RESEARCH ARTICLE

Impact of Cancer Awareness Drive on Generating Understanding and Improving Screening Practices for Breast Cancer: a Study on College Teachers in India

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Abstract

Background: Breast cancer is the most common cancer among women in India and most present at advanced stage. Although early detection is the only way to reduce morbidity and mortality, people have a very low awareness about breast cancer signs and symptoms and screening practices. The purpose of this study was to assess the level of awareness and impact of awareness programs in adoption of safe practices in prevention and early detection. **Methods:** This assessment was part of a pink chain campaign on cancer awareness. During events from 2011 to 2015 at various women colleges in different parts in India, a pre-test of knowledge related to breast cancer was followed by an awareness program. Post-tests using the same questionnaire were conducted at the end of the interactive sessions, at 6 months and after 1 year. **Results:** A total of 872 out of 985 teachers participated in the study (overall response rate of 88.5 %). Mean age of the study population was 41.6 years (range 28-59 yrs). There was a significant increase in level of knowledge regarding breast cancer at 6 months and this was sustained at 1 year. Adoption of breast self-examination (BSE) was significantly more frequent in comparison to CBE and mammography. Magazines and newspapers were sources for knowledge regarding screening tests for breast cancer for more than 60% of teachers. Regarding post-awareness at 6 months and 1 year, there was a significant change in alcohol and smoking habits. Major reasons came out to be ignorance (83%) at the start of the campaign which was changed to lack of time (37.7%), lethargic attitude (32.2 %) and lack of time (31.5 %) at 6 months and same at 1 year also. **Conclusions:** With our awareness program there was a significant increase in level of knowledge regarding breast cancer at 6 months and this was sustained at 1 year. Adoption of BSE was significantly greater in comparison to CBE, mammography. To inculcate safe lifestyle practices in people, awareness programmes such as pink chain campaigns should be conducted more widely and frequently.

Keywords: Breast cancer - awareness campaign - college teachers - safe practices

Introduction

According to World Cancer Report, there is a high incidence rate of cancer throughout the world and it may reach about 20 million by 2030 (WHO, 2008). In India, around 0.95 million new cancer cases are detected every year with 0.63 million deaths. Breast cancer is the most common cancer in women and the second leading cause of death among women (Chong et al., 2002; Harris et al., 2003; Okobia et al., 2006; Taleghani et al., 2006). Although the incidence of breast cancer in developing countries is relatively low (Ko et al., 2003), about 50% of all cases of breast cancer are diagnosed in developed countries (Sadler et al., 2001; Haji-Mahmoodi et al., 2008,

Ahmed et al., 2006). Based on a study during 1975-1990, Asia and Africa have experienced a more rapid rise in the annual incidence rate of breast cancer than that of North America and Europe (Shirazi et al., 2006; Koca et al., 2013).

Breast cancer is the most common type of cancer among women with the highest fatality rates (Kratzke et al, 2013; Oztunc et al., 2013). Considering that breast cancer is the most common type of cancer among women with an increasing incidence, there is a need to develop community-based, well-organized screening programs for breast cancer instead of coincidental screening of women (Aikgoz et al., 2011) because early diagnosis is the most effective way to reduce morbidity and mortality of

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breast cancer (Kanaga, 2011). India with its multilingual and multiethnic society has reported breast cancer as the commonest cancer in urban Indian females, and the second commonest in the rural Indian women. As per the ICMRPBCR data, breast cancer is the commonest cancer among women in urban registries of Delhi, Mumbai, Ahmadabad, Kolkata, and Trivandrum where it constitutes >30% of all cancers in female (National Cancer Registry Program 2001, Shankar et al., 2017).

As recommended by "World Cancer Research Fund/American Institute for Cancer Research" (Wiseman et al., 2008), regular consumption of vegetables, daily physical activity, limited intake of red meat and alcoholic beverages, decrease the risk of cancer development. Therefore, the cancer prevention is possible by behavioral change. This justifies the implementation of preventive actions (Inoue et al., 2006; Breslow et al., 1997; Pohls et al., 2004; McMenamin et al., 2005; Sakurai 2003; Sanderson et al., 2009). However, to ensure the effectiveness of such initiatives; the first step consists in understanding the concerns and beliefs of the target population. Indeed, awareness campaigns are crucial in cancer prevention programs. Moreover, knowledge of cancer risk factors is a determinant element in the process of behavioral change (Wiseman et al., 2008; Doll and Peto, 1981).

