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Original Research Article

Multiple behavioral risk factors causing cancer in rural women of Mysuru

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ABSTRACT

Background: Cancer has affected humans since pre-historic times, but in recent years its occurrence has sharply increased. The common causative factors are an individual's diet, decreasing physical activity, consumption of tobacco and alcohol. Cancer deaths are increasingly popular as the world is ignorant of its harmful lifestyle habits. Interventions focusing on behavior change are key to curb diseases caused by behavioral risk factors. The aim of the study was to identify the association between multiple behavioral risk factors and cancer in rural women.
Methods: A cross-sectional study was conducted in Bharat hospital and Institute of oncology for a period of 5 months (February 2021-June 2021). A total of 380 rural women diagnosed with cancer were included in the study. A structured proforma was used to collect data about behavioral risk factors. The data was coded and entered in MS Excel and analyzed using SPSS version 25. Descriptive statistical analysis was done. Crosstables were constructed, Chi square test was done to find the association of behavioral risk factors causing cancer.
Results: Significant association was found between the frequency of dairy products intake/week, frequency of fruits intake/week, frequency of vegetable intake/week, frequency of sweets intake/week, the frequency of tea, coffee consumption/day, frequency of smoking/week, frequency of snuff, sun protection practices and various cancers.
Conclusions: Multiple behavioral risk factors like diet, physical activity, tobacco consumption, alcohol use, sun exposure, etc., are can be modified and treated. Proper education and health promotion are the keys to decrease non-communicable diseases.

Keywords: Cancer, Behavioral risk factors, Rural women

INTRODUCTION

The term 'cancer' is derived from the Greek word 'Karkinos' (for crab). It is a non-communicable disease caused by the abnormal proliferation of cells in the human body.[1,2] Cancer studies aim to develop preventive methods, diagnose, detect, and treat the disease. Understanding the disease well helps in diminishing the disastrous human and economic impact of cancer.[3]

Cancer has the highest death rate across the world, around 9.6 million deaths occurred in 2018. Commonly occurring cancers are as follows: lung cancer (2.09 million), breast cancer (2.09 million), colorectal cancer (1.8 million), prostate cancer (1.28 million), non-melanoma skin cancer (1.04 million), gastric cancer (1.3 million).[4]

Cancer occurs when normal cells transform into tumors cells, it is a multistage process where normal cells from the pre-cancerous stage transform into neoplastic cells. This change is due to the interaction of an individual's genetics and environmental agents. Cancer arises when there is an uncontrolled division of normal cells, it is a multistage process that converts normal cells to pre-cancerous cells and finally to malignant tissues. It mostly occurs due to

genetic factors but environment and lifestyle also play a major role. Adopting a healthy lifestyle/avoiding risk factors can reduce cancer incidence to a great extent. Common risk factors include smoke tobacco/smokeless tobacco, obesity, poor diet with fewer fruits and vegetable intake, alcohol, poor physical activity, infections like hepatitis, sexually transmitted infections like HPV, pollutants in the air, indoor/outdoor smoke.[4] Common causes for cancer deaths: lung (1.76 million deaths), colo-rectal (8,62,000 deaths), stomach (7,83,000 deaths), liver (7,82,000 deaths) and breast (6,27,000 deaths).[4] As per National Cancer Registry Program (NCRP), >1300 deaths daily because of cancer in India. From 2012-2014, cancer mortality increased by nearly 6%.[5]

In the year 2012, there were 478,180 deaths out of 2,934,314 cases. In 2013 there were 4,65,169 deaths out of 3,016,628 cancer cases. In 2014, 4,91,598 people died among 2,820,179 cases.[5] Projected incidence of cancer patients in India was 6,79,421. 94/1,00,000 in males and 712,758 (103/1,00,000) by 2020. It was estimated that 1in 68 males, 1 in 29 females, at least 1 out of 9 Indians will get diagnosed with cancer in their lifetime. These 5 cancers were projected to occur commonly in 36% of cancers in men (carcinoma of lungs, oral cavity, prostate, and stomach) and (carcinoma breast, cervical carcinoma, cancer of ovaries, and lung carcinoma) would constitute 53% of all cancers by 2020 and in females.[6] Tobacco is a major cause of cancer and accounts for nearly 22% of cancer deaths globally.[7]

