



African Journal of Biological Sciences



Research Paper

Open Access

Improving Breast Cancer Preventive Behaviour among Female Nursing Students: An Intervention Study

Samar Gamal Mohamed¹, Hend Salah Eldin Mohamed², Amany S. Badawy³, Nabila Salem Mohamed⁴, Hanan morsy Salim⁵

- 1- Master Degree in Nursing Science faculty of Nursing Zagazig University.
- 2- Professor of Obstetrics & Gynecological Nursing, Faculty of Nursing, Zagazig university.
- 3- Professor Of Obstetrics & Gynecological Nursing, Faculty of Nursing ,Zagazig university, Faculty of Nursing October 6 university.
- 4- Assist Professor Of Obstetrics & Gynecological Nursing, Faculty of Nursing ,Zagazig university.
- 5- Assist Professor Of Obstetrics & Gynecological Nursing, Faculty of Nursing ,Zagazig university

Email: aassahmad716@gmail.com, samargamal@ninst.zu.edu.eg

Article History

Volume 6, Issue 2,

Received: 15 July 2024

Accepted: 5 August 2024

Published: 6 August 2024

doi:

10.48047/AFJBS.6.2.2024.2042-2053

Abstract: Background: Breast cancer is the most prevalent cancer among females all over the world. Breast self-examination (BSE), mammography, and clinical breast examination are screening methods used to detect breast cancer early. **Aim of the study:** the aim of this study was to improve breast cancer preventive behaviour among female nursing students. **Subjects and Methods: Research Design:** Aquazi -experimental design with pre/ post assessment was used in the current study. **Setting :** The study was conducted at Technical Nursing Institute at Zagazig University, Zagazig city at Elsharkia Governorate . **Subjects:** the data was collected from 180 female students during the academic year 2022-2023. **Tools of data collection:** three types of tools were used for data collection (1) An interview questionnaire (2) student's Knowledge regarding breast cancer and breast self-examination, (3) Breast self-examination observational check list. **Results:** revealed that The mean age of students was 18.63 ± 0.723 years old, there was highly statistically significant difference of studied female student's knowledge regarding breast self-examination between pre/ post-intervention ($P = 0.000^{**}$), while there was no statistically significant difference between post/ follow up intervention ($P > 0.05$). the present study demonstrated that (20.6%) of studied female students had good knowledge about breast cancer at pre intervention phase, while this percentage increased to 88.3% & 80.0% respectively, at post and follow up intervention. . Concerning level of total practice, 93.3 % of female students showed unsatisfactory level of practice pre-program compared to 91.7 %, 78.3% of them have satisfactory level of practice immediately post intervention and one month post program respectively. **Conclusion:** The results of present study supported the research hypothesis that there is marked an improvement in knowledge, practice toward breast cancer compared to before applying educational intervention. **Recommendations:** Continuing breast cancer preventive program for students to improve their knowledge. Several instructional handout & brochures should be distributed to female students containing preventive measures of BC & steps of BSE

Keywords: Breast self-examination, Breast cancer knowledge, practice, students

Introduction

Breast cancer (BC) is the most repeatedly detected cancer in females globally, with around 2.3 million cases diagnosed in 2020⁽¹⁾. At the end of 2020, the data showed that about 7.8 million females with breast cancer were newly reported during the last five years, making it the world's most prevalent cancer⁽²⁾.

Breast cancer is a malignancy in the breast that originates from glandular cells, glandular ducts, and breast supporting tissue but not breast skin. Cancer cells can arise when a genetic mutation has occurred due to DNA damage in normal cells. Breast cancer causes lumps in the breast and menstrual pain⁽³⁾.

Breast self-examination is a breast cancer detection method used when mammography is not available in rural or urban areas far from health facilities. Women who do BSE every month can detect lumps at an early stage. BSE checks for normal breast shape and looks for changes in breast size or shape, lumps, skin, fluid and abnormal pain⁽⁴⁾. BSE is the only method that detects abnormalities at an early stage. The advantages of using the BSE method are economical, easy to do, can be done independently and does not require special equipment⁽⁵⁾.

