

Non-modifiable Risk Factors for Breast and Cervical Cancer and their Association with Sample Characteristics

Shobha Gusain

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Abstract

Background: Cancer was the second leading cause of death globally, responsible for 8.8 million deaths in 2015. The estimates of cancer incidence would increase to 1.87 million by the year 2026. New cancer cases in females are higher as compared to males at all time periods.

Objectives: 1) To assess the Non-modifiable risk factors for breast & cervical cancer 2) To identify the association of Non-modifiable risk factors with selected sample characteristics.

Methods: Using purposive sampling technique, a pre tested and structured interview schedule was administered to 426 women in gynae O.P.D. of Lok Nayak Hospital.

Results: 86.85% of study subjects were in the Non-modifiable risk factor score category and most of them were in illiterate and primary educated group. Age, education, employment, occupation and income were significantly associated with Non-modifiable risk factor scores.

Conclusion: Moderate Non-modifiable risk factors appeared to influence the risk status of women for breast and cervical cancer in this study.

Keywords: Non-modifiable risk factors; Family history.

INTRODUCTION

Background of the study

Cancer is a group of diseases characterized by uncontrolled cellular growth with local tissue invasion and systematic metastasis. Cancer represents more than 100 types of malignant tumours that can occur in individuals of all ages,

gender, races and ethnic and socio-economic groups. No one is exempt from the potential for developing a cancer. The physical effects can be as minimal as the excision of a small basal cell cancer of the skin which leaves a minimal scar. At the other extreme, cancer treatment can be mutilating and disfiguring, with devastating changes in physical appearance and function.¹

Global cancer burden

Forouzanfar MH, Foreman KJ, Delossantos AM, Lozano R, Lopez AD, Murray CJL *et al.* revealed that the number of cases and deaths from breast and cervical cancer are rising in most countries, especially in the developing world where more women are dying at younger ages. In 2010, 425,000 women died from breast cancer, of which 68,000 were between the ages of 15 and 49 in developing countries. New cases of cervical cancer occurred more often in developing countries than in developed countries in all age groups.²

Author Affiliation: Senior Faculty, Department of Nursing, Ahilya Bai College of Nursing, Lok Nayak Hospital, New Delhi 110002, India.

Corresponding Author: Shobha Gusain, Senior Faculty, Department of Nursing, Ahilya Bai College of Nursing, Lok Nayak Hospital, New Delhi 110002, India.

E-mail: shobhagusain2010@rediffmail.com

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In 2012, there were 14.1 million new cancer cases, 8.2 million cancer deaths and 32.6 million people living with cancer (within 5-years of diagnosis) worldwide. Eight million (57%) new cancer cases, 5.3 million (65%) cancer deaths and 15.6 million (48%) 5-year prevalent cancer cases occurred in the less developed regions. The 5 most common sites of cancer diagnosed among men were lung, prostate, colorectal, stomach and liver. Among women the 5 most common sites diagnosed were breast, colorectal, cervix, lung and corpus uteri cancer.³

Cancer was the second leading cause of death globally, responsible for 8.8 million deaths in 2015. Globally, nearly 1 in 6 deaths was due to cancer. Approximately 70% of deaths from cancer occurred in low and middle-income countries.⁴

By 2030, the global cancer burden is expected to nearly double, growing to 21.4 million cases and 13.2 million deaths.⁵ And while that increase is the result of demographic changes (a growing and aging population) it may be compounded by the adoption of unhealthy lifestyles and behaviours related to economic development, such as smoking, poor diet, and physical inactivity.^{4,5}

Burden of cancer in India

Dsouza N, Murthy N S and Aras R revealed that the proportion of Indian population in the age above 40 years (which is more prone to cancer), will increase from 28% in 2011 to 35.7% by 2026. The estimates of cancer incidence would increase to 1.87 million by the year 2026. New cancer cases in females are higher as compared to males at all time periods. Further estimation of new cancer cases, by major states of India, reveals that burden is very high, in those states which are highly populous. Nearly 41.3 percent of cancers seen in Indian females are accounted by cancer of breast and cervix alone. The estimates of breast cancer incidence would increase from 1,53,297 cases to 235,490 cases during 2011 to 2026. Similarly, cancer of cervix cases would rise from 96,156 cases to 148,813 cases.⁶ Though, because of India's population, the percentage of total women affected appears less, the breast and cervical cancer burden in India is much more than developed countries and is steadily rising.

