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Original Research Article

A study on nutrition, knowledge, attitude and practice towards breast cancer prevention among female college going students in Lucknow City

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ABSTRACT

Background: Breast cancer (BC) is common in Indian women, often detected late due to low awareness. BC risk is influenced by obesity, inactivity, lifestyle changes including weight management and Mediterranean diet rich in fruits, vegetables and whole grains, may improve outcomes for survivors. Diet plays a measurable role in BC prevention, to assess knowledge, attitude, practice, and nutrition regarding BC and examine dietary habits and socio-demographic influences among female college students.
Methods: A cross-sectional study was conducted among 145 female students from IT college of Lucknow. A pre-tested self-administered questionnaire was used to assess the participants' knowledge, attitude, practice (KAP) and nutrition-related BC prevention. A total of 137 students completed the survey.
Results: The results indicate a strong association between age and the performance of breast self-examination (p=0.000). Education significantly correlates with fruit consumption (p=0.0000) and antioxidant intake (p=0.0032). A positive correlation exists between family income and belief in family history affecting BC risk (p=0.000). Additionally, family income significantly influences fruit consumption frequency (p=0.020) and awareness of breast self-examination (p=0.000), emphasizing the impact of socioeconomic factors on BC prevention practices.
Conclusions: In conclusion, nutrition KAP regarding BC prevention is influenced by factors like age, field of study, and family history. While increasing knowledge alone is insufficient for behavior change, it remains essential. Public health and nutrition education programs in institutions can enhance knowledge, improve food habits, and reduce BC risk.

Keywords: Breast neoplasms, Students, Female, Health education

INTRODUCTION

A wide range of diseases that can impact any part of the body are collectively referred to as "cancer". Other words like neoplasms and malignant are used. One of the characteristics that characterizes cancer is the quick development of aberrant cells that proliferate beyond their normal bounds, invade nearby bodily areas, and spread to other organs a process that ultimately results in death (Key et al).[1]

Various potential mechanisms influencing BC risk have been proposed, categorized into two main groups: nutritional effects mediated by changes in endogenous hormone levels and nutritional effects with a direct impact on BC risk (Key et al).[1]

Obesity is frequently caused by sedentary lifestyles and bad eating habits, which are defined as consuming an excessive amount of high-calorie, high-sugar, high-saturated-fat foods combined with a low intake of

nutrient-dense foods like fiber, omega-3 fatty acids, and natural antioxidants. The Mediterranean diet, characterized by heavy consumption of vegetables and fruits, provides significant amounts of polyphenols and fiber. Both polyphenols and fiber have been suggested to play a role in preventing carcinogenesis (Maskarinec et al and Braakhuis et al).[2,14]

BSE is regarded as an easy, quick, safe, low-cost, non-invasive intervention. In countries with limited resources, where access to more effective screening techniques is limited, this could be a helpful measure for early detection of BC. It was discovered that the test's sensitivity was 78% (Lam et al).[4] BSE also motivates women to actively participate in preventive healthcare. It also aids in getting past taboos, stigma, and fear.

Alteration in hormonal level precipitates BC. It can be due to starting and stopping of periods (Menstrual cycle) (Fletcher).[6] Fletcher also explained that having high levels of estrogen is associated with an increase in BC.[6] Sedentary lifestyle, high dietary intake of fat that can cause obesity particularly in postmenopausal women, may cause BC. The use of alcohol is also another cause of BC (Tiernan).[5] Symptoms of BC include the presence of a lump in the breast or armpit. General alerting features may include swelling or a mass in the breast, swollen lymph nodes in the armpit, nipple discharge (clear or bloody), pain in the nipple, inverted (retracted) nipple, scaly or pitted skin on the nipple, persistent tenderness of the breast, and unusual breast pain or discomfort (Stephan).[7]

BC ranks as the second most prevalent cancer globally and is the primary malignancy affecting women, constituting 22.9% of female cancer cases, with over 2 million new diagnoses in 2018 (Ferlay et al and Seward and Wild).[8,10]

BC outcomes may be improved by taking multivitamins, eating a diet high in fruits and vegetables, and engaging in physical activity (Kwan et al).[9]

