

## Application of Health Belief Model about Breast Cancer among Women Attended to Outpatients Beni-Suef Specialized Hospital

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### Abstract

**Background:** Breast cancer is an important global public health problem due to its high incidence and mortality. Women's experience of breast cancer is complex, affecting all aspects of life during and after treatment **Aim:** The Aim of the Study is to evaluate the effect of application of Health Belief Model about Breast Cancer among Women Attended to Outpatients Beni-Suef Specialized Hospital **Subjects and method:** Research design: A quasi-experimental design was conducted in this study, **Sample type:** A convenient sample from of all women attending to the previous setting throughout 3 months, **Setting:** The study was conducted at all outpatient clinics in Beni-Suef specialized hospital , **Tool:** three tools was used to collect data., **Tool I:** Structured interviewing questionnaire and it was consisted of four parts; part I: sociodemographic data of women, part II: obstetrical data of women, part III: women knowledge, **Tool II:** Champion's Health Belief Model Scale. **Tool III** :reported practice of women **Results:** there was a marked improvement in total women's knowledge as the pretest was (56%-31%-31%) improved to(3%-6%-91%) during posttest, respectively, there were marked improvement in the practice after the implementation of the HBM from one third (33.7%) of the women has satisfactory practice with pretest to (83.70%)with posttest and vast majority (91%) of the studied women has negative believes toward pre HBM implementation regarding BC which decreased to more than one tenth (13.3%) of them post HBM. **Conclusions:** The results of present study supported the research hypothesis that there is marked an improvement in knowledge, practice and health beliefs toward breast cancer compared to before application of health belief model. **Recommendations:** Continuing BC preventive program for women to improve their awareness. Several instructional handout & brochures should be distributed to women containing preventive measures of BC & steps of BSE. More studies on large samples of women are required for prevention & early detection of BC Extensive educational programs about BSE & its techniques for health workers in different medical setting.

**Keywords:** breast cancer, women, health belief model.

### Introduction

Breast cancer is an important global public health problem due to its high incidence and mortality. Women's experience of breast cancer is complex, affecting all aspects of life during and after treatment, moreover, may experience a feeling of disability because they are unable to manage daily activities and is unable to care for themselves as well as their families. Breast cancer patients express strong, unmet needs for education, information, and intervention to improve their daily living

activities and decrease pain disability (Goda, 2022).

In 2020, there were 2.3 million women diagnosed with BC and 685,000 deaths globally. At the end of 2020, there were 7.8 million women who were diagnosed with BC in the past 5 years. Low- and middle-income countries (LMICs) account for 57% and 65% of cancer cases and deaths, respectively. Diagnosed cases of BC showed a survival rate below 40% in developing countries and exceeding 80% in the developed world; these differences are due to their early health-seeking

behavior. In Ethiopia, BC is the most prevalent cancer among women and constitutes a major public health concern, which accounts for 30% of all cancers (**Wondmu et al., 2022**).

Self-breast examination (SBE), mammography, and clinical breast examination (CBE) are considered screening methods for the early detection of breast cancer. There is controversy surrounding the efficacy of SBE in countries where mammography and clinical breast examination are readily available. Data from two large trials in China and Russia (**Huang et al., 2022**).

The level of knowledge of women about breast cancer prevention is important in their participation in breast cancer screening and early treatment. Breast screening practices are influenced by risk, benefit, and barrier perceptions via a reasoning process that incorporates personal and societal influences and attitudes. Numerous methods have been developed to explain health-related behavior since the early 1950s. The health belief model (HBM) with its essential components is one of the most widely used models for conceptualizing the possible obstacles or facilitators of desirable health adoption behavior (**Nasution et al., 2021**).

Health beliefs play an important role in leading people to engage in preventive health behaviors. The health belief model (HBM) is the model most frequently utilized for breast cancer screenings in the literature. The main constructs and assumptions of the HBM include (1) perceived threat, which consists of (a) perceived susceptibility: a person's subjective perception of the risk of acquiring a disease and (b) perceived severity: a person's feelings about the seriousness of contracting a disease; (2) perceived benefits: a person's perception of the effectiveness of various actions available to reduce the threat of a disease; (3) perceived barriers: a person's belief about the potential negative aspects of taking a particular health action; and (4) cue to action: internal or external cues that determine a person's readiness for action and trigger the decision-making process (**Kissal & Kartal, 2019**).

Community health nurses play a unique and a vital role in the early detection of breast cancer as they usually have the closest contact with the women. The nursing responsibilities to teach early recognition of the signs and symptoms of malignancy are very important to enhance the Promotion of knowledge about the importance of adoption of breast cancer screening methods especially regular breast self-exam can help in detecting the disease in early non advanced stages which result in improving its prognosis especially in young age. Compliance to regular breast self-exam is very important for the researchers and the clinicians for assessing the effectiveness of intervention and also for young females for the early detection of the breast cancer (**Farhat et al., 2019**).

#### **Significant of study:**

Breast cancer (BC) is the most frequent type of cancer among women worldwide and has continually risen in recent years. In 2018, it was projected that over 2.1 million new cases of BC would occur worldwide, accounting for nearly 1 in 4 cancer cases among women. Early detection of cancer is crucial to minimize mortality. According to the literature, cancer death rates have grown by around 14% since 2008, increasing in underdeveloped nations due to delayed diagnosis and insufficient treatment (**Shubayr et al., 2022**).

In Egypt, it is the most common cancer among women representing 18.9% of total cancer cases (35.1% in women, 2.2% in men) as reported by the Egyptian National Cancer Institute. Baheya Foundation for early detection and treatment of breast cancer in Egypt stated that 34 % of the Egyptian women suffer from breast cancer and commented that it is the most common and the most dangerous type of cancer threatening the Egyptian women. Locally in Al Menoufia governorate, a study was conducted by **El-Senbawy, Abd El Bary, Shehata, Shaltout in 2018** among the female patients presented to oncology department in the period from 2012 to 2013 and reported that 41% of the female cancer patients were suffering from breast cancer (**Farhat et al., 2019**).

### **Aim of the study**

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The Aim of the Study is to evaluate the effect of application of Health Belief Model about Breast Cancer among Women Attended to Outpatients Beni-Suef Specialized Hospital through:

1. Assessing women's knowledge toward breast cancer.
2. Assessing women's reported practice toward breast cancer.
3. Assessing women's health beliefs toward breast cancer.
4. Evaluate the effect of application of the health belief model among the women to prevent and early detection of breast cancer.

### **Research hypothesis**

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Women who receive health belief model program will experience an improvement in knowledge, practice and health beliefs toward breast cancer compared to before application of health belief model.

### **Subject and Methods**

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**Subject and methods used for this study were portrayed under the four main designs as the following:**

1. Technical design
2. Operational design
3. Administrative design
4. Statistical design

**1. Technical design:**

The technical design included (research design, setting, subjects and tool for data collection)

**Research design: -**

A quasi-experimental design was conducted in this study.

**Setting:**

The study was conducted at all outpatient clinics in Beni-Suef specialized hospital. The available samples that met the specifications were taken from all clinics. The outpatient clinics at Beni-Suef Specialized

Hospital is in a separate building and consists of three floors. The first floor consists of two orthopedic clinics, two pediatric clinics, an electrocardiogram clinic, an internal medicine clinic, an obstetrical clinic, an x-ray room, a mammogram room, laboratory tests and lab virus tests. The second floor consists of a burn and cosmetic clinic, a neurology clinic, an ophthalmology clinic, two syringe management clinics, a room for dog bite vaccinations, a surgery clinic and a pharmacy for treatment at state expense. The third floor consists of three physical therapy clinics, five dental clinics, three digestive system and viruses clinics, a neurology clinic, and another pharmacy for treatment at state expense.

**Sample type:**

A convenient sample from of all women attending to the previous setting throughout 3 months. The sample was chosen according to the following criteria :women without breast cancer (a healthy women), not breast feed, not have breast surgery, voluntary agreed to participate in the study and who completely filled questionnaires through the period of 3 months involved in the current study, conscious women and consists of 150 women.

**Tools of data collection:**

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**Two tools were used to collect data:**

**Tool (I):** Structured interviewing questionnaire was developed by the investigator to collect data, under supervision staff based on reviewing related literatures and expert opinions and written in a simple Arabic language and it was consisted of four parts: -

**Part I:** Included demographic characteristics of the women about (age, marital status, occupation, educational level, residence and income).

**Part II:** Included obstetrical history (marriage age, menstrual age, number of pregnancy, number of para, age of first labor, number of abortion, number of living children and contraceptive used).

**Part III: Included Knowledge Assessment questionnaire:** which consisted of (definition of BC, risk factors, symptoms, methods of early detection, methods of treatment and complication).

#### Scoring system for knowledge:

A scoring system for women knowledge was calculated as follows (2) score for yes answer, (1) score for no answer and (0) score for don't interest, for each section of knowledge, the total scores (66 scores) of the items was summed up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score. The total score was converted into percentage and construed as follows:

- Good  $\geq 60\%$  ( $\geq 40$  points)
- Fair 60-50 (39-33 points)
- Poor  $< 50$  ( $< 33$  points) (Kucu & Andsoy, 2022).

**Part VI:** included reported practices regarding breast self-examination which consisted of steps of BSE such as (hand on thigh below and spread chest, raising hand back to head, searching about any changes, swelling, or nipple discharge, squeezing for any discharge, steps of breast self-examination while taking shower and steps of breast self-examination while lying on bed).

#### Scoring system for reported practice:

A scoring system for women reported practice was calculated as follows (2) score for done answer, (1) score for not done answer and (0) score for don't interest, for each section of reported practice, the total scores (24 scores) of the items was summed up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score. The total score was converted into percentage and construed as follows:

- Satisfactory  $\geq 60\%$  (14.4 points)
- Un satisfactory  $< 60\%$  ( $< 14.4$  points) (Gurjar, 2020).

**Tool II.** Champion's Health Belief Model Scale will be adapted from **Champion**

(1984) to assess women' health beliefs regarding breast cancer and women' health beliefs regarding breast self-examination and involved six constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy); perceived susceptibility consisted of 4 subitems, perceived severity consisted of 8 subitems, perceived benefits severity consisted of 13 subitems, perceived barriers consisted of 10 subitems, , cues to action consisted of 6 subitems and , self-efficacy consisted of 6 subitems.

