Research Article

Assessment of risk factor, awareness, and educational intervention in various types of cancers

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Received: December 16, 2020; **Accepted:** January 08, 2021

ABSTRACT

Background: Despite promising medical advancements and treatment, cancer is still a significant threat to our society. Hence, this study is undertaken to evade severe public health issues related to cancers. **Objectives:** The aim of the study was to increase the awareness among the general population in field practice areas about risk factors of prevalent cancers and its prevention with the following objectives: (1) To determine the types of highly prevalent cancers among the patients attending Government General Hospital (GGH), Kurnool. (2) To know the public awareness about risk factors and prevention of cancers. (3) To educate the population about risk factors of prevalent cancers and their prevention. **Materials and Methods:** Study design: Information collected from January 1, 2014, to April 30, 2014, from the Department of Radiotherapy, GGH, Kurnool, to reveal the district's morbidity pattern, the predominant type of cancers, followed by a community-based cross-sectional study to assess population awareness. Permissions from Institutional Ethics Committee and Head of the Department of Radiotherapy was obtained before starting of the study. Informed consent was taken from the study participants in the community. **Statistics:** Data analyzed using Microsoft Excel 2007, presented results in the form of percentages and proportions. **Results:** The predominant types of cancers identified were cervical, breast, and lung cancers based on information collected from 81 registered cases. The community-based cross-sectional study revealed meager public awareness about cervical cancer, the importance of Pap smear testing, and self-breast examination in both rural and urban field practice areas. **Conclusions:** Educational intervention was conducted to increase public awareness about cervical cancer, the importance of Pap smear testing, and self-breast examination.

KEY WORDS: Self-breast Examination; Pap Smear Test; Rural Health Training Centre; Urban Health Training Centre; Institutional Ethics Committee

INTRODUCTION

The burden of cancer is growing globally, both in developed and developing countries, including India. Trends and pattern of cancers are rapidly changing in different geographic and population groups as a result of population aging and adoption of cancer-associated lifestyle choices such as exposure to chemicals and pesticides, ionizing radiation, infection, hormonal imbalance, decreased immunity, heredity, tobacco, alcohol consumption, "westernized" diets, and behavioral factors.

Access this article online	
Website: http://www.ijmsph.com	Quick Response code
DOI: 10.5455/ijmsph.2020.12189202008012021	

The cancer burden is estimated to have risen to 18.1 million new cases and 9.6 million deaths globally in 2018. Cancer is the second leading cause of death globally after cardiovascular disorders deaths in the world.[1] According to the WHO, globally, lung (15.5%), prostate (14.5%), colorectal cancers (11.4%), and stomach (7.8%) are the leading cancers in males, together contributed 44.4% of all cancers, whereas breast (25.4%), colorectal (9.7%), lung cancers (8.8%), and cervical cancer (6.9%) top four leading cancers in females.[2] The International Agency for Research on Cancer estimates

that one in five men and one in six women worldwide develop cancer during their lifetime. One in 8 men and one in 11 women die from the disease.[1]

The cancer burden in India has more than doubled over the past 26 years. In India, the common sites are oral cavity, lungs, stomach, colorectal, and esophagus in males. Breast, oral cavity, cervix, lung, and gastric cancers among females.[1] One woman dies of cervical cancer every 8 min in India. Rural women are at higher risk of developing cervical cancer as compared to their urban counterparts. Breast cancer accounts for about a quarter of all cancers in women in Indian cities. The average age for breast cancer in India is almost a decade lower than that in the west.[3]

The risk of dying from cancer before 75 years is 7.34% in males and 6.28% in females. The top five cancers in men and women account for 47.2% of all cancers. If detected early by screening treated adequately at an early stage, we can prevent these cancer burdens.[4]

A study conducted to know the population's awareness about cardiovascular diseases and cancer risk factors found that people were more aware of risk factors of cardiovascular diseases rather than cancers. Hence, it is crucial to create awareness for risk factors of cancers in India. Moreover, the burden of the problem mainly locates in rural India, where the gaps of knowledge are wide enough to need adequate education on risk factors and symptomatology to curb at an early stage adequately. As most risk factors are lifestyle related, proper modification of lifestyle can significantly reduce cancer incidence.