Significance of the Study:

Early detection of a breast abnormality is critical for treating breast cancer and reducing morbidity and death associated with the disease. But, between different age groups, there is a significant discrepancy in perceptions of the risk and benefit of the breast self-examination technique. Student's perceptions of breast cancer risk and their link with the breast self-examination (BSE) were found to be unrelated. This could be because students are aware that the risk of breast cancer increases with age, but young female may not realize they are at danger until they are older. As a result, they do not believe it is necessary to exercise BSE on a regular basis⁽⁶⁾.

Breast cancer has been considered a significant health problem among females because of its high incidence in recent years. Breast cancer screening methods was the most critical behaviors for early diagnosis of breast cancer. 95% of all breast cancers can be diagnosed in the primary stage by BSE. Unfortunately, despite the relative benefits of regular BSE, few female examine themselves. Hence, the researcher decided to perform the study to improve breast cancer preventive behavior among nursing students.

Aim of the study:

The aim of the study was:

Improve breast cancer preventive behaviour among female nursing students

Research Hypothesis:

After implementation of the educational intervention the female students' knowledge, and practices about preventive behavior of breast cancer was improved.

Subjects and Methods:

Research design:

A quazi -experimental design was used in this study

.Study Setting:

The study was conducted at Technical Nursing Institute at Zagazig University, Zagazig city at Elsharkia Governorate

Study Subjects:

A purposive sample was conducted on 180 female students. The sample size was calculated through Assuming; percent of participant' good knowledge level was 38% at pre intervention phase. percent of participant' good knowledge level was 64% at post intervention phase. confidence level is 99% with power of study 99%. Sample size calculated using EPI INFO version 6.04, is 180 participant.

Inclusion criteria

- 1- All female students who have agreed to participate in the program.

2- Female students age 18 years and above.

Tool for data collection:

In order to fulfill the objectives of the study three tools were used to collect necessary data:

Tool 1: Structured Interviewing questionnaire : It was consisted of three part :

Part(1):Socio-demographic characteristics of female students : it was include student's age, place of residence, father& mother educational level and marital status

Part(2):Mensterual history of female students: that included age of menarch, regularity of menses, complain of any breast symptoms related to mensteruation t premarital

Part (3): Medical and family history of female students: such ashaving chronic disease, take hormonal therapy, family history of breast cancer

Tool II: student's Knowledge regarding breast cancer and breast self-examination Knowledge scoring

It consisted of (22) items of closed-ended questions such as risk factors of breast cancer, types of breast cancer, methods of BC treatment, Importance of BSE, time of BSE, age of beginning BSE

Knowledge scoring system: According to ⁽⁷⁾. each item was assigned a score of **(2)** for a complete correct , scored **(1)** if incomplete correct, and **(0)** if Incorrect or don't know.

- **Scored 75% or more** : Having good knowledge,

- **Scored 50%- <75%:**Having average knowledge.

- **Scored**

poor knowledge: **less than 50%-**

- Average : 60% to 75

- High : more than 75% to 100%

Tool III: Breast self-examinationobservational check list(pre/post educational program: A checklist was designed by the researcher to evaluate students' performance of breast self examination. This checklist consists of 9 practical steps. All steps were scored from (0-1). Each correct practical step was scored as one grades, each incorrect step was scored as zero. The total practical scores were 9 divided into two categories Scores $\geq 60\%$ referred to satisfactory practice, while scores less than 60% referred to unsatisfactory practice

Content Validity and Reliability:

Validity of the tools was tested for content validity by Jury of three experts one professor and other assistant professor obstetrics and gynecological nursing as well as one assistant professor in medical surgical health nursing

The reliability was done by Cronbach's Alpha coefficient test to ensure that three tools of data collection consisted of relatively homogenous items as indicated by the moderate to high reliability of each tool

Field work:

Data collection was within the period of eight months from the beginning October 2022 up to end of May 2023. . The researcher allocated three days weekly from 3 days per week on(Saturday , Sunday and Thursday from, 12 pm to 2 pmafter ending the practical sections).The average number which interviewed was 10-15 female student per day. The approximate time spent was around 30- 45 minutes according to response of students.

Moreover, an educational session was developed based on actual educational need assessment of the studied subjects to improve their knowledge and practice of breast self examination and health belief regarding Breast cancer. It was developed by researcher in the light of available researches and literature. It was written in simple Arabic language with attractive and colorful pictures and covers the relevant aspects of Breast cancer and preventive behaviour as well as practical aspects . The total number of sessions were (12-18) sessions.

