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Impact of Planned Teaching Program on Raising Female Students' Awareness Regarding Breast Cancer and Breast Self-Examination

Rubia Batool[1]*, Samina Kausar[2], Fouzia Jameel[3], Tyyaba Kiran[4],

Affiliations:

[1]Nursing Instructor, College of Nursing Chakwal, University of Health Sciences, Lahore
[2]Associate Professor, Institute of Nursing, University of Health Sciences, Lahore
[3]Principal/Associate Professor, College of Nursing, Mianwali, University of Health Sciences, Lahore
[4] Lecturer, University Institute of Diet and Nutritional Sciences, University of Lahore

***Corresponding Author:** Ms. Rubia Batool **, Email:** batoolrubia@gmail.com

Abstract

Breast cancer (BC) is a more common cancer among women throughout the world. In Pakistan, women diagnosed with breast cancer move to advanced stages due to lack of awareness results in delayed presentation and diagnosis. This alarming situation demands for introducing awareness sessions to lessen the hazards of the disease. This study aimed to determine the effectiveness of planned teaching program on Breast Self-Examination (BSE) and BE for degree college female students. Quasi experimental design was performed. Simple random sampling technique was used to select a sample of 120 participants following pretest to assess the awareness level of the participants before educational intervention and to administered on the same day after educational intervention, to examine the effects of educational intervention and after 03 months to assess the retention of the given information on the topic. The data was analyzed by SPSS software version, IBM – 25. Repeated Measure ANOVA was used to compare results of the pre-test, post- test and post-test after 3 months. Pairwise comparison was performed by following Post-hoc Tukey test which was used with 0.05 level of significance. There was statistically significant difference in scores on the pre-test and post-test results, pre-test and post-test after 3 months, and post-test and post-test after 3 months. Frequency and percentages of qualitative variables were calculated and presented in graphical form. The results of this study demonstrated that there was statistically significant difference between pre- knowledge scores and post-knowledge score. The post knowledge score was higher indicating that educational intervention had an affirmative effect on knowledge about breast cancer.

Keywords: Breast Cancer, Awareness, Planned Teaching Program, Female Students

Introduction

Breast cancer (BC) is one of the most common cancers among females and recognized as a prominent cause of cancer-related mortality worldwide. The incidence rate for aggressive breast cancer increased slightly from 2005 to 2009 and the death rate continued to decline gradually. (Bray et al., 2018). The universal burden of breast cancer is predicted to rise up to two million by the year 2030, with a growing proportion (Eitan et al., 2014). Currently, one out of eight women is being affected during her lifetime in the European countries (Schneider et al., 2014). While considering the Asian countries, it demonstrates the highest mortality rate due to breast cancer. (Ghoncheh et al., 2016). In Pakistan the cases of breast cancer are mostly diagnosed in the progressive stages III, IV when

almost 75% of cases in advanced countries are diagnosed in the early periods of the disease due to lack of awareness and good screening practices (Ahmadian and Samah, 2012).

National Cancer Registry for Asian countries documented that incidence rate of breast cancer varied in different countries as 21.3 for each 100.000 population in Jordan, 21.4 in Iran, 24.1 in Turkey, 34.86 in Malaysia, 48 in Japan, 54 in Singapore and 69.1in Pakistan as averaged over the years 1998-2002 (Ahmadian and Samah, 2013). This data revealed the highest recorded incidence rate of breast cancer in Asia**,** particularly, Pakistan has the highest incidence and mortality rates of breast cancer as compared to the rest of Asia that is >5.2 times and >2.8 times higher respectively. (Asif et al., 2014).

Prevalence of BC is primarily due to rapid urbanization, drastic changes in eating habits and sedentary lifestyles. Moreover, early menstruation, onset of late menopause, 1st pregnancy over 30 years, infertility, use of contraceptives, history of no breastfeeding, excessive exposure to radiation, hormonal dysfunction and stress may also contribute in the development of breast cancer (Ameer et al., 2014, Rathi and Kumari, 2020, Torre et al., 2015).

In early stages, breast cancer typically does not produce symptoms but as the tumor grows, the symptoms started appearing. These symptoms include painless lump in the breast or under the armpit, breast pain, swelling or thickness of the breasts' skin, spontaneous discharge of the nipple erosion or inversion in the nipple. Moreover, peeling or flaking of the nipple's skin, changes on touch (hardness, tenderness or warmth may be on palpation), redness or pitting of the breast skin (like the skin of an orange), change in breast color and size or shape are also observed as cardinal signs of BC (Bonsu and Name, 2019). Most of the patients presented with asymptomatic mass when they were diagnosed during BSE, clinical breast examination, and through mammography. Its treatment usually includes surgical excision, often with radiation therapy, with or without adjuvant chemotherapy, hormonal therapy, or both (Marry, 2018).

This study aims to determine the effectiveness of the planned teaching program for the degree college female students about BSE and Breast Cancer (before and after training session and after 03 months of training). As reasons for high rates of breast cancer in Pakistan are yet unknown. It was imperative to create awareness among young women about the risk factors, sign and symptoms, treatments and the screening method as greater knowledge about breast cancer and its screening methods can lead to earlier detection of the symptoms and prompt treatment which might be helpful in lessening emotional, physical and economic burden on patients and their families.

Methods

The current study was conducted in Chakwal City Districts of Punjab in Pakistan from June 2018 to December 2018. The study was planned to evaluate the effectiveness of educational interventions on BC& BSE awareness among women studying in Post graduate women collage Chakwal. The study was based on Quasi Experimental research design (without control group) as this design was most suitable to assess the effectiveness of any intervention using pre and posttest survey. Quasi-experimental methods that involve the creation of a comparison between groups are most often used when it is not possible to randomize or control individuals or groups These designs are intended to estimate the effect of an intervention pre-post designs without randomization or control group (Rogers and Révész, 2020). Sample size consisted of 120 female students which was selected by sample random sampling.

A self-structured questionnaire was designed which consisted of four items on demographic background such as Name, Age, level of study, family History of BC, knowledge about warning sign of BC, risk factors, treatment, screening method and knowledge of BSE. Prior to data collection, an official permission was taken by ethical review committee of the institute.

Results

A total of 120 female students were enrolled in the study out of 1250 female students from different departments. Based on Pre-test, designed questionaries' and nature of tests performed, results were differentiated and distributed based on different stats and displayed in the form of charts and bars. Descriptive and inferential statistics were used in the study. Frequency and bar charts have been used to signify the data including calculation of frequency and percentages of the qualitative variables presented in graphical form. Repeated Measure ANOVA

was used to compare results on the pre-test, post- test and post-test after 3 months. For pairwise comparison, post-hoc Tukey test was used and p-values were computed to compare the results of before and after the educational intervention immediately and after 3 months.

Following figures represent the demographic data of various aspects of samples.