BC is a malignant tumor that originates from breast cells, according to the American Cancer Society's definition.[3] The ability of cancer cells to spread to other parts of the body or invade nearby tissues is what distinguishes malignant tumors. While BC predominantly affects women, men can also develop the disease (American cancer society).[3]

Chan et al showed that obesity is associated with an elevated risk of post-menopausal BC and increased rates of BC recurrence and mortality.[11] A systematic review and meta-analysis of 82 follow-up studies, involving 213,075 BC survivors and 41,477 deaths (including 23,182 attributed to BC), revealed a correlation between body mass index (BMI) and BC survival. Specifically, for each 5 kg/m² increase in BMI, there was a respective increase in overall mortality by 17%, 11%, and 8% before BC diagnosis, less than 12 months after diagnosis, and 12 or more months after diagnosis (Chan et al).[11]

According to Greenlee et al vitamin C, or ascorbic acid, is a water-soluble vitamin involved in several biological processes, including biosynthesis of collagen, neurotransmitters and L-carnitine, iron absorption, and immune function.[12] The use of screening techniques like BSE, clinical breast examination, and mammography for early detection is one potentially significant tactic in lowering BC mortality. Even with the availability of multiple screening techniques, women are the ones who identify most cases of BC, which emphasizes the significance of BSE (Myers et al).[13]

Red and processed meats are considered risk factors for BC due to several factors. These meats contain heme iron, which may contribute to carcinogenesis. Additionally, the administration of estrogens to cattle and the formation of mutagens during cooking further increase the risk associated with consuming these meats (Inoue-Choi et al).[15]

Family history is a risk factor for BC. Both maternal and paternal relatives are important. The risk is highest if the affected relative developed BC at a very young age. First-degree relatives (mother, sister and daughter) are the most important in estimating the risk. Second-degree relatives (grandmother and aunt) with BC may also increase the risk (Melissa Conrad Stoppler).[16]

Lahiji et al found that nutrition KAP about BC prevention factors was influenced by individual factors such as age, field of study, familial history of BC, job, and residency status.[17]

Research findings indicate that several lifestyle factors can reduce the risk of cancer, including maintaining a healthy weight, limiting alcohol consumption, avoiding tobacco use, following a diet rich in fruits and vegetables, and engaging in regular exercise. Studies have also demonstrated that obesity in patients undergoing oncological treatment is associated with higher morbidity and mortality compared to those with a normal body mass index. Additionally, weight loss in postmenopausal women has been shown to decrease the risk of BC (Chlebowski).[18]

This study is novel in its comprehensive approach to exploring the interrelationship between nutrition awareness and preventive health behavior regarding BC among young female college students a population often overlooked in cancer prevention research.

While most previous studies have focused on clinical populations or middle-aged women, this study uniquely targets the younger demographic to assess their KAP toward BC prevention and nutritional factors influencing risk reduction.

Aim

Aim of the study was to assess the knowledge, attitude, practice and nutrition towards BC in college going women, to examine the dietary habits, socio-demographic factors (e.g., age, education, income) that may influence nutrition, KAP towards BC prevention among female college students.

METHODS

Study design and settings

A cross-sectional study was conducted using a web-based survey to assess the targeted variables. The study population comprised female college-going students from IT College, Lucknow. Although the overall study duration was from March 2022 to August 2022, data collection was carried out over a period of one month within this timeframe.

Sample size

Total 137 participant were selected and included in the study.

Sample size

The sample size was calculated by using this formula: $N=z^2p(1-p)/E^2$

Alpha [α]=0.05,

Estimation error [d]=0.05 and,

Sample size needed=145

Out of 145 forms, 8 were incomplete.

So, the final sample size was taken 137.

Tool used

A valid and reliable questionnaire was used for collecting data. The questionnaire contains open, closed-ended and multiple-choice questions with pre-defined answers.

Sampling method

The sampling method used is random sampling, focusing on individuals who meet the criteria of nutrition, knowledge, attitude and practice towards BC.

Inclusion criteria

Patients who were ready to give their consent, no major physical or psychiatric illness, with the age 18-30 years and the female students of IT college were included in the study.

Exclusion criteria

Not ready to give their concern, any major physical or psychiatric illness, with age below and above 18-30 years and female students of all other colleges were excluded from the study.

