Socio-economic Distribution of Breast Cancer Patients in Prayagraj District of Uttar Pradesh

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Abstract

Incidence of BC has shown a steep increase since last two to three decades. Initially the BC was called problem of the western and modern world , it has now become the burden of developing country. Socio-economic status has been associated with the disease in influencing the stage a diagnosis, treatment seeking pattern of the patients, the attitude and awareness of the patients regarding the risk factors primarily depends on socio-demographic pattern of patient. Descriptive cum evaluatory study was conducted on 220 breast cancer patients attending regional cancer centre in Prayagraj, Uttar Pradesh. Spearman and Pearson Correlation and chi square test was used to calculate the strength of association. Urban women were significantly more likely to live in pucca houses ($p<0.001$), while katcha housing was more prevalent in rural areas. There was a significant correlation between education and location ($p<0.001$), with urban women having higher education levels. Occupation demonstrated a weak positive correlation ($rs=0.07; p>0.05$),indicating a marginal inclination for urban women to occupy higher-skilled positions. The socioeconomic profiles of rural and urban women displayed divergent patterns. Urban women were more inclined to inhabit nuclear families, dwelling pucca houses, achieve elevated educational attainment, and declare higher family incomes.

Keywords: Breast Cancer, socio-economic status, Prayagraj India.

1. Introduction

The cancer statistics by IARC suggests that there were 20 million new cancer cases in the year 2022. (Bray ,2022). Breast cancer has become the most common cause of cancer among women globally which has 11.7 % of 2.3 million of new cancer cases. (Mohanty, 2023). It is estimated that 2.3 million of breast cancer cases will be there by the year 2040 . (Mohanty, 2023). The breast cancer incidence in India is also following the global trend and has shown a steep increase since , it was increased by 50 % by 1965 and 1985. (Saxena ,2002). In 1990s it was among the 4th common cancer in women in India and at present it has become the first most common cancer in India surpassing the lung cancer. (Mehrotra , 2022). The 5 year survival rate for breast cancer is least for later stages (Stage IV) has only 21 % survival rate and stage 1 has 95% survival rate . (Arumugham, 2014).

The 60% of BC patients in India are diagnosed at stage III stage IV of the disease. (Gogia A. 2020) .The survival of breast cancer patients is better in western countries as compare to India. (Mehrotra , 2022).

Research Methodology- A descriptive cum evaluatory study was conducted on 220 breast cancer patients attending the Regional Cancer Centre in Prayagraj , Uttar Pradesh . The patients were selected on the basis of convenience sampling . The age of the patients considered for the study was 20 to 70 years. The structured interview schedule was adopted for the study.

Inclusion criteria- women with confirmed diagnosis of breast cancer , who were attending the OPD for treatment or follow up were considered for the study

Exclusion criteria- Male Breast cancer Patients

Critically ill breast cancer patients

Not willing to participate.

The socio-economic and demographic data collected were age, location, education, occupation , income, religion, family type, family size, type of house. For education, income and occupation Kuppuswamy scale was considered. The data was collected and responses were analyzed using SPSS. Spearman and Pearson Correlation and chi square test was used to calculate the strength of association.