Marital Status of study participants (N=120)

Figure 1

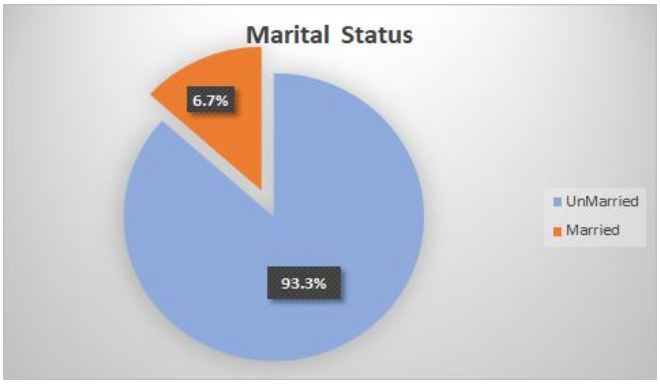
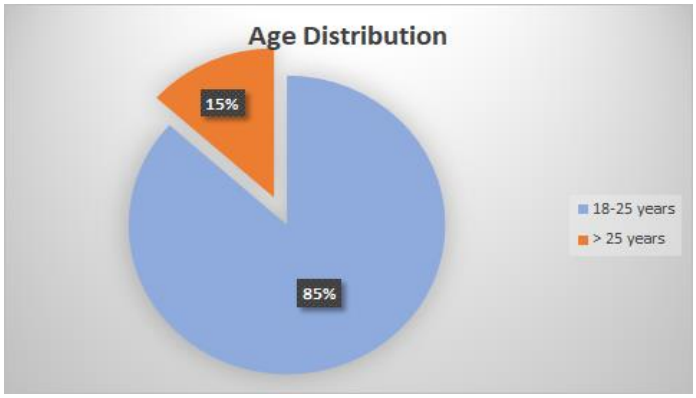


Figure 1 Legends: It demonstrates that 8 (6.7%) respondents were married and 112 (93.3%) were un-married.

Age distribution of study Participants (N=120):

Figure 2



Fiure 2 Legends: It demonstrates the age group of the females. Of the total 120 students, 85% were between the age of 18 and 25 and only 15% were above 25 years

Educational status of the study participants (N=120):

Figure 3

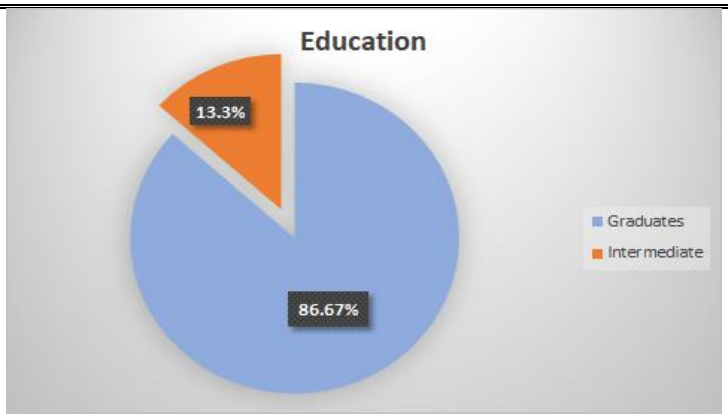


Figure 3 Legends: It represents the educational status. Out of 120 students, 13.3% students were intermediate and 86.67% were graduates from the Women College, Chakwal and universities located in the district Chakwal, Pakistan.

Family history of participants

Figure 4

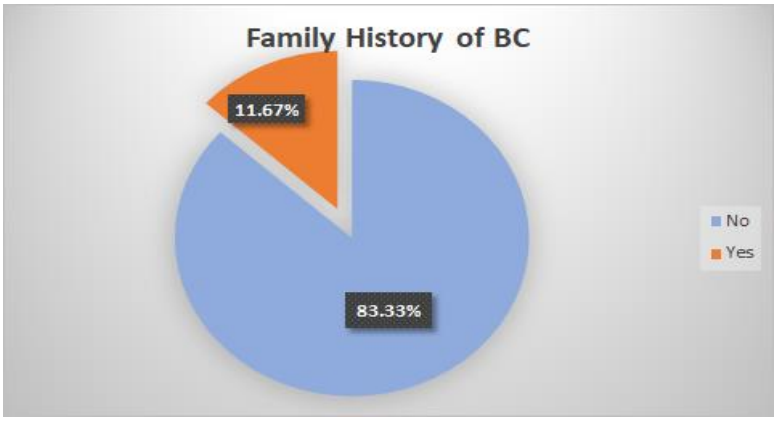


Figure 4 Legends: It shows that 83.33% of the participants had no family history of breast cancer, whereas11.67% had reported history of BC in the families.

Initial Survey Analysis

Data was gathered through four different types of questionnaires from the sample of 120 students for analysis of knowledge about the warning signs of the breast cancer, risk factor of breast cancer, treatment of breast cancer, screening method for cancer evaluation, and breast self-examination. Following results were found in the pre-test results.

Pre-test (survey -1) Results:

Warning signs of breast cancer (N=120)

Figure 5

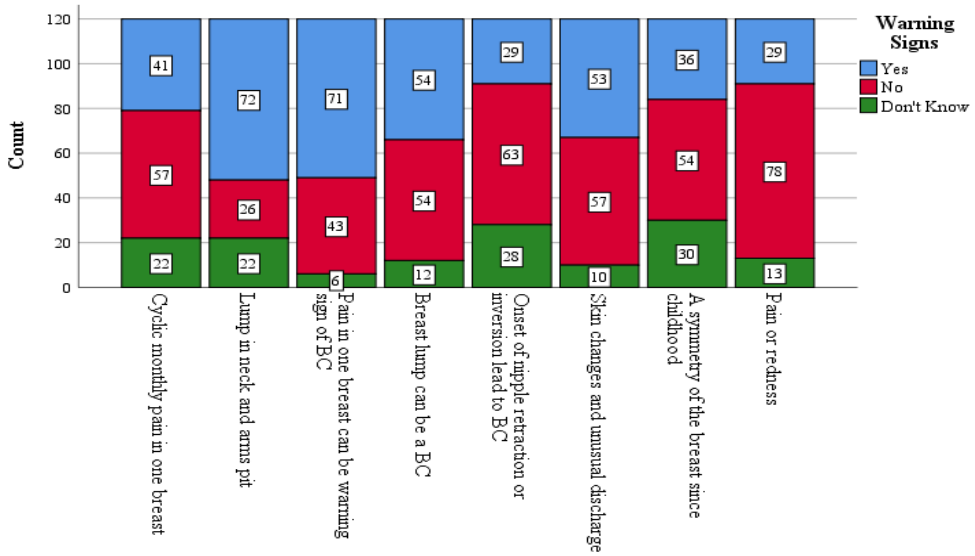


Figure 5 Legends: 60% of the study participants responded (yes) on items regarding lump in neck and arms pit as sign of BC; 59.2% responded (yes) to report that pain in one breast can be a warning sign of breast cancer, 45% responded (yes) and the item regarding breast lump as a sign of breast cancer. However, 24.2% participants said (yes) and agree that a pain or redness of breast can lead to BC. Forty-four (44%) of the participants tend to think (yes) that there is relationship between the skin changes of breast and unusual discharge with the breast cancer. Out of 120, 34.2% responded (yes) that cyclic pain in one breast is also connected with the cancer; 30% responded (yes) that they were uncertain about the asymmetry of the breast since childhood could be a cause for breast cancer while 24.2% responded (yes) about the onset of nipple retraction or inversion could be a warning sign of the breast cancer.