Mammography is the only breast screening procedure for which empirical evidence exists to have significantly reduced breast carcinoma mortality by about 63% (Tabar et al., 2001). However there are still challenges concerning its use such as costs, false positivity, and pain during the procedure and risk of radiation exposure. Evidence supporting the usefulness of mammographic screening is strongest for women between 50 and 69 years of age and it has been recommended that screening should be routinely recommended for women in this age group (Fletcher and Elmore, 2003). With rapid industrialization and effective control of communicable diseases, better diagnostic and treatment facilities, cancer is emerging as a major health problem and most of the cases are presenting very late to the hospital (Rebentisch et al., 1995). Chakraborty et al., in 2015, shows that early menarche plays an important role to develop breast cancer in India women. A study shows the correlation between that smoking and breast cancer (Malik et al., 2015). Knowledge of breast self examination and risk factors for breast cancer is essential to reduce the risk. In India, late presentation is attributed to many factors and important being the lack of knowledge and awareness, lethargic attitude towards safe practices. Decision to participate in such cancer screening programs depends upon the knowledge, beliefs and attitudes about the disease and the screening tests. Unfortunately, in a developing country like India there is a lack of awareness among people about the various risk factors and preventive aspects of these common cancers, like early detection through screening and treatment of precancerous lesions.

However, several studies have shown that the knowledge of breast cancer and practices regarding for early detection are at a low level among women. Since early detection is the only way to reduce morbidity and mortality from breast cancer, there is limited data on breast cancer knowledge, safe practices and attitudes of teachers

in India. The purpose of this study is to know the level of awareness of breast cancer risk factors and safe practices among college teachers of different states of India and impact on awareness program on changing in adoption of safe practices in prevention and early detection.

Materials and Methods

This assessment was part of Pink Chain Campaign-a campaign on cancer awareness. During the cancer awareness events in 2011–2015 at women colleges in different states, i.e. Delhi, Mumbai and Jaipur in India, pre-test related to knowledge, attitude and practice related to lung cancer was conducted before the start of the event through questionnaire. Questionnaire was formulated based on our observation in knowledge, attitude and practice which was validated in our pilot study of 186 college teachers in various states of India.

Official permission was taken to conduct pre-test and post-test and to use database at 6 months and 1 year from college authority before the awareness campaign. All the teachers were explained about questions related to this study, and after that, pre-test and post-test questionnaires were given to teachers who voluntarily wanted to take part in this. College teachers who were included in this study were teaching arts, science and commerce to graduate students in Delhi, Mumbai and Jaipur in India. Pre-test was followed by awareness programme consisting of lectures by oncologists working at medical institutions on preventive aspects of lung cancer with special note of tobacco and smoking and an interactive session. Post-test using the same questionnaire was conducted at the end of interactive session. For all the teachers who participated in the awareness programme, personal details were collected.

Pink Chain Campaign is a nationwide campaign which started with awareness on breast cancer. Over the period of time, Pink Chain Campaign also started making people aware about other common cancers, i.e. cervical cancer, lung cancer and head and neck cancer from the same platform. Literatures related to cancer awareness were sent regularly for 1 year to email IDs provided. After 6 months and 1 year, the same questionnaires were mailed to the participants on their email IDs provided at the time of programme to see the changes in practice. The changes from pre-test to post-test were analyzed using McNemar test. All the p values less than 0.05 were taken as significant. All statistical analyses were performed using Stata 12.1.