Results – The study sought to determine and compare the socioeconomic profiles of rural and urban women within a cohort of 220 women diagnosed with breast cancer. Using data codified for consistency, we applied statistical techniques, including Spearman and Pearson correlation analyses, to measure the strength and direction of associations between location and variables such as family size, family type, caste, religion, housing, education, occupation, monthly family income, marital status, and age at marriage. We also assessed the statistical significance of these relationships to determine whether the observed patterns were meaningful or likely to have occurred by chance. We also examined the distribution of key socioeconomic variables, such as family size, family type, caste, religion, housing, education, occupation, monthly family income, marital status, and age at marriage, across rural and urban women in a cohort of 220 breast cancer patients. For each variable, we calculated the count and percentage of responses for each category and assessed their statistical association with location (rural or urban) using chi-square tests to determine p-values.
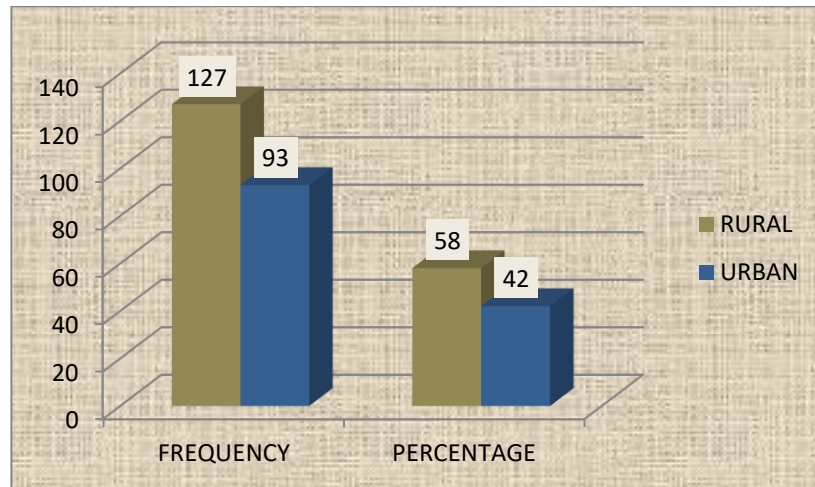
Fig. 1. Distribution of Respondents With Respect To Location

There were 58% of rural patients and 42% urban patients in the study. It is apparent that there are more rural women in this study, this might be due to the fact that Regional Cancer Centre was chosen to be the part of the study and rural women may not seek care early and more advanced cases are referred to tertiary hospitals
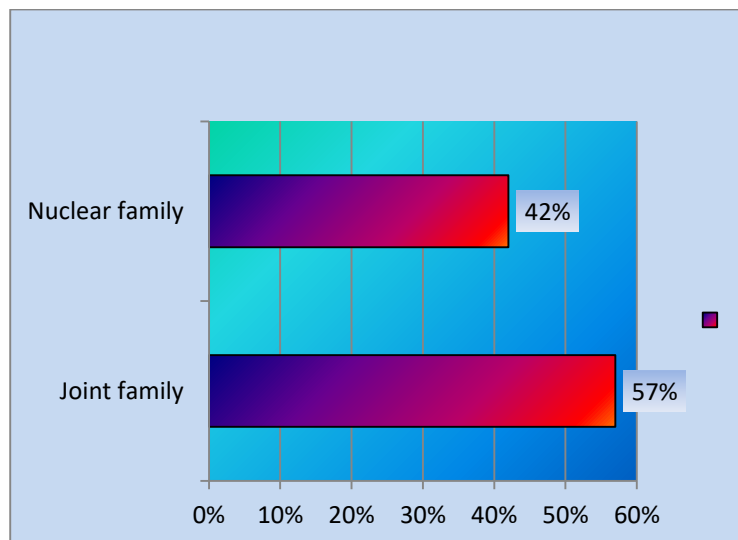

Fig. 2. Family Type of Breast Cancer Patients

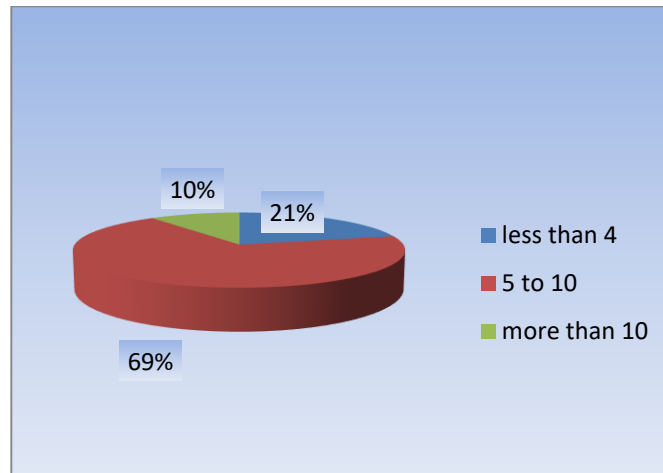Maximum number (57%) of patients had joint family and lesser number of patients had 42% had nuclear family .