Risk Factor of Breast Cancer (N=120)

Figure 6

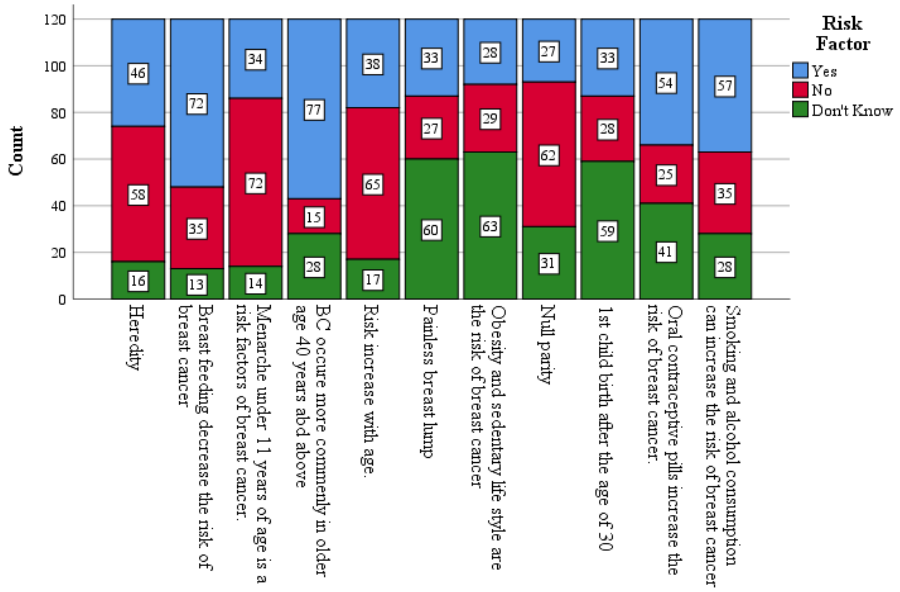


Figure 6 Legends: It displays results about the risk factors of the breast cancer. Out of 120 students, 38.3% responded (yes) on "heredity/family history is the risk of the breast cancer in the family"; 31.7% responded (yes) on "the risk of developing cancer increases with the age", while 60% responded (yes) on "breast cancer risk reduces with the breast feeding". On the other hand, only 23% of the participants responded (yes) on "relationship of the Null parity increases the risk of breast cancer"; 28% responded (yes) on risk of the breast cancer increases whenever menarche occurs less than 11 years"; 45% participants responded (yes) on "oral contraceptive increases risk of breast cancer" and 47.5% participants responded (yes) to mean that there is "correlation of the smoking and alcohol consumption in breast cancer".

Treatment of Breast Cancer (N=120)

Figure 7

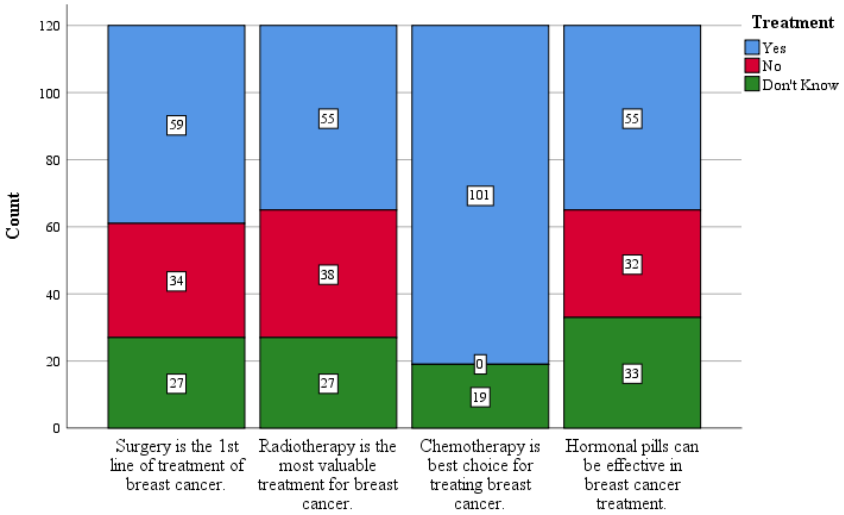


Figure 7 Legends: 84% participants responded(yes) on "chemotherapy as the best treatment for the breast cancer"; 49.2% participants responded (yes) on "surgery as the 1st line of treatment for this breast cancer"; 45% participants responded response (yes) on "radiotherapy as the valuable treatment"; and 45.8% participants responded (yes) on "cancer could be cured by the hormonal pills".

Screening Method of breast cancer (N=120) Figure 8

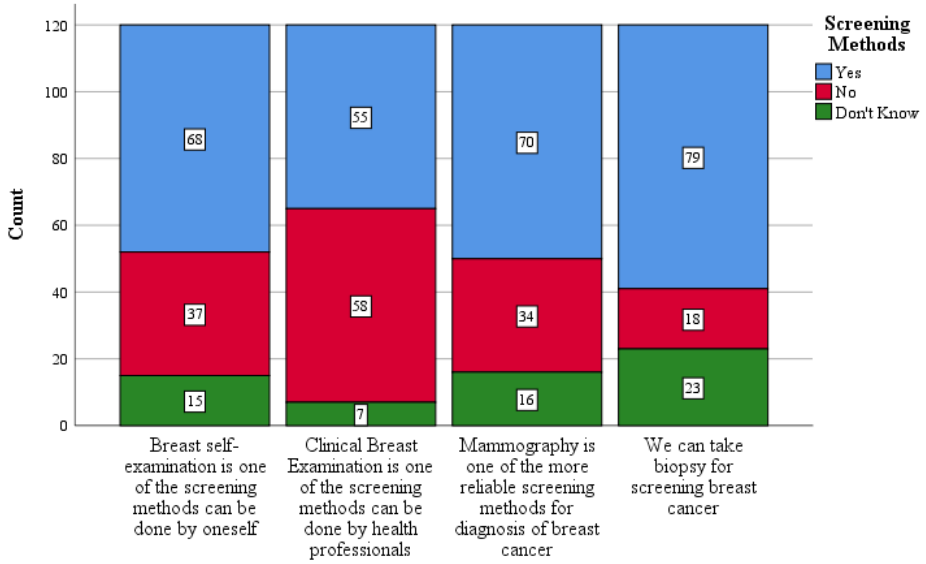


Figure 8 Legends: It exhibits participants' awareness of the screening methods : 56.7% participants responded (yes) on " breast self-examination is one of the screening methods can be done by self"; 45.8% participants responded (yes) about "the clinical breast examination is one of the screening methods can be done by health professionals"; 58.3% participants responded (yes) on "mammography is one of the reliable screening method for diagnosis of breast cancer; and 65.8% participants responded (yes) that " we can take biopsy for screening of breast cancer".

Breast Self-Examination (N=120)

Figure 9

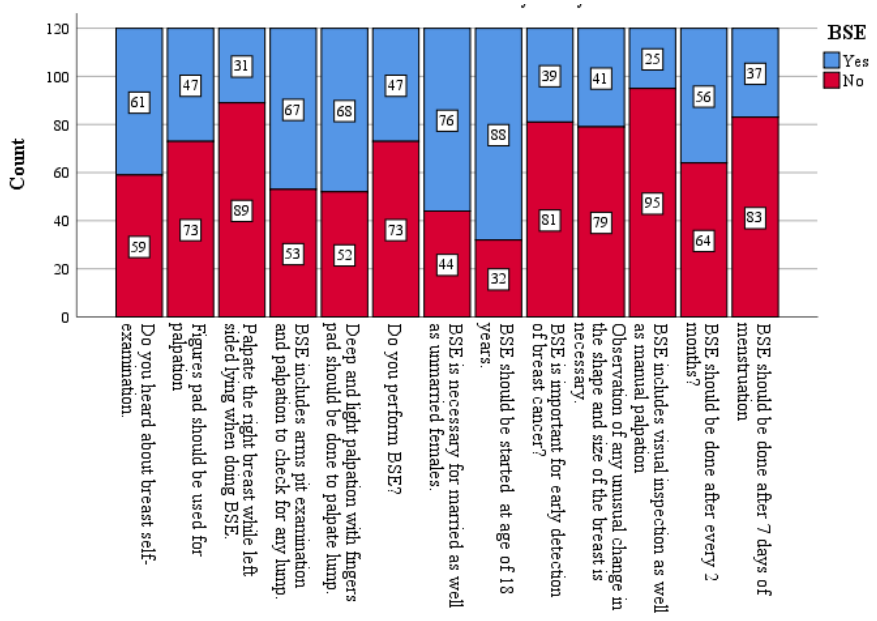


Figure 9 Legends: 50.8% participants responded (yes) "they have heard about BSE; 39.2% participants responded (yes) that "fingers pad should be used for palpation"; 57.5% responded (yes) that "BSE should start at the age of 18; 32.5% participants responded (yes) " BSE is extremely important for the early detection of breast cancer."; 56.7% participants responded (yes) that " BSE includes arms pit examination and palpation to check for any lump". However, 32% participants responded (yes) that "BSE should start from the age of 18)".