Cancer of the breast in Indian women

Breast cancer is the malignant neoplasm of breast tissues. 70% of women have no major risk factors other than gender and age. The other risk factors of breast cancer include family history and personal history of breast cancer, genetic factors, prolonged oestrogen exposure, early menarche

(age <12 years), late menopause (age >55 years), nulliparity, first full term pregnancy after the age of 30 years, obesity, high fat diet, excessive alcohol consumption and repeated exposure to ionizing radiations at younger age.^{1,7}

Initially breast cancer typically appears as unilateral, single mass or thickening, usually in the breast's upper outer quadrant. The mass is usually painless, non-tender, hard, irregular in shape and immobile. The other clinical manifestations like, skin or nipple retraction, nipple discharge and peau d'orange appearance (orange peel) of the skin reflect advanced disease.^{1,7}

Agarwal G and Ramakant P found that in general, breast cancer has been reported to occur a decade earlier in Indian patients compared to their western counterparts.⁸ Similar findings were revealed by Agarwal G, Pradeep P V, Aggarwal V *et al.*^{8,9}

Cancer of the uterine cervix

Neoplastic disease of the uterine cervix is known as cervical cancer. The risk factors for cervical cancer include Human Papillomavirus (HPV) infection, cigarette smoking, low socio economic status, first sexual intercourse before age of 16 years, multiple sexual partner, history of sexually transmitted diseases, high risk male partner, compromised immunity, HIV infection, early age at first pregnancy and multiparity.^{1,7}

Cervical cancer is asymptomatic in the early stages. As the disease progresses women may experience vaginal discharge and bloody spotting (especially after intercourse). With advanced disease, foul smelling discharge, pain in the flank, lower back and abdomen, weight loss, leg edema, dysuria, rectal bleeding, anorexia and anemia may occur.^{1,7}

Dinshaw KA, Shastri SS, and Patil SS emphasized that prevention should be the key element in any disease control programme. Prevention means eliminating or minimizing exposure to the causes of cancer, and includes reducing individual susceptibility to the effect of such causes. This approach offers the greatest public health potential and the most cost effective long-term method of cancer control. Tobacco is the single leading cause of cancer worldwide and in the fight against cancer every country should give highest priority to tobacco control. Educating people regarding the disease will help to drive away the fears and stigma associated with the disease. It is important to involve all levels of the population

in the educational process. The contents of cancer education should focus on, tobacco control, physical activity and avoidance of obesity, healthy dietary practices, reducing occupational and environmental occupational exposures, reducing alcohol use, immunization against hepatitis B virus, safe sexual practices to avoid human papilloma virus infection.¹⁰

Tsu VD, Jeronmo J and Anderson B O discuss that much attention has been paid to women in their teens and twenties because of the risks associated with sexuality and pregnancy – namely, infection with the human immunodeficiency virus (HIV) and other sexually transmitted infections, unwanted pregnancy and associated unsafe abortion, and obstetric complications. Much less attention has been focused by governments and doctors on how these earlier life experiences affect the health of women when they reach their thirties, forties and fifties – those ill-defined middle years between youth and old age.

The causes of breast and cervical cancer are related. However, the same reproductive factors that protect against one form of cancer increase the risk of the other form. Women who have early and frequent pregnancies and who breastfeed their children have a lower risk of getting breast cancer but are at increased risk of developing cervical cancer. The time is right to focus on breast and cervical cancer and to support critical interventions for reducing the incidence of these two diseases and their case-fatality rates.¹¹

Nurses as professionals can be proactive in promoting primary prevention by individual efforts. Also as Individuals nurses can practice cancer prevention measures for themselves and their families.

