

# Effect of Education with Visual Material Based on Health Belief Model on Female Teachers' Breast Cancer Screening and Breast Self Examination

<sup>1\*</sup>Mervat Moustafa Arrab, <sup>2</sup>Hanady Shaaban Ibrahim Shehata

<sup>1</sup>Family and Community Health Nursing, Faculty of Nursing, Menoufia University, Egypt

<sup>2</sup>Nursing department, College of Nursing, King Khalid University Khamis Mushait

\*Corresponding author: [ibr4ever73000@hotmail.com](mailto:ibr4ever73000@hotmail.com)

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**Abstract:** Breast cancer is the most common cancer and the second cause of cancer deaths in women worldwide as well as in Egypt.

**Aim:** This study was to study the effect of education with visual material based on health belief model on female teachers' breast cancer screening and breast self examination.

**Design:** A quasi experimental design with pre and post test was utilized.

**Sample:** The total sample of 200 female teachers filled the questionnaires and completes the study.

**Setting:** Study was carried out at governmental secondary schools at Shebin El kom city and Melig village at Menoufia Governorate. A multi stage random sample technique was used for the selection of two setting to implement the study.

**Tool:** The tools used were (1) A self-administered questionnaire, (2) Champion's Health Belief Model Constructs Scale and (3) An observation competency checklist for breast self examination.

**Results:** The results showed that, there is a highly significant improvement in knowledge, attitude that represented in all six dimensions of health belief model and practice regarding breast cancer screening and breast self examination after education with visual material compared to before education.

**Conclusion:** The educational intervention with visual material based on health belief model is effective in raising female teachers' awareness about breast cancer, and of regular screening procedures of breast self-examination.

**Recommendation:** This result recommended that, the need for developing and establishing of breast cancer screening programs to improve female awareness.

**Keywords:** Breast Cancer, Breast Self Exam, Visual Materials, Health Belief Model.

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## 1. INTRODUCTION

Cancer is a pan public problem which affects two thirds of the world population. Cancer burden is increasing in both developed and developing countries and without action taken it will go out of control [1]. One of the most fatal cancers which affect women is breast cancer (BC) [2]. Breast cancer is the leading cause of female cancer related disability and mortality worldwide [3-4].

The global burden of breast cancer in women is a vast in both developed and developing world. Over 508 000 women were died in 2011 worldwide due to breast cancer. Breast cancer incidence is increasing in the developing world as a result of increased life expectancy, adoption of western lifestyles and urbanization [5]. The International Agency for

Research on Cancer (IARC) revealed that 1.7 million women were diagnosed with BC. Now, it states that one fourth of all cancers in women [2]. In Egypt, BC is estimated to be the most common female cancer [6].

Early diagnosis and Screening are two components of early detection efforts states by World Health Organization. Early diagnosis is the awareness of early signs and symptoms in order to get them diagnosed and treated at early stage. Screening aims to identify individuals with indicative abnormalities of a specific cancer or pre cancer and refer them rapidly for treatment [7].

The timing of detection of breast cancer determine treatment outcome. The health promotion interventions have an immense contribution to early diagnosis and better survival [5]. Early diagnosis of the disease is the key of reducing deaths due to breast cancer [8]. Early diagnosis in initial stages and timely treatment, the chance of recovery is increased more than 90% of patients with cancer [9] therefore; participation of women in diagnostic and screening programs is of great importance. Early detection includes awareness of early signs and symptoms of the disease, mammography, breast self-examination (BSE) and a clinical breast examination [10].

A lack of belief concerning the importance of regular BSE has an impact on the screening behavior, that understanding women's beliefs can be used to design appropriate educational interventions to promote the desired screening behavior [1]. To improve the awareness and knowledge of women, it is important to initiate interventions that provide health education and to support preventive health care behaviors. Health Belief Model (HBM) is the most excellent models of health behavior change that proved to be efficient in studying preventive behaviors in cancer [11]. Using HBM as a theoretical framework is to study BSE and other BC detection behaviors [12]. HBM stipulates that health behavior is influenced by a person's perception of the threat posed by a health problem and by the value associated with his action to decrease that threat [13].

By using the HBM scale, a woman who perceives that BC is a serious disease and she is susceptible to it, would be more likely to perform regular breast examinations. Also, a woman who perceives more benefits of and fewer barriers to BSE would be more likely to practice it [12].

Visual aids are those instructional tools which are used to encourage learning and make it easier and motivating [13]. Visual materials offer opportunities for effective communication between teacher and learners in learning [14]. Visual aids make teaching learning process more effective and have multifarious values. Visual aids give chance to speakers to make a more professional and consistent performance [13]. Using a visual aids make people consider risk information easier to understand and recall. Also, takes people less time to understand information [15].

Nurses are often looked upon to provide information and support regarding health problems, including BC, due to their frequent contact with patients and their relatives [4]. Nurses play a critical role in teaching women and promoting BSE through specially designed educational programs through community outreach strategies and in the clinical setting [16]. Nurses should perform breast self examination that is important for early detection of BC, on a regular basis and they should teach women how to perform BSE [17]. Nursing education is the key factor for nursing students to gain knowledge and awareness about breast cancer [18].

### 1.1. Significance of the Study

Cancer is one of the main health problems worldwide, causing more than 7 million deaths yearly. Cancer new cases will increase from 10 to 15 million annually by 2020 if the current trend continues without any change [19]. Breast cancer represents about 23% of all cancers in women and 14% of the cancer deaths. Breast cancer is the most common type of cancer, prevalent among women in the world [20].

