

Evaluation of an Interventional Health Education Project: Screening of Breast Cancer and Health Education (SHE)

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Abstract

There is an increasing incidence of breast cancer in India, especially among younger women. The study's main objective was to create awareness related to breast cancer and breast self-examination by community health workers and assess the effectiveness of improving knowledge and practice. Secondary objective was to conduct clinical breast examination (CBE) of women and prompt referral. **Methods:** An outcome evaluation of the Educational Interventional project was conducted in a hilly district of Uttarakhand. Twenty Accredited Social Health Activists (ASHA) were identified and trained in breast cancer awareness, the procedure of breast self-examination, and screening methods. These ASHA's further created awareness among study participants (women above 30 years). A structured questionnaire on knowledge and practice was administered before and after educational intervention by ASHA workers. Clinical Breast Examination (CBE) camps were held for women at high risk for breast cancer who were referred to the Division of Breast Surgery, AIIMS Rishikesh, for further management. **Results:** One thousand sixty-one females participated in health education sessions by ASHAs. There was an improvement in knowledge and practice regarding Breast Self-examination after health education intervention. A low prevalence of risk factors for breast cancer was found among attendees of the CBE camp. 3.2% of participants had abnormalities on breast examination needing further workup. **Conclusion:** In the pre-test assessment, we found a low awareness and practice regarding breast cancer which increased significantly among women after behavioral change intervention. The prevalence of risk factors for breast cancer was very low. Trained community health workers were found to be effective in raising awareness, selective screening, and prompt referral.

Keywords: Breast cancer-community health workers- India- Breast self-examination- Behavioral change intervention

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Introduction

Breast cancer (BC) is the most common cancer diagnosed in women, with nearly 2.1 million new breast cancer each year accounting for 11.6% globally (IARC, 2018). In 2018, it is estimated that approximately 15% of all cancer deaths among women were due to breast cancer (IARC, 2018). As per the National Cancer Registry Programme in India, breast cancer is the most common cancer among women and the second most common (after cervical cancer) in rural areas. One in 29 females will develop breast cancer over their lifetime (Mathur et al., 2020). Majority of patients with breast cancer (57%) are diagnosed at an advanced stage. Another troubling concern about the present scenario of breast cancer in India is the peak of the incidence rates at a younger age, between 40-50 years compared to Western countries, the reason for which is unknown (Malvia et al., 2017). Presently, 4% are in 20 to 30 years age group, 16% are

in 30 to 40, and 28% are in 40 to 50 years age group. So, almost 48% of patients are below 50 (Takir et al., 2010). Breast cancer at a younger age is more aggressive. Young females have denser breasts, making them less amenable to routine screening procedures, later presenting with a palpable mass and nodal involvement (Thangjam et al., 2014; Das et al., 2015; Malvia et al., 2017). According to Global Surveillance of trends in cancer survival, the trends based on registries from 2000 to 2014 from 71 countries estimated the lowest 5-year survival ratio of 66.1% in India (Allemani et al., 2018).

Nulliparity, age at first full-term pregnancy, central obesity, history of a benign breast lesion, high-fat diet, and consumption of oils with more saturated fats have been reported as the risk factors based on case-control studies from India (Balasubramaniam et al., 2013; Nagrani et al., 2016). Breast cancer, like other forms of cancer, can result from multiple environmental and hereditary risk factors. Benign breast diseases are at least ten times more common

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than breast carcinoma, and hence their recognition, management, and delineation from malignancy are as important as their malignant counterpart.

A survey done in Uttarakhand found that breast cancer is the most prevalent cancer found in females (22.29%), followed by cervical cancer (14.86%) and ovarian cancers (13.51%) (Bag et al., 2012). Not much data is available about cancer trends and risk factors in cancer patterns in Uttarakhand, India. The primary issue is the under-diagnosis of breast cancer in rural areas, which is accountable to lack of health care facilities, lack of transportation, long-distance to tertiary health care, poor income combined with lack of awareness of symptoms among women, and social stigma.

Therefore, the need of the hour is “Behavioral change communication for early detection and screening of breast cancer”, beginning from 30 years of age so that we can detect breast cancer early and treat it, thereby giving the patient a chance for longer life. Low-cost screening strategies in low-middle-income countries include clinical breast examination (CBE) and Breast Self-Examination (BSE) utilizing community health workers (Bashar and Aggarwal, 2020; O’Donovan et al., 2020).