Pilot study:

The pilot sample was applied on 10% of the study sample who selected from the previously mentioned study setting according to inclusion criteria. The purpose of the pilot study was to ascertain the feasibility of the tools, and to detect any problems peculiar to the statement as sequence and clarity. It also helped to estimate the time needed to complete the interview..

Administration and Ethical consideration:

The ethical issues were taken into consideration during all phases of the study. Firstly, the study approved by the pertinent authority of research ethics committee of the Faculty of Nursing at Zagazig University Then, approved was taken by the dean of Faculty of Nursing at Zagazig University .On the other hand, verbal agreement for participants was taken after fully explanation of the aim of the study. Participants was given the opportunity to refuse the participation, and they were notified that they could withdraw at any stage of the data collection interviews without giving any reason and with no consequences; also, they assured that information would be confidential and used for the purpose of the study only. The researcher assured maintaining anonymity and confidentiality of the subject's data

Statistical Analysis:

Data entry and statistical analysis were done by using the Statistical Package for Social Sciences (SPSS) version 26. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative .

Moreover, independent sample t test (T test): which was used when compare between the mean of two normally distributed independent groups. Chi square test (χ^2): used for the association (or relation) between the categories of two independent sample (row and column variable) to reflect real association between these 2 variables in the population. Pearson correlation (r): used to test the nature and strength relation between two quantitative / ordinal variable. For all statistical tests done, the threshold of significance was fixed at the 5% level (p-value) whereas the p-value is the degree of significance. The P-value was considered significant at 0.05, and the statistical significance was considered high at 0.001 while non-significant when p-value > 0.05.

Results:

Table (1) Distribution of studied sample according to their socio- demographic characteristics, shows that nearly one half (47.2%) of studied sample was 18 years old .with mean age **18.63±0.723** years old. More than three quarter of them (77.2%) lived in rural area. The highly percentage of studied sample (92.8%) was single. More than two fifth of father & mother educational level was secondary level & university level (41.7%, 41.7%, 42.8, 37.2%) respectively. the majority of studied sample (83.4%) had enough income per month. Nearly two third of students (66.1%) were in first academic year

Table (2) Distribution of studied sample regarding to their medical and family history, reveals that mean age of menarch among studied sample ,was **13.22±1.17**. Three quarter of studied sample (**75.6%**) have regular menstrual cycle every 28-34 days. **That last less than 7 days (90.6%)**. Only (12.8%) had breast symptoms related to menses in form of breast pain (87.0%). only (13.0%) of studied sample consult doctor for breast complain, two students of them was diagnosed with breast mass and removed surgically

Table (3)): Distribution of studied students regarding to their knowledge about breast cancer through the program phases indicated variations in female student's knowledge regarding breast cancer before intervention phase, where the pre/ post- intervention phase demonstrated a highly statistically significant improvement in above knowledge's items (p = .000**). While, there was no statistically significant difference between post/ follow up intervention (P > 0.05).

Figure (1): Distribution of studied students regarding their source of knowledge about breast cancer), shows that nearly one half (48.9%) of studied sample reported internet as the main source of knowledge about breast cancer and breast self examination.

Figure (3): Percentage distribution of studied students regarding their total knowledge level about breast cancer through the program phases .

demonstrated that (20.6%) of studied female students had good knowledge about breast cancer at pre intervention phase, while this percentage increased to 88.3% & 80.0% respectively, at post and follow up intervention.

Figure (4): Percentage distribution of studied students regarding their total practices about breast self-examination through the program phases. displays that, 6.7% of the studied female students had satisfactory performed of breast self-examination practices in pre intervention and this percentage was increased to 91.7 % at post intervention, while 78.3% at follow up intervention

Table (1): Distribution of studied sample according to their socio- demographic characteristics (N=180).

socio demographic characteristics	No	%
student's age		
18	85	47.2
19	72	40.0
20	21	11.7
21	2	1.1
Mean ±SD	18.63±0.723	
Residence		
Urban	41	22.8
Rural	139	77.2
Marital Status		
Single	167	92.8
Married	13	7.2
Father Education level		
Illiterate	14	7.8
Primary level	16	8.9
Secondary level	75	41.7
University or more	75	41.7
Mather Education level		
Illiterate	19	10.6
Primary level	17	9.4
Secondary level	77	42.8
University or more	67	37.2
Income Levelper month		
Enough"	150	83.3
Not enough	30	16.7
Academic year		
first grade	119	66.1
second grade	61	33.9

Table (2): Distribution of studied sample regarding their menstrual history (n=180).