#### Scoring system of Health Belief model:

A scoring system for women HBM was calculated as follows (2) score for agree answer, (1) score for sometimes answer and (0) score for don't agree, for each section of reported practice, the total scores (51 scores) of the items was summed up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score. The total score was converted into percentage and construed as follows:

- Positive  $\geq 70\%$  (35.7 points).
- Negative  $< 70\%$  ( $< 35.7$  points). (El-Hosary, 2021).

#### Content validity of the tools:

Study tools that were designed submitted to a panel of five reviewers and experts (2 community health nursing, 2 obstetrical nursing field and 1 obstetrical medicine). Each one of the experts on the panel was asked to examine the instrument for content coverage, clarity, wording, length, format, and overall appearance. Modifications of tools were done according to panel judgment.

#### Reliability of the tools:

Reliability of the study tools were tested for its internal consistency by Cronbach's Alpha. Reliability of the study tools was 0.924 for knowledge sheet, 0.790 for the reported practice of BSE and 0.823 for HBM.

#### II. Operational design:

The operational design includes

preparatory phase, pilot study, and field work phase.

#### A. Preparatory phase:

A review of recent, current, national and international related literature in various aspects of the problem to design the study tools, then tools of data collection were tested for content validity through pilot study to determine the women needs by using pretest based on the collecting data on the women knowledge and their practices toward prevention of BC.

#### B. Pilot study:

It was conducted on 10% of women (15 women) were chosen randomly to test the content, the aim of the pilot study was to evaluate clarity, visibility, applicability, as well as the time required to fulfill the developed tools. According to the obtained results, modifications such as omission, addition and rewording were done. The number of the pilot study was excluded from the study sample.

#### C. Field Work:

Data were collected over 3 months from the beginning of June 2023 to the end of August 2023. The study was carried out by the investigator for the studied sample at all outpatient clinics in Beni-Suef specialized hospital. The investigator visited the previous setting 4 days per week from 9:00 am to 12:00 mid-day as it is the time of clinics working. The average time needed for the sheet was around 30-45 minutes, the average number interviewed at all outpatient clinics in Beni-Suef specialized hospital were 2-3 patients/day depending on the responses of the mothers and application of HBM program using teaching methods and filled out the post program questionnaire for participated women filled.

### **Program construction:**

#### **Phase 1: Assessment:**

The investigator selected some factors to assess study sample which related the health belief model can be applied to women as following: This model may be useful to planners of BC prevention, particularly regarding the benefits of, and barriers to and intended behavior change. Even more relevant

to BC prevention, the model has been integrated into numerous theoretical perspectives for behavior change for preventing BC. The nursing educational programs were designed by the investigator based on data obtained from pre assessment tools.

#### **Phase 2: Program Implementation:**

Program implementation based on conducting session plans using different educational methods, and media in addition to the use of guiding booklet specifically designed and developed based on women assessment needs. Time was opened for attendance to ask questions and to receive the corresponding answers as well as to express their feedback toward the teaching session. Media used posters, laptop, guidance booklet which includes instruction and information for women as a reference during and post program implementation.

#### **Objective of the program:**

Through applying the health belief model.

#### **General Objectives:**

By the end of the educational program, the women will be able to acquire knowledge and practices regarding breast cancer(BC), change the women' wrong and bad health belief to prevent and early detection of breast cancer.

#### **Specific objectives:**

- Define BC.
- Enumerate causes of BC
- List risk factors of BC.
- Describe signs and symptoms of BC.
- Determine diagnosis of BC..
- Identify complication of BC..
- Mention methods of treatment of BC.
- Discuss methods of prevention of BC.
- Guess component of self-breast examination.

#### **The practical part includes:**

- Demonstrate steps of BSE.
- Display BSE.

**Program sessions:**

Time allowed: 5 hours has been allocated for health education sessions (45 minute for each session except session 5 needed 30 minutes).

At the beginning of the first session, an orientation about the program and its purposes was given. It was agreed at the time of the sessions with the women. From the second session each session started by a summary about what was given through the previous sessions and objectives of the new one.

By the end of each session a summary were made and time allocated for questions and answers & plan for next session were made. Except for the last session a termination of sessions through feedback was done.

Educational media was used the poster, laptop, guidance booklet which includes instruction and information for women as a reference during and post program implementation. Teaching material was used Arabic Booklet and audiovisual materials.

**Program Booklet**

A Booklet including all content of the program was designed and given to women as an educational reference during program implementation and as self-learning reference post program implementation. Its aim was providing scientific knowledge & practice and HBM related guideline instructions about BC, risk factors and its preventive measures.

**Phase 3: Program evaluation:**

This phase aimed to evaluate the level of improvement in women's knowledge, health practices and their HBM regarding BC. This was done through giving posttest similar to the pretest, evaluation administered to study subjects after completion of the program in order to estimate the effect of program on women's knowledge, practices and beliefs related to BC and measuring the effect of applying the health believe model in order to improve their health status and healthy practice.

**Ethical consideration**

Informed consent will be taken from the

directors of the previous setting, and then consent will be taken from the study subjects. Anonymity and confidentiality are assured through coding the data, data will be used in the purpose for the research study and withdraw from the study at any time is accepted.

**III. Administrative Design**

An approval letter to conduct the study will be obtained from the administrative authorities of the faculty of nursing Beni-Suef University forward the director of Beni-Suef hospitalized hospital, including the aim of the study.

**Statistical Design:**

All data collected were organized, tabulated and analyzed using appropriate statistical test. The data were analyzed by using the Statistical Package for Social Science (SPSS) version 21 which was applied to calculate frequencies and percentage, mean and standard deviation, as well as test statistical significance and associations by using Chi-square test ( $\chi^2$ ) and linear correlation coefficient ( $r$ ) and matrix correlation to detect the relation between the variables (P value).

**Significance levels were considered as follows:**

Highly statistically significant	$P < 0.001^{**}$
Statistically significant	$P < 0.05^*$
Not significant	$P > 0.05$

**Results**

**Table (1):** Shows that, one third (34%) of the studied women are from 30 to less than 40 years with **Mean age  $\pm$ SD/38.902 $\pm$ .89855**. Related to marital status, two third (66%) of them are married. Be sides, less than two third (61.3%) of them are house wife. Related to family income, one third (32.7%) of them have sufficient income for basic needs.

**Figure (1):** demonstrates that nearly one third (29.3%) of the studied women have basic education, while nearly (8%) of them not read and not written.

**Figure (2):** illustrates that nearly two third (64.7%) of them are from rural areas while more than one third (35.3%) from urban area.

**Table (3)** proves that one fifth (22%) from the total sample of the studied women have family history of BC (and (48.5%) of them with first Consanguinity) Less than two third from them (63.3%) don't know about other type of cancer.

**Table (4-1):** Indicates that, there is a marked improvement in women's knowledge about breast cancer after post implementation of health belief model regarding the all items, with the posttest arrive to more than half of the sample was gave correct and complete answer compare with the pretest, which the women's knowledge were one third. The highly statistically significant difference at ( $P < 0.001$ ).

The current study present statistical significant study between pre and posttest with the following (meaning of BC.0520, breast self-examination &.041) , **respectively**. And higher significant study of other items about BC.

**Count Table (4-1) Table (4-1):** Reveals that, there is a marked improvement in in women's knowledge about BC in post implementation of HBM in all items from the total sample compare with pretest, with highly statistically significant difference at ( $P < 0.001$ ). As evidence, Regarding to danger of late detection, no one (0%) of the studied women has yes answer pre implementation of the HBM and improves to most (95.3%) post implementation of the HBM.

**Table (4-2):** Indicates that, there is a marked improvement in women's knowledge regarding methods of preventing of BC in post HBM implementation in all items from the total sample compare with pretest, with highly statistically significant difference at ( $P < 0.001$ )

**Table (5):** shows that more than two third (68%) of the studied women haven't received health education about breast cancer, more than two fifth (43.7%) receive health education about breast cancer from One year: two years.

**Table (2):** Reveals that, less than two third (61.2%) of the studied women have marriage age between 20 to less than 30 years old, more than one third (34.9%) of them are pregnant for three times. In addition, less than half (48.7% & 47.9%) of them have 18: <27 years old at first birth and have one abortion, **respectively**. Furthermore two third (66.7%) of the women use previously contraceptive and one third (34.9%) of them use IUD.

**Figure (3):** shows that (25%) from the studied women at <11 years old, less than two third (61%) of the studied women get period at 11:<14 years old, while minority (14%) of them at 14 < more years old.

**Figure (4)** illustrates that less than one third (31.3%) of them receive health education about breast cancer One year: two years from the internet, (43%) of them take the health education from un formal sources, ex (internet and others) (31.3% & 12.5%), **respectively**.

**Figure (5):** Illustrates that, there is a marked improvement in total women's knowledge as the pretest was (56%-31%-31%) improved to (3%-6%-91%) during posttest with the fowling level poor, fair, & good, **respectively**.

**Table (6):** Indicates that, there is a marked improvement in the studied women's reported practice regarding BSE in post HBM implementation compare with the pretest. Our study detect present a highly statistically significant difference between pre & posttest of HBM with the all items of reported practice regarding BSE at ( $P < 0.001$ ). **respectively** post HBM implementation.

**Figure (6):** Illustrates that, there were marked improvement in the practice after the implementation of the HBM from one third (33.7%) of the women has satisfactory practice with pretest to (83.70%) with posttest.

**Table (7-1)** shows that there is a marked highly improvement in the post HBM (agreement). Show there is a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of perceived susceptibility of BC. Our study describe higher statistically significant study between all items of studied women's perceived susceptibility of BC with pre & posttest of HBM. It is a highly statistically significant difference as ( $P < 0.001$ ) compared with pre HBM implementation, **respectively**.

**Table (7-2)** shows that there is a marked highly improvement in the post HBM (agreement). Show there is a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of

perceived severity of BC. Our study describe higher statistically significant study between all items of studied women's perceived severity of BC with pre & posttest of HBM. It is a highly statistically significant difference as ( $P < 0.001$ ) compared with pre HBM implementation, **respectively**.

**Table (7-3)** shows that there is a marked highly improvement in the post HBM (agreement). Show there is a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of perceived benefits of BC. Our study describe higher statistically significant study between all items of studied women's perceived benefits of BC with pre & posttest of HBM. It is a highly statistically significant difference as ( $P < 0.001$ ) compared with pre HBM implementation, **respectively**.