Statistical analysis

This study aims to assess the KAP, and nutrition towards BC prevention among female college students. The research will also explore how dietary habits and socio-demographic factors such as age, education, and income influence their understanding and practices related to BC prevention. A cross-sectional, web-based survey was conducted at IT College, Lucknow, from March to August 2022, with a final sample size of 137 participants.

The study seeks to determine the level of KAP regarding BC prevention and examine how these factors correlate with participants' demographic profiles and lifestyle choices.

Research question

What is the level of KAP among female college students regarding the role of nutrition in BC prevention, and how does this knowledge correlate with their demographic profile and lifestyle choices?

RESULTS

From Table 1 it can be interpreted that the study analyzed associations between age and BC-related variables. Significant associations were found with family history affecting BC chances (p=0.003) and performing breast self-examination (p=0.000]. Other variables, including awareness of risk factors, diet, and vitamins, showed no significant association (p>0.05).

From Table 2 it can be concluded that the study analyzed associations between education and BC-related variables. Significant associations were found with consuming fruits (p=0.000], vitamin E aiding recovery (p=0.0358), and antioxidants aiding recovery (p=0.0032]. Other variables, including awareness of BC and risk factors, showed no significant associations (p>0.05).

From Table 3 it can be analyzed that the study examined the association between family income and BC-related variables. Significant associations were found with belief in family history affecting BC chances (p=0.000), awareness of breast self-examination (p=0.000), exercise reducing BC risk (p=0.020), and fruit consumption (p=0.020).

Other variables, including awareness of risk factors, diet, and vitamins, showed no significant associations (p>0.05).

Table 1: Association between age and breast cancer knowledge, attitude and practice among female students.

Variables	Chi-square	P value	Result (significant or not)
Breast cancer the most common cancer in women	2.737	0.553	Non-significant
Believe in family history affects the chances of BC	14.261	0.003	Significant
Awareness of breast self-examination	7.767	0.062	Non-significant
Performance of BSE	26.752	0.000	Significant
Alcohol/smoking is a risk factor for BC	4.274	0.282	Non-significant
Exercise makes it less likely of getting BC	5.805	0.158	
Tool utilized for early detection of BC	4.828	0.461	
Diet with abundant red meat is a risk factor for BC	4.155	0.366	
Consume fruits	10.518	0.70	
Consume vegetables	9.244	0.177	
Consume junk/fast food	4.043	0.581	
Vitamin E helpful in the recovery of BC	1.681	0.782	
Vitamin D helps in slowing the occurrence of BC	4.794, 0.256	0.256	
Antioxidants help in the recovery of BC	7.106	0.095	

Table 2: Association between education and breast cancer knowledge, attitude and practice among female students.

Variables	Chi square	P value	Result (significant or non)
Breast cancer the most common cancer in women	0.04	0.8415	Non-significant
Believe in family history affects the chances of BC	0.32	0.597	
awareness of breast self-examination	4.321	0.752	
Performance of BSE	3.546	0.0597	
Alcohol/smoking is a risk factor for BC	0.316	0.5740	
Exercise make it less likely of getting BC	0.069	0.7928	
Tool utilized for early detection of BC	2.188	0.1391	
Diet with abundant red meat is a risk factor for BC	3.083	0.928	
Consume fruits	16.89	0.0000	Significant
Consume vegetable	1.625	0.2024	Not-significant
Consume junk/fast food	2.84	0.0919	
Vitamin E helpful in the recovery of BC	0.406	0.0358	
Vitamin D helps in slowing the occurrence of BC	3.455	0.0631	
Antioxidants help in the recovery of BC	8.801	0.0032	Significant

Table 3: Association between family income and breast cancer KAP among female students.

Variables	Chi square	P value	Result (significant or non)
Breast cancer the most common cancer in women	6.316	0.351	Non-significant
Believe in family history affects the chances of BC	27.019	0.000	Significant
awareness of breast self-examination	35.952	0.000	
Alcohol/smoking is a risk factor for BC	4.865	0.560	Non-significant
Exercise makes it less likely of getting BC	14.252	0.020	Significant
Tool utilized for early detection of BC	12.131	0.126	Non-significant
Diet with abundant red meat is a risk factor for BC	2.302	0.890	
Consume fruits	17.305	0.020	Significant
Consume vegetables	4.985	0.881	Non-significant
Consume junk/fast food	14.393	0.056	
Vitamin E helpful in the recovery of BC	4.256	0.649	
Vitamin D helps in slowing the occurrence of BC	2.650	0.873	
Antioxidants help in the recovery of BC	5.400	0.491	

