Breast Cancer Preventive Program among Women According to Sustainable Development Strategy 2030

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ABSTRACT

Background: Breast cancer considered the most frequent malignancy among women worldwide; sustainable development goals aim to reduce premature non communicable diseases mortality by 2030. **Aim:** Evaluate the effect of breast cancer preventive program among women according to sustainable development strategy 2030. **Research design:** A quasi experimental research design was applied. **Setting:** This research was implemented at Maternal and child Health Care Centers (A& B) at Benha City. **Sample:** A convenience sample technique was used to obtain 380 women. **Tools of data collection:** Four tools were used. **I:** A structured interviewing sheet that composed of socio demographic characteristics of the studied women, medical and obstetric history, and knowledge about breast cancer according to sustainable development health strategy 2030. **II:** Likert scale to assess the attitude of women regarding prevention of breast cancer and early detection. **III:** Likert scale to assess women's participation levels and its frequency to sustainable development strategies in Egypt. **IV:** Practices of women regarding prevention of breast cancer. **Results:** Post program; the level of knowledge of the studied women 85.2% was good, 86.8% had positive total attitude concerning prevention of breast cancer and breast self-examination, 91.8% had positive respondents to sustainable development strategies in Egypt and 89.2% had satisfactory practices regarding prevention of breast cancer and breast self-examination. **Conclusion:** Breast cancer preventive program was succeeded in increasing knowledge, changing attitude, enhance active participation in Sustainable Development strategy 2030, and improving health practices concerning breast cancer prevention and breast self-examination. **Recommendations:** Further research is required for large samples among women to fight breast cancer and early detection of it.

Keywords: Breast Cancer Preventive Program, Sustainable Development Strategy 2030, Women

Introduction

Breast Cancer (BC) is a worldwide vital issue, also the main cause of women's illnesses and deaths both in developed and developing nations. BC ranks the highest 3rd leading cause of cancers and the highest 5th reason of mortality among females **(American Cancer Society (ACS), 2023; Mihret et al., 2021).** Globally, almost three millions of women yearly diagnosed of BC **(World Health Organization (WHO), 2021)**. However, developed nations have an elevated incidence of BC, developing nations account for

75% of mortality associated with BC (**Hamed et al., 2022**).

Breast cancer is associated with various modifiable and non-modifiable risk factors like weight, physical activity, and alcohol. However, among high-risk women, the bulk of the risk is determined by non-modifiable risk factors such as family history of benign BC, high mammography breast density, or a genetic predisposition (**Daly et al., 2021**). Genetic predisposition and variables impacting endogenous hormone levels, early menarche, later menopause, null parity, delayed first conception, fewer children and shortened breastfeeding sessions, and hormone consumption via hormone replacement medication and hormonal contraceptives (**Pashayan et al., 2020**).

Breast thickening or lumps that feel different from the surrounding tissue are a sample of the symptoms and indicators of BC, other symptoms involve alteration in the shape, measurements, aspect of a breast, alterations of the skin covering the breast, like dimpling, an inverted nipple, the skin that appears red or pitted over the breast, similar to the skin of an orange, and peeling, scaling, or crumbling of areola (**National Cancer Institute, 2023; Judy & Boughey, 2022**).

Prevention of BC can be accomplished either across intervention in the entire population or by strategies in high-risk women of BC (**National Cancer Institute, 2023**). Primary prevention includes decreasing reversible risk factors, for example overweight, a sedentary lifestyle, and unhealthy nutrition. Each of the above variables can cause different impacts, based on breast tissue nature and menopausal and premenopausal age (**Buja et al., 2020**).

Secondary prevention, which includes early detection and screening, aims to identify the illness in its early stage in apparently healthy individuals, allows treatment to be started early, improving prognosis, and eventually reducing disease-related mortality (**Santaballa et al., 2020**). The goal of tertiary prevention is to lower morbidity and impairment in cancer women receiving treatment, as well as to avoid second primary malignancies, or other complications related long term treatment (**Serrano et al., 2019**).

The Sustainable Development Goals (SDGs) considered a worldwide Goals, which the United Nations adopted just like a global call for intervention to eradicate poverty, save environment, also ensure that everyone lives in peace and prosperity by 2030. The seventeen SDGs are incorporated which accept that intervention in each field will influence others, and the environmental, social, and economic sustainability must all be balanced in development (**United Nations Development Program, 2022**).

Sustainable development goals include promoting mental health, wellness and decreasing one third premature deaths from non-infectious diseases by 2030 compared to 2015 (**Roser, 2023**). The third goal of SDG seeks to ensure well-being and promote healthy lives for all individuals to establish prosperous societies (**WHO, 2020**).