**Table (7-4)** shows that there is a marked highly improvement in the post HBM (agreement). Show there is a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of perceived barriers of BC. Our study describe higher statistically significant study between all items of studied women's perceived barriers of BC with pre & posttest of HBM. It is a highly statistically significant difference as ( $P < 0.001$ ) compared with pre HBM implementation, **respectively**.

**Table (7-5)** shows that there is a marked highly improvement in the post HBM (agreement). Show there is a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of self-efficacy. Our study describe higher statistically significant study between all items of self-efficacy with pre & posttest of HBM. It is a highly statistically significant difference as ( $P < 0.001$ ) compared with pre HBM implementation, **respectively**.

**Table (7-6)** shows that there is a marked highly improvement in the post HBM (agreement). Show there is a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of cues to action of BC. Our study describe higher

statistically significant study between all items of cues to action of BC with pre & posttest of HBM. It is a highly statistically significant difference as ( $P < 0.001$ ) compared with pre HBM implementation, **respectively**.

**Figure (7):** Illustrates that vast majority (91%) of the studied women has negative attitude toward pre HBM implementation regarding BC which decreased to more than one tenth (13.3%) of them post HBM, while only one tenth (9%) of them has positive attitude pre HBM implementation regarding BC which increased to majority (86.7%) of them post HBM implementation.

**Table (8)** reveals that, there is a **highly statistically significant relation** between the studied women's total knowledge (pre & posttest) score with their educational level and family income, as  $P$ -value = 0.000 & 0.002 **respectively**. There is **statically significant relation** with their age and job as  $P$ -value = 0.04 & .05 is  $p < 0.05$ , but there is **no statistically significant relation** with their marital status as  $p$ -value = 0.523 is  $p < 0.05$ .

**Table (9)** Proves that, there is a **highly statistically significant relation** between the studied patients' total reported practice (pre & posttest) score with their age, job and their educational level as  $P$ -value = .0003 & 0.001 & 0.000, **respectively**. There is **statically significant relation** with their family income as  $P$ -value = .005. But there is **no statistically significant relation** with their Marital status as  $p$ -value = 0.552.

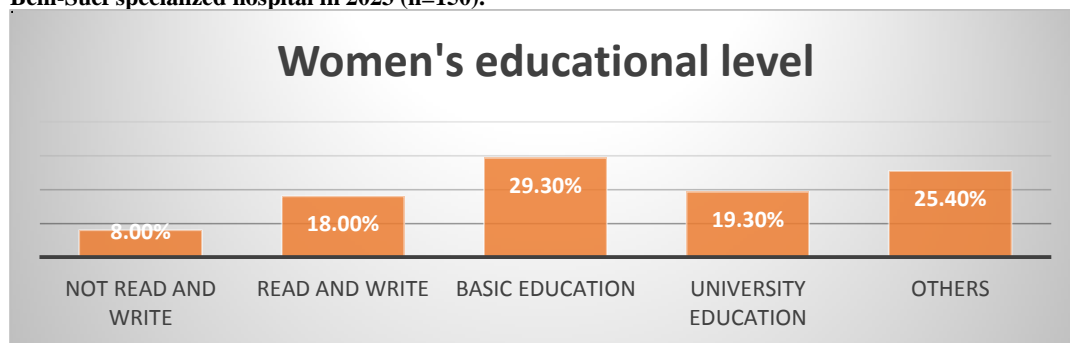
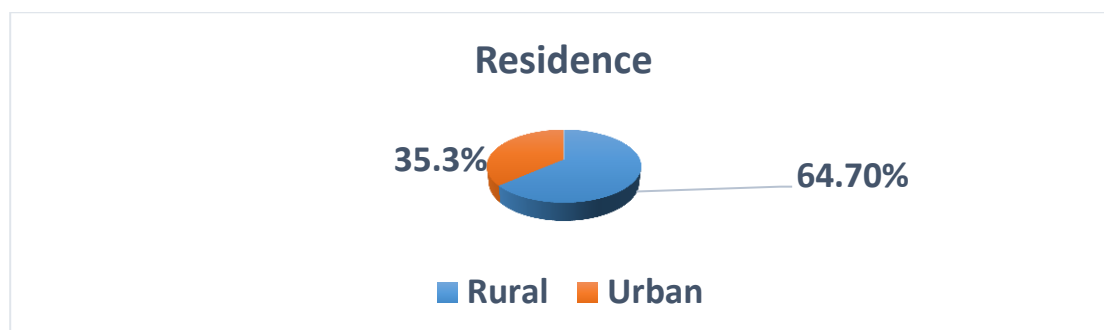
**Table (10)** Proves that, there is a **highly statistically significant relation** between the studied patients' total HBM score with their age, job and their educational level as  $P$ -value = .000 & 0.002 & 0.000, **respectively**. But there is **no statistically significant relation** with their Marital status and family income as  $p$ -value = 0.630 & 0.523, **respectively**.

**Table (11)** Shows that there is highly positive correlation statistically significant difference between total knowledge (pre & posttest) about breast cancer, with HBM and reported practice.  $p$  values  $< 0.001$ .



**Table (1): Distribution of the studied women according to their demographic characteristics at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).**

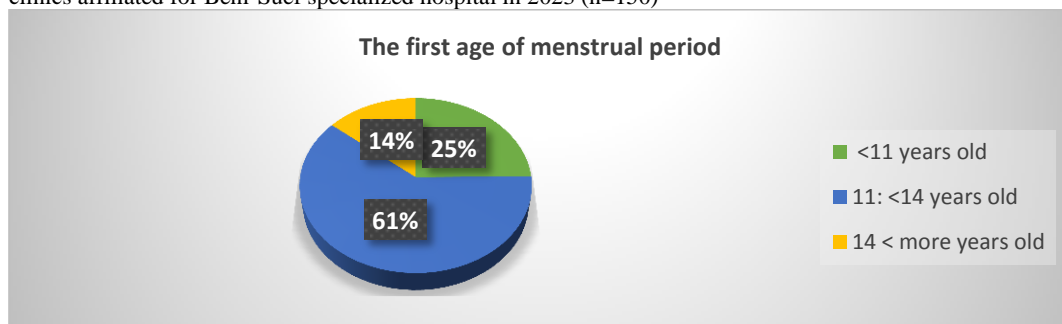
Demographic characteristics	No	%
<b>Age (year)</b>		
< 20	18	12
20 : < 30	32	21.3
30 : < 40	<b>51</b>	<b>34</b>
40 : ≤50	49	32.7
<b>Mean ±SD</b> 38.902±.89855		
<b>Marital status</b>		
Single	21	14
Married	<b>99</b>	<b>66</b>
Widowed	19	12.7
Divorced	11	7.3
<b>Job</b>	<b>92</b>	<b>61.3</b>
House wife	23	15.3
Government employee	35	23.4
Private employee		
<b>Family income</b>		
Sufficient for basic needs	<b>49</b>	<b>32.7</b>
Not sufficient for basic needs	35	23.3
Don't know	22	14.7
don't care	29	19.3
Enough and save it	15	10

**Figure (1) Distribution of the studied women's educational levels of at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).****Figure (2) Distribution of the studied women's residence at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).**

**Table (2): Distribution of the studied women according to menstrual and reproductive history at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).**

Menstrual and reproductive history history	No	%
Marriage age ( n=129)		
< 20	32	24.8
20 : < 30	<b>79</b>	<b>61.2</b>
≥30	18	14
Number of pregnancies(n=129)		
Not once	12	9.3
Once	16	12.4
Twice	19	14.7
Three	<b>45</b>	<b>34.9</b>
Four or more	37	28.7
Number of births(n=129)		
Not once	12	9.3
Once	13	10.1
Twice	18	14
Three times	<b>55</b>	<b>42.6</b>
Four or more	31	24
Age at first birth(n=117)		
<18 years old	15	12.8
18: <27 years old	<b>57</b>	<b>48.7</b>
27: <36 years old	36	30.8
≥ 36 years old	9	7.7
Age at last birth(n=117)		
<20 years old	23	19.6
20: <30 years old	34	29.1
30: ≤40 years old	<b>60</b>	<b>51.3</b>
Number of abortions(n=117)		
It did not happen	34	29
Once	<b>56</b>	<b>47.9</b>
Twice	16	13.7
Three times	11	9.4
Four or more	0	0.0
Number of live children(n=117)		
One		17.9
Two	21	16.2
Three	19	30.8
Four or more	36	35.1
Have you previously used contraceptives(n=129)	41	
Yes	<b>86</b>	<b>66.7</b>
No	43	33.3
If the answer is yes, what are(n=86)		
Contraceptive pills	17	19.8
Subcutaneous capsule	8	9.3
IUD	<b>30</b>	<b>34.9</b>
Syringe	10	11.6
Hormones	12	13.9
Others	9	10.5

**Figure (3)** Distribution of the studied women according to their first age of menstrual period at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150)



**Table (3):** Distribution of the studied women according to their family history regarding breast cancer at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).