After educational intervention (N=120)

The knowledge of the participants about the breast cancer and breast self-examination was evaluated soon after the workshop with the same questions given in the pretest. The findings of the study are presented in graph with frequency of the responses and the percentages of the results are discussed under the graph.

Knowledge about the warning signs of breast cancer (N=120)

Figure 10

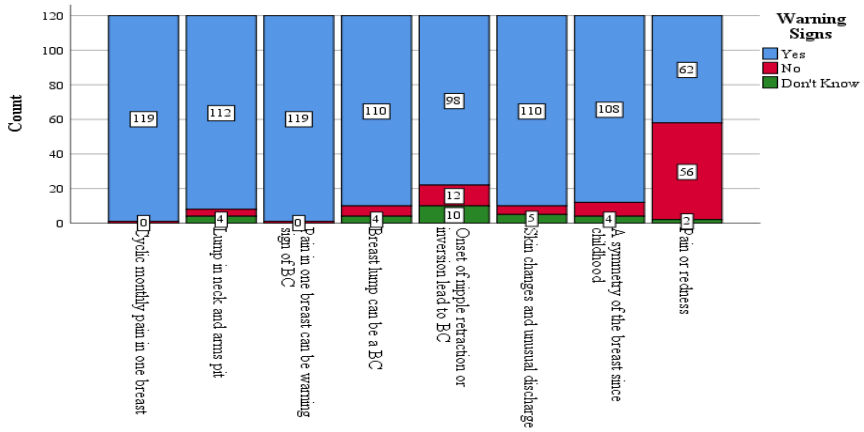


Figure 10 Legends: The graph 4.6.1 represents the participants' knowledge of the warning signs of the breast cancer after attending the workshop. The figure shows that most of the participants benefitted from the educational session as 93% participants responded (yes) that "lump in neck and arm pit is warning sign of the breast cancer"; 99.2% participants responded (yes) that "the pain in one breast could lead to the breast cancer"; 91.7% participants responded (yes) that "the skin change as well as unusual discharge is the warning sign of breast cancer" and 91.7% participants responded (yes) that "breast lump could be breast cancer". This workshop had also removed the misconceptions of the participants about cancer. Out of 120 participants, 99.2% responded (yes) that "cyclic monthly pain in one breast during the period is sign for cancer"; 81.7% participants responded (yes) that "the onset of nipple retraction or inversion can lead to breast cancer"; and 90% participants responded (yes) that "asymmetry of the breast is a sign for breast cancer.

Knowledge about the risk factors of breast cancer (N=120):

After the workshop the students were able to provide maximum information about the risk factors of the disease. The following graphs are the illustrations of the participants' changing attitude toward the risk factors of breast cancer.

Figure 11

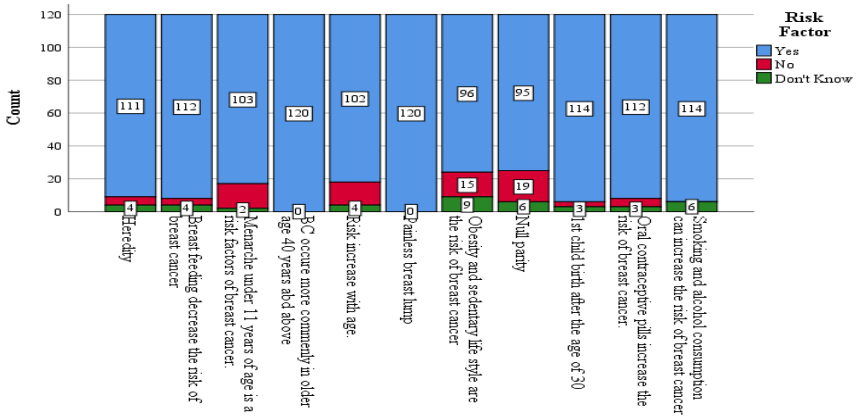


Figure 11 Legends: It is observed that 92.5% participants responded (yes) on "heredity is a risk factor for breast cancer"; 85.8 % participants responded (yes) that "menarche under the age of 11 could also be a risk for breast cancer"; "" breast cancer chances increase by the age of 40"; 100% participants responded (yes) that "painless breast lump could lead the breast cancer". Participants responded (yes) indicating that "Null parity, obesity, and smoking are also increasing risk factors for breast cancer" (80%, 95%, and 95% respectively). Similarly, 93% participants responded (yes) that "1st child birth after 30" is a risk factor; 93.3% participants responded (yes) that "oral contraceptive pills had effect on the breast cancer"; and 93.3% participants responded (yes) that "breast feeding decreases the risk of breast cancer".

Knowledge about the treatment of Breast Cancer (N=120)

Figure 12

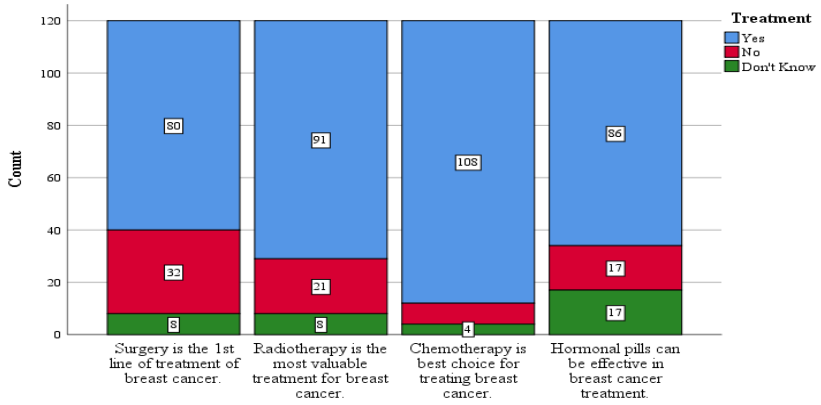


Figure 12 Legends: As according to the graph 4.6.3, 66.7 % participants responded (yes) that "surgery is the 1st line of treatment"; 79.2% participants responded (yes) that "radiotherapy is the most valuable treatment of breast cancer"; 90% participants responded (yes) that "chemotherapy is the best choice for treating breast cancer" while 71% participants responded (yes) that "hormones can be effective in cancer treatment.