Community Health Nurses (CHNs) serve an essential role in increasing women` awareness

regarding the benefits of breast self-examination and risky factors associated with BC (**Amasha, 2022**). CHNs encourage women to be aware of the normal appearance of breast and promptly disclose any changes to a healthcare professional. CHNs educate women through specifically designed educational sessions and programs implemented in health care setting, also through community outreach approaches (**American Cancer Society, 2022**).

Significance of the study:

Breast cancer is the most prevalent kind of cancer and the first reason of cancer mortality among Egyptian females. In Egypt, BC represents for thirty-three percentage of cancer among women cases and the incidence is extra 22,000 cases annually (**Azim et al., 2023; Mohamed, 2021**).

So, this study is important to enhance women's awareness concerning BC prevention and breast self-examination. CHNs could use a variety of strategies, including community education and sensitize concerning the importance of BC screening, to encourage the uptake of BC screening. with encourage active participation in the nation strategy.

Aim of study:

Evaluate effect of breast cancer preventive program among women according to sustainable development strategy 2030.

Research hypothesis:

Breast cancer preventive program will enhance knowledge, modify attitude of women,

enhance practices, and encourage active participation in sustainable development strategy 2030.

Subjects and Method:
Study design:

A Quasi experimental research design was applied to implement this research.

Study setting:

This research was implemented at Maternal and Child Health Care Centers (A& B) in Benha City, Egypt.

Sample:

A convenience sample technique was used to obtain women from the previous indicated settings via six months. The total women attended the Maternal and Child Health Care Centers in 2022 were (3800/women). The sample were 380 women.

An equation was used to calculate the sample size: Yamane, (1967)

$$n = \frac{N}{1 + N(e)^2}$$

Where: n = sample size, N= total population size, e = margin error 0.05.

Tools of data collection: Four tools were utilized in this study.

Tool I: A structured interviewing sheet: Researchers designed the tool using a review of relevant literatures which was written in appropriate Arabic language. It was divided into two sections to evaluate:

First section:

A- It covered women` socio-demographic characteristics contained 7 items as (age, marital status, educational level, occupation, place of residence, type of family and monthly income).

B- Medical and obstetric history of the woman: It contained 9 items to assess (the history of BC, any types of cancer, family history of BC, times of labor, times of abortion, age at the first labor, natural feeding, cessation of menstruation, and method of family planning).

Second section: Included questions for assessing knowledge of women regarding breast cancer according to sustainable development strategy 2030 and involved 13 closed ended questions divided into 2 questions related sustainable development of health strategy 2030, and 11 questions related knowledge about breast cancer.

Scoring system: The total scores of the knowledge ranged from 0 to 26 points. Two points are awarded for correct and complete answer, one point for a correct and partial answer, and zero point for never knowing or wrong answer.

The total knowledge score level was categorized into three levels as:

Good. scores 75% and more of total scores (≥20 points).

Average. scores 50% to less than 75% of total scores (13 less than 20 points).

Poor. scores less than 50% of total scores (0 – less than 13 points).

Tool II: Likert scale to assess the attitude of women regarding prevention of breast cancer and early detection, adapted from **(AbdElfatah, 2011)** and was modifiable by the researchers. It consisted of breast cancer attitudes which involved 14 items as BC is a fatal disease that kills all patients, breast must be removed in case of BC, taking a breast sample helps the tumor spread, breast feeding reduces the risk of BC,.. etc.

Scoring system: Attitude scale score was computed just like (2,1,0) scores for always, sometimes, and never respectively. Two levels were identified from the total attitude score, which are as follows:

Total scores of attitude = 28 points

Positive: scores 60% and more of total scores (≥17 points).

Negative: scores < 60% of total scores (< 17 points).

Tool III: Likert scale adapted from **(Samah et al., 2012)** to assess women's participation levels and its frequency according to respondents to sustainable development strategies in Egypt: A questionnaire related to women` participation in BC prevention programs was designed based on **(Rifkin, 2011).** It consisted of 12 items as participated as an audience or speaker in some of the community-based awareness programs about BC prevention, advocated community-based program in my neighborhood or my workplace regarding BC prevention program, …. etc..

Scoring system:

The program's participation was assessed using a 3-point Likert scale. The scale indicated that "never" when participants were attending the program from one to three times, "sometimes" between four and five times, and "always" more than five times in a year. Questions were regarding their usual participation in BC prevention programs implemented at residential level.

