



An Interventional Study to Assess the Best Strategy and to Promote the Practice of Breast Self Examination among Nursing Staff in Bangalore

Subi Ansari¹, Priya T. Nandimath^{2*} and N. S. N. Rao²

¹*The Leprosy Mission Nepal, Nepal.*

²*Padmashree School of Public Health, Bangalore, India.*

Authors' contributions

This research was carried out in collaboration among all authors. Author SA wrote the protocol, managed the literature searches and performed the analysis. Author PTN designed the study, drafted the protocol, managed the literature searches and wrote the manuscript. Author NSNR performed the statistical analysis. All authors read and approved the final manuscript.

Article Information

Editor(s):

(1) Dr. Bing Yan, Hainan Branch of PLA General Hospital, China.

Reviewers:

(1) Weinan Xue, Harbin Medical University Cancer Hospital, China.

(2) Misganaw Meragiaw, Addis Ababa University, Ethiopia.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/60293>

Original Research Article

Received 15 June 2020
Accepted 21 August 2020
Published 02 September 2020

ABSTRACT

Aims: The aim of this study was to assess the effects of different methods of instruction on nurses' Breast Self Examination (BSE) practice and to assess the influence of constructs of health belief model on practice of BSE among nurses.

Study Design: Completely Randomized design.

Place and Duration of the Study: A descriptive cross sectional study was conducted among the female nurses working in a tertiary care hospital in Bangalore for 2 years.

Materials and methods: A completely randomized study was conducted with a sample of 90 nurses, 30 each from Control Group, Lecture group, Video Group were included in the study. The study included pre-test; post-test and three month follow up of control group and two experimental groups (lecture and video). The control group was not given any intervention, the lecture group received intervention through a tailor made lecture session and video group received the intervention with a video on knowledge and practice of BSE.

Results: Both lecture and video methods of BSE instruction significantly increased the nurses'

*Corresponding author: E-mail: priyanandimath@gmail.com, psphprograms@gmail.com;

mean BSE effectiveness scores ($F=23.878$ and $p= 0.000$), supporting the first hypothesis. The group of nurses with the lecture and video group displayed the almost similar improvement in BSE technique with mean score at follow up. The mean score was almost same with lecture and video group. Hence both the methods of interventions were effective in improving the practice of BSE.

The scores of health belief constructs among nurses who practiced BSE were significantly higher than the health belief scores of nurses who did not practice BSE, supporting second hypothesis. At follow up the Health Belief Model variables, perceived seriousness ($p = 0.034$) and perceived benefit ($p = 0.037$) were significant predictors of BSE practice and at pre-test perceived barriers ($P=0.024$) was significant predictor of BSE practice. This signifies that (Health Belief Model) theoretical framework is useful understanding beliefs attitudes and values for the preventive health behaviour.

Conclusion: Lecture and video can be used as best strategies to improve the effectiveness of BSE among the nurses. Nurse's health belief constructs especially perceived seriousness and perceived benefits were significant predictors to influence nurses BSE.

Keywords: Breast Self Examination (BSE); health belief model; health belief constructs; lecture method and video method.

1. INTRODUCTION

Breast cancer is the most common cancer and the second major cause of cancer death among women worldwide [1]. Every three minutes a new breast cancer case is detected and every thirteen minutes a woman dies from breast cancer [2]. Increasing burden of breast cancer in devolving and developed countries has posed as a major public health problem and the burden can be reduced by early detection [3]. Early detections can be achieved through screening methods such as Breast self-Examination (BSE), Clinical Based Examination (CBE), Mammography, an X-ray of breast and Magnetic Resonance Imaging (MRI) [4]. Among these mass screening can be done through Mammography, Clinical Breast Examination (CBE) and Self-Breast Examination (SBE) or by the combination of three [5]. Breast self-examination is an inexpensive and easy method for early detection of breast cancer [6].

Nurses are considered as important influencers to educate and empower the patients to perform BSE and they constitute the largest group of health professionals. There is a strong body of research which suggests that the nursing staffs are generally ineffective practitioners of BSE and that their frequency of BSE teaching is low. Nurses need training for early detection of breast cancer as the knowledge about BSE and its methods is poor [6,7]. Hence the assessment nurses BSE practice and various methods of BSE instruction to improve the effectiveness of BSE will lead to the development of strategies for influencing nurses to better promote Breast health [8]. There are various BSE teaching strategies that have been shown to be effective

for promoting the practice of BSE. However, there is no strong evidence suggesting a definitive teaching strategy as being the most effective for positively influencing BSE behaviour.