Juneja A, Sehgal A, Mitra A B, and Pandey A discussed the need of developing alternative approaches based on risk reduction modalities. They emphasized on health education, behavioural interventions, legislative approaches and modifying the health care seeking behavior.¹²

It is evident from literature review above that there is a dire need to assess the Non-modifiable risk factors present in Indian women to find out why we are unable to control cancer incidences. This is leading to increased morbidity and mortality in women from breast and cervical cancer reducing their overall survival. By assessing the presence of Non-modifiable risk factors in Indian women we can examine the presence of Non-modifiable risk

factors (NMRF) and association of the NMRF with sample characteristics, which increases the risk status of women for breast and cervical cancer. Therefore the investigator planned to conduct this study, which was a part of PhD study, to assess Non-modifiable risk factors for breast and cervical cancer in women and its association with the selected sample characteristics.

Conceptual framework of the study - The conceptual framework of this study is based on Health Belief Model by Rosentock (1974) & Becker & Mauman (1975) which addresses the relationship between a person's belief and behaviour.¹³ It is a way of understanding and predicting how clients will behave in relation to their health and how they will comply with health care policies.

MATERIAL AND METHODS

Research approach - Quantitative research approach is used.

Research design - Exploratory & descriptive survey design has been used to identify, explore and describe the existing phenomenon and its related factors.

Variables in the study

- **Independent variables** - Selected sample characteristics (age, education, marital status, religion, employment, occupation, family income, own income and type of family and food habits)
- **Dependent variable** - Non-modifiable risk factors in women

Setting for the study - Gynaecout patient department (O.P.D.) of Lok Nayak Hospital of Delhi

Sampling technique and sample size - The sample size for the study was 426 Women who meet the laid criteria, using purposive Sampling technique.

Inclusion criteria

- i. Women who are attending Gynae O.P.D for the first time (new registrations).
- ii. Women who are married and have intact uterus.
- iii. Women in the age group of 20- 60 years of age.

Exclusion criteria

- i. Diagnosed cases of carcinoma breast and cervix, women with prolapsed uterus, who have undergone hysterectomy, women on treatment for infertility and pregnant women.
- ii. Unmarried women
- iii. Women who are menstruating/cases of bleeding per vagina.
- iv. Women who are not interested to participate in study.

Description of the tools - Interview Schedule, developed by the investigator, was used for data collection which consisted of following parts:

- Sample characteristics containing items on age, education, religion, marital status, occupation, income, menstrual history, obstetrical history, type of family and type of diet (13 items with sub headings).
- **Questionnaire on Non-modifiable risk factors (NMRF)** included items like, history of chronic disease, early menarche, late menopause, number of pregnancies, breastfeeding, multiple sex partners, use of hormones and history of sexually transmitted diseases. There were total 13 items.

Scoring of the Questionnaire on Non-modifiable risk factors (NMRF)

- **Non-modifiable risk factors** were measured as dichotomous items (yes, present/no, not present). Each risk factor if present was given 1 score and if not present was given 0 score.
- The higher the non Non-modifiable risk factor scores, the more non Non-modifiable risk factors. Maximum score was 19.

Content validity and reliability of the tool -

The content validity of interview schedule was established by giving the tool to 13 experts in the field of nursing, community medicine, oncology and gynecology. Cronbach's alphavalue for reliability of the tool was 0.64. A Hindi translation of the tool was prepared which was validated by a bi-lingual expert.

Procedure for data collection - After ethical clearance from Institutional Ethics Committee and permission from hospital authorities, three days *i.e.* Tuesday, Wednesday and Friday were selected for data collection. On an average 4-5 patients fulfilling the inclusion criteria were enrolled for data

collection per day. Time taken to collect data was 10-15 minutes per patient. Data collection was started in February 2015 and continued till August 2015. Total 431 patients were enrolled in the study out of which 5 patients left the study without completing it. Final data collection was done on 426 patients.