Results

A total of 872 out of 985 teachers participated in the study (overall response rate was 88.5%). One hundred thirteen teacher assessment forms were either not filled or incomplete. In the information provided, emails IDs of 787 teachers were available. The same questionnaires were responded by 612 and 504 teachers at the end of 6 months and 1 year, respectively. The demographic details of the studied population were described in Table 1. The mean age of the study population was 41.6 years (range 26– 59 years). Six hundred ninety-six teachers (80%)

Table 1. Demographic Details of the Studied Population

Socio-demographic variable	Frequency	Percentage
Age		
21–30	59	6.77
31–40	298	34.2
41–50	398	45.6
51-60	117	13.4
Marital status		
Married	773	85.9
Unmarried	72	8.97
Widow	27	5.12
Residence		
Urban	711	81.6
Rural	161	18.4
Addictions		
Smoking	117	13.4
Alcohol	241	27.6

were in age group 31–50 years. Most of the teachers (81.6 %) were from urban background. Among the teachers who were just asked yes or no question, 117 teachers (13.4 %) were smokers and 241 teachers (27.6%) were alcoholics. No teachers in this study started smoking and taking alcohol over 1 year who were non-smokers and non-alcoholic at the start of the study. In people who were smoking (13.4 %) and taking alcohol (27.6 %) before this campaign, change in smoking and alcoholism was noted at 6 months and 1 year. Decrease in frequency was seen in 11 % for smoking and 16%for alcohol at 1 year. Approximately 21% and 43% teachers quit smoking and alcohol respectively, at the end of 1 year.

Knowledge regarding various aspects of breast cancer in depicted in Table 2. Risk factors and symptoms of breast cancer were well known in approximately 50% of teachers, except for early menarche (13.4%), late menopause (13.9%) and radiation treatment (10.2%), oral contraceptives (12.7%), and No breast feeding (6.42%). As for screening methods, BSE, CBE, and Mammography were known modalities for breast cancer in 78.6%, 47.8% and 67.5% of teachers respectively. Knowledge and practice regarding Breast Self-Examination (BSE), Clinical Breast Examination (CBE) and Mammography were describe in Table 3. Knowledge about breast self-examination (BSE) was significantly increased at 6 months and sustained at 1 year. Among teachers with knowledge, practice of BSE was increased from 16.3 % to 59.2% at 6 months and 64.7 % at 1 year. Knowledge of clinical breast examination (CBE) was gradually increased from 18.2 % to 29.1 % at 6 months and to 36.1 % at 1 year. Practices were not changed among teachers with knowledge of CBE. Practice of mammography increased from 19.9%

Table 2. Knowledge Regarding Various Aspects of Carcinoma Breast

Knowledge about carcinoma breast	Frequency(%)- Pre test (n=872)	Frequency(%)- Post test (n=872)	Frequency(%)- at six months (n=612)	Frequency(%)- at one year (n=504)	* p-value
Symptoms					
Lump, hard knot or thickening	789 (90.5)	872 (100.0)	612 (100.0)	504 (100.0)	<0.001
Redness, warmth or darkening	442 (50.7)	867 (99.4)	609 (99.5)	504 (100.0)	<0.001
Change in the size or shape of nipple or breast	487 (55.8)	866 (99.3)	607 (99.2)	504 (100.0)	<0.001
Dimpling or puckering of the skin or nipple	407 (46.7)	851 (97.6)	607 (99.2)	504 (100.0)	<0.001
Nipple discharge that starts suddenly	405 (46.4)	851 (97.6)	608 (99.3)	504 (100.0)	<0.001
Risk factors					
Advancing age	385 (44.1)	850 (97.5)	609 (99.5)	504 (100.0)	<0.001
Genetic factors	312 (35.8)	872 (100.0)	605 (98.7)	502 (99.6)	<0.001
Family history of breast cancer	517 (59.3)	872 (100.0)	612 (100.0)	504 (100.0)	<0.001
Radiation treatment	89 (10.2)	851 (97.6)	612(100.0)	503 (99.8)	<0.001
Early menarche (<12 yr)	117 (13.4)	850 (97.5)	609 (99.5)	503 (99.8)	<0.001
Late menopause (>50yr)	121 (13.9)	851 (97.6)	608 (99.3)	502 (99.6)	<0.001
Nulliparous(No child)	151 (17.3)	848 (97.2)	608 (99.3)	501 (99.4)	<0.001
First childbirth at >30 yrs	132 (15.1)	856 (98.2)	608 (99.3)	503 (99.8)	<0.001
Oral contraceptives	111 (12.7)	841 (96.4)	609 (99.5)	502 (99.6)	<0.001
No breast feeding	56 (6.42)	843 (96.7)	609 (99.5)	502 (99.6)	<0.001
Obesity	517 (59.3)	872 (100.0)	612 (100.0)	504 (100.0)	<0.001
Smoking	589	872 (100.0)	612 (100.0)	504 (100.0)	<0.001
Preventive measures					
BSE	685 (78.6)	872 (100.0)	612 (100.0)	504 (100.0)	<0.001
CBE	417 (47.8)	872 (100.0)	612 (100.0)	504 (100.0)	<0.001
Mammography	589 (67.5)	872 (100.0)	612 (100.0)	504 (100.0)	<0.001