Various studies have tried to understand the health promoting behaviour of Breast Self Examination using Health Belief Model (HBM) which was initially developed in the 1950's [9]. This model tries to explain why people fail to accept the preventative or screening tests for early detection of diseases [10]. HBM explains the preventative behaviour which is a result of individuals differing attitude, values, beliefs and perceptions. HBM also suggests that an individual's perceptions are considered as highest influencers for his or her decision to undertake preventative behaviour. The present study was designed to understand the best strategy to promote BSE and to understand the likelihood of BSE practice as are determined by the subjects' perceived susceptibility, perceived benefits, perceived barriers, perceived seriousness and other modifying variables.

The study was designed to understand the preventative behaviour by applying the concepts of Health Belief Model (HBM). The objectives were, to assess the effects of different education methods of BSE to promote the practice of Breast Self-Examination, to evaluate the most effective method that influences the practice of BSE among nursing staff in Bangalore and to determine the influences of nurses' health belief on the practice of BSE.

The study tried to investigate two hypotheses, (a) significant difference exists in the effectiveness

of BSE practice in the experimental groups at follow-up of three months after intervention; (b) The health belief scores will be higher among the nurses who do practice BSE than the nurses who do not practice BSE.

2. MATERIALS AND METHODS

The study was conducted in selected tertiary care hospital in Bangalore. The study Population was female staff nurses of selected hospital. Sampling technique was random sampling technique. A total of 300 nurses were employed at different departments in the selected hospital. Female nurses employed at different departments in the hospitals, were assigned to the control and experimental group randomly from the list of the nurses obtained from the hospital. The study design was completely randomized design and included pretest; post-test and three month follow up of control group and two experimental groups. One experimental group received a tailor made, piloted lecture on BSE as intervention and the other group received video on knowledge and practice of BSE as intervention and the control group did not receive any intervention.

Assuming 20% improvement in the practice of BSE between the different interventions the sample size was calculated using the below mentioned formula. Assuming $p_1=0$, $p_2=20$ Using the formula $(p_1q_1+p_2q_2) (z\alpha+z\beta)^2 / (p_1-p_2)$ sample size was calculated as 40.96 approximately 41. Hence 41 nurses were required to be intervened in each group. Looking at the feasibility and convenience, 30 nurses were selected for each group. (Control, Lecture, Video) Considering the feasibility and convenience, 90 nurses were randomly selected out of 300 nurses by simple random sampling method and 30 nurses were allocated for each arm of the study, randomly, as a completely randomized design.

A pretested self-administered questionnaire was used to measure the health belief scores and practice of BSE of nurses before the intervention, one week after the intervention and three months following the interventions.

Data was collected on the personal information and socio-demographic details and on BSE Practice. BSE practice was measured by frequency, its timing in relation to the menstrual cycle, correct palpation and the bodily position

when performing BSE. Practice of BSE was further classified as effective, which is seen as monthly performance immediately following menstruation in a supine position using the flat parts of the fingers (Score of 5), Partially effective BSE at least every two/ more of the above factors included in effective BSE (as above score of 4) and Ineffective BSE practice this included the nurse who reported no BSE practice (score of 0). Data on nurses health beliefs was collected and scored. Scores for Health Belief were obtained using a 20 item scale. All the constructs (perceived seriousness, perceived barriers, perceived susceptibility, and perceived benefit) had five questions each. Likert-type scale was used to measure the responses on an agree -disagree continuum. The lowest belief was allotted a score of 1 and the highest belief, a score of 4 .A total score of 5 -20 was calculated for perceived seriousness, perceived barriers, perceived benefits. A total score of 5 to 19 was calculated for perceived susceptibility. The final scores for the HBM constructs were categorized as High degree belief if the total scores were 16-20, Moderate belief if the total scores ranged 9 to 15, Low belief if the scores were below 8.

Analysis was carried out using SPSS Version 16. Descriptive statistics were used to summarize general characteristics of the groups. To test the difference in the effectiveness of BSE practice in the experimental groups at follow-up of three months after intervention repeated measure of analysis Post hoc test was applied to measure the significance of the differences in the effectiveness of BSE between control, lecture and video group.

The influence of constructs of HBM on the practice of BSE was measured and cross tabulated with practitioners and non-practitioners. Chi-square (χ^2) were calculated to determine which constructs were significantly influencing the practice of BSE at pretest and follow up after 3 months

3. RESULTS AND DISCUSSION

3.1 Socio Demographic Findings

93.3%(28) nurses in control group, 86.7%(26) nurses in the first interventional group (lecture) and 96.7%(29) nurses in second interventional group (video) belonged to age group 20-29 years. Age groups of the nurses in the three

groups was not significantly different ($\chi^2 = 0.05$) (P=0.338).

Majority i.e. 85.6 %(77) of the nurses belonged to Hindu religion. 86.7%(26) nurses in the control group, 80%(24) nurses in the lecture group and 90%(27) nurses in the video group belonged to Hindu religion and groups were similar with respect to religion ($\chi^2 = 0.05$) (P=0.471).