The participation score was determined as follows: (2) for always, (1) for sometimes, and (0) for never. Two levels were identified based on the total participation score, which are as follows:

The total score of the women regarding total women's participation and its frequency = 24 points.

Positive: scores ≥ 60 and more of total scores ($\geq$14 points).

Negative: scores $< 60\%$ and more of total scores (< 14 points).

Tool IV: Practices for prevention of BC, contained two parts:

Part A: Women` reported practices for prevention of breast cancer which included 12 items.

Part B: Women observed breast self-examination checklist (**Cameron& Cameron, 2023**), which included 18 items. It consisted of **I: In front of mirror** which included 6 items. **II: In the shower** which included 6 items. **III: During lying down** which included 6 items.

Scoring system:

There are two levels for each answer: Done and not done. These received scores were 1 and 0, respectively.

The total score of the women concerning total practices regarding prevention of breast cancer= **30 points** was classified into the following:

Satisfactory: scores ≥ 60 and more of total scores ($\geq$18 points).

Un satisfactory: scores $< 60\%$ and more of total scores (< 18 points).

Content validity:

A jury of five experts in Community Health Nursing tested the content validity that evaluated how well the designed tools covers all relevant parts of the construct it aimed to measure. And tested the Face validity that is about whether a test appeared to measure what it's supposed to measure. It is concerned with whether a measure seemed clearly relevant and appropriate for what it's assessing and adequate for its purpose.

These tests were used to evaluate the clarity, applicability, and readability of the study tools and to estimate the approximate time required for data collection. Also, it helped to determine the obstacles and problems that may arise during the actual collection of data. The researchers did the necessary modifications, added some questions, and clarified or omitted.

Reliability:

Cronbach's Alpha coefficient test was utilized to assess reliability of tools of data collection, and the results showed that each tool had a high degree

of reliability because the items were generally homogeneous. Knowledge had an internal consistency score of 0.97, attitude scored 0.95, and practice scored 0.98.

Ethical consideration:

This research was approved by the Nursing Scientific Research Ethical Committee, Benha University. Prior to the interview, each woman was asked for her informed consent and provided a summary of the study's objectives. Also, they were given the assurance that the gathered data will be used exclusively and kept confidential for the objectives of the research. For the intent of privacy and anonymity, the forms were without names. They were told that they were free to withdraw from the research at any time without explanation. Research participants' confidential information must be treated as such, even in situations where it is not legally protected or privileged or subject to any kind of legal force.

Pilot study:

Thirty eight women (10%) of the sample size, participated in a pilot research to evaluate the tool's content, applicability, and simplicity,. The tools were arranged using the results of the pilot study. The tool's organization involved rewording and rearranging a few of the questions. Modifications were done to tools so 38 participants were not included in the studied sample, and the pilot was conducted two weeks prior to the start of the study.

Administrative Approval:

The study's title, objectives, methods, and tools were presented to the director of the Maternal and Child Health Care Centers in Benha City by a general secretariat affiliate to receive official approval to conduct the research. The purpose of the research was also communicated to the women to secure their cooperation.

Breast cancer preventive program construction:

The researchers implemented the preventive program via four phases involving:

1. **Assessment phase:** At this stage, assessed knowledge, attitude and practices by collecting and analyzing the baseline data through used tools. The researchers performed the pre- test thoroughly reviewed relevant literature before designing the program.

2. **Planning phase:** The needs of the target group were determined by the researchers, who also established priorities for the needs and created the following objectives:

General objective of the program:

Evaluate the effect of the preventive program of breast cancer according to sustainable development Egyptian Strategy 2030 among women in Benha City.

Specific objectives:

After implementation of BC preventive program, the studied women should be able to:

- Define SDGs.

- Mention the third goal of SDGs.

- Define BC.

- List risk factors, signs and symptoms and types of BC.

- Mention the periodic examinations for early detection of BC and the best time to do a breast self-examination.

- Discuss treatment of BC, purpose of chemical treatment, and methods of giving the chemical treatment.

- Discuss BC prevention techniques.

- Apply practices for prevention of BC that involve nutrition, exercise, rest, and sleep, avoid smoking and alcohol, regular checkup, and breast self-examination.

3.Implementation phase: Data were collected via 6 months, the date collected from the start of June to the end of November 2022. The researchers went to the previous study settings for three days weekly from 10:00 am - 12:00 pm. The average number of interviewed women was 4-6 daily. The program was applied through five sessions (three theoretical, two practical). Each session ranged from 45 to 60 minutes involving times for discussion as regards women' accomplishment, improvement, and feedback.

