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# EFFECTIVENESS OF BREAST CANCER PREVENTION PROGRAM ON RISK FACTORS OF BREAST CANCER AMONG YOUNG WOMEN

**Ms. Arti Tiwari**
Ph.D. Nursing Scholar Nims University Rajasthan Jaipur.
**Dr. Maharaj Singh**
Professor cum Vice principal, Nims Nursing College, Nims University Rajasthan, Jaipur.
**Dr. Bharati Sahu**
3. Associate Professor, Department of Obstetrics and Gynecology, NSCB Medical College, Jabalpur, Madhya Pradesh, India.

* Corresponding Author

## ABSTRACT

**Introduction:** Breast cancer is the most commonly occurring cancer in women. The 2020 WHO ranking on cancer burden in terms of new yearly cases being reported had ranked India at the third position after China and the US, respectively. **Aim:** To assess the effectiveness of breast cancer prevention program on risk factors of breast cancer among young women and to emphasize the importance of early screening among them. **Materials and Methods:** A Quasi-experimental study with one group pre-test post-test design was conducted among young women aged 20 to 40 years using a self administered structured questionnaire. Data was collected over a period of 6 months from January to June, 2022. A total of 250 young women were selected randomly from various colleges of Jabalpur city, MP. After taking pretest Breast Cancer Prevention programme was administered. Post test was done after one month, third month, and after six month .**Results:** In underweight category pre test showed 16(6.8%) reading , For WHR in High Risk category pretest reading was118(47%), for physical activity in inactive category pre test showed 100(40%). Effectiveness of Breast cancer prevention program was statistically calculated by comparing Pretest and posttest1, posttest2 and posttest3 using Macnemar test. Macnemar test values showed significant change in modifiable risk factors of BMI, physical activity , consumption of red meat, consumption of alcohol, with $p<0.05$.**Conclusions**: The Breast cancer prevention program was effective in minimising modifiable risk factors among young women.

**Key words:** Young women, risk factors, breast cancer prevention program.

## INTRODUCTION

Breast cancer is the most common cancer diagnosed in women, accounting for more than 1 in 10 new cancer diagnoses each year. It is the second most common type of cancer ranked one for incidence and ranked four for mortality globall.[1] With 2.30 million (2.28-2.30) new cases estimated in 2022, breast cancer was the most diagnosed cancer in females, followed by lung cancer (0.91 million) and cervical cancer (0.66 million).[2]



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Several risk factors are implicated in developing breast cancer in young women. Factors associated with breast cancer development are classified into lifestyle risk factors (i.e., physical activity, body habits, and alcohol consumption), inherent or genetic risk factors, reproductive risk factors, and iatrogenic risk factors.[3]

Lifestyle risk factors include physical activity, body mass index (BMI), alcohol, smoking, socioeconomic status, and certain occupational conditions. The current evidence suggests that physical activity is associated with a dose-dependent reduction in the risk of early onset breast cancer for all types of activity and should be recommended. Previously, the consensus was that premenopausal breast cancer risk is independent of physical activity levels, following several prospective cohort studies that reported no association.[3]

Exposures during childhood and adolescence affect a woman's long-term risk of breast cancer, but have received far less research attention than exposures that occur later in life. Evidence on childhood diet and growth in height, and adolescent alcohol intake, among other adolescent factors are related to breast cancer risk and risk of premalignant proliferative benign lesions.[4]

According to the WHO, certain habits and interventions like prolonged breastfeeding, regular physical activity, weight control, and avoiding excessive consumption of alcohol and exposure to tobacco smoke could potentially lower the risk.[5]