Family history	N	%
<b>Any family member diagnosed with BC: -</b>		
Yes	33	22
No	<b>82</b>	<b>54.7</b>
Don't know	35	23.3
<b>Consanguinity (n=33):</b>	<b>16</b>	<b>48.5</b>
First degree	2	6
Second degree	3	9.1
Third degree	12	36.4
Don't know		
<b>Any family member diagnosed with other type of cancer: -</b>		
No	55	36.7
Don't know	<b>95</b>	<b>63.3</b>

**Table (4-1):** Distribution of studied women according to their knowledge regarding BC pre & post application of the HBM implementation at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (N =150).

knowledge about breast cancer	Pre health belief model						Post health belief model						T.test	
	Complete answer		Incomplete answer		Don't know		Complete answer		Incomplete answer		Don't know		T	p-value
	No	%	No	%	No	%	No	%	No	%	No	%		
definition of breast cancer	39	26	48	32	63	42	110	73.3	27	18	13	8.7	8.259	.0520*
Predisposing factors of breast cancer	37	24.7	24	16	89	59.3	128	85.3	16	10.7	6	4	-.188	< .001**
Symptoms of breast cancer	56	37.3	75	50	19	12.7	129	86	0	0.0	21	14.0	3.606	< .001**
Factors decline the liability of exposure to breast cancer	58	38.7	80	53.3	12	8	105	70	28	18.7	17	11.3	1.956	< .001**
Ways of discovering breast cancer	42	28	89	59.3	19	12.7	118	78.7	8	5.3	24	16	2.065	< .001**
Often of breast self-examination for early detection	64	42.7	76	50.9	10	6.7	102	68	17	11.3	31	20.7	.927	.041*
Treatment methods of breast cancer	24	16	100	66.7	26	17.3	76	50.7	60	40	14	9.3	3.235	< .001**
Complications of breast cancer	60	40	79	52.7	11	7.3	99	66	18	12	33	22	2.346	< .001**

\*\* highly statistically significant at p<0.001. \*statistically significant at p<0.05

Count Table (4-1)

Knowledge	Pre health belief model						Post health belief model						T.test	
	Yes		No		Not interested		Yes		No		Not interested		t	p-value
	No	%	No	%	No	%	No	%	No	%	No	%		
breast cancer is Contagious	10	6.7	89	59.3	51	40	98	65.4	32	21.3	20	13.3	.114	< .001**
Probability of breast cancer early detection	15	10	74	49.3	61	40.7	107	71.3	0	0.0	43	28.7	.541	< .001**
Probability of cured breast cancer	12	8	128	85.3	10	6.7	93	62	27	18	30	20	-.270	< .001**
Danger of late detection	<b>0</b>	<b>0.0</b>	138	92	12	8	<b>143</b>	<b>95.3</b>	7	4.7	0	0.0	.624	< .001**
Female mostly prevalent of breast cancer	35	23.3	105	70	10	6.7	101	67.3	22	14.7	27	18	.517	< .001**
Male and female equally prevalent of breast cancer	0	0.0	63	42	87	58	104	69.3	4	2.7	42	28	.767	< .001**
Breast mass indicate Probability of breast cancer	41	27.3	22	14.7	87	58	79	52.6	13	8.7	58	38.7	.065	< .001**
Breast mass after menstruations may be breast cancer	<b>10</b>	<b>6.7</b>	63	42	<b>77</b>	<b>51.3</b>	<b>116</b>	<b>77.3</b>	34	22.7	0	0.0	.282	< .001**
Radiation discover of breast cancer is the main cause of detection	31	20.7	87	58	32	21.3	109	72.7	25	16.7	16	10.6	.120	< .001**
Breast self-examination very important for early detection	22	14.7	128	85.3	0	0.0	94	62.7	36	24	20	13.3	.209	< .001**
Drugs used for treating breast cancer not affect other body organs	<b>96</b>	<b>64</b>	24	16	30	20	<b>142</b>	<b>94.7</b>	0	0.0	8	5.3	.164	< .001**

\*\* highly statistically significant at  $p < 0.001$

**Table (4-2):** Distribution of studied women according to their knowledge regarding methods of preventing of breast cancer pre & post the health belief model implementation at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (N =150).

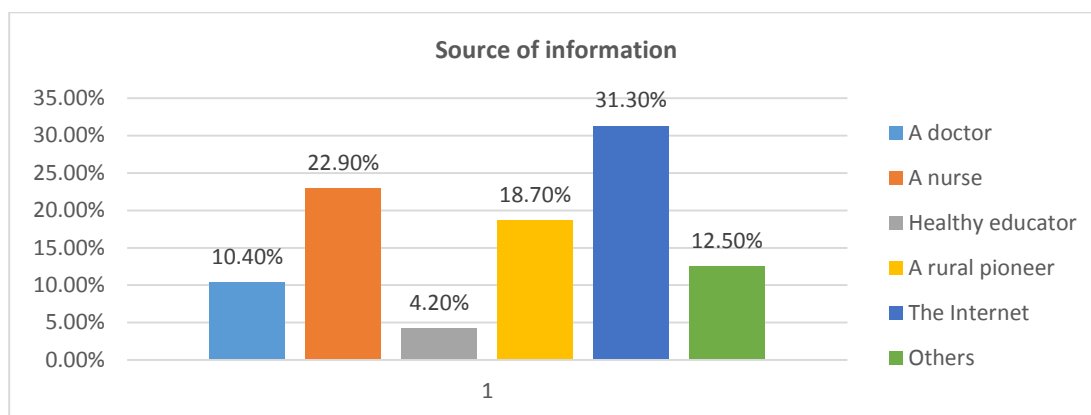
Knowledge	Pre health belief model				Post health belief model				T.test	
	Yes		No		Yes		No		T	p-value
	No	%	No	%	No	%	No	%		
Avoiding smoking	68	45.3	82	54.7	117	78	33	22	.2150	< .001**
Avoiding over weight	63	42	87	58	83	55.3	67	44.7	.2253	< .001**
Regularity sport for 30 minute	31	26.1	119	73.9	124	82.7	26	17.3	.3898	< .001**
Avoiding over dose of hormonal therapy	<b>69</b>	<b>46</b>	81	54	<b>150</b>	<b>100</b>	0	0.0	.2547	< .001**
Avoiding environmental pollution and radiational exposure	50	33.3	100	66.7	113	75.3	37	24.7	.3802	< .001**
Healthy diet with fruits and vegetables	<b>30</b>	<b>20</b>	120	80	<b>138</b>	<b>92</b>	12	8	.5597	< .001**
Healthy food	<b>55</b>	<b>36.7</b>	95	63.3	<b>141</b>	<b>94</b>	9	6	.5821	< .001**
Control weight and avoiding obesity	40	26.7	110	73.3	96	64	54	36	7.403	< .001**
Mammogram every 6 months for women 40 year and more	77	51.3	73	48.7	117	78	33	22	.7448	< .001**
Mammogram for women with history of breast cancer 30-40 age	18	12	132	88	109	72.7	41	27.3	8.966	< .001**
Avoiding hormonal therapy after menopause	51	34	99	66	127	84.7	23	15.3	7.875	< .001**
Avoiding oral contraceptives for long periods	63	42	87	58	92	61.3	58	38.7	.7919	< .001**
Avoiding child bearing after age of 30	<b>29</b>	<b>19.3</b>	121	80.7	<b>135</b>	<b>90</b>	15	10	10.687	< .001**

\*\* highly statistically significant at  $p < 0.001$ .

**Table (5): Distribution of studied women according to their source of knowledge at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (N =150).**

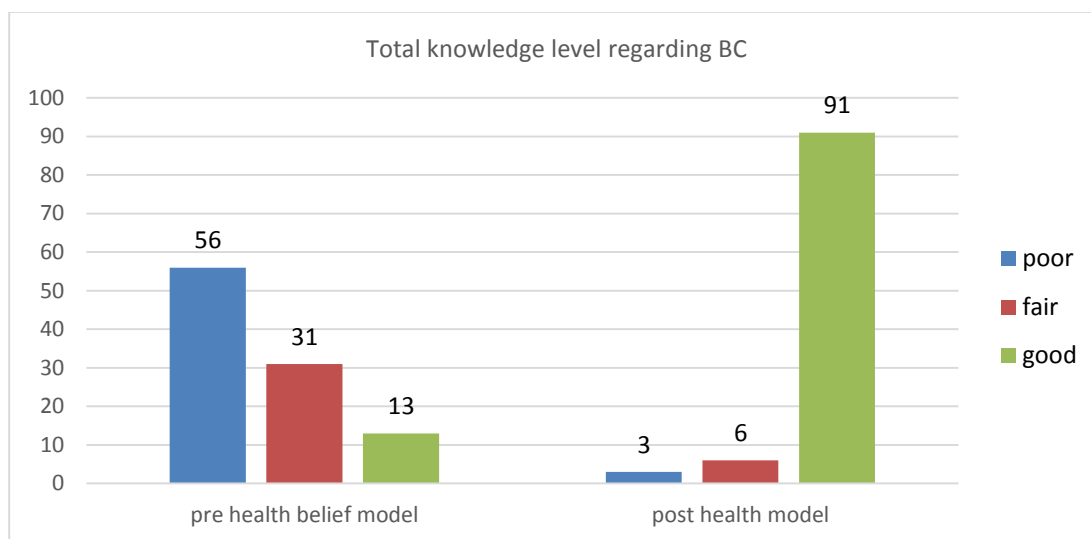
Items	N	%
Have you received health education about breast cancer?		
Yes	48	32
No	<b>102</b>	<b>68</b>
If yes, since when(n=48)		
< 1 year	14	29.2
One year: two years	<b>21</b>	<b>43.7</b>
≥ three years	13	27.1

**Figure (4): Distribution of the studied women according to their source of knowledge regarding breast cancer at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (N =150).**



While only limited percentage (4.2%) of them from health educator.

**Figure (5): Distribution of the studied women according to their total knowledge regarding BC Pre and Post HBM implementation at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (N =150).**

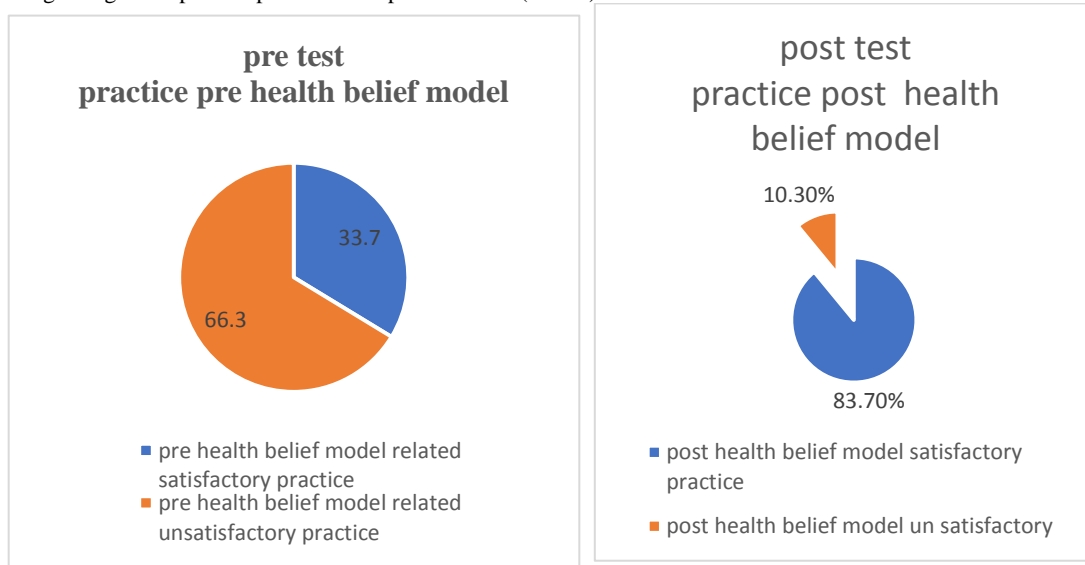


**Table (6):** Distribution of studied women according to their reported practice regarding breast self-examination (BSE) pre & post the health belief model implementation at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (N =150).