Out of 90 respondents majority 67.8%(61) of the nurses had 2-6 years of experience. 70% (21) nurses in the control group, 60%(18) nurses in lecture group and 73.3%(22) nurses in the video group had 2-6 years of experience. ($\chi^2 = 0.05$) (P=0.530).

Out of 90 respondents majority 85.6%(77) of the nurses had GNM degree. 86.7%(26) nurses in the control group and lecture group each and

83.3%(25) nurses in the video group had GNM degree. ($\chi^2 = 0.05$) (P=0.916).

Out of 90 respondent's majority 66.7%(60) of the nurses were unmarried.73.3%(22) nurses in the control group and lecture group each and 53.3%(16) nurses in the video group were unmarried. (Table 1) ($\chi^2 = 0.05$) (P=0.165).

Hence, the three groups (Control group, Lecture group and Video group) were similar with respect to the demographic variables.

3.2 Personal and Family History of Breast Lump among the Nurses

93.3%(28) in the control group, 96.7%(29) nurses each in the lecture and video group had no personal history of Breast lump. 96.7%(29) of nurses each in control ,lecture group and video group had no family history of Breast cancer (Table 2).

Table 1. Socio demographic findings

Socio-demographic variables	Groups			Total
	Control	Lecture	Video	
Age of the respondents				
20-29 Years	28(93.3%)	26(86.7%)	29(96.7%)	83(92.2%)
30-39 Years	2(6.7%)	4(13.3%)	1(3.3%)	7(7.8%)
Religion of the respondents				
Hindu	26(86.7%)	24(80.0%)	27(90.0%)	77(85.6%)
Muslim	1(3.3%)	0(0.0%)	1(3.3%)	2(2.2%)
Christian	3(10.0%)	6(20.0%)	2(6.7%)	11(12.2%)
Years of experience				
Less than 1 year	6(20.0%)	8(26.7%)	6(20.0%)	20(22.2%)
2-6 years	21(70.0%)	18(60.0%)	22(73.3%)	61(67.8%)
7-10 years	3(10.0%)	2(6.7%)	2(6.7%)	7(7.8%)
More than 10 years	0	2 (6.7%)	0	2(2.2%)
Education status				
GNM	26(86.7%)	26(86.7%)	25(83.3%)	77(85.6%)
BSC Nursing	4(13.3%)	4(13.3%)	5(16.7%)	13(14.4%)
Marital status				
Unmarried	22(73.3%)	22(73.3%)	16(53.3%)	60(66.7%)
Married	8(26.7%)	8(26.7%)	14(46.7%)	30(33.3%)

Table 2. Distribution of nurses according to personal history of breast lump and family history of breast cancer

	Groups			Total
	Control	Lecture	Video	
Personal history of Breast lump				
Yes	2(6.7%)	1(3.3%)	1(3.3%)	4(4.4%)
No	28(93.3%)	29(96.7%)	29(96.7%)	86(95.6%)
Family History of Breast Cancer				
Yes	1(3.3%)	1(3.3%)	1(3.3%)	3(3.3%)
No	29(96.7%)	29(96.7%)	29(96.7%)	87(96.7%)

Practice of BSE: Among 90 nurses at pre intervention, 24.4%(22) nurses were not practicing BSE while 75.6%(68) were practicing BSE. Similarly, after 3 months, 94.4%(85) nurses were practicing BSE while 5.6%(5) were not practicing BSE (Table 3). Thus on the overall, there was an improvement in the practice, irrespective of the method of intervention and was statistically significant with P=0.007.

Effectiveness of BSE Practice at Pre and Post Intervention: The effectiveness in performing BSE improved after interventions considering all the three groups. It was found that at pre intervention 33.3 % (30) were effectively practicing BSE, and 64.4%(58) were ineffectively practicing BSE, and 2.2%(2) were performing partially effective BSE. At post intervention 44.4%(40) were effectively practicing BSE and 21.1%(19) were ineffectively practicing BSE, and 34.4%(31) were performing partially effective BSE. The improvement in effectiveness of BSE post intervention was statistically significant with P= 0.058 (Table 4).

Effectiveness of BSE Practice among the Groups: Among the nurses in the control group, 76.7%(23) were practicing BSE ineffectively at

pre intervention, which decreased to 63.3%(19) immediately after the intervention and remained at 53.3%(16) at post intervention. At post intervention it was seen that 53.3% were practicing ineffectively, 23.3% were practicing partially effectively and 23.3 were practicing BSE effectively (Table 5).

Among the nurses in lecture group, 60%(18) were practicing BSE ineffectively and only 36.7%(11) were performing effective at pretest. Effectiveness in the practice of BSE increased from 36.7% at pretest to 43.3% immediately after the intervention and further it increased to 56.7% after 3 months of intervention (Table 6)

Among the nurses in video group, 56.7%(17) were practicing BSE ineffectively, 43.3%(13) were doing effectively at pretest. Effectiveness in the practice of BSE increased from 43.3% at pretest to 66.7% immediately after the intervention and further it increased to 53.3% after 3 months of intervention (Table 7).