Early diagnosis of breast cancer can reduce mortality significantly and will promote women's overall health [21]. Participation of women in diagnostic and screening programs is of great importance. Early detection includes awareness of early signs and symptoms of the disease, mammography, breast self-examination and a clinical breast examination [10]. Nurses should perform breast self examination that is important for early detection of breast cancer, on a regular basis and they should teach women how to perform breast self examination [17].

Therefore, the aim of this work was to study the effect of education with visual material based on health belief model on female teachers' breast cancer screening and breast self-examination.

### 1.2. Aim of the study

The aim of this study was to examine the effect of education with visual material based on health belief model on school female teachers' breast cancer screening and breast self examination. This aim achieved by:

- 1- Assess knowledge's of female teachers, their health beliefs and practices regarding breast cancer screening and breast self examination based on the health belief model.
- 2- Designing, implementing and evaluating the effect of education with visual material based on health belief model on female teachers' breast cancer screening and breast self examination.

### 1.3. Research Hypotheses

- 1- Female teachers' knowledge regarding breast cancer will have higher percentage after receive educational training intervention compared to before the educational intervention.
- 2- Female teachers' belief regarding breast cancer screening will have higher percentage after receive educational training intervention compared to before the educational intervention.
- 3- Female teachers' practice of breast self examination will have higher percentage after receive educational training intervention compared to before the educational intervention.

## 2. SUBJECTS AND METHODS

### 2.1 Research design

A quasi-experimental research design with pre and post-test was utilized.

### 2.2. Research setting

The study was carried out in two governmental secondary schools namely El Thanawya – El Readia Banat secondary school in shebin Elkom and Hussin Ezat El Shanawia mixed secondary school in Melig village affiliated to Shebin El Kom educational administration, Menoufia Governorate. Egypt.

### 2.3. Research sample

A multi-stage random selection was used in this study, according to the following stages:

**First stage:** The total number of **educational** administration in Menoufia Governorate is eight an educational administration, the names of these administrations were Shebin El-kom, Berkat El-saba, El Bagour, Tala, Ashmone, Menof, quasna, and El-sadat. One educational administration was selected by simple random selection for the conduction of the study, Shebin El Kom was selected.

**Second stage:** The educational administration was Shebin El Kom. This administration consists of eight local units' villages which include Melig, Shanawan, El Batanoon, Astabary, El-Maye and Shobra bas, El Meslha and Bakhaty. In the same manner one village was selected by simple random sample. The village selected was Melig.

**Third stage:** From Shebin El- Kom center a random selection of one secondary schools out of 5 secondary schools was done. Likewise, one random selection from 3 secondary schools from Melig village was done.

**Fourth stage:** All teachers in the selected schools were taken, the total number of the them in three schools were 230, of the total sample, only 200 teachers women filled the questionnaires and complete the study.

### 2.4. Inclusion criteria

Females teachers were chosen according to the following eligibility criteria: age **20–60 years**, no history of BC (personally or in a first-degree relative), and not pregnant or breast feeding. Participants were excluded if they refused to give informed consent.

### 2.5. Study subjects

- A convenience sample of 200 teachers will be involved in the study.

## 2.6. Tool of the study:

**2.6.1. A self-administered questionnaire:** The researchers designed after reviewing relevant literatures and which includes two parts:

A: Socio-demographic data: It was included female teacher's age, marital status, family history and residence.

B: knowledge about breast cancer and breast self examination and sources of breast cancer information.

### Scoring system:

Part B of the questionnaire constructed from 22 items used to assess female teacher's knowledge related to breast cancer and 13 items for assessing their knowledge regarding breast self examination. Each correct answer is scored by one based on predetermined key answer according to the literature, and each not correct answer or "don't know" response is scored by zero.

Then scores of knowledge were summed to obtain a total knowledge score, the total score of the female teachers' knowledge regarding breast cancer was 22 scores consider (100%) and total score of breast self examination was 13 scores consider (100%).

Scoring System regarding knowledge of female teachers about breast cancer and breast self examination were categorized according to the following

- 1- 50% and more considered satisfactory knowledge.
- 2- Less than 50% considered unsatisfactory knowledge.

### 2.6.2. Champion's Health Belief Model Constructs Scale (CHBMS):

The researchers utilized the Champion's Health Belief Model Constructs Scale, 1984 (CHBMS) to measure components of HBM. It was used to predict and enhance women's health beliefs regarding breast self examination and preventive behavior. Champion developed scales for measuring perceived susceptibility, seriousness, benefits, barriers, health motivation (cues to action) and self-efficacy related to frequency of breast self exams. This scale consists of 65 statements which contains *six dimensions*.

First dimension is susceptibility: Which contains six-item used to assess woman's perception about her susceptibility to breast cancer.

Second dimension is perceived seriousness: There are a twelve-item was used to assess the woman's perception regarding harmful or seriousness of breast cancer.

Third dimension is perceived Benefits: Based on a five-item was used to assess perceived benefits of performing breast self examination. And another five-item was used to assess perceived benefits of performing a clinical breast examination.

Fourth dimension is perceived Barriers: There are eight-item was used to assess perceived barriers to perform breast self examination. And another nine-item was used to assess perceived barriers to perform a clinical breast examination.

Fifth dimension is cues to Action (Motivation): Which includes eight-item was used to assess the motivation to live healthful lifestyle.

Sixth dimension is self-Efficacy: Which includes Twelve-items was used to assess self-efficacy in performing breast self examination and conducting a clinical breast examination.

### Scoring system

The researchers were asked female teachers to provide responses on a three-point Likert scale (disagree, neither agree and agree) scored from 1: 3 respectively. Then total attitudinal scores was calculated 195 and divided into positive and negative attitude regarding breast cancer and breast self examination.