Fig.3   Family Size of Breast Cancer Patients

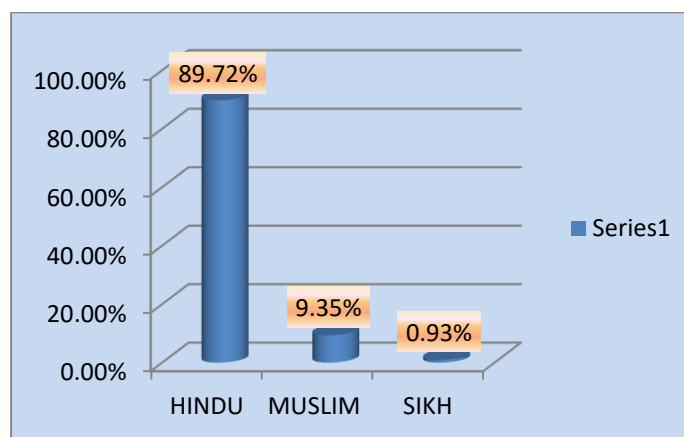Majority of patients (69%) had 5 to 10 numbers of family members.

Fig.4. Religion of Breast Cancer Patients.

The above chart depicts the percentage distribution of the breast cancer patients' religious belief . The three religious belief were reported in the cohort of 220 breast cancer patients, amongst them the majority of the patients belong to the Hindu faith, followed by Muslims and then Sikhs. The demographic composition from where the sample was drawn had a majority population of Hindu faith which is reflected in the percentage of the breast cancer patients.
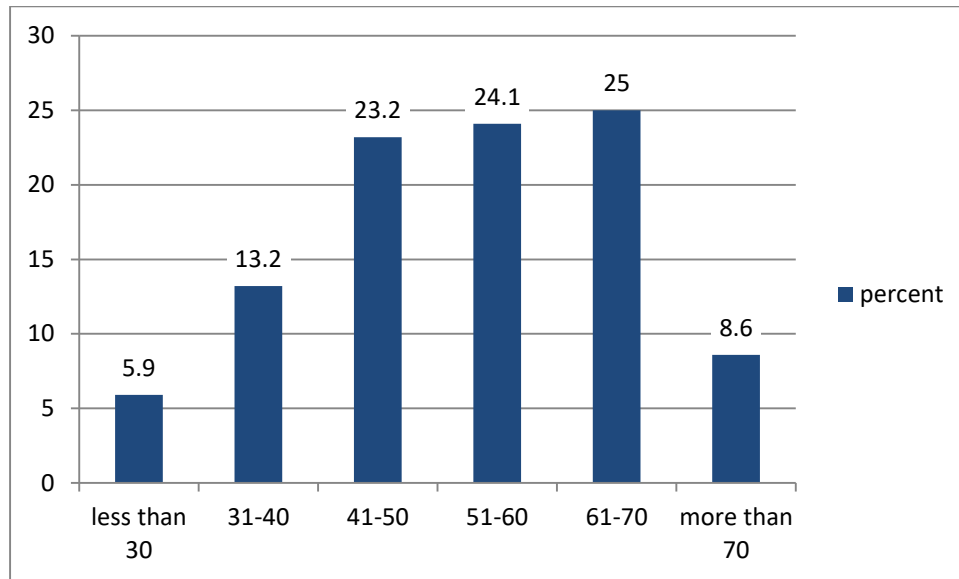
Fig. 6. Distribution of Respondents According To Age at Diagnosis