Behavioural choices and related interventions that reduce the risk of breast cancer include: prolonged breastfeeding; regular physical activity; weight control; avoidance of harmful use of alcohol; avoidance of exposure to tobacco smoke; avoidance of prolonged use of hormones; and avoidance of excessive radiation exposure.[4]Current strategies to decrease a woman's risk of developing breast cancer include primary prevention, such as avoiding tobacco, exogenous hormone use and excess exposure to ionizing radiation, maintaining a normal weight, exercise, breastfeeding, eating a healthy diet and minimizing alcohol intake. Chemoprevention medications are available for those at high risk, though they are underutilized in eligible women. Mastectomy and/or bilateral oophorectomy are reasonable strategies for women who have deleterious mutations in genes that dramatically increase the risk of developing cancer in either breast. There are a variety of strategies in development for the prevention of breast cancer. Personalized approaches to prevent breast cancer that are being developed focus on advances in precision medicine, knowledge of the immune system and the tumour microenvironment and their role in cancer development.[6]

**NEED OF THE STUDY**

Breast cancer is one of the leading causes of morbidity and mortality among women worldwide. The increasing incidence of breast cancer among young women is alarming. Research indicates that while breast cancer predominantly affects older women, younger women are also at risk due to genetic predisposition, lifestyle factors, and environmental exposures. Unlike older women, younger women often present with more aggressive forms of the disease, leading to poorer prognosis and increased mortality rates. [7]

Despite advancements in early detection and treatment, the incidence of breast cancer continues to rise, particularly among young women. Young women often do not perceive themselves at risk for breast cancer, leading to lower participation in screening and preventive behaviors. This lack of awareness contributes to delayed diagnosis, which can result in poorer prognoses and limited treatment options. Early education and intervention can significantly reduce the likelihood of developing breast cancer by encouraging risk-reducing behaviors such as regular exercise, maintaining a healthy weight, breastfeeding, limiting alcohol consumption, and avoiding tobacco use. Implementing effective breast cancer prevention programs tailored to young women can bridge the knowledge gap and promote a proactive approach to breast health.[8]

Furthermore, genetic and environmental factors play a crucial role in breast cancer risk. While genetic predisposition cannot be altered, knowledge about family history and regular screenings can help in early detection. Environmental factors such as exposure to endocrine-disrupting chemicals, processed foods, and sedentary lifestyles also contribute to the increasing risk. Many cases of breast cancer are linked to modifiable risk factors such as lifestyle, diet, obesity, lack of physical activity, and reproductive history.[9]

A significant challenge in breast cancer prevention is the lack of awareness among young women regarding risk factors, early detection methods, and lifestyle modifications. Many young women underestimate their vulnerability and often delay seeking medical attention when symptoms appear. Breast cancer prevention programs can play a crucial role in educating young women about self-breast examinations, the importance of routine screenings, and the impact of lifestyle choices on breast cancer risk. A well-structured prevention program can educate young women about these risks and empower them to make informed lifestyle choices.[10]

## AIM OF THE STUDY

To evaluate the effectiveness of breast cancer prevention program on reduction of risk factors of breast cancer among young women.

### Objectives of the study:

1. To assess the pre interventional and post interventional risk factors of breast cancer among young women.

2. To compare the pre interventional and post interventional risk factors of breast cancer among young women in order to assess the effectiveness of breast cancer prevention program.

## MATERIALS AND METHODS

A Quantitative research approach was used in the study to evaluate the Risk factors of Breast Cancer among young women. Quasi experimental research design (one group Pre-test and post test design) was applied in present study. This study was conducted among 250 young women between 20 to 40 years of age at PG colleges of Jabalpur city. The subjects were selected by multistage random sampling technique.

The data collection tool consisted of two sections. Section I: Structured socio-demographic variable questionnaire- it includes age, residence, religion, education standard, marital status, family type, source of information related to breast cancer. Section II: Structured Questionnaire for assessing risk factor for breast cancercomprised of Questions regarding marital status, Body Mass Index, age of menarche, repeated exposure to radiations (chest X ray etc.), family history of any benign or malignant breast disease, breast symptoms (lump, breast tenderness) family history of late menopause, physical activity, and use of alcohol, smoking, OCP's, consumption of red meat, consumption of fruits and vegetable, use of chemical hair dye were included.The validity of data collection tool was obtained from the experts in the field of Medical and Nursing. The content validity index value was 0.94. The reliability of Structured Breast cancer Risk factor assessment questionnaire was checked by split half method and it was found r=0.94.