Creating awareness among populations about risk factors can significantly reduce the incidence of cancers in the coming years. Educating the people in highly prevalent areas about the risk factors of various cancers can cause awareness of early detection of pre-cancerous lesions. It can ensure proper treatment to prevent the development of cancer.[4] Thus, we aim to find out the patterns of various cancers in patients attending the Department of Radiotherapy, Government General Hospital, Kurnool, and assessment of awareness of risk factors and education intervention among women in urban and rural field practice areas of Kurnool Medical College, Kurnool by (1) understanding trends of various cancers in patients attending Government General Hospital (GGH), Kurnool. (2) To find out the type of cancers that are predominant. (3) To know the population's awareness in urban and rural field practice areas of Kurnool Medical College. (4) To educate the people in those areas about risk factors and healthy lifestyle practices.

MATERIALS AND METHODS

- For collecting information from the Department of Radiotherapy – 4 months from January 1, 2014, to April 30, 2014
- For the community-based cross-sectional study – 2 months from May 1, 2014, to June 30, 2014.

Study Design and Setting

We conducted a study to find out the predominant cancers in patients attending the Department of Radiotherapy, Government General Hospital, Kurnool, from January 1, 2014, to April 30, 2014. Later targeting those predominant cancers, a descriptive cross-sectional study was conducted in urban and rural field practice areas of Kurnool Medical College, Kurnool, from May 1, 2014, to June 30, 2014. Rural field practice areas are Munagalapadu, Mamidalapadu, and Masa Masjid. Urban field practice areas are Arora Nagar, JNR Nagar, and Sreeram Nagar.

The population is primarily served by tertiary care level hospital, Government General Hospital, Kurnool, which has facilities for the screening of breast cancer and cervical cancer in the Department of Radiology and Pathology. The Department of Radiotherapy in GGH, Kurnool, treats all the cancer patients requiring chemotherapy and radiotherapy coming from Kurnool district and other districts/states (Karnataka-Bellary and Raichur, Telangana-Gadwal, and Alampur and Mahaboobnagar) around Kurnool. It records all the details of the patients treated. Details of the patients admitted from January 1, 2014, to April 30, 2014, are collected from their records to reveal the cancers' trends and know the place distribution.

Study Population, Sampling, and Participants

Details of 81 patients were taken from the department of radiotherapy to study the pattern of cancers. Males were 22 and females were 59. As the predominant cancers were cervical and breast cancers, the target population comprised women in rural and urban field practice areas of Kurnool Medical College. Women aged 20 years or more, consenting, and participating in interviewer-administered questionnaires are eligible in the study. Participants identified by random sampling of eligible women met at an Anganwadi center in respective areas. Participants were allowed to participate in urban areas 158 until they reached a double sample size of 79 in rural areas. The period of study is 2 months, May–June 2014.

Data Collection, Variables, and Measurements

Data collection pro forma was used to collect the data in the department of radiotherapy. A standardized questionnaire was used to collect the data in the field practice areas. The questionnaire had five sections: Demographic characteristics, knowledge about the importance of Breast Self-examination (BSE), knowledge about breast cancer, cervical cancer, and the importance of Pap smear. The questionnaire was interviewer administered; consenting participants were individually asked questions on one-to-one basis. Participants

were given time to respond at their will and convenience in a private, confidential setting. The same technique was followed in both urban and rural areas. The sample size of 79 was total women gathered in the rural area. In the urban area, the sample size was 158 to compare both areas. After completing the questionnaire, an awareness session held to create awareness regarding causes, risk factors, prevention and treatment for cervical, breast cancers, and the importance of BSE and Pap smear in early diagnosis, better prognosis, and preventing the progress of these cancers. At the end of the session, women were allowed to ask their doubts and apprehensions regarding these topics.