RESULTS

Sample characteristics

The demographic data revealed that that maximum number of the study subjects were aged between 30-39 years (33.8%) and illiterate (33.57%) followed by education up to 5th class were (19.95%). Majority of study subjects were married and living with husband (96.71%). About 56.34% of study subjects were Hindu followed by Muslim (41.78%) by religion. The employment status of study subjects depicts that majority of them (87.32%) were unemployed housewives. Only 54 (12.68%) study subjects were employed. Out of the employed study subjects maximum number *i.e.* 22 (40.74%) were in private job. The monthly income of the majority of employed study subjects (40.38%) was up to Rs. 5000. The monthly family income of most of the study subjects (41.31%) was Rs. 5001-10000.

Almost equal number of study subjects were living in joint family (50%) and nuclear family (48.83%) and most of the study subjects were non-vegetarian (59.62%). The place of residence of maximum number of study subjects (80%) was Delhi. 20% of study subjects were from outside Delhi region.

Frequency and percentage wise distribution of Non-modifiable risk factors (NMRF)

- i. Majority of study subjects did not suffer from: AIDS (98.83%), arthritis (96.24%), T.B. (91.78%), thyroid disorders (95.07%), and diabetes (96.48%).
- ii. They did not have family history of cancer either in parents/sibling (97.42%) or in relatives (95.77%). Among the study subjects with family history of cancer, majority of the family members/relatives suffered from different types of cancers (62.07%) followed by breast cancer (17.24%), cervical cancer (13.79%) and ovarian cancer (6.90%).
- iii. Majority of study subjects did not attain menopause after 55 years of age (98.59%), did not get married before the age of 18 years (68.31%), did not have sexual relationship

with more than one man (98.36%) neither their husbands had relationship with other women (97.18%) and never used hormonal contraceptive pills (86.85%).

- iv. Majority of the study subjects (86.38%) breast fed their children for more than three months. Maximum number of study subjects (56.57%) had 3 or more than 3 full term pregnancies.
- v. As many as 89.44% and 95.07% never had hormonal drugs/other drugs during pregnancy and never took treatment for sexually transmitted diseases respectively.

Category wise Non-modifiable risk factors scores (NMRF)

Category Wise Non-modifiable Risk Factors

Scores (NMRF) show that 97% of subjects were in the Non-modifiable risk factors scores (NMRF) category with mean score of 2.1 and standard deviation of ± 1.7 . The range of scores varied from 0-19 marks. Only 3% of study subjects were in the moderate non modifiable risk factors category. None of the study subject was under high Non-modifiable risk factors category.

This shows that majority of women do not have large number of non-modifiable risk factors which cannot be changed. This is very promising as health system and women have to focus more on modifiable risk factors which can be changed and risk of cancer can be reduced.

The non-modifiable risk factors scores of study subjects for breast and cervical cancer are summarized in Table 1.

Table 1: Category Wise Non-modifiable Risk Factors Scores (NMRF)

(N=426)

Category	Range of Scores	Frequency	Percentage	Mean score and Std. Deviation
Low NMRF	0-6	414	97	2.1
Moderate NMRF	7-13	12	3	± 1.7
High NMRF	14-19	0	0	

Association of Non-modifiable risk factor scores (NMRF) with selected sample characteristics

Pearson chi square test was performed to find association between NMRF and selected sample characteristics. Age, education, religion,

employment status, occupation, family income, own income, family type and food habits did not have significant relationship with NMRFs. Only marital status showed the significant relationship with NMRFs. The summary of findings is presented in the Table 2 given below:

Table 2: Summary of findings of Pearson chi square test for association of Non-modifiable risk factor scores with selected sample characteristics