The objective of this study was to assess the improvement in knowledge and practices regarding self-breast examination after educational intervention. Secondary objective was to determine the risk factors for breast cancer among participants attending a clinical breast examination camp, find the proportions of participants having abnormal findings during CBE, and document the Bi-rads score of all referrals.

Materials and Methods

This reporting follows the WIDER recommendations for reporting Behavioral change intervention (Albercht et al., 2013).

An outcome evaluation of the Educational Interventional project (SHE) was carried out in Tehri Garhwal, a hilly district of Uttarakhand, from Nov 2019–to Dec 2020. Due to difficult terrain and sparsely populated area, many communities cannot access health facilities, especially women. One such Primary Health Centre in Fakot was chosen with ten sub-centres purposively. After receiving permission from the State health authority, health personnel recruitment and training was conducted. Two female doctors residing in the nearby area were selected and trained in clinical Breast examination at All India Institute of Medical Sciences Rishikesh by a Surgeon. Twenty Accredited Social Health Activists (ASHA), the community health workers, were identified and trained in the basics of breast awareness, the procedure of breast self-examination, and screening methods. They were also oriented to questionnaires to be filled by participants.

Details of intervention:

Health Education camps

All ASHAs (Accredited Social Health Activists) enrolled in the project identified all the women above 30 years in their respective areas. ASHAs interviewed participants to fill out the Pre-test questionnaire before

the education session. The questionnaire consisted of ten open and closed-ended questions. They arranged the meeting to educate for early signs of cancer, risk factors of cancer, the importance of BSE (Breast Self-Examination), the method of doing it, and the way to lead a healthy life. Education was done in the local language (Hindi) for 30–40 minutes with the help of a flex chart in a group of 10–20 participants. This was followed by a doubt clearing session for various myths and facts. Participants were given a hands-on BSE on a cloth breast model. Participants also shared their stories of known ones who suffered from breast cancer. A placard (4 by 6 inches) mentioning the self-breast examination steps was handed over to each participant. (Supplementary file 1) Behaviour change intervention was provided throughout the project, as mentioned in Table 1.

Between the follow-ups, ASHAs circulated educational videos on the importance of SBE and motivational videos of breast cancer survivors on WhatsApp groups. They also emphasized importance of CBE during any interaction with participants. ASHAs were also supposed to practice SBE and become role models for the community.

Follow-up

After three months of health education sessions, ASHA revisited the households and interviewed the participants using the post-test questionnaire.

ASHAs also motivated participants to remove their hesitation and come forward for a Clinical Breast examination camp within their community.

Clinical Breast examination camps

Two medical doctors were trained for three days in clinical breast examination in the Department of Breast Surgery. Doctors took clinical history in clinical breast examination camps and examined the participants. Each camp was held for 3 hours, and 30–35 women were examined. Women at high risk for breast cancer or abnormalities found during CBE were referred to the Integrated Breast cancer clinic, AIIMS Rishikesh, for a diagnostic mammogram. If found to be positive, then further diagnosis and management were done by the Division of Breast Surgery. Concerned ASHA supported participants in the hospital.

Statistical analysis

Data management and analysis were done using MS Excel (2016). Descriptive statistical analysis was reported as mean, standard deviation (SD), and proportions. Chi-square was used to analyze the significant difference before and after the study. A p-value less than 0.05 was considered significant.

Ethical Consideration

This study was approved by the Institutional Ethics committee AIIMS Rishikesh. All participants voluntarily gave written informed consent before enrollment in the study.

Results

One thousand sixty-one participated in health education sessions by ASHA. The mean age of study participants was 36.9 (10) yrs. 97 % of participants were married, 88.8 % were housewives, and 44% had primary school education (Table 2). Table 3 shows a significant difference in knowledge and practice regarding BSE before and three months after health education intervention. Sixty-eight participants (6.4%) either did not respond or were not available during post-test visits. 81.7 % could recall at least two points on the importance of BSE. 93.3 % knew that BSE was to be done by self, and 84% could remember the steps for BSE. 61% could recollect the correct age of starting BSE, and 60% remember it to be done a week later after menstruation. 89% practised BSE in the recent three months, of which 4.4 % did monthly, and 58% did once.

Table 4 shows the distribution of risk factors for breast cancer among those attending the CBE camp. 55.7% (n=591) out of 1,061 participants attended the camps. The mean age of participants was 38.3 ± 11.6 yrs. Thirteen per cent of participants were above 55 years, 12 were nulliparous after 30 years, and 23.6% were obese or overweight. Five participants had early menarche,

and 14 (2.3 %) had late menopause. Eight (1.35 %) had taken hormonal pills for more than five years. None had a history of radiation therapy, breast cancer, or a first-degree relative with a BC.