**Data collection procedure:** The study was approved by ethical committee of Nims University Rajasthan, Jaipur. The purpose of the study was explained to the respondents and written consent was taken. Pre- test was conducted for all 250 samples by using self-administered structured questionnaire.

Breast cancer prevention program was administered on second day, which included lectures, questions and answers, PowerPoint presentations, videos & demonstration related to breast self-examination (BSE). Intervention program was held in three sessions, each of which took about 1 hours. Educational materials were provided in to increase awareness of women about breast cancer symptoms, their knowledge regarding right time for mammography and to improve their practice on preventive behaviors of breast cancer including physical activity and healthy diet including consumption of fruits and vegetables. These constructs, in turn, could help young woman to strength their ability and impart positive beliefs towards preventive behaviors including breast self-examining practices, clinical breast examination and mammography.

The effects of the intervention on breast cancer risk factors were measured, and compared with pre-test data at one month, third month and sixth month (Post-test) by using same questionnaire. The collected data were coded and analyzed by using descriptive and inferential statistics.

## RESULTS

A total of 250 young women participated in the study. Respondents were 20-40 years of age. 186 (74.4%) respondents were married and 64(25.6%) were unmarried.

On assessment of risk factors for the development of female breast cancer, Only 19(7.6%) women had >160 cm height which increase risk for Breast cancer. Among young women 45(18%) had menarche at age of 7 to 11 years. Only 3(1.2%) young women had Positive family history of breast cancer with one first-degree relatives and only 1(0.4%) had Positive family history of breast cancer with more than one first-degree relative. Among young women 41(19%) had history of late menopause in family. 38(16%) young women received hormonal replacement therapy 20 (8%) young women had received 'multiple chest radiological examinations for any reasons (PTB, trauma fractures) before age 30. None of young women had personal history any cancer and any genetic test performed. 37(15%) young women was from >30 age group at the

time of first live birth .74(38.9%) of young women did not breast feed their child. 30(12%)of young women were using oral contraceptive for <5Year and 3(1.2%) of young women were using oral contraceptive from >5years. Majority 204(81.6%) of young women hadn't any sign and symptom related to breast cancer. 37(14.8%) had < two sign and symptom and 9(3.6%) had >two sign and symptom of breast cancer.

Modifiable risk factors among young women revealed, 16(6.8%) had Under Weight (Below 18.5BMI).Majority of young women 100(40%) were inactive, 98 (39%) were doing exercise <5hrs/wk and only 52(21%) young women exercise >5hrs/wk.45(18%) ofwomen drinks 7-13 drinks/week or 10-30gm/day and none of the women taking >14 drinks/week >30gm/day. Only one young woman in present study had history of smoking. Majority 166(66%), of young women consumed red meat,66(26%) women consumed <3serving/week group andonly 18(8%) women consumed > 3serving /week. Majority 141 (48.4%) of young women consumed <3serving fruits and vegetable per day, only 8(3.2 %) young women not preferred fruits and vegetables. 58(23.2%) young women occasionally & 09(3.6%) were regularly using dark chemical hair dye.