Data collection Instruments/Data Validation

1. Data collection pro forma used for details taken from the department of radiotherapy
2. Pre-designed, semi-structured questionnaires to assess the awareness about risk factors in prevalent areas
3. Material that helps to educate people about risk factors and early detection of pre-cancerous lesions.

Data Management and Statistical Analysis

Details from the department of radiotherapy were entered into a spreadsheet and analyzed using Microsoft Excel. Details from the questionnaire were entered into a spreadsheet and analyzed using Microsoft Excel. Based on the study's purely descriptive nature, we described continuous variables such as age using means and standard deviations. The categorical variables such as the frequency of yes, number of responses were used for analysis.

Ethical Clearance

The Institutional Ethics Committee clearance was obtained from the college ethical committee, and permission to collect data for the baseline study was taken from the radiotherapy HOD. Informed consent was taken from study participants in the community.

RESULTS

Study Participants

Table 1 shows the various cancers among the 81 patients enrolled in the department of radiotherapy. Approximately half (54.33%) of cancers were of the cervix and breast. Women among those 81 patients were close to three-quarters (72.83%). Hence, study subjects were targeted as women.

Table 2 shows the characteristics of 237 women (79 rural and 158 urban) who were participated in this study. Nearly 55% of women in the rural area were aged between 20 and 30 years, and the majority (35.44%) of women in urban areas were aged between 31 and 40 years. Almost all were married (98.74% in rural and 91.14% in urban). The sample was largely illiterates, with close to two-thirds (64.55%) in urban and rural areas. Half (50.63%) of women were farmers in rural areas, slightly less than half (46.83%) were housewives. In urban areas, more than three-quarters (77.22%) were housewives. Nearly half (50.63%) of women in rural areas and two-thirds (64.55%) in urban areas were Hindus. One-third (35.44%) of women in rural areas had two children, and another third (35.44%) had three children.

Table 1: Patterns of various cancers in 81 patients enrolled in the department of radiotherapy

Type of cancer	Gender	Frequency	%
Anal canal	Male	1	1.23
	Female	0	0.00
Bladder	Male	3	3.70
	Female	0	0.00
Breast	Male	1	1.23
	Female	17	20.99
Cervix	Female	26	32.10
Cheek	Male	0	0.00
	Female	1	1.23
Colon	Male	1	1.23
	Female	2	2.47
Esophagus	Male	0	0.00
	Female	1	1.23
Larynx	Male	0	0.00
	Female	3	3.70
Lung	Male	3	3.70
	Female	5	6.17
Ovary	Female	1	1.23
Pharynx	Male	1	1.23
	Female	0	0.00
Rectum	Male	2	2.46
	Female	2	2.46
Stomach	Male	5	6.17
	Female	1	1.23
Tongue	Male	1	1.23
	Female	2	2.47
Vallecula	Male	1	1.23
	Female	0	0.00
Lymph node	Male	1	1.23
	Female	0	0.00

Participant's Knowledge, Practice, and Perceptions on Breast Self-examination

Overall awareness of BSE* is nil in the rural area, and nearly 95% of women in an urban area also unaware of BSE. None of them have heard about BSE in the rural area, and only 7.5% have heard about it in the urban area. About 5% in the urban area and none of them in the rural area knows how to

Table 2: Characteristics of 79 women in the rural areas and 158 women in urban areas who responded to survey on breast and cervical cancers in field practice areas of the Department of SPM, Kurnool Medical College