Deaths due to cancer can be prevented by early detection through timely screening and treatment including vaccination. Cancer has a huge impact on public health in the USA. The economic burden due to lost productivity, years of life lost due to premature deaths, the long-term effects of cancer, the costs associated with illness, and its treatment on the quality of life, in cancer survivors, have a huge burden on the population level.[8] With changes in lifestyle, increased longevity, prevention, and control of infections, NCDs have become a major public health problem worldwide, especially in developing and under developed countries. After cardiovascular diseases, cancer is the next cause of mortality and morbidity. The National Centre for Disease Informatics and Research in Bengaluru, India, 1.45 million cancer cases were estimated in 2016. 4 The incidence is expected to double in the coming 20 years.[9,10]

Objective

The objective of this study was to assess the association between multiple behavioral risk factors and cancer among rural women.

METHODS

This was a cross-sectional study and it was conducted at Bharat Hospital and Institute of Oncology, Mysore. A total of 380 patients were included in the study. The study was conducted for 5 months (February to June 2021). A structured questionnaire was used to collect the data on socio-demographic characteristics like age, gender, education, occupation, family income, marital status, socio-economic status, type of cancer, staging of cancer, BMI, risk factors like diet, physical activity, smoking/tobacco consumption, alcohol consumption, and sun exposure. Data was collected by interviewing the patient and entered into Google forms.

Assuming the percentage of behavioral risk factors as high as 45% sample size calculated, with an absolute precision of 5% and confidence interval of 95% a sample size of 380 was obtained.

The data obtained was coded and entered into Microsoft excel. Descriptive statistics such as mean, frequencies, and percentages were calculated. Crosstables were constructed, Chi square test was done to determine the association of behavioral risk factors causing cancer. Data were analyzed using SPSS version 25.

Inclusion criteria and exclusion criteria

Patients diagnosed with cancer for at least 1 year and those who are on treatment for at least 6 months, patients who are conscious, mentally stable, and cooperative, female patients from rural areas, and patients who are willing to participate in the study were included. Female cancer patients from urban areas and patients who are terminally ill and uncooperative were excluded.

RESULTS

In this study out of 380 women, the mean age of the participants is 50±7.9 years. 106 (27.9%) were in the age group 41-45 years and 94 (24.7%) were in the age group 51-55 years. In this study, 279 (73.4%) belonged to class I, 94 (24.7%) belonged to class II, 1 (0.3%) belonged to class IV and 6 (1.6%) belonged to class V. Out of 380 women, 119 (31.3%) were diagnosed with breast cancer, 84 (22.1%) were diagnosed with cervical cancer, 44 (11.6%) had ovarian cancer, 41 (10.8%) had uterine cancer and 92 (24.2%) were diagnosed with other types of cancer included AML, peri-ampullary cancer, gastric cancer, lung cancer, thyroid cancer, and colorectal cancer.

In this study out of 380 women, the majority (27.9%) were in the age group 41-45 years. The mean age of the participants was 50±7.9 years, 88.2% were married, 67.9% had received a basic education, 72.6% were housewives, 73.4% belonged to class I, and 47.9% were overweight.

In the present study out of the multiple behavioral risk factors causing cancer, a significant association was found between the frequency of dairy products intake/week and cancer (p value=0.00), fruits intake/week and cancer (p value=0.01), the frequency of vegetable intake/week and cancer (p value=0.01), frequency of sweets intake/week and cancer (p value=0.0003877).

In the present study out of the multiple behavioral risk factors causing cancer, no significant association was found between the frequency of fish intake/week and cancer (p value=0.19), frequency of poultry intake/week and cancer (p value=0.17), frequency of red meat intake/week and cancer with (p value=0.14), the frequency of fried food intake/week and cancer with (p value=0.07). In the present out of the multiple behavioral risk factors causing cancer, no significant association was found between the frequency of eating outside/week and cancer (p value=0.63). In this study out of the multiple behavioral risk factors causing cancer, a significant association was found between the frequency of tea, coffee consumption/day, and cancer (p value=0.0).