- 1- Positive attitudes (98-195).
- 2- Negative attitudes (<98).

### **2.6.3. An observation competency checklist for breast self examination:**

The researchers designed a checklist used to evaluate female teachers' performance of breast self-examination. This contains 7 practical steps. Each step was scored from (0-2). Each correct and complete practical step was scored as 2 grades and grade 1 for correct but incomplete step and grade zero for incorrect and incomplete step. The total practical scores were 14 categorized according to.

- 1- Good practice (8-14).
- 2- Poor practice (<8).

### **2.7. Validity and reliability**

The study instrument translated for an Arabic version of the instrument was performed by using a back-translation technique by three English professional translators and then back-translation of it to the source language.

Validity of the questionnaire was ascertained by a group of qualified subject area experts, obstetric, community and psychiatric nursing staff who reviewed the tool for content validity. They were asked also to judge the items for completeness and clarity. Suggestions were incorporated into the instrument. All recommended modifications were performed. Internal consistency of tool I was calculated using Cronbach alpha and the degree of reliability alpha precision equaled 0.82 which indicates an accepted reliability of the tool.

### **2.8. Pilot study**

A pilot study was carried out on 10% of female teachers at the previously mentioned settings to assess the clarity, feasibility, applicability of the study tools, and the time needed to fill each tool. The necessary modifications were done and improvements were made prior to data collection according to the pilot study results. The female teachers who participated in the pilot study was excluded from the main study sample.

### **2.9. Ethical and administrative considerations:**

Researchers followed all the ethical issues in conducting the research. Informed consent was obtained from the participants who were willing to participate in the study. The participants were informed that participation in this study is voluntary; they can withdraw at any time during the study without giving reasons. The researchers were explained the aim of the study to all university students in the study sample. They reassured that any obtained information would be strictly confidential.

### **2.10. Data collection Procedure:**

- 1- The data collection started on the first of September to the end of October 2017.
- 2- All official permission was obtained through the following the researchers contacted the Ministry of Education and send a formal letter and a copy of research's tool directed from the Dean of Faculty of Nursing, Menofia University, to obtain the agreement to conduct the research. Then an agreement letter was obtained and directed to the manager of each school.
- 3- Before starting the data collection, the agreements and the aim of the study were explained to each manager. From the previously mentioned settings after the purpose of the study was explained. Before collecting the data, the researchers ensuring that, all participants giving an informed oral consent. Also, the researchers ascertain that all participants in their study have the voluntary to exclude from the study at any time and all collected data would be only used for the purpose of the current study.
- 4- After obtaining approval and informed consent to conduct the study, the researchers were initiated data collection from female teachers who fulfilled the selection criteria. The researchers held meetings with the female teachers during their free class's time and during breaks and attended the selected schools two days per week, from 9.00 A.M. to 2.00 P.M.
- 6- Data was collected in a comfortable place was chosen for the interview. Orientation was done about the purpose of the study, significance and content. The nature and the purposes of the study were explained by the researchers. All female teachers were informed that participation is voluntary. After obtaining the informed consent from female teachers for

participating in the current study, the questionnaires were distributed to each female teacher for collecting pretest. Explanations and clarifications were provided according to female teachers' questions. The researchers ensured that the participants complete the sheet. The average time taken for completing the sheet was around 30-40 minutes.

7- A comprehensive health educational intervention with visual materials was prepared and implemented for 200 female's teachers who had completed filling out tool I & II in "Media class". The educational training intervention with visual materials was conducted by using the observational checklist to observe female teachers' performance of BSE, after assessing knowledge' of the female teachers and their performance, the researchers divided the total sample into small eight groups, each group ranged from 20-25 female teachers. The education training intervention was organized in two sessions. Each session was taken about one hour. One hour was allocated to cover the theoretical session and one hour to cover the practical session on two consecutive days for each group.

8- The content of educational intervention included basic information regarding breast cancer facts and figures, breast cancer epidemiology, breast anatomy, risk factors of breast cancer development, signs and symptoms, important early detection, recommended screening methods, guidelines for mammography screening, role of mammography in early diagnosis breast cancer and presentation list of governmental hospital where can get mammography. In addition to this information, each group received specific messages related to health motivation, susceptibility to breast cancer, the perceived benefits and barriers of mammography and perceived self-efficacy based on HBM.

9- In the first session, the researchers taught the theoretical part by using lectures and group discussions. Videos, documentary film, power point presentations, pictures and posters are visual educational materials used in this research. At the end of each session additional 10 minutes were assigned for an open discussion with the female teachers about this topic. Also, brochures were distributed to female teachers at the end of the session which contains brief points about breast cancer and BSE.

10- The second session, the researchers taught the practical part through asked the female teachers about the performance of BSE through demonstration and re-demonstration on a breast model and with the aid of posters, printed materials handouts (brochure) and educational video.

11- After one week, the researchers use the same questionnaire after implementation of the 2 educational training intervention sessions for collecting post test for the female teachers who received the educational training intervention for evaluating the effect of the comprehensive health educational training intervention on the level of female teachers ' knowledge, attitudes and practice about breast cancer and breast self-examination.

### 2.11. Statistical analysis

Data was analyzed using the Statistical Package for Social Sciences (SPSS) Version 20. Descriptive statistics was used to calculate percentages and frequencies. Chi square (X<sup>2</sup>) and Z test was used to estimate the statistically significant differences. P. value was considered significant when it was <0.05 and highly significant when P value was <0.01.

## 3. RESULTS

**Table 1** shows the distribution of female teachers according to their socio-demographic characteristics. It can be observed that, the mean age of was 38 years. Most of the female teachers (86.0%) were married. Moreover, more than sixty (64.5%) lived in an urban area. The majority of the female teachers (87.0%) had no family history of breast cancer.