Reported practice regarding BSE	Pre health belief model						Post health belief model						T.test	
	Yes		No		Not interested		Yes		No		Not Interested		t	p-value
	No	%	No	%	No	%	No	%	No	%	No	%		
<b>A. Steps of breast self-examination in front of the mirror</b>														
1.Do hand on thigh below and spread chest	50	33.3	100	66.7	0	0.00	70	46.7	55	36.6	25	16.7	13.903	< .001**
2.Raise hand back to head	64	42.7	20	13.3	66	44.0	107	71.3	40	26.7	3	2.5	7.448	< .001**
3.Search about any changes, swelling, or nipple discharge	0	0.00	87	58.0	63	42.0	93	62.0	56	37.3	1	0.7	9.431	< .001**
4.Squeeze for any discharge	51	34.0	90	60.0	9	6.0	74	49.3	64	42.7	12	8.0	12.076	< .001**
<b>B. Steps of breast self-examination while taking shower</b>														
5.Raise hand back to head	47	31.3	85	56.7	18	12.0	105	70.0	40	26.7	5	3.3	9.862	< .001**
6.Use hand and soap to examine chest	29	19.3	88	58.7	33	22.0	89	59.3	59	39.4	2	1.3	12.908	< .001**
<b>C. Steps of breast self-examination while lying on bed</b>														
7.Lying on back with hand back to head	68	45.3	82	54.7	0	0.00	79	52.7	69	46.0	2	1.3	9.437	< .001**
8.Use 3- 4 fingers of right hand to examine left breast	35	23.3	92	61.4	23	15.3	103	68.7	43	28.6	4	2.7	11.875	< .001**
9.Circle movement of fingers around breast beginning of nipple	16	10.7	100	66.7	34	22.	87	58.0	38	25.3	25	16.7	8.966	< .001**
10.Simple pressure on breast to detect any mass	40	26.7	60	40.0	50	33.3	96	64.0	38	25.3	16	10.7	13.623	< .001**
11.Examine axillary to detect Any mass	29	19.3	76	50.7	45	30.0	79	60.7	43	28.0	16	10.7	13.903	< .001**
12.Simple pressure on left nipple to detect any mass	52	34.7	98	65.3	0	0.00	78	52.0	59	39.3	13	8.7	7.448	< .001**

\*\* highly statistically significant at p<0.001.

**Figure (6):** Distribution of the satisfactory & unsatisfactory studied women according to their reported practice regarding BSE pre and post HBM implementation (n=150).



**Table (7-1):** Distribution of studied women according to their perceived susceptibility of BC pre and post implementation of HBM at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).

\*\* highly statistically significant at  $p < 0.001$ .

**Table (7-2):** Distribution of studied women according to their health belief model regarding perceived severity of BC pre and post implementation of HBM according perceived severity at all outpatient clinics affiliated for

perceived susceptibility of BC	Pre health belief model						Post health belief model						x <sup>2</sup>	P value
	Agree		Sometimes		Don't agree		Agree		Sometimes		Don't agree			
	No	%	No	%	No	%	No	%	No	%	No	%		
1. Always think to be diagnosed with breast cancer	40	26.7	20	13.3	90	60	135	90	10	6.7	5	3.3	.927	< .001**
2.I am afraid of early diseased of breast cancer	35	23.3	40	26.7	0	0.00	129	86	20	13.3	1	.7	3.521	< .001**
3.I feel worry if member of my family diagnosed with breast cancer	23	15.3	47	31.3	80	53.4	36	24.0	90	60.0	24	16.0	8.734	< .001**
4.Danger of breast cancer destroy me	17	11.3	65	43.3	68	45.4	39	26.0	82	54.7	29	19.3	1.026	< .001**

Beni-Suef specialized hospital in 2023 (n=150).

perceived severity of BC	Pre health belief model						Pre health belief model						x <sup>2</sup>	p-value
	Agree		Sometimes		Don't agree		Agree		Sometimes		Don't agree			
	No	%	No	No	%	No	No	%	No	%	NO	%		
I can't meet my family needs if diagnosed with breast cancer	19	12.7	53	35.3	78	52	105	70	35	23.3	10	6.7	1.850	< .001**
I feel worry about the disease adverse effect on daily life	20	13.3	35	23.3	95	63.3	61	40.7	46	30.7	43	28.6	3.841	< .001**
Disease have cost effect on my family	29	19.3	40	26.7	81	54	115	76.7	30	20	5	3.3	5.005	< .001**
Diseased idea fear me	26	17.3	15	10	109	72.7	118	78.7	22	14.7	10	6.6	.523	< .001**
My heart beat increase while think of this disease	24	16	38	25.3	88	58.7	70	46.7	79	52.6	1	0.7	-5.98	< .001**
Repeat the disease idea fear me	25	16.7	58	38.6	67	44.7	58	38.7	92	61.3	0	0.00	-.419	< .001**
Breast cancer threat my partner relationship	34	22.7	48	32	68	45.3	64	42.7	73	48.7	13	8.6	1.850	< .001**
If I had breast cancer this will change all my life	32	21.3	57	38	61	40.7	69	46.0	70	46.7	11	7.3	3.531	< .001**

\*\* highly statistically significant at  $p < 0.001$ .

Table (7-3): Distribution of studied women according to their health belief model regarding perceived benefits of BSE pre and post implementation of HBM according at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).

Perceived benefits of BSE	Pre health belief model						Post health belief model						x <sup>2</sup>	p-value
	Agree		Sometimes		Don't agree		Agree		Sometimes		Don't agree			
	No	%	No	%	No	%	No	%	No	%	No	%		
3. Breast self-examination help in detection of breast mass	11	7.3	65	43.3	74	49.4	99	66	45	30	6	4	3.830	<.001**
4. Frequent examination to feel peace	5	3.3	35	23.3	110	73.3	87	58	48	32	15	10	1.013	<.001**
5. Breast self-examination reduce death rate of breast cancer	15	10	20	13.3	115	76.7	98	65.3	38	25.3	14	9.3	5.129	<.001**
6. I feel self-agree when do breast self-examination	20	13.3	15	10	115	76.7	92	61.3	38	25.3	20	13.4	3.587	<.001**
7. Monthly breast self-examination relax me	7	4.7	15	10	128	85.3	82	54.7	59	39.3	9	6	6.032	<.001**
8. Monthly breast self-examination help early detection of breast mass	23	15.3	20	13.3	107	71.3	138	92	12	8	0	0.0	3.718	<.001**
9. Monthly breast self-examination reduce probability of breast surgical removal	36	24	42	28	72	47.4	129	86	14	9.3	7	4.7	4.290	<.001**
10. Monthly breast self-examination help detection of mass before telling nurse or doctor	25	16.6	23	15.3	102	68	141	94	9	6	0	0.0	.182	<.001**
11. I do sport frequently 21 min daily three times weekly	2	1.3	25	16.6	123	82	98	65.3	52	34.7	0	0.0	4.130	<.001**
12. I have vitamins while not eat healthy meal	9	6	20	13.3	121	80.7	111	74	39	26	0	0.0	2.321	<.001**
13. I have meals rich of vegetables and fruits to avoid breast cancer	10	6.7	15	10	125	83.3	108	72	42	28	0	0.0	3.648	<.001**
14. Takeaway, fried meat, sugar, and carbohydrates increase the chance of the disease	5	3.3	35	23.3	110	73.3	122	81.3	25	16.7	3	2	3.507	<.001**
15. I always obey all medical orders that it is beneficial	7	4.7	15	10	128	85.3	105	70	45	30	0	0.0	5.027	<.001**



\*\* highly statistically significant at  $p < 0.001$ .

**Table (7-4):** Distribution of studied women according to their health belief model regarding perceived barriers of BC pre and post implementation of HBM according at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).

perceived barriers of BC	Pre health belief model						Post health belief model						x <sup>2</sup>	p-value
	Agree		Sometimes		Don't agree		Agree		Sometimes		Don't agree			
	No	%	No	No	%	No	No	%	No	No	%	No		
I am embarrassed of talking about breast self-examination with my family and friends	10	6.7	20	13.3	120	80	100	66.7	30	20	20	13.3	5.336	< .001**
I am embarrassed of doctor doing breast examination	29	19.3	40	26.7	81	54	115	76.7	30	20	5	3.3	3.683	< .001**
I don't like breast self-examination	5	3.3	35	23.3	110	73.3	45	30.0	88	58.7	17	11.3	6.608	< .001**
I feel afraid from doing breast self-examination	15	10	20	13.3	115	76.7	86	57.3	47	31.3	17	11.3	2.929	< .001**
I am embarrassed from doing breast self-examination	20	13.3	15	10	115	76.7	66	44.0	82	54.7	2	1.3	.810	< .001**
Breast self-examination is time consuming	7	4.7	15	10	128	85.3	89	59.3	55	36.7	6	0.4	1.245	< .001**
Breast self-examination is painful	5	3.3	35	23.3	110	73.3	83	55.4	50	33.3	17	11.3	.107	< .001**
I don't have enough privacy to do breast self-examination	2	1.3	25	16.6	123	82	101	67.3	22	14.7	27	18.0	.921	< .001**
I don't have enough knowledge about breast self-examination technique	25	16.6	23	15.3	102	68	141	94	9	6	0	0.0	9.410	< .001**
Breast examination by doctor is costly	2	1.3	25	16.6	123	82	97	64.7	26	17.3	27	18.0	.330	< .001**

\*\* highly statistically significant at  $p < 0.001$ .