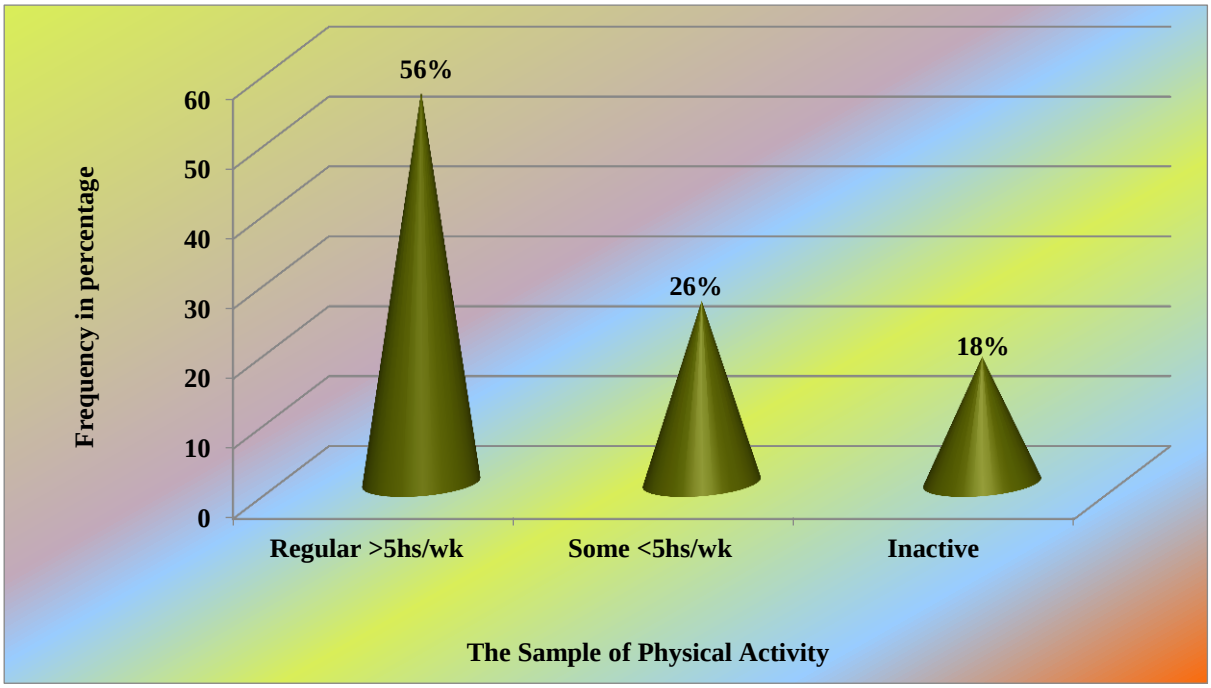


**Figure 1:- Distribution of Respondents according to Risk Factor of Breast Cancer among Young Women's Signs and Symptoms**

**The Effectiveness of Breast Cancer Prevention Program on Risk Factors**

Comparison of Modifiable Risk Factors**:**

Table 1:- Distribution of young women according to Body Mass Index in pretest, posttest1, posttest 2 and posttest 3.

| S.No. | Body Mass Index | Pre test | | Post test 1 | | Post test 2 | | Post test 3 | |
|---|---|---|---|---|---|---|---|---|---|
| | | f | % | f | % | f | % | f | % |
| 1. | Under Weight (Below 18.5) | 16 | 6.8 | 15 | 6 | 10 | 4 | 0 | 0 |
| 2. | Normal Wt (18.5-24.9) | 137 | 55 | 142 | 55.6 | 152 | 60.8 | 165 | 66 |
| 3. | Pre- Obesity | 83 | 33.2 | 80 | 32 | 77 | 30.8 | 70 | 28 |
| 4. | Obesity Class-I | 14 | 5.9 | 13 | 5.2 | 11 | 4.4 | 5 | 2 |
| 5. | Obesity Class-Ii | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**BMI (Body Mass Index):** In underweight category pre test showed 16(6.8%) in 1st month 15(6%), then in 3rd month 10(4%), and at 6th month none had underweight. In normal weight category pre test showed 137(55%), in 1st month 142(55.6%), then in 3rd month 152(60.8%) and 6th month165 (66) reading. in pre-obesity category pre test showed 83(33.2%), in 1st month 80(32%), then in 3rd month 77(30.8%) and 6th month 70(28%) reading. In obesity class-I category Pre test showed 14(5.9%), in 1st month 13(5.2%), then in 3rd month 11(4.4%) and 6th month had 5(2%) reading.