Items	NO	%
Age of menarche		
≤11	11	6.2
12-14	147	81.1
>14	22	12.2
Mean ±SD	13.22±1.17	
cycle length		
Regular every 28-34 days	136	75.6
More frequent-less than 21days apart	10	5.6
Less frequent-more than 45 days apart	1	0.6
Irregular/unpredictable	33	18.3
Days your period last		
less than 7days	163	90.6
equal or more than7 days	17	9.4
Any breast symptoms related to menses		
No	157	87.2
Yes	23	12.8
Symptoms (n=23)		
breast pain	20	87.0
Breast mass	3	13.0
Consult a doctor for this breastsymptoms		
No	20	87.0
Yes	3	13.0
The diagnosis for breast problem(n=3)		
benign mass	2	66.7
breast abcess	1	33.3
The treatment prescribed		
surgical removal of breast mass	2	66.7
surgical intervention to remove breast abscess	1	33.3

Table (3): Distribution of studied students regarding to their knowledge about breast cancer through the program phases (N=180).

Breast cancer Knowledge items		Knowledge						X ² ₁	p-value	X ² ₂	p-value
		Pre - intervention		Immediate Post – intervention		Follow-up intervention					
		No	%	No	%	No	%				
Types of breast cancer	Incorrect	96	53.3	2	1.1	5	2.8	304.76	.000*	21.817	.000
	Incomplete	81	45.0	10	5.6	39	21.7				
	Correct	3	1.7	168	93.3	136	75.6				
The risk factors of breast cancer	Incorrect	58	32.2	4	2.2	6	3.3	243.02	.000*	1.710	.425
	Incomplete	113	62.8	20	11.1	27	15.0				
	Correct	9	5.0	156	86.7	147	81.7				
Symptoms of breast cancer	Incorrect	132	73.3	7	3.9	3	1.7	234.53	.000*	6.474	.039
	Incomplete	40	22.2	30	16.7	48	26.7				
	Correct	8	4.4	143	79.4	129	71.7				
The secondary factors for breast cancer exposure	Incorrect	58	32.2	4	2.2	6	3.3	243.02	.000*	1.710	.425
	Incomplete	113	62.8	20	11.1	27	15.0				
	Correct	9	5.0	156	86.7	147	81.7				
Breast cancer can be detected through	Incorrect	50	27.8	3	1.7	6	3.3	258.52	.000*	2.160	.340
	Incomplete	122	67.8	17	9.4	23	12.8				
	Correct	8	4.4	160	88.9	151	83.9				
Methods for breast cancer treatment	Incorrect	59	32.8	4	2.2	7	3.9	229.06	.000*	3.941	.139
	Incomplete	107	59.4	19	10.6	30	16.7				
	Correct	14	7.8	157	87.2	143	79.4				
Factors that determining the type of treatment	Incorrect	92	51.1	2	1.1	5	2.8	257.52	.000*	6.578	.037*
	Incomplete	86	47.8	29	16.1	46	25.6				
	Correct	2	1.1	149	82.8	129	71.7				