**Table 2** displays that; there are verity of factors related to breast cancer which includes obstetric factors, modifiable factors and non modifiable risk factors. The most known risk factors to women were family history of breast cancer and hormonal contraceptive methods (68.5 % and 48.5% respectively).

**Table 3** illustrates the female teachers' knowledge regarding warning signs of breast cancer. Breast lump were known to more than two thirds (71.5%) of the female teachers, bloody nipple discharge (54.0%), pain in breast (76.0%) and change in breast shape and/or size (76.5%). Regarding knowledge' of female teachers about screening methods of breast cancer illustrates that, minority of them know that mammogram is consider a method of early detection (24%) also, (62.5%) of them reported that one of a method of early detection is clinical breast examination and illustrated that mammogram have the ability to discover a lump earlier than clinical breast examination (41.0%).



**Figure 1** represents sources of information' of female teachers about breast cancer and breast self-examination, represents that the most sources of information for the participants is audio visual media (83%) followed by social media (36.50%).

**Figure 2** displays the female teachers' performance of breast self examination, which represents that the majority of participants (83%) didn't perform breast self-examination and a minority of them (2%) performed in the last month.

**Figure 3** illustrates marked deficiency in female teachers ' knowledge before the intervention. The implementation of the educational intervention with visual materials was associated with statistically significant improvements knowledge' of female teachers about breast self- examination ( $P < 0.001$ ).

**Figure 4** represents poor breast self examination practice of female teachers before the educational intervention. The implementation of the educational intervention with visual materials was associated with statistically significant improvements regarding practice' of female teachers regarding breast self- examination ( $P < 0.001$ ).

**Table 4** shows there was statistically significant improvement in all domains of health belief model which include perceived susceptibility, perceived severity, perceived benefits ( $P < 0.00$ ), perceived barriers, cues to action (motivation) and self-efficacy ( $P < 0.00$ ).

**Figure 5** clarifies that there were statistically significant improvements in attitude of all domains of health belief model of female teachers ' practice regarding breast self- examination ( $P < 0.001$ ) was observed after the implementation of the educational intervention.

**Table 5** shows that, there was a statistically significant improvement in female teachers ' knowledge regarding breast self-examination in all the HBM domains, perceived susceptibility, perceived severity and cues to action (motivation) and self-efficacy ( $P < 0.001$ ) was observed after attending of the educational intervention with visual material.

**Table 6** shows that all items of HBM were statistically significant improved after educational intervention with visual materials as compared to before the intervention ( $P < 0.001$ ). Good practice with a positive attitude has increased after the test.

**Table 1: Socio-demographic characteristics of the female teachers (N=200)**

Item	No.	%
<b>Age (by years)</b>		
< 30 year	8	4.0
30 –50	173	86.5
50-60	19	9.5
<b>Mean± SD</b>	<b>38.11±5.53</b>	
<b>Marital status</b>		
Single	16	8.0
Married	172	86.0
Divorced	6	3.0
Widowed	6	3.0
<b>Number of children</b>		
No children	1	1
One or two	22	22
Three or more	67	67
<b>Family income</b>		
Enough	25	25
Not-enough	75	75
<b>Family history of breast cancer</b>		
Yes	26	13.0
No	174	87.0

Table 2: Distribution of the female teachers' knowledge about risk factors of breast cancer

Risk factors of breast cancer	Yes		No		Don't know		Z test	P value
	No	%	No	%	No	%		
<b>Obstetric factors</b>								
Use of HRT for a long Duration	40	20.0	47	23.5	113	56.5	127.08	< 0.001*
Hormonal Contraceptive Methods	97	48.5	28	14.0	75	37.5	37.27	< 0.001*
Late menopause	40	20.0	81	40.5	79	39.5	16.03	< 0.001*
<b>Modifiable (Lifestyle ) factors</b>								
Obesity	70	35.0	73	36.5	57	28.5	2.17	0.34
Smoking	95	47.5	59	29.5	46	23.0	19.33	< 0.001*
Lack of physical exercise	76	38.0	71	35.5	53	26.5	4.39	0.11
Larger breast size	49	24.5	98	49.0	53	26.5	22.21	< 0.001*
Eating food rich in fat	87	43.5	60	30.0	53	26.5	9.67	< 0.001*
<b>Non Modifiable risk factors</b>								
Advanced age	73	36.5	60	30.0	67	33.5	1.27	0.53
Never breast fed	95	47.5	60	30.0	45	22.5	19.75	< 0.001*
Family history of breast cancer	137	68.5	47	23.5	16	8.0	118.5	< 0.001*

Table 3: Distribution of the female teachers' knowledge regarding warning signs of breast cancer and screening methods

Warning signs of breast cancer	Yes %	No %	Don't know %	Z test	P value
<b>Breast cancer warning signs:</b>					
Lump in breasts	71.5	13.0	15.5	131.29	< 0.001*
Bloody discharge from nipple	54.0	12.0	34.0	52.96	< 0.001*
Retraction of nipple	68.0	17.0	15.0	108.28	< 0.001*
breast Pain	76.0	6.0	18.0	168.16	< 0.001*
Size and shape of breast is change	76.5	7.5	16.0	169.87	< 0.001*
Skin of breast become redness	62.0	15.0	23.0	75.88	< 0.001*
<b>Breast cancer Screening methods:</b>					
Mammogram is considering a method of early detection	24.0	15.5	60.5	68.59	< 0.001*
The method of early detection is a clinical breast examination	62.5	16.0	21.5	77.47	< 0.001*
The ability of mammogram to discover a lump earlier than Clinical breast examination	41.0	14.5	44.5	32.29	< 0.001*
At the age of twenty mammograms is recommended	28.5	9.5	62.0	84.79	< 0.001*