When Comparisonof BMI Pre-Test and Post -Test 1 Statistical McNemar value for the post test 1 BMI was 0.031, & p=0, for Pre-Test and Post -Test 2Statistical McNemar value was 0.053, &p=0.001, for Pre-Test and Post -Test 3 Statistical McNemar value was 0.143, & p=0.016 these all values are less than the value 0.05 revealing significance in difference in pretest and post test BMI so hypothesis RH1 was accepted.

**WHR (Waist Hip Ratio)**

Distribution of respondents according to WHR inPre-Test, 1 Month, 3 Month and 6 Month showed that in low risk category pre test showed 07(3%), and there is no change in any post test category In moderate risk category pre test showed 125(50%), In 1st month,3rd month had same 125(50) reading and 6th month had 127(50%). In High Risk category also there is no change in pretest and a post test1 (1st month) & posttest 2(3rd month) category the value is same 118(47%), in posttest 3(6th month) had 116(46.5%).

Statistical McNemar value for the pretest and posttest 3 WHR was 0.524 & (p=0.001) p<0.05 which revealing significance difference in pretest and posttest 3 WHR, so hypothesis RH1 was accepted.

**Risk Factor Physical Activity**

Table 2 :- Distribution of Respondents according to Risk factor Physical Activity in pretest , posttest1, posttest 2 & posttest 3 N=250

| **Sno.** | **Physical Activity** | **Pretest** | | **Posttest1** | | **Posttest2** | | **Posttest3** | |
|---|---|---|---|---|---|---|---|---|---|
| | | f | % | f | % | f | % | f | % |
| 1. | >5hs/wk | 52 | 21 | 105 | 42% | 95 | 38% | 125 | 50% |
| 2. | <5hs/wk | 98 | 39 | 125 | 50% | 125 | 50% | 110 | 44% |
| 3. | Inactive | 100 | 40 | 30 | 12% | 30 | 12 | 15 | 8 |

Distribution of respondents according to risk factor physical activity at Pre-Test, 1 Month, 3 Month and 6 Month presents that in >5hrs/wk category pre test showed 52(21%), in 1st month 105(42%), then in 3rd month 95(38%) and 6th month 125(50%) reading. In <5hs/wk category pre test showed 98(39%), in 1st month 125(50%), then in 3rd month 125(50%) and 6th month had 110(44%) reading. In Inactive category pre test showed 100(40%), in 1st month 30(12%), then in 3rd month 13(12%) and 6th month had 15(8%) reading.

Statistical McNemar value for the physical activity pretest and posttest1 was 0.23 & p= 0.001,pretest and posttest 2 was 0.321 & p= 0.001, pretest and posttest 3 was 0.428 & p= 0.001 these all value were less than the value 0.05 revealing significance in difference in pretest and post tests.

**Risk factor consumption of red meat among young women**

Distribution of respondents according to risk factor consumption of red meat in Pre-Test, 1 Month, 3 Month and 6 Month revealed that In never category pre test showed 166(66.4%), in 1st month , 3rd month and 6th month reading is same 166(66.4%). In <3 serving/wk category pre test showed 66(26.4%), in 1st month 74(29.6%), then in 3rd month 80(32%) and 6th month 83(33.2%) reading. In >3 serving category pre test showed 18(7.2%), in 1st month 10(4%), then in 3rd month 4(1.6%) and 6th month 01(0.4%) reading.

Statistical McNemar value for risk factor consumption of red meet in pretest and post test 1 was 0.238 & p= 0.03, in pretest and post test2, 0.428 & p= 0.001 & in pretest and post test3 was 0.541 & p= 0.001 so research hypothesisH1was accepted.

**Risk factor 'Alcohol Use' among Young Women**

Distribution of Respondents according risk factor Alcohol Use' among Young Women (Pre-Test, 1 Month, 3 Month and 6 Month) revealed that in 0 - <7 drinks/week or <10gm category pre test showed 205(82%), in 1st month 225(90%) 3rd month 233(93.2%) , and 6th month reading was 245(98%). In 7-13 drinks/week or 10-30gm/day catagorypre test showed 45(18%), in 1st month 25(10%), then in 3rd month 17(6.8%) and 6th month had 05(2%) reading. In >14 drinks/week >30gm/day category all test has 0(0.0%)reading.