Knowledge about the screening methods of breast cancer (N=120) Figure 13

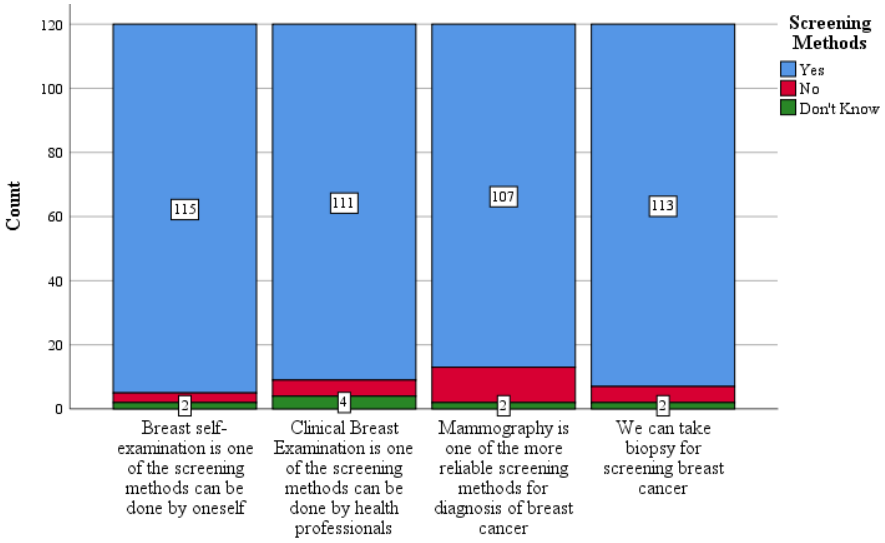


Figure 13 Legends: According to the graph 4.6.4, 95.8% participants responded (yes) that "breast self-examination is one of the screening methods, can be done by one self". The next priority is given to the biopsy: 94.2% participants responded (yes) that "we can take biopsy for screening breast cancer"; 92.5% participants

responded (yes) that "it can be done by health care professionals"; and for 89.2% mammography is at the last priority "it is reliable screening method for diagnosis".

Knowledge about the Breast Self-Examination (N=120)

Figure 14

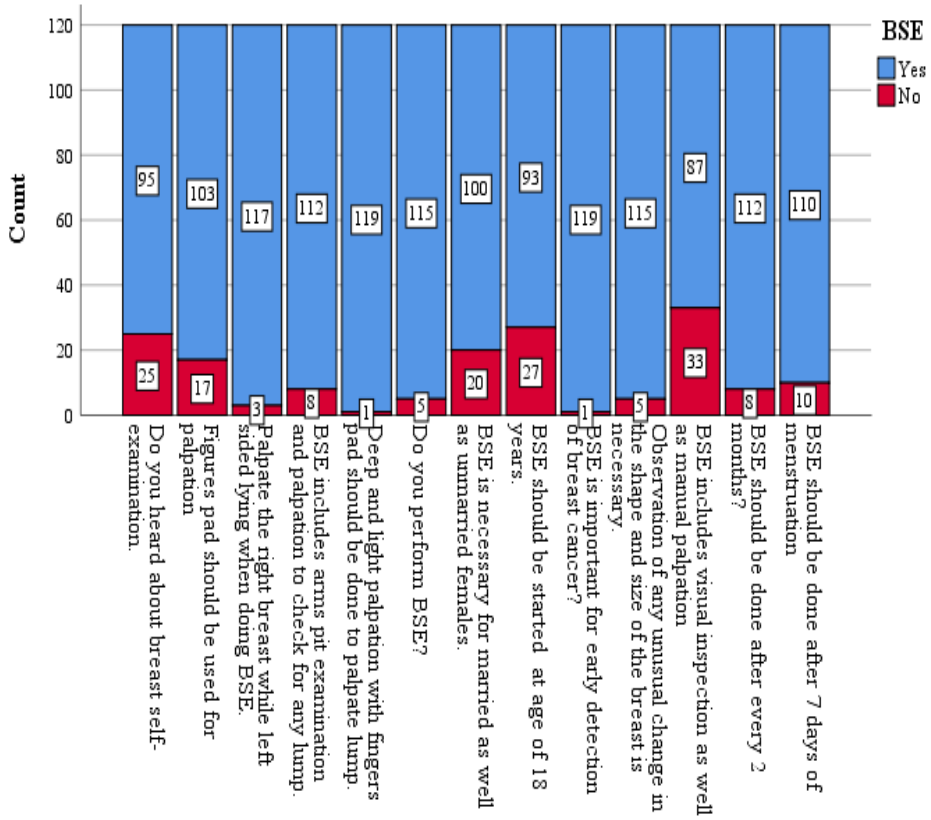


Figure 14 Legends: Graph 4.6.5 illustrates that after the workshop, 65% participants responded (yes) that "they started to perform BSE"; 99.2% participants responded (yes) that "BSE is importance for the early detection of cancer both for the married as well as unmarried females"; 93% participants responded (yes) that "it should be started at the age of 18 years". When asked about the self-examination, 95% participants responded (yes) that "they can be observed for changes in the size and the shape of breast"; 83% participants responded (yes) that "the process of palpation would be after 7 days of menstruation" and 93.3% participants responded (yes) that "it should be done after every 2 months".

About the process of palpation, 97.5% participants responded (yes) that "it should be done on the right breast while lying left side when doing BSE"; 85% participants responded (yes) that "finger pads should be used around the breast tissues for palpation"; 93.3% participants responded (yes) that "lumps should be examined under the arm pit and the breast tissues".

After Three Months of the Work Shop:

To assess the effectiveness of the planned educational program, data were taken after 03 months of the workshop. Upon examination of the data sample after 3 months it was found that there is variation in the results. These results are described in the tables that follow.

Knowledge about the Warning Signs of Breast Cancer (N=120)

Figure 15

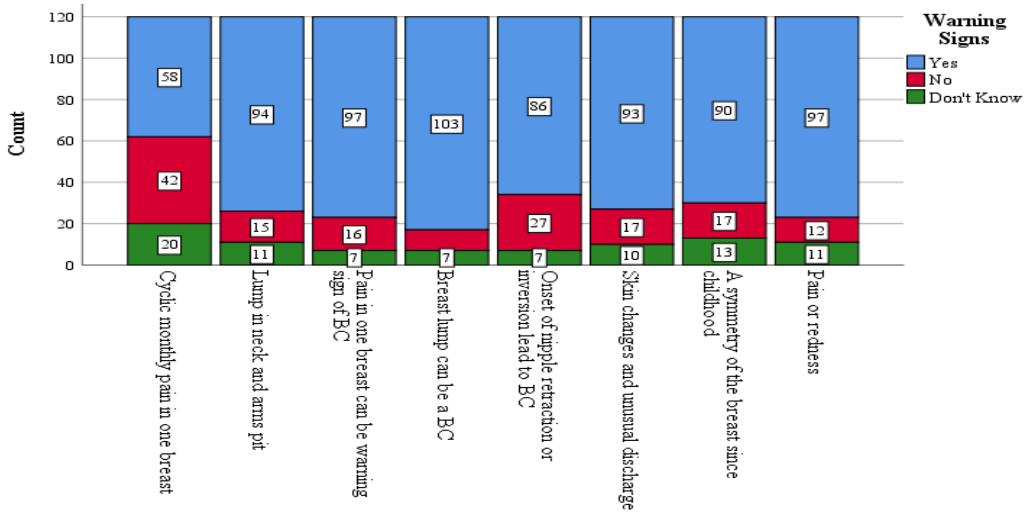


Figure 15 Legends: It shows the results of the data set after 3 months. It shows that 78.3% participants responded (yes) that "lump in neck and arm pit can be warning sign of breast cancer" 80.8% participants responded (yes) that " pain in one breast can be a warning sign of breast cancer"; 85.8% participants responded (yes) that "breast lump is breast cancer"; 80.8% participants responded (yes) that "the pain and redness of the breast is the warning sign of breast cancer". Out of 120, 77.5% participants responded (yes) that "skin change and unusual discharge as alarming situation about the breast cancer"; 48.3% participants responded (yes) that "the cyclic monthly pain in one breast can be a warning sign of BC"; 75% participants responded (yes) that "asymmetry of the breast can be a sign of the breast cancer"; and 71.7% participant responded (yes) that " the onset of nipple retraction or inversion is the warning sign of breast cancer.