Effectiveness in the practice of BSE increased both in the lecture and video group after the intervention.

Table 3. BSE practice at pre and post interventions

BSE practice	Pre intervention n (%)	Post intervention n (%)
Not practiced	22(24.4)	5(5.6)
Practiced	68(75.6)	85(94.4)
Total	90(100.0)	90(100.0)

Table 4. Effectiveness of BSE practice at pre-test and post-test in all the groups

Effectiveness	Pre Intervention n (%)	Post Intervention n (%)
Ineffective	58(64.4)	19(21.1)
Partially Effective	2(2.2)	31(34.4)
Effective	30(33.3)	40(44.4)
Total	90(100.0)	90(100.0)

Table 5. The effectiveness of BSE among the control group

Levels of Effectiveness of BSE	Pretest	Immediately after intervention	At three months
	n (%)	n (%)	n (%)
Ineffective BSE	23(76.7)	19(63.3)	16(53.3)
Partially effective BSE	1(3.3)	2(6.7)	7(23.3)
Effective BSE	6(20.0)	9(30.0)	7(23.3)
Total	30(100.0)	30(100.0)	30(100.0)

Table 6. The effectiveness of BSE among the lecture group

Levels of Effectiveness of BSE	Lecture group		
	Pretest	Immediately after intervention	At three months
	n (%)	n (%)	n (%)
Ineffective BSE	18(60.0)	11(36.7)	1(3.3)
Partially effective BSE	1(3.3)	6(20.0)	12(40.0)
Effective BSE	11(36.7)	13(43.3)	17(56.7)
Total	30(100.0)	30(100.0)	30(100.0)

Table 7. The effectiveness of BSE among the video group

Levels of Effectiveness of BSE	Video group		
	Pretest	Immediately after intervention	At three months
	n (%)	n (%)	n (%)
Ineffective BSE	17(56.7)	10(33.3)	2(6.7)
Partially effective BSE	0(0)	0(0)	12(40.0)
Effective BSE	13(43.3)	20(66.7)	16(53.30)
Total	30(100.0)	30(100.0)	30(100.0)

Effect of interventions on effectiveness of BSE practice among different groups: The mean score for control group at pre-test was 2.47 which increased to 2.90 after one week and at follow up of three months it further increased to 3.33.

Similarly, the mean score for lecture group at pre-test was 3.03 which increased to 3.83 immediately after the intervention and at follow up it further increased to 4.53.

The mean score for video group at pre-test was 2.73 which increased to 4.07 immediately after the intervention and at follow up which further increased to 4.40.

Thus there were significant differences in the effectiveness of BSE practice in the experimental groups at follow-up of three months after intervention as compared to control group.

Differences in the mean scores of practice over the periods were significant ($F=23.878$,

$P=0.000$), whereas the interaction between the group and periods was not significant.

Post Hoc test analysis showed that the differences in the mean scores between lecture and the control group was statistically significant with $P=0.12$, as well as, between video and control groups with $P=.022$. However, between video and lecture groups the difference was not significant, with mean scores for the two groups being almost same.

Thus video and lecture methods of interventions were equally effective in improving the practice of BSE (Table 8).

Influence of health belief constructs on the practice of BSE: The health belief scores of nurses who practiced BSE were significantly higher than the health belief scores of nurses who did not practice BSE (Table 9). This indicates that better health belief positively influences the practice BSE.

Table 8. Pretest, immediate and follow-up mean scores of effectiveness of BSE practice among control, lecture and video groups

Groups	n	Pre intervention		Immediately after intervention		At three months	
		Mean	SD	Mean	SD	Mean	SD
Control	30	2.47	1.697	2.90	1.729	3.33	1.322
Lecture	30	3.03	1.771	3.83	1.234	4.53	.571
Video	30	2.73	2.196	4.07	1.437	4.40	.814
Total	90	2.74	1.894	3.60	1.549	4.09	1.088

The scores for perceived susceptibility, perceived benefits, perceived barriers and perceived seriousness, were high with nurses who practiced BSE at follow-up. Perceived seriousness ($\chi^2 = 0.05, p = 0.034$), Perceived benefits ($\chi^2 = 0.05, p = 0.037$) at follow up were statistically significant predictors of BSE practice whereas all other constructs were not significant. Perceived seriousness according to HBM is considered to directly increase the perceived threat of the disease and hence increases the likelihood of engaging in preventive behaviour. And similarly perceived benefits will directly influence in engaging in preventive behaviour. Hence these can be considered as important predictors in influencing in preventive behaviours.