In this study out of the multiple behavioral risk factors causing cancer, no significant association was found between the frequency of alcohol consumption/day and cancer (p value=0.25). In this study out of the multiple behavioral risk factors causing cancer, no significant association was found between smoking and cancer (p value=0.53). In this study out of the multiple behavioral risk factors causing cancer, a significant association was found between frequency of smoking/week and cancer (p value=0.02). In this study out of the multiple behavioral risk factors causing cancer, a significant association was found between frequency of snuff and cancer (p value=0.04). In this study out of the multiple behavioral risk factors causing cancer, a significant association was found between the frequency of sun protection practices and cancer (p value=4.75 E-06).

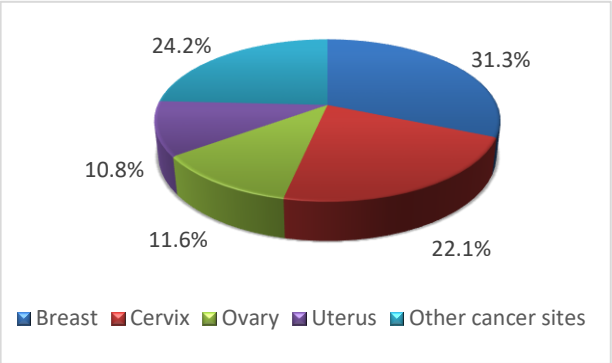

Figure 1: Distribution of study participants based on the site of cancer.

Table 1: Distribution of study participants concerning age.

Age (in years)	Number	Percentage (%)
34-40	39	10.3
41-45	106	27.9
46-50	46	12.1
51-55	94	24.7
56-60	57	15.0
61-65	22	5.8
66-70	16	4.2
Total	380	100

Table 2: Distribution of study participants based on their socio-economic status.

Income class	Number	Percentage (%)
Class I	279	73.4
Class II	94	24.7
Class IV	1	0.3
Class V	6	1.6
Total	380	100

Table 3: Association between the multiple behavioral risk factors and cancer.

Variables	Categories	Types of cancers					Chi square value	Degrees of freedom	P value
		Breast	Cervical	Ovarian	Uterine	Other			
Intake of diary products (milk, ghee, etc.)	2-3 times/week	17	4	1	4	2	45	20	0.00
	4-5 times/week	7	4	4	5	11			
	Daily	52	48	17	14	43			
	None	3	1	0	2	10			
	Once/week	21	10	12	7	17			
	Rarely	19	17	10	9	9			
Intake of fruits	2-3 times/week	1	2	1	0	2	37	20	0.01
	4-5 times/week	0	1	0	0	3			
	Daily	3	0	0	2	13			

Continued.

Variables	Categories	Types of cancers					Chi square value	Degrees of freedom	P value
		Breast	Cervical	Ovarian	Uterine	Other			
	Once/week	67	48	25	18	41			
	Rarely	48	33	18	21	33			
Intake of vegetables	2-3 times/week	26	17	10	14	27	25	12	0.01
	4-5 times/week	38	36	16	13	13			
	Daily	53	29	16	14	51			
	Once/week	2	2	2	0	1			
Intake of sweets/ desserts	2-3 times/week	3	1	0	1	8	48	20	0.00
	4-5 times/week	0	0	0	0	2			
	Daily	4	1	1	3	3			
	None	1	0	0	0	8			
	Once/week	41	30	21	10	24			
	Rarely	70	52	22	27	47			
Intake of fish	2-3 times/week	1	0	0	1	2	16	12	0.19
	None	21	12	5	13	22			
	Once/week	8	10	6	2	11			
	Rarely	89	62	33	25	57			
Intake of poultry	2-3 times/week	27	23	9	4	15	21	16	0.17
	4-5 times/week	0	0	0	0	2			
	None	23	10	6	11	20			
	Once/week	37	27	20	14	25			
	Rarely	32	24	9	12	30			
Intake of meat	2-3 times/week	1	0	1	2	3	17	12	0.14
	None	21	11	4	10	24			
	Once/week	25	19	8	4	17			
	Rarely	72	54	31	25	48			
Intake of fried food (home cooked/ outside)	2-3 times/week	8	5	2	1	9	25	16	0.07
	4-5 times/week	1	0	0	0	1			
	Daily	0	0	0	0	2			
	Once/week	80	56	39	25	51			
	Rarely	30	23	3	15	29			
Eating outside	2-3 times/week	1	0	0	0	1	10	12	0.63
	None	14	9	6	7	13			
	Once/week	9	9	8	1	9			
	Rarely	95	66	30	33	69			
Frequency of drinking tea/coffee per day?	1	47	33	22	14	24	35	12	0.00
	2	34	23	7	13	41			
	3	3	0	0	3	11			
	4 or more	1	0	0	1	0			
	None	34	28	15	10	16			
Frequency of alcohol consumption	Once/day	3	0	0	1	0	15	10	0.25
	Twice/day	0	0	0	1	0			
	None	116	84	44	39	92			
Smoking	No	119	84	44	41	91	3	4	0.53
	Yes	0	0	0	0	1			
Using snuff	No	115	83	41	38	82	10	4	0.04
	Yes	4	1	3	3	10			
Sun protection practices	No	30	14	9	12	47	30	4	0.00
	Yes	89	70	35	29	45			