Every session began with a quick summary of the previous session's goals and the current one's. During program sessions, learning was improved through discussion, encouragement, and reinforcement. In addition to the direct reinforcement in the form, each woman received a gift copy of the program to use as a future reference. Every woman cooperated with the researchers. Women took part in a conversation to clear up any misunderstandings at the conclusion of each session. Women were additionally informed about the time of the next session.

Teaching Methods: The following techniques were employed to teach the program's content: Lectures, discussions, role plays, demonstration and re-demonstration, and presentations.

Teaching Aids: Appropriate educational aid had been developed especially for the program application, including videos, lab tops, colored posters, and handouts created by the researchers.

Theoretical sessions (3 sessions).

The 1st session: Involved explanations of SDGs meaning, the 3rd goal of SDGs, meaning of BC and its risk factors.

The 2nd session: Contained explanations of signs and symptoms of BC, types, periodic examinations for early detection of BC and the best time to do a breast self-examination.

The 3rd session: Included treatment of BC, purpose of chemical treatment, and methods of giving the chemical treatment, and BC prevention techniques.

Practical sessions (2 sessions).

The 1st session: Included general practices of BC prevention techniques that involved healthy nutrition, be physically active, get enough sleep and rest, keep weight in check, avoid smoking, alcohol and stress, regular checkup, breastfed, if possible, avoid birth control pills, particularly after age 35, avoid menopausal hormone therapy.

The 2nd session: Involved techniques of breast self-examination in front of mirror, in the shower and while lying down.

4-Evaluation phase: Post implementing the program, the post-test that followed the similar structure as the pre-test, was used for evaluation as a means to examine the modification in the knowledge, attitudes, and practices of the women under study immediately after the program had been implemented.

Statistical analysis:

The Statistical Package for Social Science (SPSS version 21) was employed to arrange, accumulate, and analyze all the data that were gathered. For qualitative descriptive data, frequencies and percentages were used; for relation tests, the chi-square coefficient x2 was utilized; for quantitative data, mean and standard deviation were employed; and for correlation analysis, the Pearson correlation coefficient (r) was utilized to determine the degree of significance.

The following was taken into consideration for the detection difference and associations:

- Whenever P value was < 0.001**, it indicates highly statistically significant.

- Whenever P value was < 0.05*, it confirms statistically significant.

- Whenever P value was > 0.05, it shows not significant.

Results:

Table (1): Reveals that, 40.8% of studied women aged from 30-40 years old with mean standard deviation 35.47 ± 8.135 years, 91.3% of them were married, 69.5% of them had secondary education, 79.7% of them were housewives, 55.3% of them lived in rural areas, and 60.5% of them hadn't enough monthly income.

Table (2): Clarifies that, 5% of studied women had previous history of breast cancer, 87.1% of them age at first menstruation from **9** to 11 years, 76.6% of them had breast fed their children.

Figure (1): Shows that; 31.9% of studied women had good knowledge level about regarding breast cancer and SDGs preprogram which increased to 85.2% post program, while 47.0% of them had poor knowledge level about regarding breast cancer and SDGs pre- program, which lowered to 6.5% post program.

Figure (2): Represents that; 31.1% of studied women had positive attitude regarding prevention of breast cancer and breast self-examination preprogram implementation which increased to 86.8% post program, while 68.9% of them had negative attitude at preprogram compared to 13.2% post program.

Figure (3): Clears that; 34.1% of studied women had positive respondents to sustainable development strategies in Egypt pre preprogram implementation which increased to 91.8% post program, while 65.9% of them had negative respondents at pre-program compared to 8.2% post program.

Table (3): Clears that; there were highly statistically significant differences in all items related to studied women reported practices regarding prevention of breast cancer (p=0.000). 22.9% of the studied women practiced regular breast self-examination preprogram, which

enhanced to 86.8% post program, and 100% of them avoided alcohol intake.

Table (4): Explains that; there were highly statistically significant differences in all items as regards studied women observed practices concerning prevention of breast cancer (p=0.000). 28.7 % of the studied women practiced breast self-examination in front of mirror pre-program, and then this percentage enhanced to 84.5% post program.

Figure (4): Describes that; 29.1% of studied women had satisfactory practice pre

implementation of program regarding prevention of breast cancer and breast self-examination which increased to 89.2% post program, while 70.9% of them had unsatisfactory practice pre-program compared to 10.8% post program.

Table (5): Emphasizes that, there were highly positive statistically significant correlations between women total` knowledge, practices, and attitude score regarding prevention of breast cancer and breast self-examination at pre and post program.

Table (1): Distribution of the studied women regarding their socio-demographic characteristics (n=380).