The scores for Perceived susceptibility, perceived benefits, perceived barriers or perceived seriousness, were high with practitioners at pretest. Perceived barrier ($\chi^2 = 0.05, P = 0.024$) was significant predictor of BSE practice among the practitioners at pretest whereas all other constructs were not significant. Perceived barrier will prevent in engaging in preventive behaviour/ action, the present study proved that at before the intervention the major influencer for practice was perceived barrier and hence the practice was low and at follow up after the interventions the perceived barrier was not a significant influencer.

Hence perceived seriousness and perceived benefits were significant influencers of practice of

Table 9. Health belief constructs scores among the nurses who practiced and not-practiced

HBM Constructs	Levels	Before intervention		At three months	
		Not Practiced	Practiced	Not Practiced	Practiced
Perceived seriousness	Highly perceived seriousness	12(54.5%)	38(55.9%)	3(60%)	77(90.6%)
	Moderately perceived seriousness	10(45.5%)	30(44.1%)	2(40%)	8(9.4%)
	Low perceived seriousness	0	0	0	0
Perceived barrier	Highly perceived Barrier	15(68.2%)	24(35.3%)	3(60%)	60(70.6%)
	Moderately perceived Barrier	7(31.8%)	43(63.2%)	2(40%)	25(29.4%)
	Low perceived Barrier	0	1(1.5%)	0	0
Perceived susceptibility	Highly perceived susceptibility	7(31.8%)	26(38.2%)	2(40%)	46(54.1%)
	Moderately perceived susceptibility	12(54.5%)	37(54.4%)	3(60%)	39(45.9%)
	Low perceived susceptibility	3(13.6%)	5(7.4%)	0	0
Perceived benefit	Highly perceived seriousness	8(36.4%)	26(38.2%)	2(40%)	68(80%)
	Moderately perceived seriousness	14(63.6%)	40(58.8%)	3(60%)	17(20%)
	Low perceived seriousness	0	2(2.9)	0	0

BSE after the interventions. Perceived barrier was significant influencer for practice of BSE at pretest.

3.3 Modifying Factors For Preventive Behaviour

a) Cues to action: 66.7 % in the lecture group and 80% of the nurses in the video group said that they do not have any method for reminding BSE at follow up. 33.3% nurses in lecture group and 20% of nurses in video group said that they have a method to remind BSE practice (Table10).

b) Breast examination performed by the doctor at any consultation: 40%(36) nurses said that they were never examined by the doctor, 40%(36) nurses said that they were sometime and 12.2%(11) said they were most of the time examined and 7.7%(7) said they were always examined by the doctor for breast lump.

c) Doctors asking about performing monthly BSE consultation: Out of 90 nurses 63.3 %(57) of them said that doctors did not ask them about performing BSE and 36.6%(33) said that doctors asked about performing BSE.

d) Self efficacy / confidence: Self efficacy / confidence is considered to directly influence the

likelihood of preventive behaviour. Confidence in turn is believed to increase by educational status, social and economic status.

The confidence to perform BSE among both the experimental group increased after the intervention. In the lecture group, at pretest 43.3%(13) of the nurses were very confident, 53.3%(16) of the nurses were somewhat confident, 3.3%(1) of the nurses were not confident at all and at follow up after the intervention it was found that 73.3%(22) of the nurses were very confident, 26.7%(8) of the nurses were somewhat confident.

Similarly, In the video group, at pretest 56.7%(17) of the nurses were very confident, 43.3%(13) of the nurses were somewhat confident and at follow up after the intervention it was found that 73.3%(22) of the nurses were very confident, 26.7%(8) of the nurses were somewhat confident.

Demographic variables (age, sex, race, ethnicity etc.) Socio-psychologic variables (peer pressure, social class, personality Structural variables (knowledge about the disease, prior contact with the disease) are considered as modifiable factors / variables which are considered to influence perceived threat and hence increase the preventive behaviour.

Table 10. Method to remind to perform BSE

Method reminding breast self-examination	Lecture	Video
	Post test n (%)	Post test n (%)
Yes	10(33.3)	6(20.0)
No	20(66.7)	24(80.0)
Total	30(100.0)	30(100.0)

Table 11. First source of information about BSE among all the groups

First source of information about BSE	Groups					
	Control		Lecture		Video	
	n	%	N	%	n	%
Can't remember	3	10.0	1	3.3	0	0
Doctor	2	6.7	7	23.3	1	3.3
Pamphlet elsewhere	0	0	0	0	0	0
BSE Educational programme	13	43.3	11	36.7	11	36.7
TV	0	0	2	6.7	2	6.7
Newspaper	0	0	0	0	2	6.7
Radio	0	0	0	0	0	0
In hospital as a patient	1	3.3	0	0	1	3.3
Mother/sister/relative/friend	0	0	0	0	1	3.3
Nurse	9	30.0	7	23.3	11	36.7
Other	2	6.7	2	6.7	1	3.3
Total	30	100.0	30	100.0	30	100.0

Knowledge about breast self-examination:

Among the control group ,43.3%(13) of the nurses heard first about BSE from BSE educational programme and 30%(9) of the nurses heard about BSE examination from the nurses and 10%(3) of the nurses said they can't remember. Similarly, among the lecture group 36.7%(11) of the nurses heard first about BSE from BSE educational programme and 23.3%(7) of the nurses heard about BSE examination from the nurses and doctors each. Whereas in video group 36.7%(11) of the nurses heard first about BSE from Nurses and BSE Educational programme, and 6.7%(2) of the nurses heard about BSE from the TV and Newspaper each (Table 11).