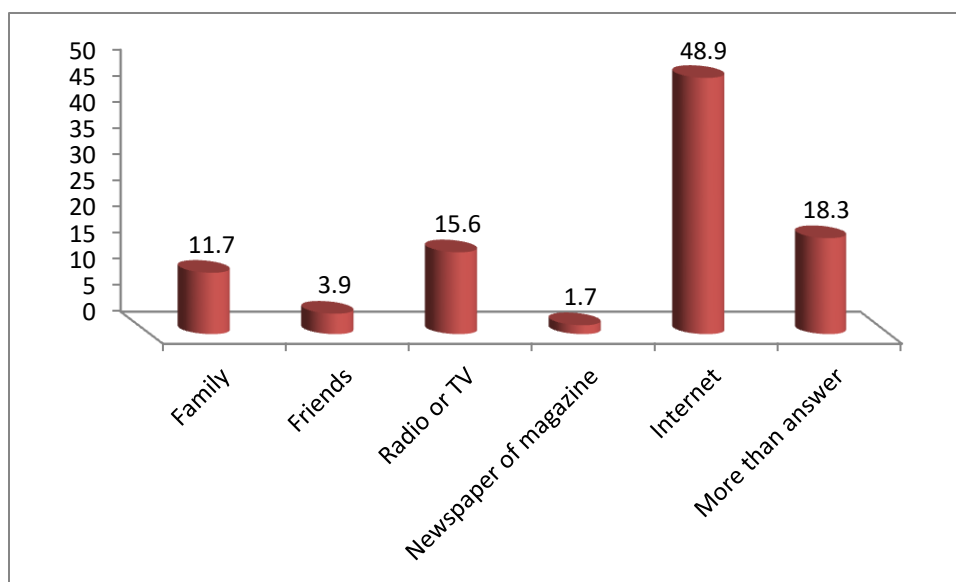


Figure (1): Distribution of studied students regarding their source of knowledge about breast cancer (n=180).

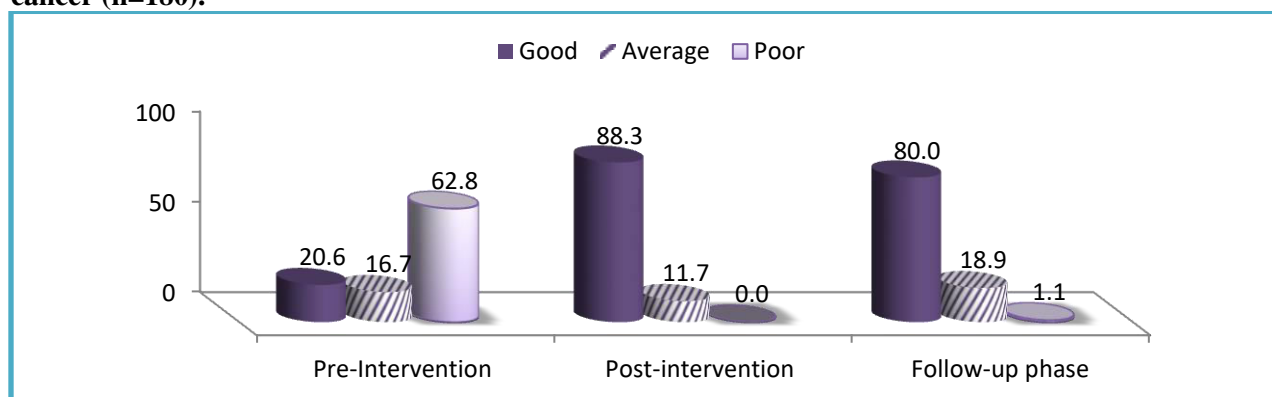


Figure (2): Percentage distribution of studied students regarding their total knowledge level about breast cancer through the program phases (n=180).

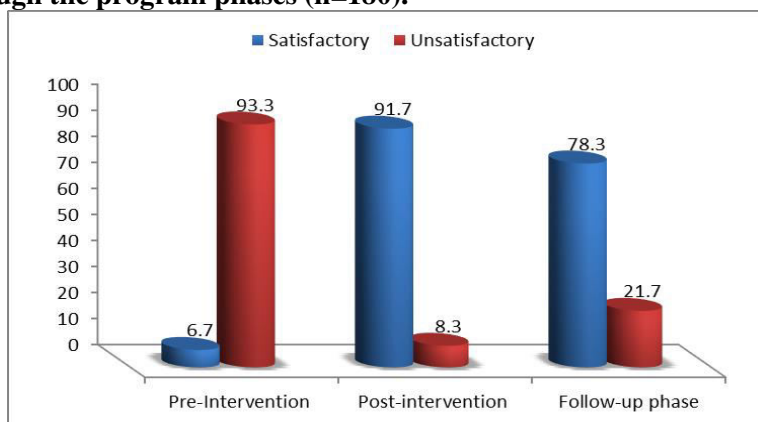


Figure (3): Percentage distribution of studied students regarding their total practices about breast self examination through the program phases (n=180).

Discussion:

Since breast cancer is difficult to prevent, it becomes increasingly important to find ways to detect it at an early stage, so it has been shown to improve patient mortality. One of the easiest and safest methods to recognize any breast abnormality is Breast self-examination (BSE), getting it essential for all females to be aware of it and to practice it regularly ⁽⁸⁾. Therefore, the aim of this study was to improve breast cancer preventive behaviour among female nursing students: an Intervention Study. This was achieved

through pre- assessment for female students knowledge, and practices of breast self-examination, design an educational session for those female students, and then implement and evaluate these educational sessions. The study findings indicated enhancement of the female student's knowledge and practices of breast self-examination after attending the educational sessions, which leads to acceptance of the research hypotheses.