Knowledge about the Risk Factors of Breast Cancer (N=120)

Figure 16

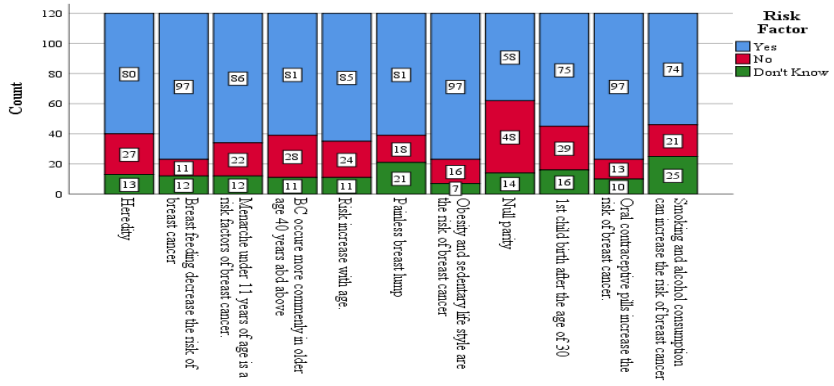


Figure 16 Legends: It represents the data of the risk factors of breast cancer, 66.7% participant responded (yes) that "hereditary is a factor for the breast cancer"; 71% participant responded (yes) that "the BC risk factor increases with the age of females"; 67% participants responded (yes) that "painless breast lump is an alarming about the risk factor of the breast cancer"; 71% participants responded (yes) that "the obesity and sedentary life as a cause for the breast cancer"; 62% participant were responded (yes) that smoking was the risk factor, and

48.3% participants responded (yes) that "null parity as a risk factor leading to breast cancer. Out of 120, 80% participant responded (yes) that "breast feeding decreases the risk of the breast cancer"; 68% participant responded (no) that "1st child birth after age of 30 is not a risk factor for the cancer"; and 80.8% participants responded (yes) that "Oral contraceptive pills had effect on the breast cancer".

Knowledge about the Treatment of Breast Cancer (N=120):

Figure 17

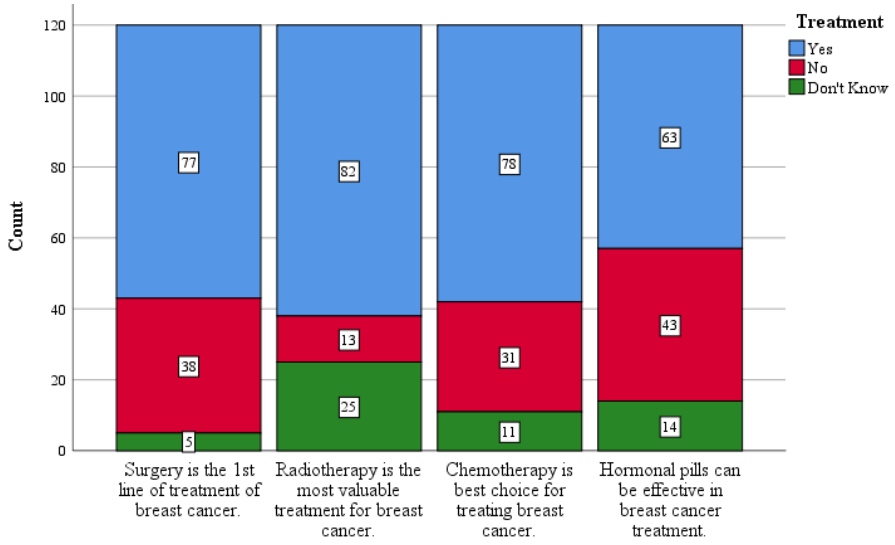


Figure 17 Legends: It presents results of the Treatment (Survey 3) After 3 months. Overall, there is a change in knowledge about the treatment of the breast cancer. It shows that 64.2 % participant responded(yes) that "surgery is the 1st line of treatment of BC"; 68.3% Radiotherapy is the most valuable treatment 68.3% participant were responded (yes) and 65% participants responded (yes) that "chemotherapy is the best choice of treatment"; and 52% participants responded (yes) that "hormonal pills can be effective on breast cancer treatment.

Knowledge about the Screening Method of Breast Cancer (N=120)

Figure 18

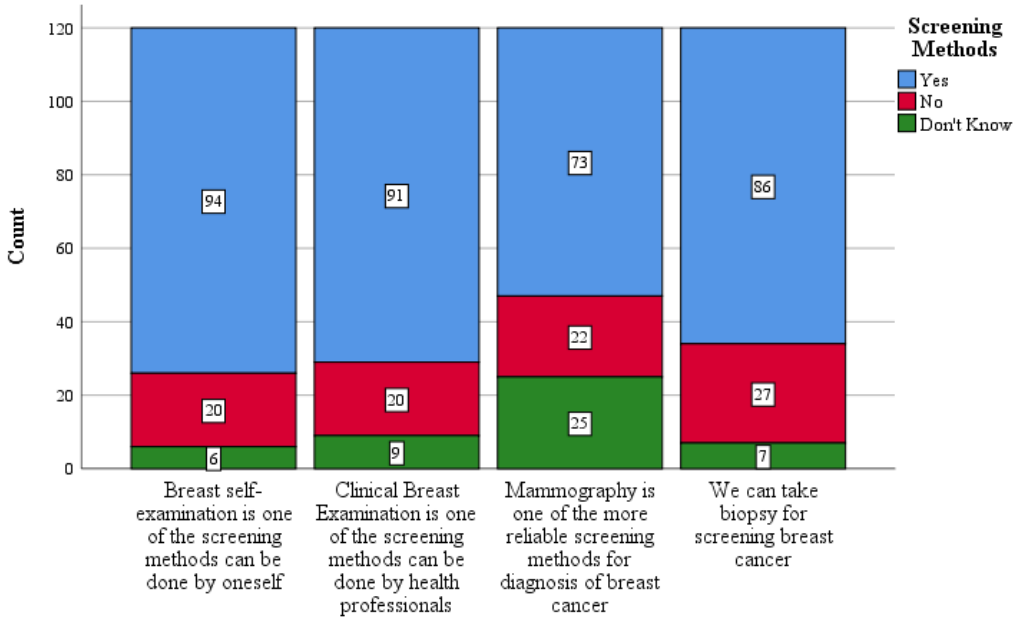


Figure 18 Legends: represents findings about the knowledge of screening methods after three months: 78.3% participants had retained their response (yes) about "the Breast Self-Examination is one of the screening methods

can be done by one self" whereas 75.8% participants retained response (yes) on "the clinical breast examination is one of the screening method can be done by health professionals"; 60.8% participants responded (yes) that "Mammography as the reliable screening method for diagnosis"; and 71.7% participants responded (yes) that "we can take biopsy for diagnosis". It indicates that the participants were well aware of the methods for diagnosis of breast cancer even after three months of the educational intervention.