The maximum number of respondents were from 60-70 age group. Almost 50 % of the respondents were from 50-70 age group. Very few (5.9%) of patients were from less than 30 age group. The above data suggests that as the age increases the risk of developing breast cancer increases.
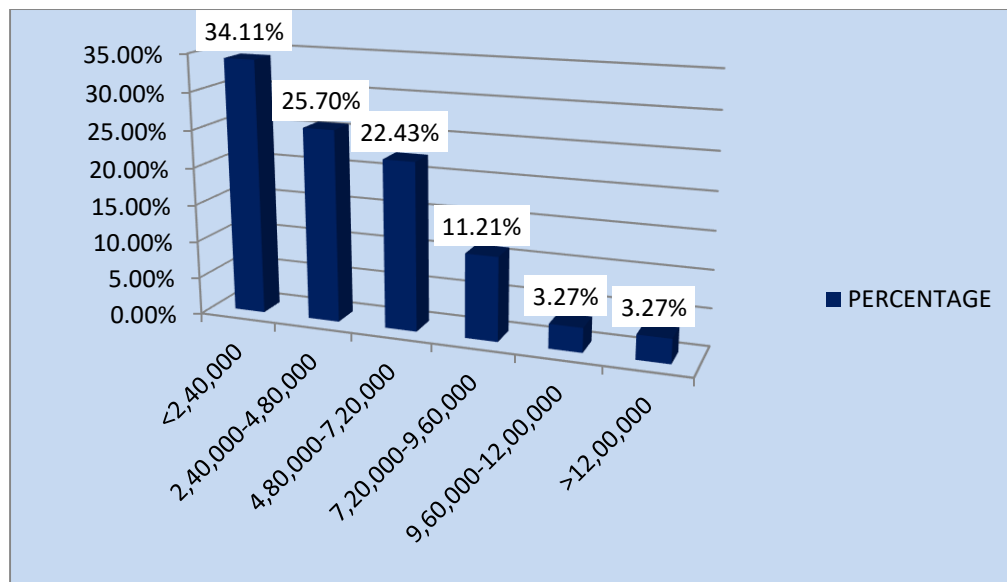

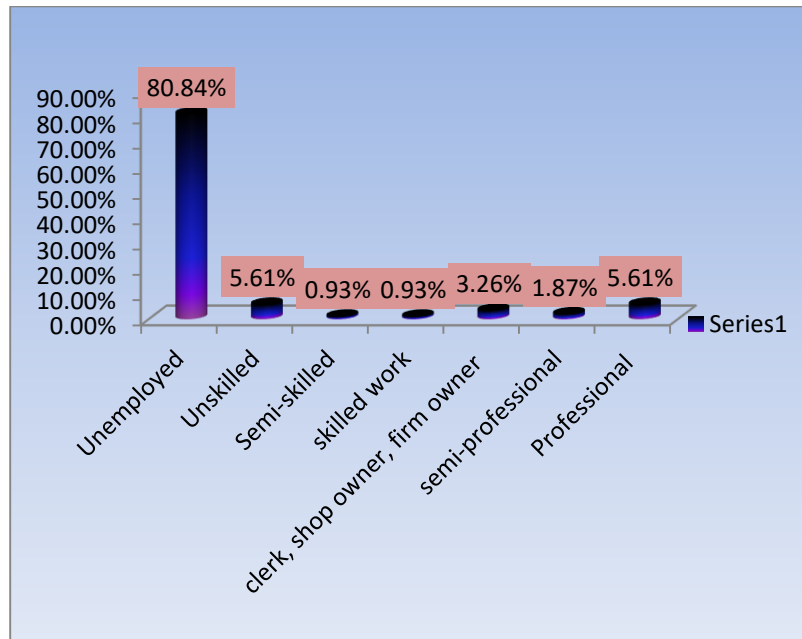**Fig.7. Annual Household Income of Breast Cancer Patients**