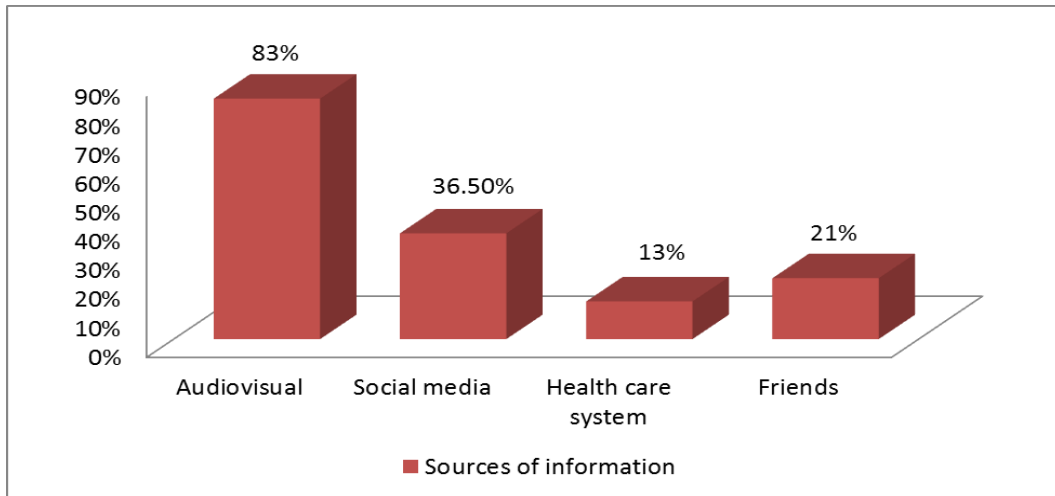


Fig 1: Distribution of study sample according to sources of information

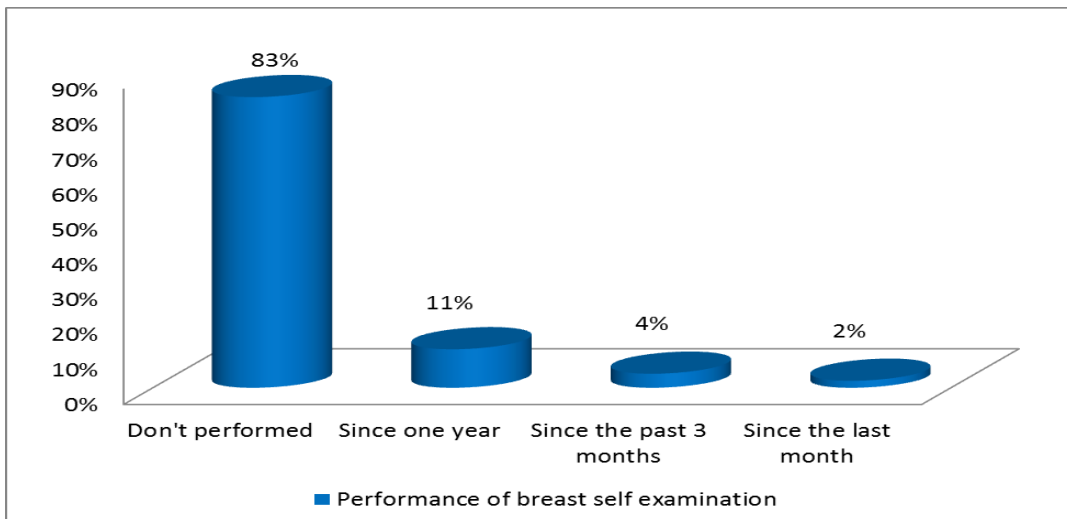


Fig 2: Distribution of study sample according to performance of breast self examination

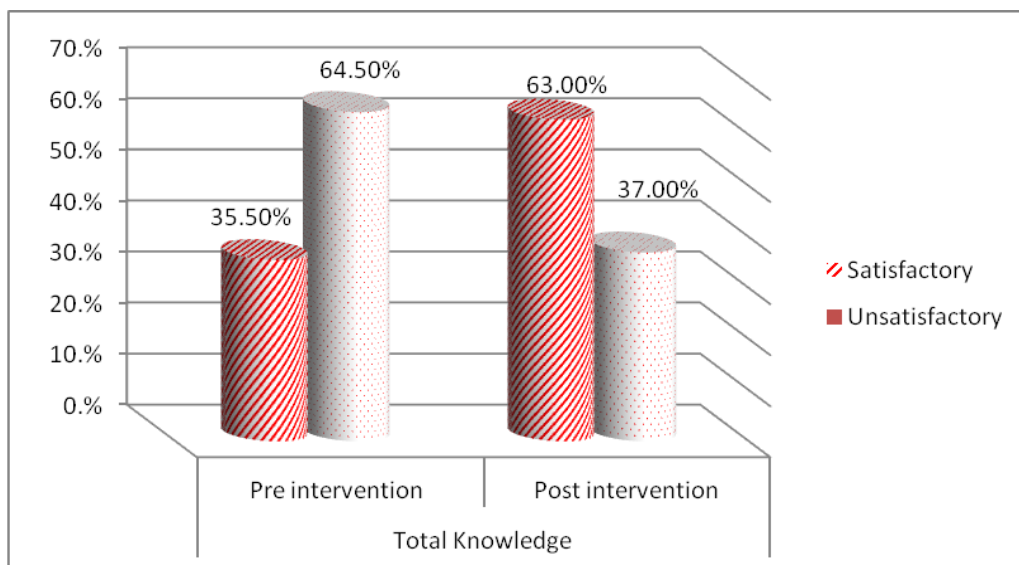


Fig 3: Total knowledge before and after educational intervention with visual materials