Regarding to demographic characteristics, the current study revealed that **nearly one half of studied students their age was 18 years .with mean age 18.63 ± 0.723 years old**. This study was in the same line with across sectional study in cairo university carried by **Mohamed**⁽⁸⁾ clarified that the majority of study participants age from 18 to 21 years. Also, this finding is similar to a study by **Rana**⁽⁹⁾ who reported that Majority of the respondents were within the age of ≥ 17 years. On other hand, this result disagreed with a study by **Mihret**⁽¹⁰⁾ about "Knowledge and Practice on Breast Self-Examination and Associated Factors among Summer Class Social Science Undergraduate Female Students in the University of Gondar, Northwest Ethiopia" who reported that nearly half of students was aged 26-31 years . The difference may be due to variations in socio- demographic characteristics, study setting and sample.

As regard to educational level ,the present study revealed that More than two fifth of father& mother educational level was secondary level & university level. This results was contrasted with **Abo Al-Shiekh**⁽¹¹⁾ who reported that nearly half of father& mother educational level was university& level secondary level

Regarding menstrual history of studied students. The current study illustrated that more than three quarters of the studied sample, had menarche at the age between 12 and 14 years old with a regular menstrual cycle and its duration was less than 7 days .This was agree with **Mohamed**⁽¹²⁾ a study on Beni- Suf Effect of structured visual educational sessions on knowledge and practices regarding breast- self examination among adolescents girls with hearing and speech challenges, had menarche at the age between 12 and 13 years old with an irregular menstrual cycle and its duration was between 3 to 5 days. From the researcher's point of view, this discrimination in menstrual characteristics may be due to personal differences or hormonal changes among female students.

Regarding female student's knowledge about breast cancer, the study result demonstrates that, the total score of student's knowledge's regarding breast cancer throughout pre/ post-intervention was highly statistically significant difference, while no statistically significant difference between post/ follow up intervention. The finding was in **the same line with Sarker** ⁽¹³⁾ who investigated 'Effectiveness of educational intervention on breast cancer knowledge and breast self-examination among female university students in Bangladesh: a pre-post quasi-experimental study' in and indicated that the study population had inadequate awareness and knowledge at baseline which was improved significantly after educational intervention at $p < 0.001$. The finding was **agreed with Rakhshani** ⁽¹⁴⁾ who investigated 'The Effect of Educational Intervention on Knowledge, Attitude, and Practice of Women towards Breast Cancer Screening' in Iran and illustrated that there was a significant difference was observed after the intervention, with the experimental group obtaining significantly higher mean scores of knowledge at ($P = 0.05$). In the researcher point of view, this result may be due to training HBM program introduced good information and the interesting for participated students participated. the current study was in agreement with **(Ibrahim)**⁽¹⁵⁾ study that revealed there was a highly statistical significant difference ($p = < 0.000$) in the adolescent student's total knowledge mean scores as

pre/immediate post and after one month of intervention implementation, This may be related to the effect of health educational intervention regarding breast self-examination on knowledge, and practices of female adolescent student and the booklet which covered all identified needs and knowledge gaps about the topic among the adolescent girls.

In relation to the previous knowledge about breast cancer and the source of these knowledge of the studied female students, the current study showed that 94.7% of studied female students reported that they had heard about breast cancer. In this respect a study done by (**Mohamed**⁽⁸⁾ in Cairo university, mentioned that, about 90% had heard about breast cancer. Nearly half of studied female students (48.9%) had source of knowledge about breast cancer from internet followed by Radio & TV. These findings contradicted those of **Murad**⁽¹⁶⁾, who stated that radio and TV is the main source of information about BC followed by Family, friends, neighbors.

Furthermore, these results were in agreement with **Mohamed**⁽¹²⁾, in Damanshour who stated that, less than half (40.6%, 49.7%) of intervention and control groups respectively reported that the mass media and the internet were the most common sources of information about breast cancer. This result was in harmony with **Alsowayan**⁽¹⁷⁾ in Saudi Arabia who revealed that the nearly two third of the respondent was informed by internet and TV.