Socio-demographic characteristics	No.	%
Age / years		
20-	103	27.1
30-	155	40.8
40-	94	24.7
50+	28	7.4
$\bar{x} \pm$S.D 35.47 ± 8.135		
Marital status		
Married	347	91.3
Divorced	29	7.6
Widowed	4	1.1
Educational level		
Secondary education	264	69.5
University education	110	28.9
Postgraduate studies	6	1.6
Occupation		
Housewife	303	79.7
Working	77	20.3
Residence		
Urban	170	44.7
Rural	210	55.3
Monthly income		
Enough and save	49	12.9
Just enough	101	26.6
Not enough	230	60.5

Table (2): Distribution of the studied women regarding their medical history (n=380).

| Medical history	No.	%
Previous history of breast cancer	2	0.5
Family history of breast cancer	11	2.9
Age at first menstruation		
9-11	61	87.1
12-15	46	65.7
16	59	84.3
Number of labors		
Once	83	21.8
Twice	171	45.0
Three and more	114	30.0
None	12	3.2
Number of abortions		
Once	107	28.2
Twice	40	10.5
Three and more	31	8.2
None	202	53.1
Age at the first labor		
15-20	107	28.2
21-25	190	50.0
26-30	83	21.8
Breast feeding	291	76.6
Method of family planning		
None	63	16.6
IUD	92	24.2
Pills	119	31.3
Injection	106	27.9
Age at amenorrhea(n=59).		
40-45	39	66.1
46-50	20	33.9
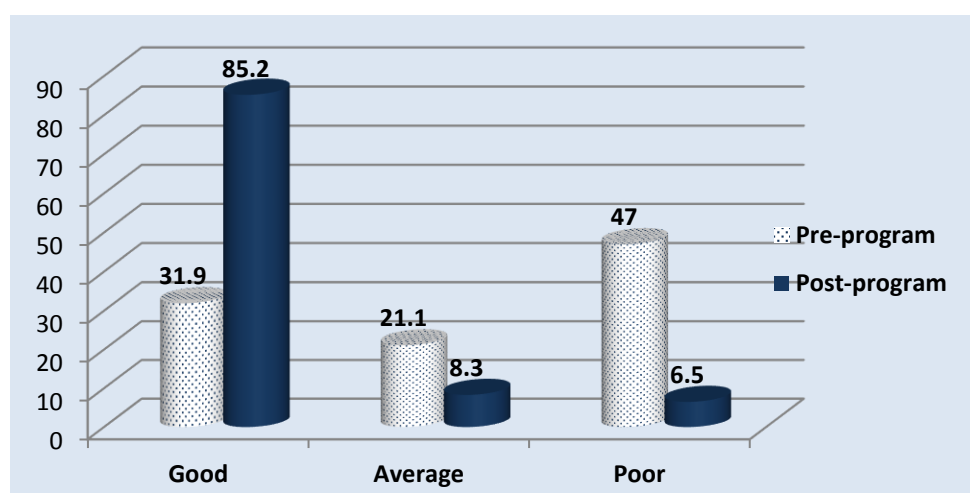
Figure (1): Percentage distribution of the studied women concerning their total knowledge level regarding breast cancer and SDGs pre and post program (n= 380).
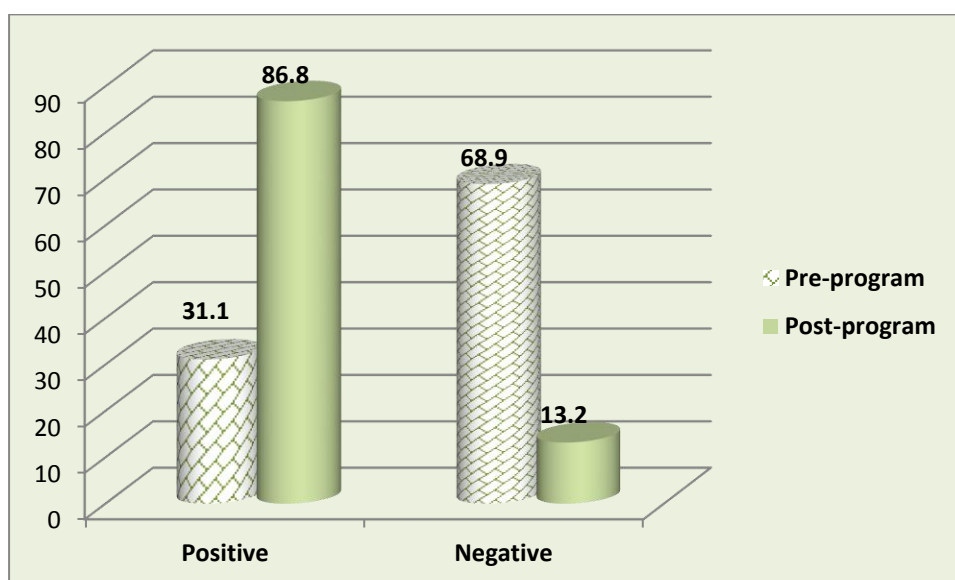
Figure (2): Percentage distribution of the studied women regarding their total attitude level regarding prevention of breast cancer and breast self-examination pre and post program implementation (n= 380).
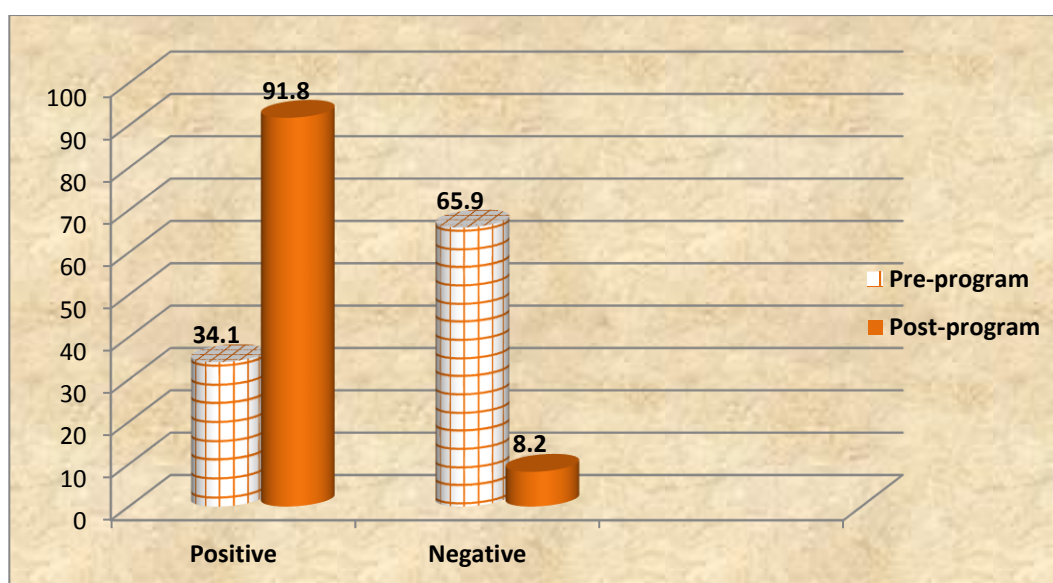