Fig.8. Occupation of the Breast Cancer Patients

Maximum number of patients (80.84%) were unemployed and only 0.93% were skilled worker.
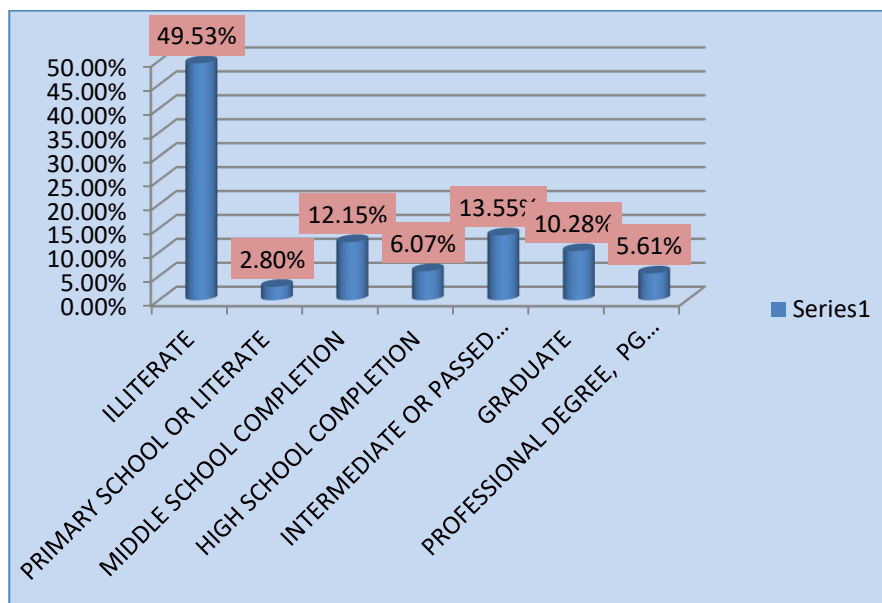

Fig. 9. Education of the Breast Cancer Patients.

The above chart depicts that about 49.53% of the patients were illiterate and only 5.61% of them were professional or PG degree holder.
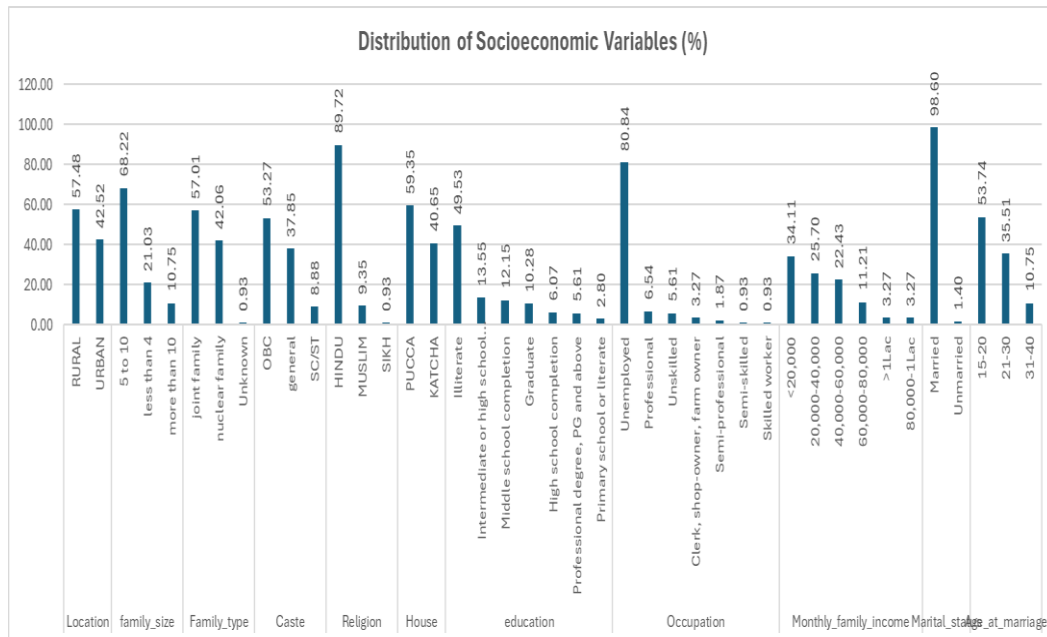
Fig.10. Distribution of Socio-Economic Variables.

The study identified distinct patterns in the socioeconomic distribution of rural and urban women. In terms of family size, the majority (68.2%)of women reported having 5 to 10 members, with rural women having larger families, though the difference was not statistically significant (p>0.05). Family type had a statistically significant relationship with location (p=0.015), with urban women more likely to live in nuclear families than rural women, who tended to live in joint families. Caste distribution showed no significant association (p>0.05), with general caste women slightly more prevalent in urban areas and SC/ST women marginally more represented in rural areas .Religion showed no significant differences (p>0.05), with Hindu women making up the majority in both rural and urban areas.