Reasons for practicing and not practicing BSE:

Among all the groups group, the major reasons for practicing BSE were, early detection has a great value 48.5%(33) and fear of Breast cancer 48.5%(33) followed by Breast lump found by women herself 27.9%(19). Among all the groups, the major reasons for not practicing BSE were, afraid I will find something 54.5%(12), followed by don't have the time practicing BSE 50%(11), followed by not applicable for practicing BSE 27.3%(6) respectively in all the groups.

3.4 Discussion

The aim of the present study was to assess the effects of different methods of instruction (lecture and video) on nurses' BSE practice and to assess the influence of constructs of health belief model on practice of BSE among nurses. The study was proposed on the theoretical framework of health belief model.

Practice of BSE: The results of the present study showed that, at pre-test, 24.4% nurses were not practicing BSE and 75.6% nurses were practicing BSE but only 33.3% were effectively performing BSE at pre-test. The improvement in the practice of BSE before and after the intervention was statistically different and it can be attributed to the interventions. The effectiveness of the practice of BSE also was statistically significant irrespective of the interventions at the follow up. The results of the present study are similar with a study conducted by Julia Agars [11] which showed that among 86% of nurses who were practicing BSE only 18% were effectively performing BSE at pretest. Similarly, a study conducted by Heyman et al. found that although 99% of the nurses indicated that they are capable of performing BSE but only

26% of the nurses in their sample used effective techniques [12].

Similarly, the present study also showed that, at follow up, 94.4% nurses were practicing BSE and 44.4% were effectively performing BSE at follow up. In a study conducted by Julia Agars it was found that there was a not much difference in the practice of BSE at follow up. (86% at pretest and 86% at follow up). Therefore, it can be commented that, in the present study the effectiveness of performing BSE improved from 75.6% to 94.4% which indicates that the instruction either video or lecture improved the practice of BSE.

The present study did not show any association of BSE practice with age. But various studies showed that higher age was significantly associated with practice of BSE. Clarke and Sandler, in their study concluded that all the nurses over 40 years of age practiced BSE Edgar et al. [13]. Similarly, BSE practice was found to be significantly higher in older nurses in the study conducted by Julia Agars [11]. The reason for the difference in the finding in the present study can be attributed to the fact that the study participants were not beyond the age of 39 years.

Effect of different interventions on the practice of BSE:

The results of the present study revealed that both lecture and video group had a significant improvement in BSE practice in comparison to the Control group. Differences in the mean scores between lecture and the control group ($p=0.12$) and video and the control group ($p=.022$) were statistically significant. Between video and lecture the difference was not significant. It can be commented lecture and video can be used a best strategies to promote BSE. It can be commented from the present study that this type of learning and instructional method may be more acceptable to the nurses and also lecture and video are the methods are already known to the nurses. The nurses have exposure to such methods, hence these methods may be very easy to follow and can be used receptively. Therefore, lecture and video can be used as best strategies to improve the effectiveness of BSE practice among the nurses. Targeted interventional / educational programmes can significantly improve BSE practice and behavior and if they are shown how then BSE practice could be done regularly (Dickson et al. 1986). It is believed that symbolic modeling involving the behaviours occurs

through films/ videos, cartoons, audio and by written scripts (Perry & Furukawa in Kanfer & Goldstein, 1986). A study conducted by Julia Agars concluded that film and discussion methods were the methods which significantly improved the BSE practice whereas one-to-one model and booklets did not show significant improvement on BSE practice [11]. Hence it can be commented that group methods can be considered as better methods for improving the effectiveness of BSE. A randomized study conducted on 825 women who attended the film and discussion showed significant increase in monthly BSE (Calnan, Chaniberlain and Moss, 1983).

Health Beliefs: The present study showed that the mean Health Belief Score for BSE were high for practitioners than non-practitioners both at pretest and follow up. The scores were significantly high at follow up than at pretest hence indicating that the beliefs predict the practice of BSE.