In addition to, the result is in line with study conducted in carried by **Mohamed**⁽⁸⁾, who reported that half of the study sample (50%) had their information from mass media. These findings demonstrate that one of the most significant sources of knowledge regarding BC and BSE is the media, and they also highlight the media's role in working with healthcare educators to disseminate accurate information about BC to young adults.

Concerning total level of knowledge regarding breast cancer; the present results displayed that nearly two third of studied sample (20.6%) had good level of knowledge about breast cancer, meanwhile, more than three quadrants of studied female students had good level of knowledge about BC in post and follow up intervention. This reflects the importance of the educational program which increased the female students' knowledge in promoting health.

Similarly, a study in Banha, Egypt carried by **Saad Shoulah**⁽¹⁸⁾ reported that only 17.1% of studied women had good knowledge in pre educational program implementation this percentage was increasing to 47.7% in post program implementation. In the same line **Mahmoud**⁽¹⁹⁾ reported that more than one third of the studied women had good knowledge regarding breast cancer detection before model implementation, and then this percentage increased to slightly less than two thirds of them post model implementation.

Concerning' total level of practice regarding breast self-examination, the current study revealed that only 6.7% of the studied female students had satisfactory performed of breast self-examination practices in pre intervention while the majority of studied students had satisfactory practice in post and follow up intervention. In the same line with a study in Sohag Governorate, Egypt. carried by (**Mohamed**⁽¹²⁾) illustrated that majority of the studied subjects had an unsatisfactory level of practice with BSE before program implementation, while more than three quarters of studied subjects had a satisfactory level of practice after program implementation. This finding was in accordance with (**Gurjar, 2021**) who found only one fifth of the studied women had satisfactory practice regarding BSE pretest which increased to less than two third posttest after implementation of health educational program. From the researcher point of views, this could be due to increasing awareness of participated students about the importance of performing of BSE and perform and easily performed at home which not required any equipment and money. In the same line with this study **Abd-Elaziz**⁽²⁰⁾ found that nearly one third of the studied sample had good practice regarding breast self-examination pre-program increased to most (98.0%) of them post-program with highly statistically significant differences which $P\text{-value} < 0.0001$

Conclusion:

The results of present study supported the research hypothesis that there is marked an improvement in knowledge, practice toward breast cancer compared to before applying educational intervention

Recommendation:

Based on findings, the study recommended:

1-Health education is a keystone in improving students knowledge toward preventive behavior for breast cancer

2-Continuous health educational program for students regarding breast cancer in Egypt building on the president's initiative to support student's health for early detectionof breast cancer.

3- Several instructional handout &brochures should be distributed to female students containing preventive measures of BC &steps of BSE.

References:

