influences and dogmas that may be interrelated to the exercise of Breast Self-Examination among 519 Jordanian females from two universities, which comprised of university personnel, graduates and undergraduates [31]. The results showed, "The frequency of practice of BSE in the previous year students was associated with their personal history of Breast Cancer (X2=18.62, $p<0.001$) and previous information about Breast Cancer and BSE (X2= 95.35, $p<0.001$). In the succeeding year results revealed that participants age (X2=36.92, $p<0.001$) and education (X2= 25.58, $p<0.001$) had a lineage ($p<0.05$) with the frequency of Breast Self-Examination".

6. CONCLUSIONS

The subsequent deductions were derived from the study outcomes:

Most urban women are between the ages of 20 and 30, have a graduate degree or higher, and are jobless. Except for one, none of them underwent breast self-examination, a clinical breast examination, or a mammogram, although the majority had learned about it via newspapers and print media. The lack of symptoms among urban women and the lack of hospital services were the obstacles to using the Breast Self-Examination, Clinical Breast Examination, and Mammogram.

The study deduces that the intervention, Multi-interventional Mass Education Strategy enhanced the comprehension scores and compliance scores of urban women relating to Breast Cancer, Breast Self-Examination, Clinical Breast Examination and Mammography respectively. Improved knowledge of Breast Awareness did not increase the utilization of Mammogram. The reason for this can be attributed to non-availability of Mammogram in government hospitals as well as the cost of Mammogram facilities. The study also emphasized the need for frequent follow up and reinforcement.

The scores related to compliance of Breast Awareness showed significant association with the age, marital status, educational status, occupation and previous history of Breast Cancer of the urban women. The comprehension scores of urban women regarding Breast Carcinoma and compliance to Breast Awareness were shown to be interdependent.

7. LIMITATIONS

The ensuing were the limitations of the study:

1. Convenience sampling was used for selection of samples which limits the generalizability of study findings
2. The study was relatively of shorter duration hence the compliance of Breast Awareness couldn't be followed up beyond six months of pretest.

8. RECOMMENDATIONS

The ensuing recommendations were enlisted for potential research grounded on the outcomes of the present inquiry.

1.A comparative investigation among urban and rural population can be accomplished to explore the understanding of Breast Cancer and Breast Awareness and compliance with Breast awareness.

3.The study replication can be undertaken in different settings on different categories of study subjects.

4. A comparative inquiry can be accomplished with a control group for more precise results.

5. To determine the utilization of screening services a follow-up study can be undertaken.

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