There were significant disparities in housing conditions, education levels, and income. Urban women were significantly more likely to live in pucca houses (p<0.001), while katcha housing was more prevalent in rural areas. There was a significant correlation between education and location (p<0.001), with urban women having higher education levels (e.g. graduate and professional degrees) and rural women having lower education levels or illiteracy. Annual family income also differed significantly (p=0.001), with urban families reporting higher income levels. In contrast, occupation (p>0.05) and marital status(p>0.05)had no statistically significant relationship with location. Rural women married earlier, but this was not statistically significant
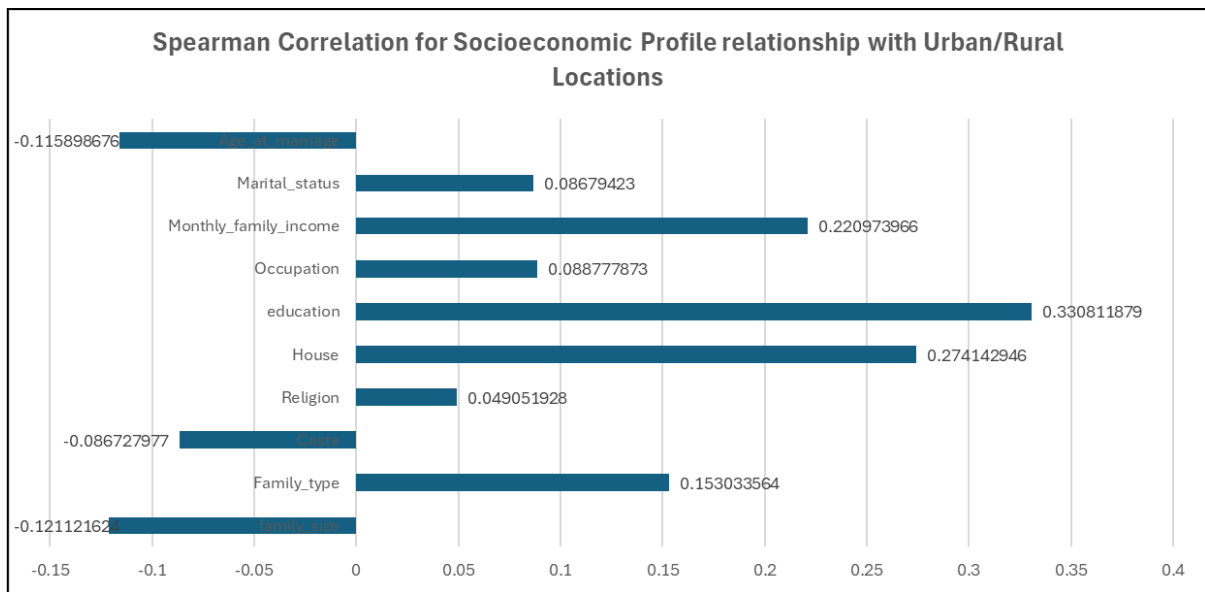
Fig.11. Spearman Correlation for Socio-economic Profile relationship with Urban/Rural Locations

The analysis examined the correlations between location (rural or urban) and multiple socioeconomic variables, assessing both the strength and significance of these relationships. The family size exhibited a weak negative correlation (rs = -0.11; p>0.05), suggesting that women in rural regions generally had marginally larger family sizes than those in urban areas. This relationship lacked statistical significance. Conversely, family type demonstrated a weak positive correlation (rs = 0.17; p=0.014), indicating that urban women were more inclined to live in nuclear families, a trend corroborated by statistical significance. The correlation between caste and location was minimal (rs=-0.08; p>0.05), indicating an absence of significant association. Likewise, religion exhibited no substantial correlation with location (rs=0.05;p>0.05),signifying that religious affiliations were evenly distributed among rural and urban women.