- 1- ęukasiewicz S, Czezelewski M, Forma A, Baj J, Sitarz R, Stanisławek A. Breast Cancer—Epidemiology, Risk Factors, Classification, Prognostic Markers, and Current Treatment Strategies—An Updated Review. *Cancers*. 2021; 13(17):4287. doi:10.3390/cancers131742872.
- 2- World Health Organization (WHO). Breast Cancer. 26 March 2021. Available: <https://www.who.int/news-room/fact-sheets/detail/breast-cancer>
- 3- Dewi GAT, Hendrati LY. (2015). AnalisisRisikoKankerPayudaraberdasarkan Riwayat Kontrasepsi Hormonal dan Menarche. *J Berkala Epidemiologi*, 3(1): 12–23. Retrieved from https://www.researchgate.net/publication/313947330_Breast_Cancer_Risk_Analysis_by_the_Use_of_Hormonal_Contraceptives_and_Age_of_Menarche/-link/58b0bb4a45851503be97f103/download.
- 4- Maranata, M., Pamungkasari, E. P., & Adriani, R. B. (2020). Application of Health Belief Model on Breast Self-Examination: A Meta-Analysis. *Journal of Health Promotion and Behavior*, 5(3), 221-231.
- 5- Fajriah AS, Respati SH, Murti B. (2019). Theory of Planned Behavior and Health Belief Model on Factors Associated with Breast Self Examination among University Students. *J Health PromotBehav*, 4(4): 246–257
- 6- Paulsamy, P., Alshahrani, S. H., Qureshi, A. A., Sampayan, E. L. E., Venkatesan, K., & Sethuraj, P(2021). Breast Self-examination: Knowledge, Attitude and Practice among Female College Students.
- 7-Karkot, Y. (2019). Assessment of knowledge, attitudes, and behaviors regarding breast and cervical cancer among women in western Turkey. Available at: <https://doi.org/10.1177/0300060519830252>
- 8-Mohamed, S. K. (2021). Awareness and knowledge toward breast cancer and breast self-examination: A cross-sectional descriptive study among undergraduate female students at Cairo University, Egypt. *The Malaysian Journal of Nursing (MJN)*, 12(3), 111-119.
- 9- Rana, S., Shrestha, R., & Poudel, S. (2024). Knowledge and attitude on breast self-examination among female students in secondary school of Kathmandu.
- 10- Mihret, M. S., Gudayu, T. W., Abebe, A. S., Tarekegn, E. G., Abebe, S. K., Abduselam, M. A., ... & Kebede, G. W. (2021). Knowledge and Practice on Breast Self-Examination and Associated Factors among Summer Class Social Science Undergraduate Female Students in the University of Gondar, Northwest Ethiopia. *Journal of cancer epidemiology*, 2021(1), 8162047.
- 11- Abo Al-Shiekh, S. S., Ibrahim, M. A., &Alajerami, Y. S. (2021). Breast cancer knowledge and practice of breast self-examination among female university students, Gaza. *The Scientific World Journal*, 2021(1), 6640324
- 12- Mohamed, A. H., Ibrahim, E. M., Madian, A. A. E. A., & Abd Elghaffar Moustafa, A. A. (2023). Impact of Web-Based Educational Intervention on Preventive Behaviors of Breast Cancer among Damanhour University Female Students. *Damanhour Scientific Nursing Journal*, 1(2),
- 13- Sarker, R., Islam, M. S., Moonajilin, M. S., Rahman, M., Gesesew, H. A., & Ward, P. R. (2022). Effectiveness of educational intervention on breast cancer knowledge and breast self-examination among female university students in Bangladesh: a pre-post quasi-experimental study. *BMC cancer*, 22(1), 199
- 14- Rakhshani, T., Dada, M., Kashfi, S. M., Kamyab, A., &Jeihooni, A. K. (2022). The effect of educational intervention on knowledge, attitude, and practice of women towards breast cancer screening. *International Journal of Breast Cancer*, 2022(1), 5697739.
- 15- Ibrahim, E. E., Ibrahim, S., & Mohamed, S. (2019). Effect of Health Educational Intervention regarding Breast Self-Examination on knowledge and Practices of Female Adolescent'Students. *International Journal of Novel Research in Healthcare and Nursing*, 6(1), 361-75
- 16- Murad, E., Mehmet, N., Ünal, E., & Mollahaliloğlu, S. (2022). KNOWLEDGE, ATTITUDE, AND PRACTICE ON BREAST SELF EXAMINATION AMONG FEMALES IN ADDIS ABABA, ETHIOPIA. *ESTÜDAM Halk SağlığıDergisi*, 7(3), 521-530.

- 17- Alsowayan AA, Almotyri HM, Alolayan NS, Alissa LI, Almotyri BH, AlSaigh SH. Breast cancer knowledge and awareness among females in Al-Qassim Region, Saudi Arabia in 2018. *Journal of Family Medicine and Primary Care*. 2020;9(3):171231-52
- 18- Saad Shoulah, A. E. R., & Mohamed Abd Elaal, E. (2021). Awareness of Breast Cancer and Self-Examination among Women Working at Benha University. *Journal of Nursing Science Benha University*, 2(2), 431-442.
- 19- Mahmoud, A. A., Abosree, T. H., & Abd El Aliem, R. S. (2020). Effect of the health belief model-based education on preventive behaviors of breast cancer. *Evidence-Based Nurs Res*, 2(4), 11.
- 20- Abdelaziz, A. H., Shawki, M. A., Shaaban, A. M., Albarouki, S. K., Rachid, A. M., Alsalhani, O. M., & Jomaa, M. K. (2021). Breast cancer awareness among Egyptian women and the impact of caring for patients with breast cancer on family caregivers' knowledge and behaviour. *Research in Oncology*, 17(1), 1-8.
- 21- Gurjar NR. (2021). Impact of an educational programme on knowledge on breast cancer and practice of breast self examination among women: *Indian J Cont Nsg Edn* 2020;21:155-