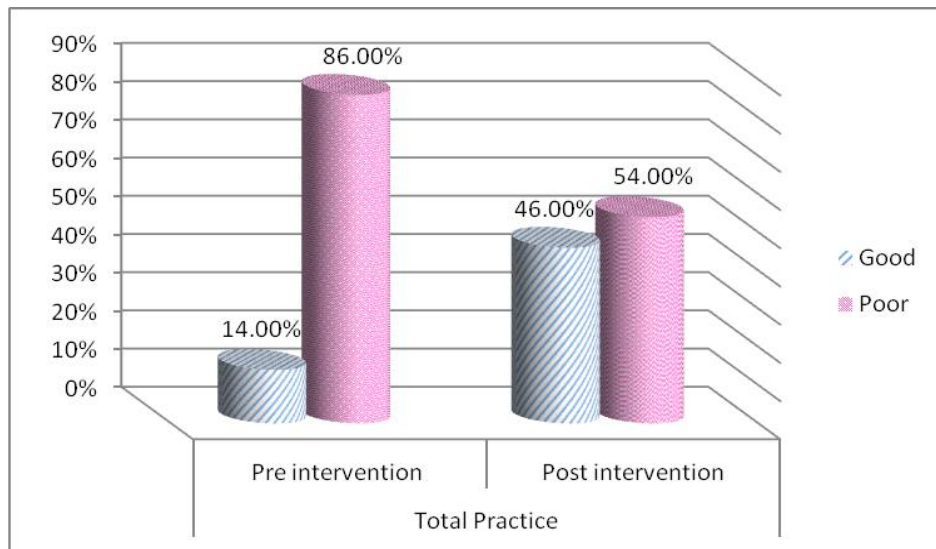


Fig 4: Total practice before and after educational intervention with visual materials

Table 4: The Mean Scores of HBM Constructs before and after educational intervention with visual materials

	HBM dimensions		Paired t test	P value
	Pre intervention Mean ±SD	Post intervention Mean ±SD		
Susceptibility	10.03±4.28	12.54±3.64	15.7	< 0.001*
Severity	25.51±8.06	28.59±7.11	10.63	< 0.001*
Benefits	23.98±5.22	25.77±4.35	9.31	< 0.001*
Barriers	25.36±4.85	19.09±3.07	19.57	< 0.001*
Cues to action	15.00±4.88	19.31±4.23	16.61	< 0.001*
Self-Efficacy	18.46±7.09	23.06±6.32	17.20	< 0.001*
<b>Total</b>	<b>118.94±22.40</b>	<b>128.20±20.56</b>	<b>11.30</b>	<b>&lt; 0.001*</b>

\*: Significance

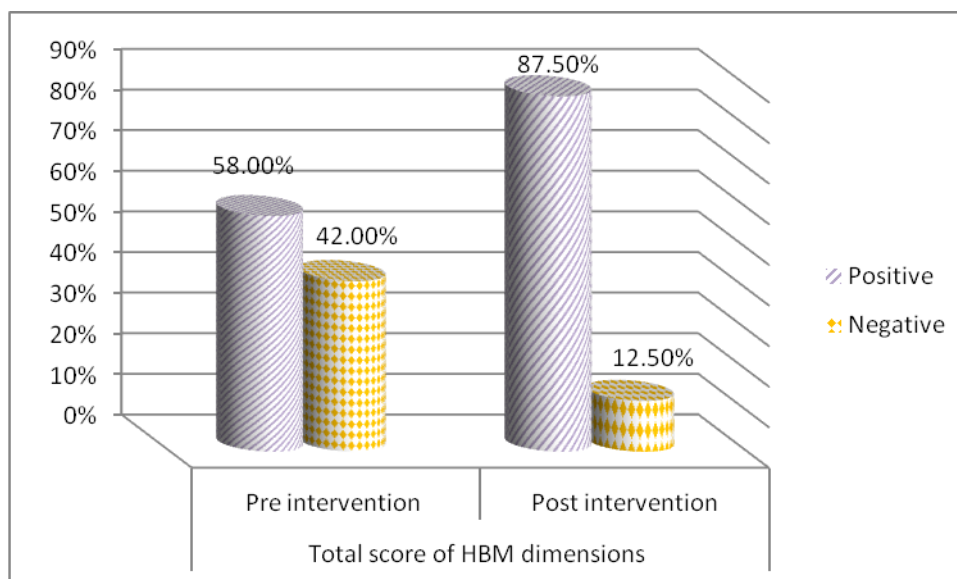


Fig 5: Total score of all domains before and after educational intervention with visual materials

**Table 5: Comparison's of knowledge' of the female teachers 's about breast cancer and breast self- examination by using HBM pre& post educational intervention with visual materials**