Abnormalities on breast examination needing further workup were found in 19 women (3.2 %) and referred to the hospital. Of these, a lump was palpable in 16 (2.7 %), nipple discharge was found in 5 (0.85%), and a change in breast shape was noticed in two (0.34%) participants. Only 17 returned to the hospital for workups. Out of these 17 participants, 5 (29%) had a Breast Imaging-Reporting and Data System (Bi-rads) score of 3, 4 (23%) had a Bi-rads score of 2, 3 had a Bi-rads score of 1, and 4 each followed by 2 (12%) had Bi-rads score of 5. One was found to have malignancy stage 1 on FNAC.

Discussion

Out of 1,061 women, only 121 (11.4%) women had heard about the BSE, and 44 (4.15%) knew about the importance of BSE. The prevalence of various risk factors for breast cancer was less than 5 %, except for overweight and obesity. Three percent of participants of CBE camps had positive findings on examination and were referred. Five participants had Bi-rad scores of 4 and 5 needing a

Table 1. Behavioral Changed Interventions

Intervention	Definition	Activity under project
Education	Increasing knowledge or understanding	Group education for women participants with flex chart followed by doubt clearing session for myths
Persuasion	Using communication to induce positive or negative feelings or stimulate action	Sharing stories, WhatsApp Videos and Regular sensitizing participants by message or informal talks. Placard for self breast examination steps ASHA to practice BSE and be a role model
Incentivization	Creating an expectation of reward	ASHA was incentivized for educating the community
Training	Imparting skills	Participants were given a hand-on BSE on cloth breast model Image based Flex chart
Enablement	Increasing means/reducing barriers to increase capability or opportunity	Clinical breast examination camp in community Referral , Support and follow-ups if needed

Adapted from - Michie S, van Stralen MM, West R (13)

Table 2. Demographic Characteristics of Participants

Demographic characteristics	No. of Participants (n=1061)	Percentages	
Mean age Mean (SD)	36.9 (10) yrs		
Marital Status	Married	1032	97.27
	Widow	19	1.79
	Separated	7	0.66
	Single	3	0.28
Occupation	Housewife	943	88.88
	Self-help group	64	6.03
	Daily wage laborer	36	3.39
	Govt./Private jobs	18	1.7
Education	No formal education	201	18.94
	Primary school	468	44.11
	Middle school	326	30.73
	Higher secondary and above	66	6.22

Table 3. Knowledge and Practice Regarding Self-Breast Examination before and after Intervention

Knowledge and practice	Correct response	Before intervention (n=1061)	After intervention (n=993)	P value
Heard about CBE	Yes	121 (11.4 %)	993 (100%)	<0.0001
Importance of CBE (any 2)	a) To be familiar with the breast texture	44 (4.15%)	812 (81.7%)	<0.0001
	b) Early detection of breast cancer			
	c) Detection of any abnormal changes in the breast			
Correct age of starting CBE	After menarche	0	608 (61.2 %)	Not estimated
Frequency of doing CBE	Monthly once	6 (0.57%)	706 (71.1%)	<0.0001
Best time to do CBE	Week after menstruation or on fixed day post-menopausal	0	603 (60.7%)	Not estimated
CBE should be done by	Self	14 (1.32%)	926 (93.25 %)	<0.0001
Steps of doing CBE	Inspect , palpate with finger pad in circular motion, press nipple for discharge (if any)	5 (0.47%)	842 (84.8%)	<0.0001
Action if any abnormality is noted	Consult Doctor	817 (77%)	842 (84.8 %)	<0.0001
Had you practice CBE ever		24 (2.26%)	884 (89 %)	<0.0001
How often CBE done in last 3 months	Once	0	576 (58 %)	Not estimated
	Twice	0	264 (26.6 %)	Not estimated
	Once in Every month	0	44 (4.4%)	Not estimated

further biopsy. Behavioural change upon communication interventions in a large cohort was the main strength of this project. According to Hermann Ebbinghaus, we forget more than half of the information within one hour and more if not reviewed periodically (Wittman, 2021). Therefore, the Posttest knowledge questionnaire was given three months after the education session to evaluate the assimilation and knowledge retention over the long period.