**Table (7-5): Distribution of studied women according to their health belief model regarding self-efficacy of breast cancer pre and post implementation of HBM according at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).**

Self-efficacy	Pre health belief model						Post health belief model						x <sup>2</sup>	p-value
	Agree		Sometimes		Don't agree		Agree		Sometimes		Don't agree			
	No	%	No	No	%	No	No	%	No	No	%	No		
I am sure of practicing breast self-examination correctly	25	16.6	23	15.3	102	68	135	90	15	10	0	0	4.772	<.001**
I am able to detect any mass while doing breast self-examination	2	1.3	25	16.6	123	82	93	62	57	38	0	0	3.880	<.001**
I am sure of correct steps for doing breast self-examination	35	23.3	40	26.7	0	0.00	129	86	20	13.3	1	.7	3.847	<.001**
I am able to know the normal image and tissue while doing breast self-examination	2	1.3	25	16.6	123	82	107	71.3	43	28.7	0	0	1.026	<.001**
While watching my breast at mirror I can detect any abnormality	9	6	20	13.3	121	80.7	95	63.3	33	22	22	14.7	12.55	<.001**
I can use the correct fingers to do breast self-examination	10	6.7	15	10	125	83.3	122	81.3	28	18.7	0	0	2.020	<.001**

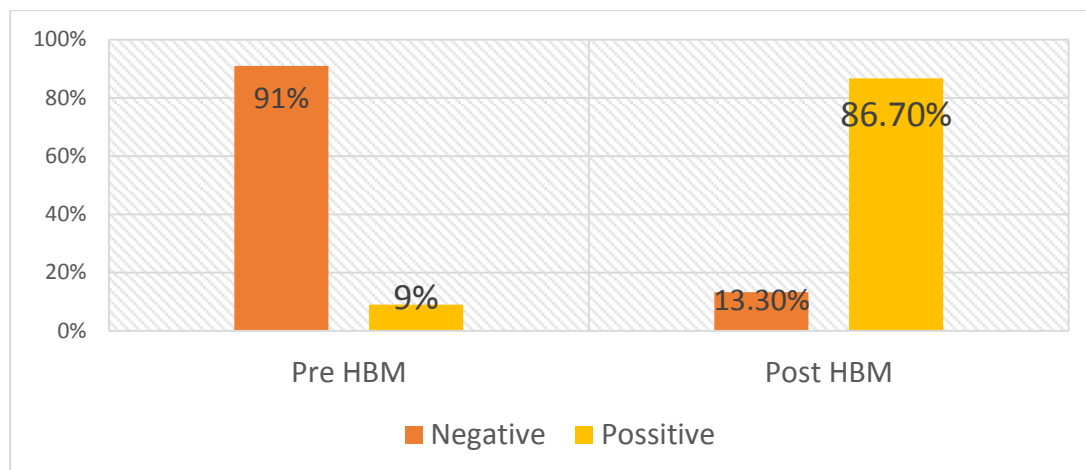
\*\* highly statistically significant at p<0.001.

**Table (7-6): Distribution of studied women according to their health belief model regarding cues to action of BC pre and post implementation of HBM according at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023(n=150).**

cues to action of BC	Pre health belief model						Post health belief model						x <sup>2</sup>	p-value
	Agree		Sometimes		Don't agree		Agree		Sometimes		Don't agree			
	No	%	No	No	%	No	No	%	No	No	%	No		
I want to discover any health problem early	19	12.7	24	16	115	76.7	115	76.7	19	12.7	24	16	-2.47	<.001**
Good health serving is very important to me	21	14	27	18.0	102	68	112	74.7	36	24	2	1.3	-4.400	<.001**
I search any new problem to improve my health	5	3.3	35	23.3	110	73.3	93	62	48	32	9	6	-0.95	<.001**
I believe there is activities in which promote health	15	10	20	13.3	115	76.7	109	72.7	39	26	2	1.3	4.557	<.001**
I feel self-confident while performing breast self-examination	20	13.3	15	10	115	76.7	112	74.7	27	18	11	7.3	1.120	<.001**
Timely medical investigations although not diseased	7	4.7	15	10	128	85.3	115	76.7	30	20	5	3.3	3.261	<.001**

\*\* highly statistically significant at p<0.001.

**Figure (7):** Distribution of the women according to their health attitude related to health belief model regarding breast cancer (n=150).



**Table (8)** Relations between the studied women’s total knowledge score with their demographic characteristics(pre & posttest) at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023(n=150).

Demographic characteristics	N	total knowledge pre						total knowledge post						X2	P-value
		Good		Fair		Poor		Good		Fair		Poor			
		N	%	N	%	N	%	N	%	N	%	N	%		
<b>Age</b>															
< 20	18	2	1.3	3	2	13	8.7	16	10.7	1	.7	1	.7	4.63	*0.04
20 : < 30	32	1	.7	2	1.3	28	18.7	30	20	1	.7	1	.7		
30 : < 40	51	3	2	33	22	15	10	45	30	3	2	3	2		
40 :≤50	49	3	2	2	1.3	44	29.3	44	29.3	3	2	2	1.3		
<b>Marital status</b>															
Single	21	1	.7	2	1.3	18	12	19	12.7	1	.7	1	.7	9.32	0.523
Married	99	4	2.7	1	.7	94	62.7	95	63.3	2	1.3	2	1.3		
Widowed	19	2	1.3	2	1.3	15	10	16	10.7	2	1.3	1	.7		
Divorced	11	1	.7	3	2	7	4.7	9	6	1	.7	1	.7		
<b>Job</b>															
House wife	92	2	1.3	3	2	87	58	85	56.7	4	2.7	3	2	5.63	*0.05
Government	23	1	.7	2	1.3	20	13.3	20	13.3	2	1.3	1	.7		
Private employee	35	3	2	5	3.3	27	18	33	22	1	.7	1	.7		
<b>Educational level</b>															
Not read & write	12	2	1.3	2	1.3	8	5.3	10	6.7	1	.7	1	.7	0.324	**0.000
Read & write	27	2	1.3	5	3.3	20	13.3	25	16.7	1	.7	1	.7		
Basic education	44	2	1.3	2	1.3	40	26.7	41	27.3	2	1.3	1	.7		
University education	29	4	2.7	5	3.3	20	13.3	25	16.7	2	1.3	2	1.3		
Others	38	4	2.7	4	2.7	30	20	30	20	4	2.7	4	2.7		
<b>Family income</b>															
Sufficient for basic needs	49	3	2	3	2	43	28.7	40	26.7	5	3.3	4	2.7	3.24	**0.002
Not sufficient for basic needs	35	3	2	2	1.3	30	20	31	20.7	2	1.3	2	1.3		
Don't know	22	2	1.3	3	2	17	11.3	20	13.3	1	.7	1	.7		
don't care	29	4	2.7	5	3.3	20	13.3	25	16.7	2	1.3	2	1.3		
Enough and save it	15	2	1.3	3	2	10	6.7	13	8.7	1	.7	1	.7		

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

(\*) Statistically significant  $p < 0.05$

**Table (9)** Relations between the studied women's demographic characteristics and their total reported practice score at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).

Demographic characteristics	N	Total reported practice level pre				Total reported practice level post				X <sup>2</sup>	P-value
		satisfactory		unsatisfactory		Satisfactory		unsatisfactory			
		No.	%	No.	%	No.	%	No.	%		
<b>Age</b>											
< 20	18	3	2	15	10	16	10.7	2	1.3	<b>15.72</b>	<b>0.003</b>
20 : < 30	32	14	9.3	18	12	29	19.3	3	2		
30 : < 40	<b>51</b>	13	8.7	38	25.3	48	32	3	2		
40 : ≤50	49	20	13.3	29	19.3	45	30	4	2.7		
<b>Marital status</b>											
Single	21	14	9.3	7	4.7	16	10.7	2	1.3	<b>1.75</b>	<b>0.552</b>
Married	<b>99</b>	20	13.3	79	52.7	29	19.3	3	2		
Widowed	19	6	4	13	8.7	48	32	3	2		
Divorced	11	3	2	8	5.3	45	30	4	2.7		
<b>Job</b>											
House wife	<b>92</b>	2	1.3	90	60	85	56.7	7	4.7	<b>12.45</b>	<b>0.001</b>
Government	23	3	2	20	13.3	19	12.7	4	2.7		
Private	35	5	3.3	30	20	32	21.3	3	2		
<b>Educational level</b>											
Not read &	12	2	1.3	10	6.7	12	8	0	0	<b>2.25</b>	<b>0.000</b>
Read & write	27	5	3.3	22	14.7	25	16.7	2	1.3		
Basic	44	4	2.7	40	26.7	42	28	2	1.3		
University	29	4	2.7	25	16.7	27	18	2	1.3		
Others	38	3	2	35	23.3	34	22.7	4	2.7		
<b>Family income</b>											
Sufficient for basic needs	49	4	2.7	45	30	47	31.3	2	1.3	<b>10.25</b>	<b>0.05</b>
Not sufficient for basic needs	35	3	2	32	21.3	34	22.7	1	.7		
Don't know	22	2	1.3	20	13.3	16	10.7	6	4		
don't care	29	4	2.7	25	16.7	20	13.3	9	6		
Enough and	15	1	.7	14	9.3	15	10	0	0		

(\*\*) Highly statistically significant  $p < 0.001$

(\*) Statistically significant  $p < 0.05$

**Table (10)** Relations between the studied women's demographic characteristics and their total HBM score at all outpatient clinics affiliated for Beni-Suef specialized hospital in 2023 (n=150).

Demographic characteristics	N	HBM pre				HBM post				X <sup>2</sup>	P-value
		Negative		Positive		Negative		Positive			
		No.	%	No.	%	No.	%	No.	%		
<b>Age</b>											
< 20	18	15	10	3	2	2	1.3	16	10.7	<b>15.72</b>	<b>0.000</b>
20 : < 30	32	27	18	5	3.3	3	2	29	19.3		
30 : < 40	<b>51</b>	45	30	6	4	1	.7	48	32		
40 : ≤50	49	40	26.7	9	6	4	3.3	45	30		
<b>Marital status</b>											
Single	21	15	10	6	4	2	1.3	19	12.6	<b>1.75</b>	<b>0.630</b>
Married	<b>99</b>	75	50	24	16	9	6	90	60		
Widowed	19	16	10.7	3	2	4	3.3	15	10		
Divorced	11	6	4	5	3.3	3	2	8	5.3		
<b>Job</b>											
House wife	<b>92</b>	85	56.7	7	4.7	3	2	89	59.3	<b>12.45</b>	<b>0.002</b>
Government	23	16	9	7	4.7	2	1.3	21	14		
Private	35	30	20	5	3.3	2	1.3	33	22		
<b>Educational level</b>											
Not read &	12	10	6.7	2	1.3	1	.7	11	7.3	<b>2.25</b>	<b>0.000</b>
Read & write	27	20	13.3	7	4.7	2	1.3	25	16.7		
Basic	44	38	25.3	6	4	1	.7	43	2.9		
University	29	20	13.3	9	6	3	2	26	17.3		
Others	38	35	23.3	3	2	0	0	38	25.3		
<b>Family income</b>											
Sufficient for basic needs	49	35	23.3	14	9.3	3	2	46	30.7	<b>3.025</b>	<b>0.523</b>
Not sufficient for basic needs	35	29	19.3	6	4	1	.7	34	22.7		
Don't know	22	15	10	7	4.7	2	1.3	20	13.3		
don't care	29	19	12.7	10	6.7	1	.7	8	5.3		
Enough and	15	11	7.3	4	3.3	0	0	15	10		

(\*\*) Highly statistically significant p &lt; 0.001

(\*) Statistically significant p &lt; 0.05

**Table (11):** correlation between the studied women's total knowledge, HBM and reported practice pre and post health belief model implementation (n=150).