S. no.	Variables	Value	Df	P	Association
1.	Age and Non-modifiable risk factors	2.069 ^a	3	.558	Not significant
2.	Education and Non-modifiable risk factors	5.245 ^a	6	.513	Not significant
3.	Marital status and Non-modifiable risk factors	39.591 ^a	3	.000	Significant
4.	Religion and Non-modifiable risk factors	7.520 ^a	4	.111	Not significant
5.	Employment status and Non-modifiable risk factors	2.173 ^a	1	.152	Not significant
6.	Occupation and Non-modifiable risk factors	1.775 ^a	3	.620	Not significant
7.	Family income and Non-modifiable risk factors	4.462 ^a	5	.485	Not significant
8.	wn income and Non-modifiable risk factors	1.861 ^a	5	.868	Not significant
9.	Family type and Non-modifiable risk factors	7.704 ^a	2	.021	Not significant
10.	Food habits and Non-modifiable risk factors	2.405 ^a	2	.300	Not significant

p $\leq$ 0.05

DISCUSSION

- Majority of study subjects did not suffer from AIDS (98.83%), arthritis (96.24%), T.B.

(91.78%), thyroid disorders (95.07%), and diabetes (96.48%). Kiefe C I, Funkhouser E *et al.* on chronic disease as a barrier to breast and cervical cancer screening concluded that among women who sought outpatient care,

screening rates decreased as co-morbidity increased.¹⁴

- Most of the study subjects did not have family history of cancer either in parents/sibling (97.42%) or in relatives (95.77%). Saxena S, Rekhi B *et al.* revealed positive family history of cancer, among which breast or ovarian cancer were the commonest type (72.0%). Among the various determining factors for development of breast cancer and for its early detection, family history of cancer forms one of the major risk factor.¹⁵
- Majority of study subjects did not have menopause after 55 years of age (98.59%), did not get married before the age of 18 years (68.31%), did not have sexual relationship with more than one man (98.36%) and their husbands did not have relationship with other study subjects (97.18%) and never used hormonal contraceptive pills (86.85%).
- A study by Jayaraman L K M, Khichi SK *et al.* reported that sexual debut earlier than 20 years was very commonly mentioned by nearly 67% of participants. Majority of study participants *i.e.* more than 50% had multiple sexual partners.¹⁶ Thakur A, Gupta B, Gupta A and Chauhan R. identified early marriage highly prevalent in the study subjects and found to be significantly associated with cancer cervix.¹⁷ In the present study also marital status showed the significant relationship with NMRFs.
- Another study by Sasieni P. to investigate the association between cervical carcinoma and pattern of oral contraceptive use, revealed that among current users of oral contraceptives the risk of invasive cervical cancer increased with increasing duration of use (relative risk for 5 or more years' use¹⁸ versus never use. The risk declined after use ceased, and by 10 or more years had returned to that of never users.^{19,20}
- Dieterich CM, Felice JP *et al.* write that a decrease in risk for reproductive cancers has been observed among women who have breastfed, possibly due to their reduced lifetime exposure to hormones such as estrogen.²¹ These studies are in agreement with the present study findings on NMRFs.

CONCLUSION

The findings of the study conclude that the NMRFs were relatively low in the subjects which

may be due to cultural and social influences as well as self-awareness of the study subjects. There is a need to support the pro health cultural & social norms such as being loyal to your spouse, not indulging in sexual intercourse before marriage, breastfeeding children *etc.* Also there is a strong need to adopt practices like preventing marriage before 18 years of age, judicious use of contraceptives, avoiding multiple pregnancies, taking measures to reduce chances of other diseases like diabetes, hypertension *etc.*, meditation yoga and other alternative therapies to improve hormonal balance of the body which may reduce NMRFs at personal, societal and government level.

Recommendations

More studies need to be conducted to explore various dimensions of effect of Non-modifiable risk factors for breast and cervical cancer in various geographical locations of India to facilitate the early diagnostic and curative measures for women at risk.

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