*McNemar test

Table 3. Knowledge and Practice Regarding Breast Self-Examination (BSE), Clinical Breast Examination (CBE) and Mammography

		Pre-test		At 6 month		At 1 year		p-value
		Yes	No	Yes	No	Yes	No	
Practice BSE		Knowledge about BSE as screening test for carcinoma breast						
	Present	112 (16.3)	573 (83.6)	362 (59.2)	250 (40.8)	326 (64.7)	178 (35.3)	<0.05
	Absent	0 (0.0)	187 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Underwent CBE		Knowledge about CBE as screening test for carcinoma breast						
	Present	76 (18.2)	341 (81.8)	178 (29.1)	434 (70.9)	182 (36.1)	322 (63.9)	<0.05
	Absent	0 (0.0)	455 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Underwent mammography		Knowledge about mammography as screening test for carcinoma breast						
	Present	117 (19.9)	472 (80.1)	292 (47.7)	320 (52.3)	282 (55.9)	222 (44.1)	<0.05
	Absent	0 (0.0)	283 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	

Table 4. Reasons for not Undergoing Screening Tests

Reasons	Day of campaign (n=872)	at 6 months (n=612)	at 12 months (n=504)
Cost	61 (7.00)	52 (8.50)	49 (9.72)
Lack of Time	95 (10.9)	231 (37.7)	208 (41.3)
Lethargic attitude	256 (29.4)	197 (32.2)	179 (35.5)
Fear	78 (8.94)	73 (11.9)	65 (12.9)
Hesitation	107 (12.3)	193 (31.5)	168 (33.3)
Ignorance	728 (83.5)	123 (20.1)	109 (21.6)
Any others	63 (7.22)	43 (7.03)	41 (8.13)

to 47.7% in teachers with knowledge of mammography at 6 months but 55.9 at 1 year.

Magazines and newspapers were source for knowledge regarding screening test for breast cancer in more than 60% of teachers. Post awareness at 6 months and 1 year, there was a significant change in alcohol and smoking habits. Various reasons for not undergoing screening tests is depicted in Table 4. Major reasons came out to be ignorance (83%) at the start of the campaign which was changed to lack of time (37.7%), lethargic attitude (32.2 %) and lack of time (31.5 %) at 6 months and same at 1 year also.

Discussion

Malignant neoplasms remain a leading cause of death worldwide. At the beginning of this century, comprehensive treatment for malignant neoplasm had progressed considerably with advances in molecular targeted therapy, immunotherapy and gene therapy. In spite of all this progress, cancer related mortality is very high as most of the patients present at advanced stage to hospital (Shankar et al., 2015). Total 872 out of 985 women between 28-59 years of were included in the study. 113 teachers assessment form was not suitable for analysis. At the end of 6 months and one year, 612 and 504 teachers participated in study. The risk factors and symptoms of breast cancer was generally not well known in beginning. There was gradual increase in knowledge and practice of breast cancer at 6 months and was sustained at one year.

Important risk factors for breast cancer include gender, age, family and genetic factors, a history of breast cancer, race, exposure to radiation, younger age at menarche (12 years of age) and age at menopause (Older than 55 years of age). Additional risk factors related to development of breast cancer include nulliparity or pregnancy after the age of 30, ovarian activity, use of oral contraceptives, receiving hormone replacement therapy after menopause, lactation, alcohol consumption, obesity and high-fat diets and physical activity (Amosu et al., 2014, Kanbur et al., 2011, Koca et al., 2013).