Perceived barrier was significant predictor for BSE practice ($P=0.024$) at pre-test. Whereas at follow up perceived seriousness ($P=0.034$) and perceived benefit ($P=0.037$) were statistically significant predictors for BSE practice. The studies conducted by Champion, 1985, 1987, Hill, and Gardner & Rassaby, 1985 also found that perceived barriers were highest influencers in practice of BSE [14]. A review conducted by Janz and Becker (1984) also showed that perceived barrier is the important predictor of BSE practice [10]. Perceived susceptibility was found to be an important predictor BSE according to the study by Schlueter (1982) and Rutledge and Davis (1988) and Champion (1984,1985,1987,1988) [15]. Study highlights that Perceived seriousness and perceived benefits are the two important predictors of Practice after the intervention. Hence, it can be commented that the educational interventions on BSE should focus on increasing the seriousness of breast cancer and also emphasize on the importance of benefits of BSE.

However, perceived barrier which is the measure of nurse's negative component of anticipated behaviour such as pain, inconvenience, embarrassment, side effects, cost etc. was found to be significant predictor only at the pretest in the present study. This result also indicates that the lecture and the video demonstration sessions have taken out the negative component of the preventive behaviour.

Cues to action: Cues to action such as Mass media campaigns, advice from others reminder postcard from physician, illness of family member or friend, newspaper or magazine article are considered to improve the knowledge and hence increase the perceived threat and hence the likelihood of preventive behaviour.

Method of reminder: 66.7% of the nurses said that they have no method for reminding BSE at post-test among lecture group and 80% of the nurses said that they have no method for reminding BSE in post-test among video group. Most of the respondents said calendar and alarm method was their method of reminder. So this form of reminder is appropriate for the nurses of the present study as everyone were still in the reproductive age group and menstrual cycle itself can be calendar for reminding the nurses to perform BSE. However, this cannot be found appropriate for the women at post-menopausal stage [11].

Various studies have shown that Compliance to BSE practice is found to be associated with the use of prompting strategy according to the study conducted by Grady, Goodenow and C & Borkin, [16]. The reminders can be in the form of telephone call, self-managed use of calendars with reminder stickers according to studies conducted by Mayer and Frederiksen, 1986, Grady, 1984), and found that reminder method was significantly associated with compliance of BSE [10].

The role of the general practitioner in BSE education: 40% nurses said that they were never examined by the doctor, 40% nurses said that they were sometime and 7.7% said they were always examined by the doctor for breast lump. 67% of the nurses said that doctors did not ask them about performing BSE.

Doctors play an important role in promoting BSE. Various studies show that nurses learn breast examination from doctors by direct observation. In a study conducted by Julia Agars it was found that there was a relation between general practitioner performing breast examination and nurses who were performing effective BSE [11]. In another study conducted by Rutledge and Davis (1988) it was found that there was a strong relation between doctors asking about performing BSE to the patients and their compliance to BSE [17]. But in the present study doctors rarely asked if the nurses performed BSE. These results indicate that the doctors should be proactive in performing breast

examination and also asking if the patients perform BSE. This would support in compliance as well as promote BSE.

Confidence to perform BSE: At follow up 73.3% of the nurses were very confident in performing BSE from both lecture and video group, whereas only 43.3% and 56.7% of the nurses were confident in performing BSE among lecture and video group respectively at pretest. This indicates that there was definitely an improvement in the confidence of the nurses after the interventions. According to a study conducted by Clarke and Sandler Confidence is considered to be an important predictor for compliance to BSE [18]. However false confidence was observed with practice of BSE in the study conducted by Norman and Tudiver (1986) and Julia Agars. However, majority of the studies indicate confidence as the major predictor for BSE practice [19].

First source of information about BSE: The present study found that the first source of information about BSE is BSE educational programme (43.3%) among the nurses in all the groups (control, lecture, video). TV and Newspaper, (6.7%) nurses (30%) and doctors (20%) were also the source of information. Another cross-sectional study was conducted by Katende Godfrey, Tukamuhebwa Agatha, Joyce Nankumbi, 56.9% of student received information through mass media [3]. The study conducted by Kalayu Birhane, Miskir Alemaychu, Belayneh Anawte, Gebru Gebremariyamon said that source of information about Breast cancer is mass media [20]. Similar results were found. a study conducted by U.M.D. Gwarzo, K. Sabitu and S.H Idris. It was found that the sources of information about BSE among respondents, media was found most common followed by health workers accounting for 45.5%, 32.2% respectively [21].

Reasons for practicing and not practicing BSE: The major reasons for practicing BSE were, early detection has a great value (48.5%) and fear of Breast cancer (48.5%) followed by Breast lump found by women herself (27.9%). These indicate the preventive attitude and anxiousness about breast cancer, among the nurses.

The major reasons for not practicing BSE were, afraid I will find something 54.5%, followed by don't have the time practicing BSE 50%, followed by not applicable for practicing BSE 27.3% respectively in all the groups. These reasons

also indicate apprehensiveness about the disease and poor knowledge about the disease.