HBM dimensions	Pre intervention		P value	Post intervention		P value
	S. %	Un. %		S. %	Un. %	
<b>Susceptibility</b>						
Positive	78.6	70	<b>1.93</b>	91.5	60.2	<b>27.00</b>
Negative	21.4	30	<b>0.16</b>	8.5	39.8	<b>&lt; 0.001*</b>
<b>Severity</b>						
Positive	90.5	71.6	<b>9.46</b>	97.2	57.4	<b>50.7</b>
Negative	9.5	28.4	<b>0.002</b>	2.8	42.6	<b>&lt; 0.001*</b>
<b>Benefits</b>						
Positive	89.3	75.9	<b>4.75</b>	97.6	80.5	<b>16.4</b>
Negative	10.7	24.1	<b>0.02</b>	2.4	19.5	<b>&lt; 0.001*</b>
<b>Barriers</b>						
Positive	83.1	69.2	<b>4.74</b>	98.4	48.1	<b>72.02</b>
Negative	16.9	30.8	<b>0.03</b>	1.6	51.9	<b>&lt; 0.001*</b>
<b>Cues to action</b>						
Positive	69.0	81.1	<b>3.96</b>	92.4	61.0	<b>27.7</b>
Negative	31.0	18.9	<b>0.04</b>	8.6	39.0	<b>&lt; 0.001*</b>
<b>Self-Efficacy</b>						
Positive	84.6	68.9	<b>5.80</b>	94.9	37.8	<b>79.8</b>
Negative	15.4	31.1	<b>0.01</b>	5.1	62.2	<b>&lt; 0.001*</b>
<b>Total</b>						
Positive	87.2	70.6	<b>7.17</b>	96.8	55.7	<b>53.0</b>
Negative	12.8	29.4	<b>0.007</b>	3.2	44.3	<b>&lt; 0.001*</b>

S: Satisfactory knowledge / UN: Unsatisfactory knowledge

**Table 6: Comparison of female teachers' breast self-examination practice by using HBM pre & post educational intervention with visual materials**

HBM dimensions	Pre		P value	Post		P value
	Good %	Poor %		Good %	Poor %	
<b>Susceptibility</b>						
Positive	85.7	41.7	<b>18.6</b>	98.9	33.7	<b>92.2</b>
Negative	14.3	58.3	<b>&lt; 0.001</b>	1.1	66.3	<b>&lt; 0.001*</b>
<b>Severity</b>						
Positive	92.9	68.0	<b>7.29</b>	100.0	59.4	<b>48.1</b>
Negative	7.1	32.0	<b>0.007</b>	0.0	40.6	<b>&lt; 0.001*</b>
<b>Benefits</b>						
Positive	95.8	80.4	<b>4.38</b>	98.0	70.6	<b>26.5</b>
Negative	4.2	19.6	<b>0.03</b>	2.0	29.4	<b>&lt; 0.001*</b>
<b>Barriers</b>						
Positive	88.7	65.4	<b>6.52</b>	100.0	56.4	<b>52.3</b>
Negative	11.3	34.6	<b>0.01</b>	0.0	43.6	<b>&lt; 0.001*</b>
<b>Cues to action</b>						
Positive	67.9	85.2	<b>5.29</b>	99.0	40.7	<b>76.6</b>
Negative	32.1	14.8	<b>0.02</b>	1.0	59.3	<b>&lt; 0.001*</b>
<b>Self-Efficacy</b>						
Positive	90.4	45.0	<b>19.1</b>	95.9	25.6	<b>99.2</b>
Negative	9.6	55.0	<b>&lt; 0.001</b>	4.1	74.4	<b>&lt; 0.001*</b>
<b>Total</b>						
Positive	96.4	76.9	<b>5.73</b>	100.0	51.7	<b>59.9</b>
Negative	3.6	23.1	<b>0.01</b>	0.0	48.3	<b>&lt; 0.001*</b>

\*: Significance

#### 4. DISCUSSION

Breast cancer is the most common cancer in women worldwide that is why women's awareness of breast cancer is critical. The need to evaluate the knowledge, attitudes and practice of BSE by using health belief model among women is necessary and recommended [22]. The present study was conducted to determine the effect of educational intervention based on health belief model by using visual material on changing behavior of breast self examination knowledge, attitude and practice among female teachers. This is one of the few studies in Egypt to assess the benefits of a health education intervention by using visual materials on improving female teachers' knowledge, attitude and practice for the early detection of breast cancer.

Regarding risk factors of breast cancer, the results of the current study revealed that the most widely known risk factors among female teachers were family history of breast cancer and using hormonal contraceptive methods. This results are consistent with a study done at Egypt by Amer (2012) [23] and reported that majority of studied women known genetic factors, family history of breast cancer and hormonal contraceptive as the most widely risk factors.

One of the most important factors for early diagnosis and treatment of breast cancer is improving awareness. Concerning female teachers' knowledge regarding symptoms of breast cancer and methods of early detection. Results clarified that size and shape of breast is change, breast pain, breast lump and bloody nipple discharge consider the most common symptoms were recognized by female teachers and the minority of them unaware of the methods of early detection, the same results were reported by Al Junaibi & Khan (2011) [24]. However, the results of the current study contradictory with Habib et al (2010) [25] and Sambanje & Mafuvadze (2012) [26] they reported that the majority of participants were not aware of early signs of breast cancer and methods of early diagnosis.

As for female teachers' knowledge about breast cancer and breast self-examination, the results of the present study imply that female teachers had limited knowledge and practice regarding breast self- examination (BSE) and breast cancer before the educational training intervention and there was a statistically significant improvement in female teachers' knowledge level and practice at the post intervention phase as compared to the pre one. This means that educational intervention with visual material is effective methods of teaching. Studies have shown that one of the causes of failure to perform BSE is the lack of awareness of how to do it (Abolfotouh et al., 2015) [27]. The present study assessed female teachers' knowledge of breast cancer and BSE before implementation of the educational intervention. The findings reported low levels of satisfactory knowledge regarding breast cancer and breast self examination. Similar observation was reported with Moustafa, Abd-Allah & Taha (2015) [28] who studied "effect of a breast-self examination (BSE) educational intervention among female university students in Egypt", which demonstrated a low level of fundamental knowledge of breast cancer and BSE. The markedly low levels of satisfactory knowledge about breast cancer and BSE among the female teachers of the present study indicates a deficiency in the role of the healthcare providers as health educators. In fact, the female teachers reported that the media was the main source of information about breast cancer, followed by friends and relatives, and only a few of them mentioned doctors and nurses as their sources of information about these issues. "The finding is alarming and necessitates urgent corrective actions" [28].