Characteristic	Level	Rural		Urban	
		Frequency	%	Frequency	%
Age (years)	20–30	43	54.43	34	21.52
	31–40	14	17.72	56	35.44
	41–50	8	10.13	32	20.25
	50 and above	14	17.72	36	22.79
Marital status					
	Married	78	98.74	144	91.14
	Single	0	0.00	2	1.26
	Divorced	1	1.26	0	0.00
	Widow	0	0.00	12	7.60
Occupation					
	Student	0	0.00	2	1.27
	Business woman	2	2.53	2	1.27
	Farmer	40	50.63	24	15.18
	House wife	37	46.84	122	77.22
	Govt. employee	0	0.00	8	5.06
Educational level					
	Illiterate	51	64.56	102	64.56
	Up to 7	16	20.25	34	21.52
	Up to 10	6	7.60	12	7.59
	Up to inter	2	2.53	0	0.00
	Degree	4	5.06	10	6.33
Religion					
	Hindu	40	50.63	100	63.29
	Muslim	8	10.13	38	24.05
	Christian	31	39.24	20	12.66
Children					
	None	7	8.86	6	3.79
	One	9	11.39	16	10.13
	Two	28	35.44	58	36.71
	Three	18	22.79	56	35.44
	Four or more than 4	17	21.52	22	13.93

perform and how frequently they should perform BSE. All rural women, 79 (100%) and most urban women 150 (95%), believed that BSE is not that important [Table 3].

Participant's Knowledge and Perceptions of Breast Cancer

Table 4 shows the participant's perceptions about the causes, risk factors, prevention, and treatment of breast cancer.

Only 15.19% of women in rural areas, nearly half (44.30%) of urban women, knew about breast cancer. Nearly 19% of urban knew about breast cancer.

Moreover, 6% of rural women knew that breast cancer was familial. The most attributable risk factors by the rural population were excessive alcoholism (3.79%) and excessive smoking (3.79%). The risk factor mostly indexed by urban women was "high animal fat diet" (13.93%). Only 2.53% of rural women and 7.59% of urban women believed that breast cancer could be prevented, and none of them felt that BSE was an early detection method for breast cancer to halt disease progression. Similarly, only 11.39% of rural and 24.05% of urban women knew that breast cancer had treatment. Only 2 women (2.53%) in rural areas opened that breast cancer treated spiritually. In the urban area, 38% opined that it could be treated medically.

Participant's knowledge and perceptions of cervical cancer.

Table 5 shows participants' perceptions about the causes, risk factors, prevention, and treatment of cervical cancer.

Table 3: Knowledge, practices, and perception regarding the importance of breast self-examination in women of field practice areas of the Department of SPM, Kurnool Medical College

Knowledge/practice	Response	Rural		Urban	
Ever heard about BSE		**Frequency**	**Percentage**	**Frequency**	**Percentage**
	Yes	0	0.00	12	7.59
	No	79	100	146	92.41
Know how to perform BSE					
	Yes	0	0.00	8	5.06
	No	79	100.00	150	94.94
Frequency of BSE					
	Monthly	0	0.00	2	1.26
	Every 6 months	0	0.00	0	0.00
	Yearly	0	0.00	6	3.80
	Never	79	100.00	150	94.94
Overall awareness of BSE*					
	Not aware	79	100.00	150	94.94
	Partially aware	0	0.00	6	3.80
	Substantially aware	0	0.00	2	1.26
Impression on importance of BSE					
	Important	0	0.00	8	5.06
	Not important	79	100.00	150	94.94

Table 4: Knowledge and perceptions about breast cancer among 158 women in urban and 79 women in rural field practice areas of Kurnool Medical College