The Housing conditions exhibited a more significant disparity moderate positive correlation (rs=0.27; p<0.001) suggested that urban women were more inclined to inhabit pucca houses, whereas rural women primarily resided in katcha houses. Education demonstrated a notable disparity, with a robust positive correlation (rs=0.34; p<0.001) indicating that urban women possessed higher educational attainment than their rural counterparts. Occupation demonstrated a weak positive correlation (rs=0.07;p>0.05),indicating a marginal inclination for urban women to occupy higher-skilled positions. This relationship lacked statistical significance. Monthly family income exhibited a moderate positive correlation (rs=0.22; p=0.001), suggesting that urban families possessed higher incomes than their rural counterparts.

Discussion- The study analyzed data from a cohort of 220 breast cancer patients. , focusing on socio – economic variables such as family structure, housing, education, income, occupation, caste and religion. An unexpected observation in this study was observed in the demographic distribution of breast cancer patients, with a higher proportion from rural areas. This finding is contrary to the traditional understanding that urban women are at greater risk due to lifestyle patterns. The study conducted by

Singh R. et. al. in Jaipur, India to study the breast cancer prevalence in rural population , demonstrated that the prevalence proportion was 98 per 100,000 which was a concerning scenario regarding the increase in prevalence of breast cancer in rural India and emphasizing the need of awareness about risk factors and early screening and detection of breast cancer. (**Singh**, **2024**)

In an Age- Period cohort study conducted by **Sathiskumar K**. **et.al**. in 2021 to analyze the trends of cervical cancer and Breast cancer in India by National Cancer registry program. Five major cities were considered to analyze the trend, namely, Bangalore, Chennai, Delhi, Barshirural and Bhopal . The study revealed that there was a significant increase in the breast cancer in Bangalore(1.2%, Delhi 2.7% . (**Sathishkumar**, 2021)

Nearly half of the patients were illiterate (49.5%) which is similar to the study conducted by Meedimale.in 2022 where 49.2 % of the BC patients were illiterate (**Meedimale** , 2022)

Education levels presented one of the most striking contrasts between rural and urban women. Urban women demonstrated higher educational attainment, with a notable percentage holding graduate or professional degrees, whereas significant proportion of rural women were illiterate or had limited schooling. The correlation between education and location were both strong and statistically significant ($p<0.001$), reflecting systematic inequalities in access to education across rural and urban regions.

Higher education attainment among urban women may influence their access to healthcare, potentially affecting diagnosis and treatment.

In a meta-analysis of 18 cohort study conducted by **Dong JY** et.al (1920) which was aimed to examine the association between education and breast cancer , it was depicted that a higher education level may be associated with the increased risk of developing breast cancer, in which age, alcohol usage , hormonal therapy , may play a mediating role.

Occupation and income- while the majority of women in the study were unemployed, urban women showed a slight tendency towards higher –skilled or professional roles. However, the relationship between occupation and location lacked statistical significance ($p>0.05$).

In contrast, monthly family income exhibited a significance disparity ($p=0.001$). Urban families reported higher incomes, aligning with better access to employment opportunities in urban setup.

This income gap has implications for healthcare affordability, access to nutritious food, and general well being.

In a study by **Surbhi et.al**. in **2022** Reported that the QOL of patients with breast cancer was considerably lower. The key variables influencing the quality of life of patients with breast cancer were age, occupation, family structure, and location.

Conclusion

The socioeconomic profiles of rural and urban women displayed divergent patterns. Urban women were more inclined to inhabit nuclear families, dwelling pucca houses, achieve elevated educational attainment, and declare higher family incomes. These findings highlight is parities in socio economic conditions between rural and urban environments within the cohort. The disparities in education and income suggest that rural women may face greater barriers to access healthcare, understanding the importance of early detection and managing the cost of cancer treatment. The lack of education influences the decision making and treatment seeking pattern , illiterate and less educated women tend to ignore the early sign and symptoms due to poor awareness and lack of knowledge and hence the late detection of cases are more prevalent in the rural women.

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