Figure (3): Percentage distribution of the studied women regarding their total level of their participation and its frequency according to respondents to sustainable development strategies in Egypt pre and post program implementation (n= 380).

Table (3): Distribution of the studied women regarding their reported practices regarding prevention of breast cancer (n=380).

Reported practices	Pre- program				Post- program				X^2	p-value
	Done		Not done		Done		Not done			
	No.	%	No.	%	No.	%	No.	%		
Keep weight in check	189	49.7	191	50.3	338	88.9	42	11.1	137.41	0.000**
Do regular physical exercise	165	43.4	215	56.6	301	79.2	79	20.8	102.60	0.000**
Eat fruits & vegetables	158	41.6	222	58.4	263	69.2	117	30.8	58.71	0.000**
Avoid alcohol	380	100	0	0.0	380	100	0	0.0		
Avoid active and passive smoking	258	67.9	122	32.1	361	95.0	19	5.0	92.38	0.000**
Breastfeed, if possible	260	68.4	120	31.6	331	87.1	49	12.9	38.35	0.000**
Avoid birth control pills, particularly after age 35	104	27.4	276	72.6	314	82.6	66	17.4	234.45	0.000**
Avoid menopausal hormone therapy	359	94.5	21	5.5	373	98.2	7	1.8	7.268	0.007*
Get enough sleep	183	48.2	197	51.8	315	82.9	65	17.1	101.49	0.000**
Avoid stress	147	38.7	233	61.3	304	80.0	76	20.0	134.42	0.000**
Do regular medical check up	89	23.4	291	76.6	342	90.0	38	10.0	343.06	0.000**
Practice regular breast self-examination	87	22.9	293	77.1	330	86.8	50	13.2	313.75	0.000**

* Statistically significant at (p<0.005)

** Highly statistically significant at (p<0.001)

Table (4): Distribution of the studied women regarding their observed practices regarding breast self-examination (n=380).