Knowledge/perception	Rural		Urban	
	Frequency	**%**	**Frequency**	**%**
Knowledge of breast cancer's existence	12	15.19	70	44.30
Perceived causes of breast cancer				
Exposure to a wide range of cancer-causing agents	0	0.00	6	3.80
A family history of breast cancer	5	6.33	3	18.99
Exposure to X-rays before 30 years of age	0	0.00	14	8.86
Prolonged use of OCPs	0	0.00	10	6.33
Overweight	0	0.00	14	8.86
Perceived risk factors for breast cancer				
Excessive alcoholism	3	3.80	4	2.53
Excessive smoking	3	3.80	4	2.53
Sedentary lifestyle	0	0.00	16	10.13
Prolonged use of dark hair dyes	0	0.00	0	0.00
High animal fat diet	2	2.53	22	13.92
Nulliparity	0	0.00	4	2.53
Early menarche and late menopause	0	0.00	6	3.80
Perception that breast cancer can be prevented	2	2.53	12	7.59
Perceived methods of preventing breast cancer				
Dieting	1	1.26	0	0.00
Exercise	1	1.26	0	0.00
Vaccination	0	0.00	2	1.26
Breast self-examination	0	0.00	0	0.00
Perception that breast cancer can be treated	9	11.39	38	24.05
Perceived methods of treating breast cancer				
Medically	7	8.86	38	24.05
Traditionally	0	0.00	0	0.00
Spiritually	2	2.53	0	0.00
Not known	70	88.60	120	75.95

Table 5: Knowledge and perceptions about cervical cancer among 158 women in urban and 79 women in rural field practice areas of the Department of SPM, Kurnool Medical College

Having correct knowledge/perception among total	Rural		Urban	
	Frequency	%	Frequency	%
Knowledge of cervical cancer's existence	12	15.18	30	18.98
Perceived causes of cervical cancer				
Exposure to a wide range of cancer-causing agents	0	0.00	2	1.26
HPV	0	0.00	2	1.26
Prolonged use of OCPs	1	1.26	4	2.53
Perceived risk factors for cervical cancer				
Coitus before 18 years	1	1.26	4	2.53
Multiple sexual partners	2	2.53	4	2.53
Delivery of the first baby before 20 years	2	2.53	4	2.53
Multiparity with poor birth spacing between pregnancies	0	0.00	10	6.33
Poor personal hygiene	2	2.53	12	7.59
Excessive alcohol consumption	3	3.80	2	1.26
Excessive cigarette smoking	3	3.80	2	1.26
The perception of cervical cancer can be preventable	3	3.80	6	3.80
Perceived methods of preventing cervical cancer				
Dieting	1	1.26	0	0.00
Exercise	1	1.26	0	0.00
Vaccination	0	0.00	0	0.00
Regular screening by Pap smear	1	1.26	2	1.26
Know the availability of treatment for cervical cancer	4	5.06	16	10.12
Perceived methods of treating cervical cancer				
Medically	4	5.06	16	10.12
Traditionally	0	0.00	0	0.00
Spiritually	0	0.00	0	0.00

Only 15.2% of women in rural areas and nearly 19% of women in the urban area knew previously about cervical cancer existence. Only one woman in a rural area and four women in an urban area recognized "prolonged use of Oral contraceptive pills (OCPs)" as the cause. The risk factors mostly attributed to rural population were excessive alcoholism (3.79%) and excessive smoking (3.79%). The risk factor mostly indexed by urban women was "poor personal hygiene" (7.60%). Overall, only 3.79% in both rural and urban areas believed that breast cancer could be prevented. Only one woman in rural and two women in urban areas believed that screening by Pap smear is a preventive method for cervical cancer. Similarly, only 5.06% in rural and 10.12% in urban opined that cervical cancer could be treated medically.

Participant's Knowledge and Perceptions on Pap Smear

Only 1 woman (1.26%) of 79 participants in rural and 2 women (1.26%) of 158 participants in urban areas had previously heard about Pap smear [Table 6] and claimed to be tested by Pap smear once and believed that screening by Pap smear is crucial. However, none of them were aware of a vaccine for cervical cancer.

Participant's Overall Knowledge, Perceptions on Breast and Cervical Cancers, and Screening Procedures

After health education, all the women in urban and rural areas, irrespective of their education level and social background can recognize the causes, risk factors, preventive methods, and treatment options for cervical and breast cancers. They also unanimously reported the importance of Pap smear and BSE after the education session.