Knowledge about the Breast Self-Examination (Survey 3) Figure 19

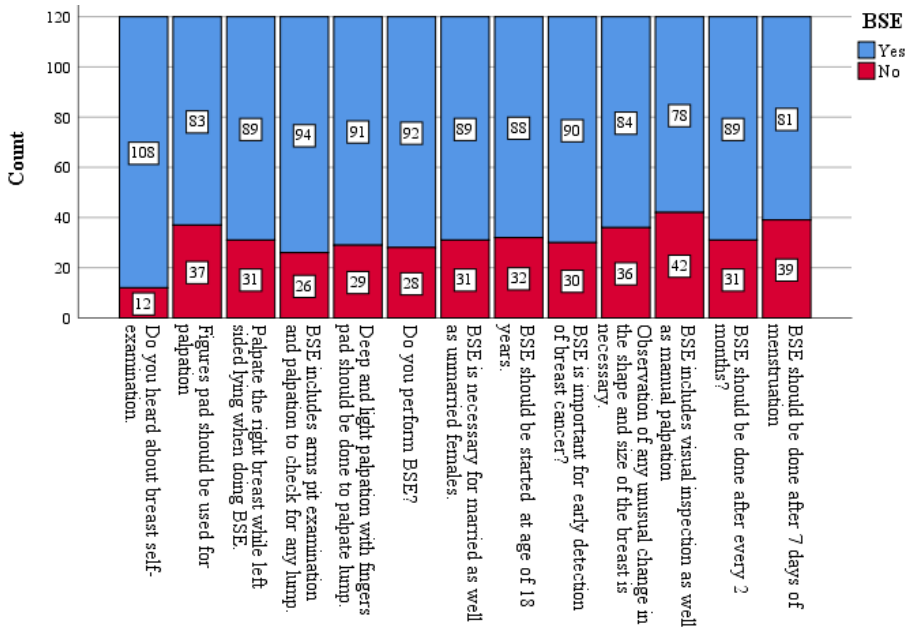


Figure 19 Legends: Upon examining the breast self-examination after 3 months, the following results are obtained. According to graph 4.7.5, 78% participants responded (yes) that "BSE should be start at the age of 18"; 75% participants responded (yes) that "BSE is extremely important for the early detection of breast cancer"; 69.2% participants responded (yes) that" fingers pad should be used for palpation"; 78.3% participants responded (yes) that "BSE includes arms pit examination and palpation to check for any lump"; 68 % participants responded (yes) that "BSE should be done after 7 days of menstruation"; and 74.2% participants responded (yes) that " BSE should be done after 2 month"s. Overall, results show that participants retained the information about BSE.

Repeated Measure ANOVA

Table 1

Questionnaire	Pre-test	Post-test	Post-test after 3 months	F-value	df (n_1.n_2)	p-value
BC&BSE awareness	17.58±9.50[a]	35.17±5.26[b]	28.57±6.50[c]	99.30	2,118	<.001

Note. Means with different letters are statistically significant different at 0.05 levels

Table 1 Legends: Summary of Repeated measure ANOVA: Difference in pre-test, post-test and post-test after 3 months of intervention

To determine the effect of the educational intervention, repeated Measure ANOVA was conducted. Results of the analysis show that there was significant difference in BC and BSE awareness on pre-test, post-test and post-test after 3 months: F (2,118) =99.30, p<.001). Post hoc Tukey test was employed to see pair-wise difference. Results show that mean scores of pre-tests (M±SD=17.58±9.50) were lower than the mean scores of post-tests (M±SD=35.17±5.26) and mean scores of post-tests after 3 Months (M±SD=28.570±6.50). The mean scores of post-tests (M±SD=35.17±5.26) were higher than the mean scores of post-tests after 3 Months (M±SD=28.570±6.50).

Difference in pre-test, post-test and post-test after 3 months of intervention

Figure 20

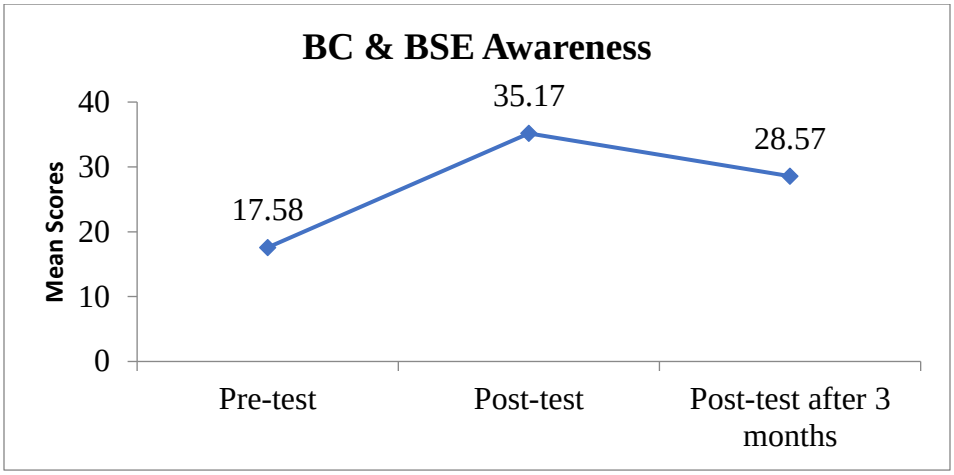


Table 2

	Pre-test	Post-test	Post-test after 3 months	F-value	df ($n_1.n_2$)	p-value
1. Warning Signs of Breast Cancer (WSBS).	3.21±1.76[a]	6.78±1.42[b]	5.98±1.24[b]	190.07	2,118	<.001
2.Risk Factors (RF)	4.16±2.53[a]	9.99±1.17[b]	7.59±1.59[c]	299.88	2,118	<.001
3.Treatment of Breast Cancer (TBC)	2.25±1.13[a]	3.04±0.92[a]	2.50±1.05[c]	18.31	2,118	<.001
4.Screening Methods (SM)	2.27±1.16[a]	3.72±0.49[b]	2.87±0.82[c]	84.95	2,118	<.001
5. Breast Self-Examination (BSE).	5.69±2.92	11.64±1.26	9.63±1.80	247.63	2,118	<.001

Note. Means with different letters are statistically significant different at 0.05 levels

Table 2 Legends: . Summary of Repeated measure ANOVA: difference in pre-test, post-test and post-test after 3 months of intervention with five attributes

Warning Signs of Breast Cancer

Results of the analysis in Table 2 show that there was significant difference in Warning Signs of Breast Cancer (WSBS) on pre-test, post-test and post-test after 3 months: F (2,118) =190.07, p<.001). Post hoc test was conducted to find pair- wise difference. Results show that mean scores of pre-tests (M±SD=3.21±1.76) were lower than the mean scores of post-tests (M±SD=6.78±1.42) and mean scores of post-tests after 3 Months (M±SD=5.98±1.24). The mean scores of post-tests (M±SD=6.78±1.42)) were higher than the mean scores of post-tests after 3 Months (4.35±1.04).

Risk Factors

Results of the analysis in Table 2 show that there was statistically significant difference in Risk Factors (RF) on pre-test, post-test and post-test after 3 months: F (2,118) =299.88, p<.001). Post hoc test was conducted to find pair- wise difference. Results show that mean scores of pre-tests (M±SD=4.16±2.53[a]) were lower than mean scores of post-tests (M±SD=9.99±1.17) and mean scores of post-tests after 3 Months (M±SD=7.59±1.59). The mean scores of post-tests (M±SD=9.99±1.17) were higher than mean scores of post-tests after 3 Months (M±SD=7.59±1.59).

Treat of Breast Cancer

Results of the analysis in Table 2 show that there was significant difference in treatment of breast cancer (TBC) on pre-test, post-test and post-test after 3 months: F (2,118) =18.31, p<.001).

Screening Methods

Results of analysis in Table 2 show that there was significant difference in Screening Methods (SM) on pre-test, post-test and post-test after 3 months: F (2,118) =84.95, p<.001). Post hoc test was conducted to find pair- wise difference. Results show that mean scores of pre-tests (M±SD=2.27±1.16[a]) were lower than mean scores of post-tests (M±SD=3.72±0.49) and mean scores of post-tests after 3 Months (M±SD=2.87±0.82). The mean scores of post-tests (M±SD=3.722±0.49) were higher than mean scores of post-tests after 3 Months (M±SD=2.87±0.82).