Breast self-examination	Pre- program				Post- program				X^2	p-value
	Done		Not done		Done		Not done			
	No.	%	No.	%	No.	%	No.	%		
In front of mirror	109	28.7	271	71.3	321	84.5	59	15.5	240.7	0.000**
In the shower	102	26.8	278	73.2	317	83.4	63	16.6	245.8	0.000**
Lying down	99	26.1	281	73.9	308	81.1	72	18.9	231.0	0.000**

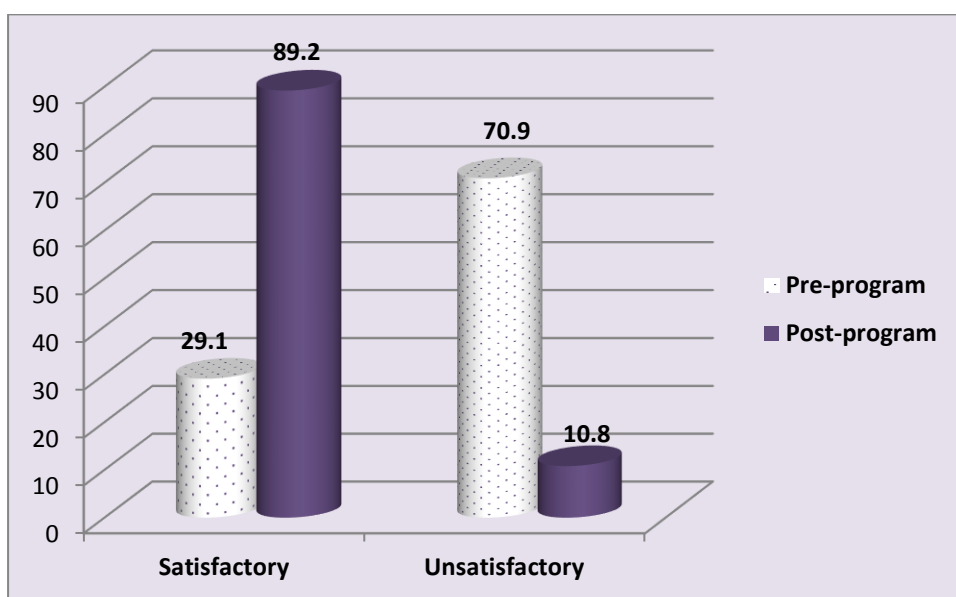**** Highly statistically significant at (p<0.001)**

Figure (4): Percentage distribution of the studied women concerning to their total practices level related to prevention of breast cancer and breast self-examination pre and post program implementation (n= 380).

Table (5): Correlation between women` total knowledge, practices, and attitude score regarding prevention of breast cancer and breast self-examination through program phases (n=380).

Items	Total attitude			
	Pre-program		Post-program	
	r	p-value	r	p-value
Total knowledge	0.77	.000**	0.97	.000**
Total practices	0.80	.000**	0.96	.000**

** Highly statistically significant at (p<0.001)

Discussion:

Breast cancer is the 2nd most widespread cancer among women globally, with disparities across regions in incidence and mortality **(Wangr, 2023).** BC is the leading cause of cancer-related death among Egyptian women. It is anticipated that preventing and controlling of breast cancer will decrease mortality, boost productivity, and improve the accomplishment of the economic SDGs **(Rostom et al., 2022).**

Regarding to socio demographic characteristics of the studied women, the present research illustrated that; two fifths of the studied women aged from 30 to less than 40 years old with mean standard deviation 35.47 ± 8.135 years. This finding agreed with **Abdelaziz et al. (2021),** who make a study to assess awareness of Egyptian women, n= 704 regarding BC and the impact of caring for patients with BC on family caregivers' knowledge and behavior and documented that the mean age of all women was 39.92 years. This

might be due to the most attended women to Maternal and Child Health Center during childbearing age.

The findings of the present research indicated that; most of the studied women were married, more than three quarters of the studied women were housewives, more than half of the studied women were lived in rural areas, and three fifths of them hadn't enough monthly income. This finding was in agreement with **Abd-El Aziz et al. (2021),** who evaluate the effect of breast self-examination program conducted in Minia City among 100 Egyptian women, and stated that 91.0% of the women were married, 70.0% of them were housewives, 68.0% of them were lived in a rural area, and 80.0% of women hadn't insufficient income.