DISCUSSION

This study showed that very few women knew about the existence of cervical and breast cancer. Although the scenario is better for breast cancer in the urban area, there is no much difference in cervical cancer scenario between urban and rural areas. Except for a few, almost everyone had misperceptions on risk factors, prevention, and treatment for both cancers in both urban and rural areas. The condition is much worse in the case of the vaccine for cervical cancer. None of 237 women knew about it. Our findings are confined to a sample of relatively illiterate women in both areas, thus limiting their applicability to the Kurnool district. The study findings

Table 6: Knowledge, practice, and perceived importance of Pap smear among 158 women in urban and 79 women in rural field practice areas of Kurnool Medical College

Knowledge/practice	Response	Rural		Urban	
		Frequency	%	Frequency	%
Ever heard of Pap smear					
	Yes	1	1.26	2	1.27
	No	78	98.74	156	98.73
Ever tested by Pap smear					
	Yes	1	1.26	2	1.27
	No	78	98.74	156	98.73
Impression on the importance of Pap smear					
	Important	1	1.26	2	1.27
	Not important	78	98.74	156	98.73
Ever heard of a vaccine for preventing cervical cancer					
	Yes	0	0.00	0	0.00
	No	79	100	158	100

may also be limited because questionnaires are interviewer administered, causing embarrassment for women to answer; this may underestimate the results.

A study done by Takiar and Kumar[5] showed that 55.5% had a cervix, the present study noticed 32% cervical cancers among the 81 patients enrolled in the department of radiotherapy. A study done by Nagaraju *et al*. (2014)[6] who showed that breast cancer found in 21%, which is nearly similar findings (22%) reported in the present study.

Strengths

We have conducted educational intervention among general population about cancer, its risk factors, preventive strategies, and early detection of the pre-cancerous lesions.

Limitations of this Study

We have conducted educational intervention only once and could not emphasize it repeatedly.

CONCLUSIONS

Our findings indicate that breast and cervical cancer awareness is meager in urban and rural field practice areas of Kurnool Medical College, Kurnool. Considering the substantial role of breast self-examination and Pap smear combined with the high breast cancer burden, these findings suggest an urgent need for interventions to implement and reinforce existing cancer awareness and cancer screening programs. Health education campaigns will be needed to elucidate the public on the causes, risk factors, and breast cancer prevention. We recommend encouraging more women to get tested by Pap smear to prevent cervical cancer. Moreover, this topic is quite embarrassing for Indian women to discuss freely and to get motivated. Further studies need to explore what interventions could improve the uptake and practice of BSE and regular screening by Pap smear.

Moreover, an immediate post-test after the educational intervention may not reflect the effect of education in creating awareness. This might overestimate the post-intervention results on awareness. The post-test findings may also be limited by the fact that these were based on self-reports – women were not asked nor assessed on their ability to correctly perform BSE. Thus, the estimate of knowledge of how to perform a BSE may be an overestimate (performance evaluation was not done), hence not mentioning the post-test results.

Benefits

By creating awareness among the population about cancer, its risk factors, preventive strategies, and early detection of the pre-cancerous lesion will prevent new cancer cases in coming years in India. Moreover, this study helps us determine the prevalence of cancers in rural India, where data on cancers are not available. It also helps policy-makers to consider education programs about cancers in the coming years.

ACKNOWLEDGMENTS

The authors are grateful for the support given by Prof and HOD, Department of Radiotherapy, and also thankful to the study participants for their cooperation.

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How to cite this article: Sreedevi A, Kala TS, Bharadwaj PK. Assessment of risk factor, awareness, and educational intervention in various types of cancer. Int J Med Sci Public Health 2020;9(10):604-611.

Source of Support: Nil, **Conflicts of Interest:** None declared.