Breast Self- Examination

Results of the analysis shows that there was significant difference in Breast Self-Examination (BSE). on pre-test, post-test and post-test after 3 months: F (2,118) =247.63, p<.001). Post hoc test was conducted to see pair- wise difference. Results show that mean scores of pre-tests (M±SD=5.69±2.92) were lower than mean scores of post-tests (M±SD=10.94±1.18) and mean scores of post-tests after 3 Months (M±SD=9.26±1.69). The mean scores of post-tests (M±SD=11.64±1.26) were higher than mean scores of post-tests after 3 Months (M±SD=9.63±1.80).

Difference in pre-test, post-test and post-test after 3 months of intervention with five attributes

Figure 21

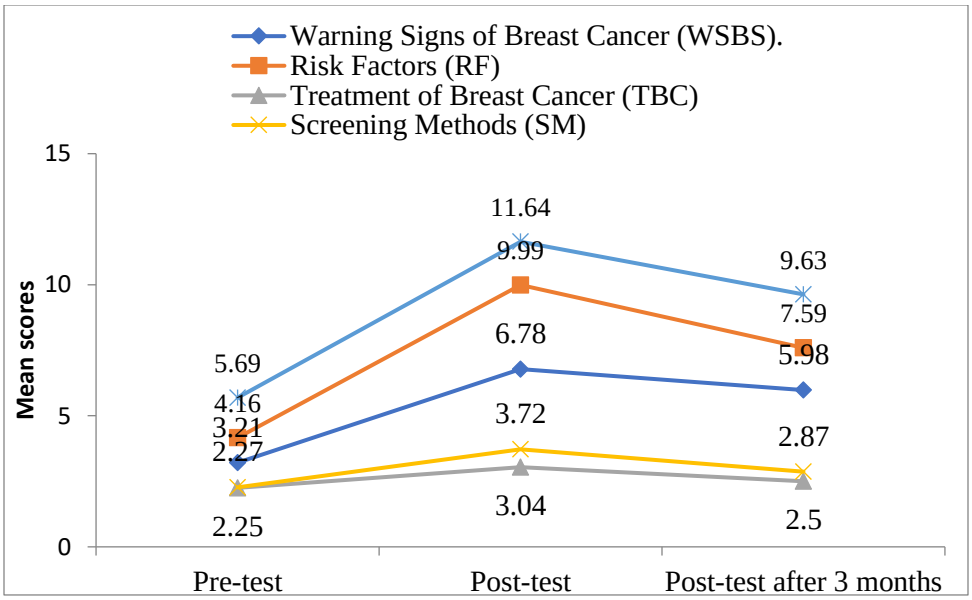


Figure 21 Legend: Results of the analysis show that there was significant difference in BC and BSE awareness on pre-test, post-test and post-test after 3 months: F (2,118) =99.30, p<.001). Post hoc Tukey test was conducted to see pair -wise difference. Results show that mean scores of pre-tests (M±SD=17.58±9.50) were lower than mean scores of post-tests (M±SD=35.17±5.26) and mean scores of post-tests after 3 Months (M±SD=28.570±6.50). The mean scores of post-tests (M±SD=35.17±5.26) were higher than mean scores of post-tests after 3 Months (M±SD=28.570±6.50).

Discussion

The main objective of the study was to determine the effectiveness of planned teaching program for degree college female students on BSE and Breast Cancer (before and after training session spanned over 03 months). The

independent variable of the study was educational intervention (41 items) and the dependent variable was knowledge level. The educational intervention consisted of the knowledge about the warning signs, risk factor, treatment, screening methods and BSE. The pre-intervention, post and 03 months after post-test knowledge were assessed with the scaled items of three response options: Yes, No, don't know. With regard to socio-demographic characteristics of the participants, the findings of the present study revealed that 85% of the participants were between the age of 18 to 25 and 15% female participants were above 25 years. As for the marital status of the participants, only 8 (6.7%) respondents were married and 112 (93.3%) were un-married. Data on the family history of breast cancer (BC) showed that 88.3% of the participants had no family history of breast cancer.

BC and BSE awareness educational program has statistically significant positive effect on female college student's knowledge soon after the intervention. Results of analysis showed that there was significant difference in BC and BSE awareness on pre-test, post-test and post-test after 3 months: F (2,118) =99.30, p<.001). The mean score of the pre-test (M±SD=17.58±9.50) was lower than mean score of the post-tests (M±SD=35.17±5.26). So, H1 is accepted as the post knowledge test has shown statistically significant improvement. The difference between the pre-test and post-test mean scores was significant (M±SD 60.0855 +8.7558 77), (M±SD 8024+ 5.8228). The results of a quasi-experimental study conducted in India on BC awareness were statistically significant (*P* = 0.0001) (Nisha et al., 2020). Additionally, another randomized control trial on BC awareness revealed that the intervention group showed significant improvements in knowledge (*P*=0.01 and *P*=0.001, respectively) as compared to control group (Zonouzy et al., 2019).

The educational session was effective in improving knowledge of the participants regarding the Warning Sign of Brest Cancer (WSBC). WSBC consisted of 08 items. The results of analysis showed that there was statistically significant difference about knowledge of risk factors (RF) on pre-test, post-test: F (2,118) =299.88, p<.001). The finding of the current study was consistent with the study conducted in UAE that also reported significant difference (P value $\chi 2 < 0.001$) between the pre-test and post-test scores (Abduelkarem et al., 2015).

Treatment of Breast Cancer showed increased knowledge on post-test as compared to the pre-test after completing a BC and BSE awareness educational program. There was statistically significant improvement when compared to the pre-test the mean scores of pre-tests (M±SD=2.27±1.16[a]) were lower than mean scores of the post-tests (M±SD=3.72±0.49. The results were statistically significant as pretest mean score was (M±SD 2.70 ± 1.331 38) and posttest was (M±SD 57 5.60 ± 1.224 80) in the area of risk factors and signs and symptoms (Chacko and Science, 2016). **Screening Method** (SM) of breast cancer, the educational intervention also worked well as participants demonstrated good knowledge on posttest as compared to the pretest. Results of the analysis indicated that there was significant difference in Screening Methods (SM) on pre-test, post-test F (2,118) =84.95, p<.001). Results showed that mean scores of pre-tests (M±SD=2.27±1.16[a]) were lower than mean scores of the post-tests (M±SD=3.72±0.49). A comparable finding was also presented by a study with quasi-experimental design on awareness of BC. This research found a statistically significant difference in pretest and post-test. "**Breast Self-Examination**" results showed statistically significant difference in Breast Self-Examination (BSE) knowledge on pre-test, post-test F (2,118) =247.63, p<.001). Mean scores of pre-tests (M±SD=5.69±2.92) were lower than mean scores of the post-tests (M±SD=10.94±1.18). our findings are similar to a randomized controlled trial conducted in Malaysia which presented statistically significant increase in knowledge in the experimental group ($p<0.001$) as compared to the control group (*Yong N.T., Soon L.K 2017).*

BC and BSE awareness educational program has statistically significant positive effect on Female college student's knowledge after 03 months of intervention. The result was in line with the study conducted with university students on the impact of BC interventional program. The analysis of the post test revealed that participants in the interventional group had significant improvement in knowledge of BC and BSE as compared to the participants in the control group (Arwa Alsaraireh et al, 2017).

Conclusion:

The results of this study demonstrated that there was statistically significant difference between pre- and post-knowledge scores as the post-test knowledge score. The higher score indicates that educational intervention has

an affirmative effect on knowledge. Thus, findings of the current study stressed that health education can bring about significant changes in health-related behaviors. We have also seen that formal education does not contribute much in health-related awareness. Exposure to the health-related information enhances awareness and encourages healthy practices. **Recommendations**

There should be local training program with unified knowledge of BC and BSE with rational measures for all secondary and higher secondary girls' schools. The study has found that educational interventions can promote cancer awareness over the short time periods, so, it is necessary to educate the population at regular intervals

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