DISCUSSION

The present study explored the relationship between demographic variables and awareness, beliefs, and practices related to BC prevention, the revealing several significant associations. Age was significantly linked to the belief that family history influences BC risk (p=0.003) and the practice of breast self-examination (p=0.000). This aligns with findings by the American Cancer Society (2007a, 2011) and Myers et al which indicate that

awareness of hereditary risk tends to increase with age and exposure to health information.[13] Despite high awareness of BSE in our sample (70.80%), only 48.91% reported performing it, reflecting a global challenge where awareness does not always translate into practice (Lam et al and Fletcher).[4,6]

Education level significantly influenced fruit consumption (p=0.000), as well as beliefs in the role of vitamin E (p=0.0358) and antioxidants (p=0.0032) in recovery. These findings correspond with research by Key et al and Braakhuis et al which emphasize the role of dietary components-particularly fruits, vegetables, and bioactive compounds-in modulating BC risk and prognosis.[1,14] Similarly, Raji Lahiji et al found that higher education was associated with better nutrition knowledge and preventive practices.

Family income showed strong associations with several factors, including belief in family history's impact (p=0.000), BSE awareness (p=0.000), exercise as a preventive measure (p=0.020), and fruit consumption (p=0.020). Higher-income participants were more likely to consume fruits daily and to believe in the role of hereditary factors in BC. Previous literature supports that socioeconomic status influences both awareness and access to preventive resources, including healthy diets and screening tools (Chan et al and Greenlee et al).[11,12] However, as Seward and Wild note, income alone does not determine screening uptake; cultural norms, healthcare access, and health literacy are critical mediators.

Dietary awareness in our study reflected moderate recognition of risk and protective factors, with over half of participants identifying alcohol, smoking, and red meat consumption as risks, in agreement with Maskarinec et al and Inoue-Choi et al.[2,15] Preventive behaviours such as healthy diet (67.15%) and physical activity (48.18%) were commonly reported, consistent with the literature linking lifestyle modification to reduced incidence and recurrence risk (Tiernan and Kwan et al).[5,9] Nevertheless, gaps remain in translating knowledge into consistent action, suggesting a need for tailored educational interventions targeting younger age groups and those with lower income or education.

Overall, our findings support prior evidence that demographic factors shape BC -related awareness and behaviours (Ferlay et al and Chlebowski).[8,18] By highlighting specific associations such as education with dietary practices and income with belief in hereditary risk this study underscores the importance of targeted awareness campaigns and equitable access to prevention resources. Future interventions should integrate culturally appropriate dietary guidance, structured BSE training, and community-based lifestyle modification programs to bridge the awareness-practice gap and the reduce BC burden.

CONCLUSION

BC is the most commonly diagnosed cancer in women. BC among students is greatly influenced by nutrition KAP. Lowering the risk of BC can be achieved by realizing the benefits of a balanced diet high in fruits, vegetables and whole grain, avoiding processed food and limiting the alcohol intake. Promoting awareness about the importance of regular screenings, including mammography, alongside encouraging self-examination, is crucial for improving early detection rates and overall breast health outcomes. Lifestyle factors such as diet, exercise, and weight management play crucial roles in reducing BC risk. The Mediterranean diet, rich in fruits and vegetables, is associated with lower cancer risk, while red and processed meats may increase it.

Reducing the morbidity and mortality linked to BC requires a strong focus on young women's KAP. It is possible to significantly lower the incidence rate of BC over the next 30 years if we can slow down the trend of the disease in younger populations through primary prevention.

This study highlighted a significant gap in the nutrition-related BC risk. Women should motivate each other for regular breast self-examination, sharing information and setting examples as healthcare professionals. Future studies that consider a broader age range and larger scale are needed to unravel the predictors of nutrition-related BC risk reduction practices in the Lucknow among female population. Further research is essential to explore the efficacy of such interventions and their impact on BC outcome. Raise awareness among college girls by using information, education, and communication (IEC) materials about BC and also trained them about self-breast examination for early detection.

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