Regarding practice of BSE and CBE in the current study only 2% practice BSE in the last month and 83% reported that they never performed it. The majority of them reported that the main barrier for not practicing BSE and CBE was lack of knowledge. The findings are similar to Amer (2012) [23] who studied "effect of educational intervention on the practice of breast self examination among women at rural area" concluded that the main barrier for not practicing BSE was lack of knowledge.

In this study, a significant increase was observed between the mean scores of knowledge after the educational training intervention. This is consistent with findings of other studies (Khiyali et al., 2017) [29] who conducted an intervention studied on breast self-examination behavior in women referred to health centers". These findings show that proper intervention can increase the level of awareness among women about breast cancer and ways of its early diagnosis.

Plus, knowledge, attitude is also an important factor for preventive health behavior. Regarding female teachers' attitude toward breast self exam, the findings of the current study showed a notable attitude improvement in all domain after implementing the educational training intervention by using instruction with visual materials as compared to before. All previous studied confirmed that by changing negative attitude of individuals, will improve healthful practice. Based on

previous studies, women who concerned that breast cancer is a serious health problem and think that they are susceptible to it, are more likely to do breast self exam regularly (Abolfotouh et al., 2015) [27]. Rezaeian et al., (2014) [30] showed that women have increased their understanding of the seriousness of the risk and its complications and felt more exposed to danger after the intervention. These results are consistent with the results of a study done by Khyali et al., (2017) [29] who indicated that the HBM mean scores were increased in all six dimensions after educational intervention also, replied that "women who did BSE achieved higher scores on perceived benefits than women who did not do BSE". The results of the current study confirmed this concept as shown that there was a significant increase in the post-test mean score of perceived benefits.

The construct of perceived barriers is the most important aspect in predicting preventive behaviors (Rezaeian et al., 2014) [30]. In previous studies, BSE behavior was associated with lower perceived barriers (Secginli et al., 2006) [31]. This mean that the educational training intervention by utilized visual materials is effective way by reducing or eliminating the embarrassment of practicing BSE and CBE. This confirmed by the results of the current study as shown that there was statically significant difference before and after the intervention. This is consistent with the finding by Moodi et al., (2013) [32] and Lotfi et al., (2012) [33] who reported that the significant impact of educational interventions on reducing perceived barriers to breast cancer screening behaviors.

Regarding Self-efficacy, which included the confidence's ability of participants to perform BSE and detect tumors successfully and correctly in this study, has been reported as the most powerful predictor of BSE behavior. As shown from this study majority of the female teachers motivated after the intervention that they need to discover any problem as early as possible where there was a significant improvement in the self-efficacy score after the intervention. This result is consistent with Kessler et al., (2012) [34] demonstrated that the self-efficacy of women who did BSE behavior was significantly higher than women who did not. Also, this result is consistent with the findings of study carried out by Rezaeian et al., (2014) [30] in Iran which demonstrated significant improvements in women's perceptions of self-efficacy and health motivation.

Previous studies have shown that women's higher level of knowledge of breast cancer increases their BSE practice (Alwabr, 2016) [35]. In addition, female teachers' practice of breast self examination has also improved after attending educational training intervention. According to HBM, by increasing female teachers' perception of their susceptibility to breast cancer and the severity of the disease were associated with increase their practice of breast self examination and other screening procedures. So for women who received the educational training intervention, the perceived susceptibility of having breast cancer increased. In the same line with these results, the findings of the study conducted by Aghamolaei et al., 2011[36] studied " Improving Breast Self-Examination: An Educational Intervention Based on Health Belief Model " concluded that the educational intervention effective in promoting breast self examination through enhancing perceived susceptibility, perceived seriousness, perceived barriers and self-efficacy regarding BSE. In addition to Amer, (2012) [23] studied effect of educational intervention on the Practice of breast self exam among women at rural area. She concluded that the educational intervention was effective in raising women's awareness about BC, and of regular screening procedures (BSE).

Concerning applying of health belief model the current study verified that health belief model was successful in improving female teachers' knowledge; attitude and practice total scores were though to be a direct result of educational training intervention by using visual materials. This result was in agreement with a study conducted by Alameer et al., 2018 [37] studied "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" who also confirmed the effectiveness of health education based on HBM who revealed that the significant improvement in the study group's mean knowledge, HBM component, and behavior scores point to the positive effect of the intervention.

## 5. CONCLUSION

The educational intervention with Visual Material Based on Health Belief Model is effective in raising female teachers' awareness about BC, and of regular screening procedures (BSE). Also based on the findings of this study, there is a significant increase in the participants' level of knowledge, acquiring positive attitude and improvement in proficiency of breast self exam practice. Therefore, Using the health belief model is a significant predictor and instrument that can be used to teach women about breast self exam. It can be used easily to change the health beliefs about breast cancer and breast self exam.

## 6. RECOMMENDATIONS

Based on the results of this study, we recommend that;

- 1-The need for developing and establishing of breast cancer screening programs to improve female awareness.
- 2- Policy makers should integrate breast cancer screening programs in the routine programs provided in healthcare centers and different settings in the community by health professionals.
- 3- Breast Self-Examination training programs must be adopted as one of the routine services presented to the working females.

### Abbreviations

**BC:** Breast Cancer

**BSE:** Breast Self-Examination

**CHBMS:** Champion's Health Belief Model Scale

**HBM:** Breast Self-Examination

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