DISCUSSION

An individual's lifestyle choices have a huge impact on his/her health. Risky choices can be treated/modified. Behaviors about diet, physical activity, smoking, tobacco chewing, alcohol abuse are all some of the major behavioral risk factors. In our study out of 380 women, 119 (31.3%) were diagnosed with breast cancer, 84 (22.1%) were diagnosed with cervical cancer, 44 (11.6%) had ovarian cancer, 41 (10.8%) had uterine cancer and 92

(24.2%) were diagnosed with other types of cancers. In the present study out of the multiple behavioral risk factors causing cancer, a significant association was found between the frequency of dairy products intake/week (p value=0.00), frequency of fruits intake/week (p value=0.01), frequency of vegetable intake/week (p value=0.01), frequency of sweets intake/week (p value=0.00), the frequency of tea, coffee consumption/day (p value=0.00), frequency of smoking/week (p value=0.5), frequency of snuff (p value=0.04), sun protection practices various cancers (p value=4.75 E-06). The results were at par with the following studies, A study revealed obesity, a sedentary lifestyle, alcohol abuse are associated with a greater risk of developing breast cancer. Cigar, pipe, and smokeless tobacco use also increase the risk of cancer, as does exposure to environmental tobacco smoke.[11]

A study revealed, the evidence indicates, almost 25-30% are due to tobacco, 35% are diet-related, 15% are caused by infections, the other causes are stress, etc.[12] A sedentary lifestyle has been linked to 5% of deaths from cancer.[13] In terms of cancer and chronic disease prevention, a healthy diet is rich in fruits and vegetables, is limited in red meat and animal fat, and includes a daily multivitamin with folate.[13]

In the present study out of the multiple behavioral risk factors causing cancer, no significant association was found between the frequency of fish (p value=0.19), frequency of poultry (p value=0.17), frequency of red meat intake/week (p value=0.14), frequency of fried food intake/week (p value=0.07), eating outside/week (p value=0.63), alcohol consumption/day (p value=0.2).

As the above risk factors are preventable along with dietary awareness the following measures should be considered. Public information on screening for early detection and knowledge of common signs and symptoms is crucial for better health outcomes. Education on self-breast examination should be prioritized. HPV vaccination among girls can be encouraged. Awareness of timely follow-ups is important to detect and prevent a recurrence.

Limitations

The limitations of the study were- (a) results cannot be generalized to the whole population as it is a hospital-based study; (b) study focuses only on rural women; and (c) other behavioral risk factors like sexual activity, screening, etc were not studied.

CONCLUSION

The study was conducted to find the association of behavioral risk factors causing cancer in rural women. Rural women have poor access to health care, poor health-seeking behavior, lack of awareness, and low socio-economic status making them vulnerable to various diseases. Studying the influence of such risk factors on cancer among rural women can help in prevention strategies. As per the results, there is a need for appropriate IEC materials, behavior change strategies, and periodic awareness in rural areas to promote healthy living and reduce the incidence of cancers.

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