Concerning past medical history, the finding of the current research indicated that; minority of studied women had age at first menstruation from 9 to 11 years, more than three quarter of them had breast fed their children. This finding was agreed with **Elbasuony et al., (2021),** who assess impact of BC guideline based on prevention on attitude among 56 Egyptian healthy females with family history and reported that 16.0% of studied women age of menarche less than 12years and 82.9% of participants possessed a breastfeeding.

As regard to the total knowledge level of studied women, the current findings revealed that; less than one third the studied women had poor knowledge pre implementation of the program and most of the studied women had good knowledge post program. This finding was consistent with

EL-Lassy and Madian (2020), who studied the effect of a health education program among 120 female employees in Damanhour University, Egypt regarding breast self-examination, and showed that 10.8% of the studied sample had good knowledge scores preprogram and raised to 77% post program. Also, these results supported by **Tosson (2020),** who performed health educational program among 300 women, in Assiut University hospitals in Egypt, and reported the program helped in improving women knowledge in contrast to pre-program also, reported that there was a highly statistical significance difference between pre/post program implementation in relation to the women knowledge related to BC (P-value <0.000). This might be due to health education interventions are effective in changing beliefs and knowledge levels.

In the context of the total attitude, the results of the present research illustrated that; slightly less than one third of the studied women had positive attitude related to prevention of BC and breast self-examination preprogram which improved to most of them post-program. This finding was incongruent with **Elbasuony et al. (2021),** who showed that 10% of the studied women positive attitude concerning BC pre intervention and enhanced to 76% after intervention. This could be the result of the women in the study having higher levels of knowledge and practices, that by roles impact positively on their attitudes regarding prevention of BC.

The current study confirmed that; more than two third of the studied women had negative

attitude at preprogram. This finding was unconsented with **Irani et al. (2021),** who made a study on 406 women in Mashhad, Iran regarding BC screening behaviors and reported that 7.9% of the sample had negative attitudes toward BC.

Concerning the total level of the studied women participation respondents to sustainable development strategies in Egypt, the findings of the present research demonstrated that; one third of the studied women had positive respondents to sustainable development strategies in Egypt pre preprogram which increased to most post program. This could be due to the fact that women's responses to sustainable development strategies in Egypt were influenced by their increased knowledge after the program's implementation.

Regarding reported practices of the studied women, the current research showed that; slightly more than one fifth of the studied women practiced regular breast self-examination preprogram, that increased to the majority post program. This result was supported by **Ahmed & Shrief (2019),** who conducted health promotion program in Egypt in Beni-Suef University Hospitals among 80 females to evaluate female BSE knowledge and practices and reported that 37.5.% of the studied women practiced regular breast self-examination preprogram and increased to 87.5% post program.

Also, this finding was in the same line with **Abdelaziz et al. (2021),** who documented that thirty percent of the studied participants practiced well concerning breast self-examination pre-program and enhanced to Ninety-eight percent post-program having differences that are extremely

statistically significant (P-value < 0.0001). This could be attributed to the impact of knowledge on the value of breast self-examination; and women who possess good knowledge tend to be more confident and proficient in their breast self-examination practices.

Regarding to observed practices concerning breast self-examination, the present study demonstrated that; more than one quarter of the studied women done breast self-examination practices in front of mirror preprogram which expanded to most of them post program. This finding of the present study was congruent with **Tosson (2020),** who reported that the breast self-examination checklist had improved before, immediately after, and one month after the end of the guidance program was implemented. All the breast self-examination checklist's steps showed extremely significant differences (P=0.000).

The current research uncovered that; more than one quarter of studied women had satisfactory practices pre-program related to prevention of BC and breast self-examination which increased to the most of studied women had satisfactory practice post-program. This result was consistent with **Abd-Elaziz et al. (2021),** who reported that before the program's completion, thirty percentage of the sample under study practiced breast self-examination properly; this improved to 98.0% post-program, with extremely significant improvements (P-value < 0.0001).

Concerning correlation between the studied women` total knowledge, practices, and attitude regarding prevention of breast cancer and

breast self-examination; the results of the present research demonstrated that, there were highly positive statistically significant correlations between women total knowledge, practices, and attitude concerning prevention of BC and breast self-examination at pre and post program implementation. This might be the result of the women's inadequate practices and knowledge, which had a significant impact on their attitudes.

Conclusion:

Breast cancer preventive program was succeeded in increasing knowledge, changing attitude, enhancing active participation in sustainable development strategy 2030 and improving health practices regarding BC prevention and breast self-examination.

Recommendations:

- Continuing BC preventive program for women to improve their awareness.

- Several instructional handout and brochures should be distributed to women containing preventive measures of BC and steps of breast self-examination.

- More studies on large samples of women are required for prevention of BC and early detection it.

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