4. CONCLUSION

Conclusion and recommendations:

- Lectures and videos are ideal methods which can be used to encourage BSE practice in the hospital where staff could be invited to attend such sessions.
- The Health Belief Score for BSE were high for practitioners than non-practitioners both at pretest and follow up.
- Considering the significant influence of health belief constructs especially perceived seriousness and perceived benefits to influence the practice on BSE, as observed in this study as well as other studies, future educational programmes should emphasise on increasing the seriousness of breast cancer as well as the importance of benefits of BSE.
- The use of a "reminder" for effective BSE practice should be considered in planning future programmes to improve the compliance to BSE practice.
- Nurses in the hospital should practice BSE as a routine and they should also be encouraged to train Breast examination of the patients in their General practice.

CONSENT

All authors declare that, written informed consent was obtained from the respondent for publication of this paper.

ETHICAL APPROVAL

The studied is approved by an Institutional Review Board (IRB), Ethical Committee, and the approval is preserved by the author(s).

ACKNOWLEDGEMENT

Authors are grateful to all participants who participated in this study and appreciate the support of Padmashree School of Public, Bangalore.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Michael N. Okobia. Knowledge attitude and practice of Nigerian women towards

- breast cancer: Cross sectional study. World Journal of Surgical Oncology. 2006;11(4):1-9.
2. Gass M, Rebar R. Demographics of the aging population. Glob. Libr. Women's Med; 2008.
DOI: 10.3843/GLOWM.10078
 3. Katende Godfrey, Tukamuhebwa Agatha, Joyce Nankumbi. Breast cancer knowledge and breast self-examination practices among female university student in Kampala Uganda: A descriptive study. OMJ. 2016;31:129-134.
 4. Shrestha K. Breast cancer knowledge and screening practice among women; visited to Kist medical college. Nepal Medical College Journal. 2012;14(4):308-311.
 5. Mohammad Sohel Mia. Knowledge, attitude and practice regarding breast cancer among Medical Students of Bangladesh. 2007;2(5):1-55.
 6. Mary Atanga Bi Suh, Julius Atashili, Eunice Asoh Fuh, Vivian Ayamba Eta. Breast self examination and breast cancer awareness in women in developing countries: A survey of women in Buea, Cameroon. BMC Research Notes. 2012;5:627.
 7. Shubhada Sunil Avachat, Vijaya Jayant Thipse, Sandip Arunrao Joshi. Evaluation of impact of educational intervention on knowledge and practice regarding BSE among paramedical workers in a teaching hospital Maharashtra, India. International Journal of Community Medicine and Public Health. 2016;3(8):2217-2221.
 8. Ebirim Chikere Ifeanyi Casmi, Nwoke Eunice Anyalewechi, Ibe Sally Nkechi Onyeka, Etal. Knowledge and practice of breast-self examination among female undergraduates in South-Eastern Nigeria. Scientific Research Publishing. 2015;7: 1134-1141.
 9. Becker MH, (Ed). The health belief model and personal health behaviour. Charles B. Slack, New Jersey: Thorofare; 1974.
 10. Janz NK, Becker MH. The health belief model: A decade later. Health Education Quarterly, U. 1984;1-47.
 11. Julia Agars. An evaluation of comparative strategies for teaching breast self examination. Edith Cowan University Research Online. 1991;1-155.
 12. Heyman E, Tyner R, Phipps C, Cave L, Owen DC. Is the hospital setting the place for teaching breast self-examination? Cancer Nursing. 1991;14:35-40.
 13. Edgar L, Shamian J, Patterson D. Factors affecting the nurse as a teacher and practice of breast self-examination. International Journal of Nursing Studies. 1984;21:255-265.
 14. Champion VL. Use of the health belief model in determining frequency of breast self-examination. ~h in Nursing and Health. 1985;8:373-379.
 15. Champion VL. Instrument development for health belief model constructs. Advances in Nursing Science. 1984;6:73-85.
 16. Grady KE, Goodenow C, Borkin JR. The effect of reward on compliance with breast self-examination. Journal of Behavioural Medicine. 1988;11:43-57.
 17. Rutledge DN, Davis GT. Breast self-examination compliance and the health belief model. Oncology Nursing Forum. 1988;15:175-179.
 18. Clarke DE, Sandler LS. Factors involved in nurses' teaching breast self-examination. Cancer Nursing. 1989;12:41-46.
 19. Norman RMG, Tudiver F. Predictors of breast self-examination among family practice patients. The Journal of Family Practice. 1986;22:149-153.
 20. Kalyan Birhane, Miskir Alemayehu, Belayneh Anawte, Gebru Gebremariam, Ruth Daniel, et al. Practices of breast self-examination and associated factors among female Debre Berhan University students. International Journal of Breast Cancer. 2017;1-6.
 21. Gwarzo UMD, Sabituand K, Idris SH. Knowledge and practice of breast self-examination among female undergraduate students of Ahmadu Bello University Zaria, North-western Nigeria. Annals of African Medicine. 2008;8(1):55-58.

© 2020 Ansari et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/60293>