Categories	Total knowledge		x <sup>2</sup>	P value
	Pre health belief model	Post health belief model		
HBM	2.828	-.160	12.557	< .001**
Total reported practice	3.634	0.05	-8.259	< .001**
Mean± SD	5.00667±.40667	4.88319±.60309	-	-

## Discussion:

Breast cancer (BC) is a disease that results from uncontrolled growth and changes in breast tissue, typically resulting in a lump or mass. It is the most common cancer and also the primary cause of mortality in female patients around the world. Globally, it is the leading cancer-related disease both in morbidity and in mortality among female patients, affecting 2.1 million annually, and over half million died in 2018. While BC rates are higher in more developed regions, it is increasing in every region internationally, including Ethiopia (Wondmu et al., 2022).

Breast cancer (BC) is the most frequent cancer among women and rate of death is increasing day by day. Furthermore, because of the increase in aging, 19.3 million new cases of cancer are estimated to occur in 2025 and more than half of cancer deaths are expected to be seen in less developed regions around the world. Increased BC incidence leads more health spending and high death rates. On the other hand, maintaining an effective cancer screening is one of the most important factors to assess the outcomes of diagnosis, and treatment. Due to this reason, BC should be controlled and prevented through early diagnosis and screening Program. Mammography, clinical breast examination (CBE) and breast self-examination (BSE) are a crucial for early diagnosis of BC (AKARSU & ANDSOY, 2022).

The aim of the study is to assess the effect of application of health belief model about breast cancer among women attended to outpatients Beni-Suef specialist hospital. This aim will be achieved by assessing women's awareness toward breast cancer (knowledge, practices), assessing women's health beliefs toward breast cancer and evaluate application effect of the Health Belief Model among the women to prevent and early detection of breast cancer.

The current study revealed that one third of the studied women are from 30 to less than 40 years with Mean age  $\pm$ SD/38.902 $\pm$ .89855. Related to marital status, two third of them are

married. Be sides, less than two third of them are house wife.

The current study illustrated that one third of the studied women are from 30 to less than 40 years with Mean age  $\pm$ SD/38.902 $\pm$ .89855. this result was agreement with Shakor et al., (2019) who investigated 'Determinants of Breast Self-Examination Practice amongst Iraqi/Sulaimani Women using Champion Health Belief Model and Breast CAM' in Iraq and found that one third (31.1%) of the participants were from 30-39 years old, majority (79.8%) of them were married, two third (65.7%) of them were unemployed and less than one third (29%) of them had primary education. And Gurjar, (2021) who investigated 'Impact of an Educational Programme on Knowledge on Breast Cancer and Practice of Breast Self-Examination among Women' in India and proved that more than one third (37.5%) of participants were in the age group of 31–40 years.

Also, Kissal & Kartal, (2019) who investigated 'Effects of Health Belief Model-Based Education on Health Beliefs and Breast Self-Examination in Nursing Students' in Turkey and found that vast majority (91.7%) of the participants were not working. In addition, Tweneboah- Koduah, (2018) who investigated 'Social marketing: Using the health belief model to understand breast cancer protective behaviours among women' in Ghana and found that more than half (57.9%) of the participants were married. **From the researcher point of view, this may be due to majority of the participants are from rural areas and had no job.**

**Related to family income**, one third of the studied women had sufficient income for basic needs. This finding was disagreed with Abd-Elaziz et al., (2021) who investigated 'Effect of Breast Self-Examination Programme on Women's Awareness for Early Detection of Breast Cancer' in Minia, Egypt and proved that one fifth (20%) of the participants had Sufficient income. **The researcher point of view that this may be due to different community socio-economical level.**

**According educational level**, the current study mentioned that nearly one third of the

studied women have basic education. This finding was **supported with Gooda, (2022)** who investigated 'Women's self-care practices improvement strategy regarding post-surgical complications of breast cancer' in Benha, Egypt and proved that less than one third (28.7%) of the participants women had basic education. **From the researcher point of view, this may be due to that nearly two third of participants were from rural areas and different culture around education.**

The current study demonstrated that nearly two third of them are from rural areas while more than one third from urban area. This study was **supported with Farhat et al., (2019)** who investigated 'Application of an Intervention Based on Health Belief Model on Knowledge and Compliance to Breast Self -Examination among Female Students at Risk for Radiation Exposure' in Menoufia, Egypt and proved that majority (88%) of them lived in rural area. **From the researcher point of view, this may be due to Beni-suef governorate consists of 6 rural local units including 40 villages - 105 estates, so most residence are from rural areas.**

**Regarding distribution of the studied women according to menstrual and reproductive history,** the current study revealed that less than two third of the studied women have marriage age between 20 to less than 30 years old, more than one third of them are pregnant for three times.

These findings was **in the same line with Gangane, (2018)** who investigated 'Breast Cancer in Rural India: Knowledge, attitudes, practices; Delays to care and Quality of life' in India and found that less than two third (64.5%) of the participants married at age from 20-35 years and more than one fifth (22.9%) of them had three pregnancy.

**Regarding age at first birth,** the current study pointed that less than half of the studied women had 18: <27 years old at first birth and half of them had 30: ≤40 years old at last birth. These findings was **supported with Gooda, (2022)** who mentioned that one third (32.5%) of the participants women had 20-29 years at first birth and less than two third (62.3%) of them had 30-45

years at last birth.

**Regarding previously used contraceptives,** the study proved two third of the women use previously contraceptive and one third of them use IUD. This finding was **in accordance with Bonsu et al., (2019)** who investigated 'Breast cancer knowledge, beliefs, attitudes and screening efforts by micro-community of advanced breast cancer patients in Ghana' in Ghana and found that more than half (51.5%) of the participants used contraception.

**Regarding distribution of the studied women according to their first age of menstrual period,** the current study revealed that less than two third of the studied women get period at 11:<14 years old. This finding was **in the same line with Yilmaz et al., (2018)** who demonstrated that three quarters (75.8%) of the participants' Age at menarche was at 12-14 age. And, **Gangane, (2018)** who revealed that more than two third (69.6%) of the participants get period at 10:14 years old

**Regarding distribution of the studied women according to their family history regarding breast cancer,** the current study proved that one fifth from the total sample of the studied women have family history of BC and less than half of them with first Consanguinity. This finding was **in the same line with Al-Hosni et al., (2023)** who investigated 'Effectiveness of an Educational Program on Awareness of Breast Cancer Risk Factors, Symptoms, and Barriers to Seeking Medical Help among Adolescent Omani School Students—An Interventional Study' in Oman and found that two fifth (42.2%) of the participated women had family history and less than half (47.6%) with first Degree of relative with cancer

Also, this finding was **supported with Mohamed et al., (2023)** who investigated 'Knowledge of high school female students about breast self-examination' in Saudi Arabia and found that less than one fifth (17.7%) of the participants had family history of BC. And, **Shubayr et al., (2022)** who investigated 'Knowledge and Factors Associated with Breast Cancer Self-Screening Intention among Saudi Female College Students: Utilization of the Health Belief Model' in Saudi Arabia and proved that more than one fifth (23.7%) had had a family member or friend experience breast cancer.

The current study indicates that, there was a marked improvement in women's knowledge

about breast cancer after post implementation of health belief model regarding the all items, with the posttest arrive to more than half of the sample was gave correct and complete answer compare with the pretest, which the women's knowledge were one third. The highly statistically significant difference at ( $P < 0.001$ ).

The finding was **agreed with Rakhshani et al., (2022)** 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 ( $P = 0.05$ ). And, **Mahmoud et al., (2020)** who investigated 'Effect of The Health Belief Model-Based Education on Preventive Behaviors of Breast Cancer' in Benha, Egypt and proved that there were improvements in the studied women's knowledge scores regarding breast cancer post-model implementation ( $P < 0.001$ ). **From the researcher point of view, this may be due to the effectiveness of the HBM application on women's knowledge regarding BC.**

**The current study revealed that,** there is a marked improvement in women's knowledge about breast cancer after post implementation of health belief model regarding the all items, with the posttest arrive to more than half of the sample was gave correct and complete answer compare with the pretest, which the women's knowledge were one third. The highly statistically significant difference at ( $P < 0.001$ ).

The finding was in **the same line with Sarker et al., (2022)** 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  $p < 0.001$ . And **Rakhshani et al., (2022)** who investigated 'The Effect of Educational Intervention on Knowledge, Attitude, and Practice of Women towards Breast Cancer Screening' in Izeh city, Iran and found a significant difference was observed after the intervention, with the experimental group obtaining significantly higher mean scores of knowledges ( $P = 0.05$ ). **From the researcher**

**point of view, this result may be due to training HBM program introduced good information and the interesting of mothers participated had a protective effect against HPI.**

**The current study indicated that,** there is a marked improvement in women's knowledge regarding methods of preventing of BC in post HBM implementation in all items from the total sample compare with pretest, with highly statistically significant difference at ( $P < 0.001$ ). This finding was **supported with Alameer et al., (2018)** who investigated 'Effect of Health Education on Female Teachers' Knowledge and Practices Regarding Early Breast Cancer Detection and Screening in the Jazan Area: a Quasi-Experimental Study' in Jazan and illustrated that Compared to the control group, the intervention group showed a statistically significant increase in knowledge items related to BC detection, screening tools and prevention at both 6 weeks and 3 months post-intervention. **this may be due to the HBM program consists of various prevention methods which increase their knowledge regarding BC.**

Regarding distribution of the studied women according to their source of knowledge regarding breast cancer, the current study revealed that less than one third of them receive health education about breast cancer One year: two years from the internet, more than two fifth of them take the health education from un formal sources, ex (internet and others). While only limited percentage of them from health educator.