Statistical McNemar value for the risk factor Alcohol Use' pretest and post test1 was 0.428 & p= 0.001 pretest and post test2 was 0.362 & p= 0.001 & for pretest and post test3 was 0.428 & p= 0.001 these all value were less than the value 0.05 revealing significance in difference in pretest and posttest risk factor alcohol use so hypothesis RH1 was accepted.

**Risk Factor Use of Dark Chemical Hair Dye**

Statistical McNemar value for the risk factor use of dark chemical hair dye in Pre-Test and Post -Test 1 was 0.378 & p= 0.001. In Pre-Test and Post -Test 2 was 0.382 & p=0.001 and in Pre-Test and Post -Test 3 was 0.42& p=0.001 which was less than the value 0.05 revealing significance in difference in pretest and all post tests.

**DISCUSSION**

A total of 45 (18.0%) females in this study had early menarche, which increases their risk for breast cancer. A study published in Nursing Midwifery Research Journal (2017) shows significant relationship between early menarche and breast cancer .[11]Also evidence from a study (2020) suggests that LNG-IUS users have an increased breast cancer risk regardless of age and indication.[12]

In this study researchers estimated that absolute excess risk of developing breast cancer over a 15-year period in women with five years use of oral contraceptives ranged from eight in 100,000 women for use from age 16 to 20, to 265 in 100,000 for use from age 35 to 39.[13]

46(18.4%) young women were overweight in this research. A study done in 2014 says that weight gain as an adult was positively associated with risk of post-menopausal breast cancer, with a 6 % increase in risk for every 5 kg gained since age 20. This study also says that women who exercised more than 30.9 metabolic equivalent task (MET) hours per week had a 21% decreased risk of breast cancer compared to women who exercised less than 3 MET hours per week.[14]

In our study out of 250 young women majority 218 (87.2%) had not practice physical exercise regularly (at least 3 hrs per week) that place them in risk for breast cancer. Findings of one

another study also indicate that a physically inactive women engaging in at least 150 min per week of vigorous physical activity would reduce their lifetime risk of breast cancer.[15]

This study also assessed the impact of a breast cancer prevention program, particularly on red meat consumption. Findings aligned with Gebretatyos and Amanuel (2000). The mean score for practicing a healthy diet and physical activity improved from 27/44 (SD = 4.20) pre-intervention to 31/44 (SD = 5.36) post-intervention. A significant difference was observed (MD = 4.06, $p < 0.0001$). The educational intervention was equally effective across age, education, and occupation levels, demonstrating its broad applicability.[162]

## CONCLUSION

The Breast Cancer Prevention Program proved effective in reducing modifiable risk factors such as BMI, waist-to-hip ratio (WHR), physical inactivity, red meat consumption, and alcohol use among young women. By addressing these lifestyle factors, the program contributes to lowering breast cancer risk and promoting overall well-being.

Health care professionals play a crucial role in educating young women about breast cancer risk factors and encouraging them to adopt healthier habits. Raising awareness about the importance of maintaining a balanced diet, engaging in regular physical activity, and avoiding harmful substances can significantly impact long-term health outcomes.

Given the program's feasibility and success, it is essential to implement similar large-scale initiatives, especially in countries like India, where preventive healthcare measures are needed to reduce the growing burden of breast cancer. A mass-level approach can help create a widespread culture of health consciousness, empowering women to take proactive steps in preventing breast cancer.

Government and health organizations should collaborate to integrate such programs into public health strategies, ensuring accessibility for all women. By prioritizing breast cancer prevention through education and lifestyle modifications, it is possible to make a meaningful difference in reducing the incidence of this disease.

**Conflicts of Interest: Nil**

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