In this study, awareness was breast cancer risk factors were found in less than 20% for most of the risk factors except genetic factors (35.8%) and advancing age (44.1%). Family history of breast cancer, Obesity and smoking as a risk factor for breast cancer was known to more than 50% of the participants. In a similar kind of study by Shankar et al., in (2015) conducted among teachers in India found that risk factors and symptoms of breast cancer were well known in more than 50% of teachers, except for early menarche (16.66%), late menopause (17.9%) and radiation treatment (14.1%).

Most known symptom was lump in breast. BSE awareness was very good (70%) however teachers were not well aware about CBE (45%) and mammography (54%). Nearly half of women failed to opine for availing the early diagnostic services may be because of lack of awareness. Awareness about risk factors for cancer breast was very low (30%), which may be hurdle for prevention. Similar findings were noted by other studies (Akhigbe et al., 2009). Among the screening modalities for breast cancer, BSE was practiced by only 11% of teachers. Similar finding was shown in a study by Parsa et al where only 19% of the women performed BSE on a regular basis (Parsa et al., 2011). In a study by Dandash and Al-Mohaimeed in 2007, 43.4% of the female teachers were found to have never performed BSE and Montazeri et al.,'s study (2008) found that 63.0% of the women never performed a BSE in their lifetime.

Mammography was exercised by 14% and 17% of teachers respectively. In a study by AbdelHadi in 2006 on school teachers in Saudi Arabia in 2006 in which only 14% were practicing mammography. It is important to improve awareness about breast cancer and screening methods for promoting early screening. Policymakers need to

make key decisions which among three methods (breast self-examination (BSE), clinical breast examination and mammography) can best be used as a screening tool and how to successfully implement population wide screening program to prevent mortality and morbidity from breast cancer in India (Bodapati and Babu 2013). Source of knowledge of screening modalities for breast cancer was magazines, newspapers, internet in majority of cases but doctors were important source for mammography. In a Jordanian study, out of the 435 respondents who were aware of breast cancer, 51.8% obtained their information on breast cancer from friends and health workers (Suleiman, 2014).

According to women, main barrier for using early diagnostic services for breast cancer was lack of awareness about symptoms and availability of tests, and therefore, the possibility of early diagnosis. Similar findings were mentioned by other studies (Saha et al., 2010). Poor awareness lowers the possibility of early diagnosis in spite of availability of screening test. Nearly half of the women have shown attitude or willingness for using the early detection method if they are available. Hence, lack of awareness was the main hindrance for early detection.

It suggests that awareness through mass media may not be sufficient in changing attitude or practice. Other barriers were lethargic attitude (44.87%), economic barrier (time and money), availability, fear and hesitation. Nessa et al., in (2013) showed that more emphasis must be given to use of print and audiovisual media in breast cancer prevention . Tan et al., in 2010 showed that mass media and education were the most common sources of information of cervical cancer.

Though several studies (Shankar et al., 2016; Shankar et al., 2015; Shankar et al., 2016; Shankar et al., 2015) shown many diagnostic and treatment option are available in developing countries like India, but breast cancer education continues to pose a challenge to the health care system in developing countries and countries with limited resources. Community-based cancer education requires intervention at many levels that address the fundamental causative contributing issues to the myriad of health disparities (Hurd et al., 2003).

In conclusion, the risk factors and symptoms of breast cancer were generally well known. Level of knowledge of breast cancer risk factors, symptoms and screening methods was high but screening practice has not been improved. There was a significant increase in level of knowledge regarding risk factors, symptoms and screening test for breast cancer at 6 months and this was sustained at 1 year. There was a significant increase in adoption of BSE whereas practice of CBE and mammography were increased significantly but less in comparison to BSE.

To inculcate safe practices in life style of people, awareness programmes such as pink chain campaign should be conducted more widely and frequently and knowledge attained through them should be reinforced by treating physicians who are at first point of contact with health system. So creating awareness among health care providers is another issue which has to be looked into. It is important to create awareness among community through educational programs on cancer prevention, preventable cancer risk factors, benefits of early diagnosis, and availability of screening facilities.

Conflict of Interest

Authors have no conflicts of interest.

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