This finding was **supported with Mohamed et al., (2023)** who illustrated that the main sources of information about BSE for the participants were the internet (45.18%). But, this finding was disagreed with **Abd-Elaziz et al., (2021)** who showed that one third (33.0%) of the studied sample their source of knowledge was from television, followed by less than one third (30.0%) of them was their friends and relative. **From the researcher point of view, this may be due to the access network of participants which enables them to look forward about topics interested.**

Regarding distribution of the studied women according to their total knowledge regarding BC Pre and Post HBM implementation, the current study illustrated that, there was a marked improvement in total women's knowledge as the pretest was (56%-31%-31%) improved to (3%-6%-91%) during posttest with the following level



poor, fair, & good, respectively. This finding was **agreed with Abd-Elaziz et al., (2021)** who illustrated that one third (30.0%) of the studied sample had good practice regarding breast self-examination pre-program increased to most (98.0%) post-program with highly statistically significant differences which P-value < 0.0001. **As women were careful on attendance training program (HBM) that help them to protect themselves and their relatives.**

But, this finding was **disagree with Nema Ram, (2020)** who investigated 'Impact of an Educational Programme on Knowledge on Breast Cancer and Practice of Breast Self-Examination among Women' in India and found that in the post-test, around half (45%) of the women had good knowledge, two fifth (40%) had poor knowledge and more than one tenth (15%) had average knowledge. **This may be due to illiterate participants which hinder their understanding.**

The current study indicated that, there was a marked improvement in the studied women's reported practice regarding BSE in post HBM implementation compare with the pretest with a highly statistically significant difference between pre & posttest of HBM with the all items of reported practice regarding BSE at (P<0.001), respectively post HBM implementation.

The finding was **in agreement with Akarsu & Andsoy, (2022)** who investigated 'Evaluation of Breast Self-examination Training in Turkish Women Living in Northwestern Turkey' and demonstrated that significant improvements were observed in the post-test (after training, after one month and three months training) scores for steps of BSE after the intervention (p < 0.001). And **Rakhshani et al., (2022)** who proved that the mean score of practice in the experimental group significantly increased after the educational intervention (27.86 ± 4.03) compared to the preintervention score (15.46 ± 4.14). In other words, practice-focused interventions could lead to an increase in screening practices.

This finding also **was agreed with Sarker et al., (2022)** 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 Bangladesh and found that there was a significant percentage of change in BSE practices was obtained between

pre-test and post-test (21.3% vs. 33.8%; p < 0.001). And **Nema Ram, (2020)** who revealed a significant improvement in the practice of all domains or steps of BSE after educational programme. **From the researcher point of view, this result may be due to the success of the HBM program on the improvement of women's reported practices regarding BSE and awareness of women about importance of BSE in early detection and prevention of BC.**

Regarding distribution of the satisfactory & unsatisfactory studied women according to their reported practice regarding BSE pre and post HBM implementation. The current study illustrated that, there were marked improvement in the practice after the implementation of the HBM from one third of the women has satisfactory practice with pre HBM implementation increased to with post HBM implementation.

This finding was **in accordance with Gurjar, (2021)** who found only one fifth (20%) of the studied women had satisfactory practice regarding BSE pretest which increased to less than two third (62.5%) posttest after implementation of health educational program. **From the researcher point of views, this is could be due to increasing awareness of participated women about the importance of performing of BSE and perform and eastly performed at home which not required any equipment and money.**

Regarding distribution of studied women according to their perceived susceptibility of BC pre and post implementation of HBM, the current study revealed that there was a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of perceived susceptibility of BC (P<0.001).

These findings were **in agreement with Farhat et al., (2019)** who proved that there was a highly statistically significant difference between the studied participants perceived susceptibility regarding breast cancer and breast self-exam using Champion health belief model within pre and post intervention (p value < 0.001). from the researcher point of view, this may be due to higher awareness of women participated in HBM and having more information about BC screening and BSE.

Regarding distribution of studied women according to their health belief model regarding perceived severity of BC pre and post

implementation of HBM according perceived severity, the current study revealed that there was a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of perceived severity of BC.

This finding was **in accordance with Shakor et al., (2019)** who illustrated that there is statically significant between items of perceived severity pre and post HBM implementation. **This may be due to the increasing awareness of participated women regarding importance of BSE and early screening of BC.**

The current study demonstrated that there was a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of perceived benefits of BC. This finding was **in accordance with Asiri & Rashad, (2019)** who investigated 'Prediction of The Awareness and Practice of Breast Self-Examination among Females Using Health Believe Model. A literature review' in Saudi Arabia who found a statistically significant differences between perceived benefits and BSE behavior ( $P = 0.001$ ). **this may be due to and active participation of women in educational sessions through HBM implementation.**

**Regarding pre perceived barriers of BC** and post implementation of HBM, there was a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of perceived barriers of BC.

This finding was **in the same line with Tweneboah- Koduah, (2018)** who proved that there was statistically significant relationship between perceived barrier and performance of breast cancer protective behaviours ( $p < .000$ ) pre and post HBM implementation. **This may be due to the positive effect of HBM.**

**Regarding distribution of studied women according to their health belief model regarding self-efficacy of breast cancer pre and post implementation of HBM,** the study proved that there was a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of self-efficacy.

This finding was **in the same line with Farhat et al., (2019)** there was a highly statistically significant difference between the studied participants' self-efficacy regarding breast

cancer and breast self-exam using Champion health belief model within pre and post intervention ( $p$  value  $< 0.001$ ).

**Regarding distribution of studied women according to their health belief model regarding cues to action of BC pre and post implementation of HBM,** the study demonstrated that there was a marked improvement in the posttest HBM with (agree) compare with the pretest toward all items of cues to action of BC.

This finding was in accordance with **Shakor et al., (2019)** who illustrated that there is statically significant between items of cues to action pre and post HBM implementation.

Relations between the studied women's total knowledge score with their demographic characteristics (pre & posttest), the current study proved that there was a highly statistically significant relation between the studied women's total knowledge (pre & posttest) score with their educational level and family income, as  $P$ -value= 0.000 & 0.002 respectively. There is statically significant relation with their age and job as  $P$ -value= 0.04 & .05 is  $p < 0.05$ .

The current study proved that there was a highly statistically significant relation between the studied patients' total reported practice (pre & posttest) score with their age, job and their educational level as  $P$ -value= . 0.003 & 0.001 & 0.000, respectively. There is statically significant relation with their family income as  $P$ -value= . 0.05.

This finding was **agreed with Elsayy et al., (2023)** who proved that there were statically significant between participants' practice and their educational level.

The current study illustrated that vast majority of the studied women has negative attitude toward pre HBM implementation regarding BC which decreased to more than one tenth of them post HBM, while only one tenth of them has positive attitude pre HBM implementation regarding BC which increased to majority of them post HBM implementation.

These findings were **in accordance with Elsayy et al., (2023)** who investigated 'Effect of Utilizing Health Belief Model on Knowledge, Beliefs, and Behaviour of Visually Impaired

Women toward Breast Self-examination' in Egypt and found that more than half (57.14%) of the participants women had negative belief pre HBM which decreased to (0) post HBM implementation, while two fifth (42.86%) of them had positive belief which increased to all (100%) of them post HBM implementation. This may be due to the positive effect of HBM program which change their beliefs.

Regarding relations between the studied women's demographic characteristics and their total HBM score, the current study proved that there is a highly statistically significant relation between the studied patients' total HBM score with their age, job and their educational level as P-value = . 0.000 & 0.002 & 0.000.

This finding was **supported with Yılmaz et al., (2017)** who investigated 'The Effects of Training on Knowledge and Beliefs About Breast Cancer and Early Diagnosis Methods Among Women' in Turkey and found that , a significant relationship among the level of education of women and all aspects of HBM was found ( $p < .001$ ).

Regarding correlation between the studied women's total knowledge, HBM and reported practice pre and post health belief model implementation, the study proved that here is highly positive correlation statistically significant difference between total knowledge (pre & posttest) about breast cancer, with HBM and reported practice. p values < 0.001.

This finding was **in accordance with Mahmoud et al., (2020)** who proved that there was a positive statistically significant correlation between the studied women's total knowledge (pre and post model implementation), practices (post model implementation), and their total health belief. And, **Mousavi et al., (2021)** who investigated 'Health Belief Model and Determinants of Breast Self-examination Performance' in Iran and demonstrated that there was a positive relationship between health knowledge and health-promoting behaviors (HBM). And **Ishtiak et al., (2022)** who investigated 'Knowledge, practice and associated factors of breast self-examination among female university students of Bangladesh' in Bangladesh and demonstrated Practice of BSE was positively associated with level of knowledge regarding BSE (aOR: 1.48; 95% CI 0.08–0.79).

Also, this finding was **in the same line with Gurjar, (2021)** who found that there was highly positive correlation statistically significant difference between total knowledge (pre & posttest) and practice. And **Dewi et al., (2019)** who investigated 'Determinants of breast self-examination practice among women in Surabaya, Indonesia: an application of the health belief model' in Indonesia and revealed that the HBM variables were significantly associated with BSE practice. **This may be due to the fact that the knowledge is the baseline of practices which affect positively on heir beliefs and behaviour..**

## Conclusion

**After conducted of the current study, it was found the following:**

The results of present study supported the research hypothesis that there was marked an improvement in knowledge, practices and health beliefs of studied women toward breast cancer compared to before application of health belief model, this enhancing active participation in SD strategy 2030. There is a highly statistically significant relation between the studied women's total HBM score with their age, job and their educational level as P-value=. 0.000 & 0.002 & 0.000, respectively. But there is no statistically significant relation with their Marital status and family income as p-value =0.630 & 0.523, **respectively.**

## Recommendation

**The recommendations were illustrated as follow:**

- 1) Continuing BC preventive program for women to improve their awareness.
- 2) Several instructional handout & brochures should be distributed to women containing preventive measures of BC & steps of BSE.
- 3) More studies on large samples of women are required for prevention & early detection of BC .
- 4) Extensive educational programs about BSE & its techniques for health workers in different medical setting.

**Further recommendation: -**

- Effect of educational program on quality of life (goal) improvement for women with BC.

- 2) Future research should consider a more comprehensive study to reach participants from different regions.
- 3) Future studies should consider identifying measures to help ensure that participants are responsive to the questionnaire and survey to obtain more expansive responses and data.
- 4) Replication and repeating the study using different and large sample size, to determine the generalizability of the results.

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