Only 11.4% of study participants had heard of BSE, while a negligible proportion had some knowledge of BSE, and only 2% of them had ever done BSE. This is in line with Somadatta (Somdatta and Baridalyne, 2008) and Roa (Siddharth et al., 2016) conducted in urban resettlement colonies in Delhi and outpatient departments in rural areas, respectively. Poor knowledge regarding BSE was also seen in educated women. (Kalliguddi et al., 2019; Doshi et al., 2012). In contrast, Sachdeva et al., 2021 indicated a good knowledge score [22 on a total of 30] but poor attitude [36 on a total of 52] and practice [13 on a total of 28] score. This study was a Google survey; 63% and 32% were postgraduate and graduate, explaining high knowledge scores. A scoping review among the women of the Sub-Saharan region showed a comparatively higher

proportion of knowledgeable participants regarding BSE i.e. at least 40% in 20 included studies and practising BSE compared to Indians (Udoh et al., 2020). Also, much better knowledge was observed in research conducted in Iran (79.8%) (Reisi et al., 2013), Turkey (Hacihanoglu and Gozum, 2008; Korkut, 2019), and Vietnam (Tuyen, 2019; Toan, 2019). This shows the urgent need for a health education campaign for BSE in India.

We found significant improvement in knowledge and practice three months later after the educational intervention. A significant number of women remember the steps of doing BSE 3 months after the intervention. This was consistent with a study conducted among rural women of Tamil Nādu, India, which reported a 71.8% increase in knowledge regarding breast health and breast examination practice from 7.14% to 64.7% (Nisha and Murali, 2020). Many other studies in the past have also reported the effectiveness of training (Hacihanoglu and Gozum, 2008; Toan, 2019; Gupta et al., 2020). The current project was grounded on a behavioural change model with an adult learning approach and providing clinical breast examination services in the community. Only 4.4 % of participants did BSE monthly, and the majority (58%) did it once in the last three months. Half

Table 4. Distribution of Risk Factor among the Participants Attending the Clinical Breast Examination Camp

Risk Factor	Categories	No. of participants (n=591)	Percentage
Age	55 -64 yrs.	57	9.64%
	>65 years	21	3.55%
Age of first child./ Nulliparous > 30 years		12	2.03%
BMI	Overweight	101	17.09%
	Obesity	39	6.60%
Early menarche (< 12 years)		5	0.85%
Late menopause (>55 years)		14	2.37%
Exposure to hormonal pills	<2 years	63	10.70%
	2-5 years	12	2%
	>5 years	8	1.35%

of the participants attended clinical breast examination camps. We, therefore, assume that participants had moved from the pre-contemplation stage to varying stages of Behavioral change communication as contemplation, planning, and action stage model (Raihan and Cogburn, 2021; FHI, 2002). This must be sustained with regular sensitization by field workers and accessible services to prevent relapse.

We found a very low prevalence of risk factors for breast cancer among the rural women residing in hilly areas. A study done in Mumbai (FHI, 2002) India found twice the prevalence of all risk factors except more than five years' exposure to hormonal pills, 1.35 % (present study) and 0.2 % (Dyavarishetty and Kowli, 2018). All the eight participants taking hormonal pills over a long duration had a hysterectomy done at 45 years. It is also documented in the LASI report that the rate of hysterectomy is 6.8 % in Uttarakhand between 45-and 59 years (LASI, 2022). We consider that living in rural areas decreases the risk of breast cancer compared to urban counterparts due to adherence to traditional lifestyle, as also confirmed by Nagrani et al., (2014). Due to rapid urbanization and social development, risk factors for non-communicable diseases have increased over the last two decades (ICMR, 2017).

Abnormalities like a lump, nipple discharge, or change in a breast were found in 3.2 %. Only 2 and 3 had BIRAD scores of 4 and 5, respectively, and one was detected to have stage 1 cancer. Considering the prevalence of breast cancer in India, our sample is not adequate to comment on prevalence (Malvia et al., 2017). It was encouraging that one case was detected at a very early stage of cancer. We could not follow the cohort due to the pandemic situation in 2020.

In conclusion, we found that awareness and practice regarding breast cancer have increased significantly among women after behavioural change intervention. The majority of participants performed the BSE in the last three months. The prevalence of risk factors for breast cancer was very low. This study reveals that Behavioral change interventions need to be imparted to women with breast cancer / CBE. Existing primary health care infrastructure can be effectively utilized by training the community health workers for health awareness, selective or opportunistic screening, and prompt referral.

Author Contribution Statement

study conception and design: MK, BR, RK; data collection: MK, AM, BR, PS; analysis and interpretation of results: MK, AM.; draft manuscript preparation: MK, MK, BR, RK, PS, AM. All authors reviewed the results and approved the final version of the manuscript.

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Conflict of interest

None

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