

Nurse's Role in Early Detection of Breast Cancer through Mammography and Genetic Screening and Its Impact on Patient's Outcome

Salwa Hagag Abdelaziz, Dorria Salem, Hoda Zaki, Suzan Atteya

Abstract—Early detection of breast cancer saves many thousands of lives each year via application of mammography and genetic screening and many more lives could be saved if nurses are involved in breast care screening practices. So, the aim of the study was to identify nurse's role in early detection of breast cancer through mammography and genetic screening and its impact on patient's outcome. In order to achieve this aim, 400 women above 40 years, asymptomatic were recruited for mammography and genetic screening. In addition, 50 nurses and 6 technologists were involved in the study. A descriptive analytical design was used. Five tools were utilized: sociodemographic, mammographic examination and risk factors, women's before, during and after mammography, items relating to technologists, and items related to nurses were also obtained. The study finding revealed that 3% of women detected for malignancy and 7.25% for fibroadenoma. Statistically significant differences were found between mammography results and age, family history, genetic screening, exposure to smoke, and using contraceptive pills. Nurses have insufficient knowledge about screening tests. Based on these findings the present study recommended involvement of nurses in breast care which is very important to in force population about screening practices.

Keywords—Early detection, Genetic Screening, Mammography.

I. INTRODUCTION

EARLY detection and correct diagnosis will determine the final prognosis of a woman with breast cancer because tumors are detected when they are small and localized [1]. The most useful diagnostic modalities for early detection of breast cancer are mammography and genetic screening [2].

Mammography is the most frequently used screening method [3]. The primary purpose of mammography is to produce fine detail-images of the breast that can be used to screen for breast cancer and to evaluate signs and symptoms of breast disease [4]. It uses low dose X-ray, high contrast,

high resolution film and an X-ray system designed specifically for mammography to create detailed images of the breast [5]. It is recommended to women above 40 years every one to two years [6].

Although mammography is currently the best images approach for breast cancer screening, several factors may limit its accuracy such as breast density, improper positioning, poor technique and incorrect interpretation [7]. Studies documented that among women of all ages, 5% to 10% require additional testing and that number might be higher in women who have a greater breast density [8].

The American College of Radiology (ACR) Breast Imaging Reporting and Data System (BIRADS), improved the communication of mammography results through standardized descriptions and final assessment to a recommended management protocol [9].

It is stated in the literature that several factors correlate with the occurrence of breast cancer, such as age, family history, history of breast biopsy, early onset of menstruation (before 12) years, late menopause and genetic mutation in family which are considered risk factors that cannot be altered. However other risk factors can be altered such as, taking hormone replacement therapy, birth control pills, and overweight, not exercising and dietary food intake [10].

Doctors may suggest ways to reduce the risk of breast cancer in women who have the genetic alteration because mutations in two genes BRCA-1 and BRCA-2 were predicted to account for 85 to 90% of hereditary breast cancer syndrome [11]. So, early mammography is recommended for women who carry BRCA-1 or BRCA-2 gene mutations [12].

Other researchers mentioned a number of factors that influence a woman's comfort level during mammography which include breast compression, friendliness and sensitivity of the mammography technologists, facility atmosphere and procedures [13].

Regarding to primary and secondary prevention of breast cancer, nurses have an important role because their holistic perspective and advanced practice skills enable them to intervene for women at all level of health care. They use their advanced knowledge and practice skills to educate women about cancer risk factors and to initiate screening program aimed at early detection and intervention [14].

When the role of the nurse is explicitly identified, further studies can begin to determine the effectiveness of nursing practice in terms of women health regarding early detection through screening practices [15]. Therefore, the purpose of the

This article was based on PhD thesis 2007 of the corresponding authors under supervision of the co-authors.

Dr. Salwa Hagag Abdelaziz, Lecturer of Medical Surgical Nursing, Faculty of Nursing Cairo University, Egypt (phone: 0020227636790, 00966561409281; e-mail: nadakimo@yahoo.com),

Dr. Dorria Salem professor at the Department of Radiology, Women Imaging Unit, Radiology Consultant for Ministry of Health, Secretarial General of Egyptian Society of Women's Imaging and Health care, Egypt. (phone: 002-0122154306; e-mail: dorriasalem@yahoo.com).

Dr. Hoda Zaki is Dean of the College of Nursing in Modern University for Technology and Information, Cairo, Egypt (phone: 002-01222132466; e-mail: hzaki02@yahoo.com).

Dr. Suzan Atteya is Professor of Medical Surgical Nursing, Cairo University, Head of Research Center, Faculty of Nursing, Cairo University, Egypt, (phone: 002-01222176416; e-mail: suzanatteya@yahoo.com).

study was to identify nurse's role in early detection of breast cancer through mammography and genetic screening and its impact on patient's outcome.

It has been observed during nearly four years of experience as a clinical instructor at the general surgical wards that the number of women with cancer breast has increased. It is estimated that 36% of all cancer cases have a cancer breast (National Cancer Institute, NCI) in Cairo, 2002, 2003). Furthermore, a recent study done in Cairo stated that breast cancer cases occur in nearly one in ten women [16].

Since breast care involves so many people, clear and accurate communication between health team with the emphasis on the nurses are almost as important as technical competence. So, nurses have a vital role to play in encouraging women to become more breast aware. Their health promotion activities in this area have an important impact on the up take of breast screening initiatives. Nurses use their teaching and assessment skills in the prevention and detection of cancer. Furthermore, several studies conducted in different countries have shown that a definite reduction in mortality from breast cancer in women who are screened with mammography is increased. In addition mutations in the BRCA-1 and BRCA-2 genes explain at least 10% of breast cancer cases [17]. Also, more than 90% of women who performed mammography during this year in the Early Detection Department in NCI in Cairo have a cancer breast, most of them are in advanced stage and others in stage one as well as stage two. It is hoped that findings of this study might help in providing an evidence based data that can promote nursing practice and research.

The theoretical context of this study relies mainly on screening and early detection of cancer which proposed as a framework for cancer disease [18]. The best and most effective treatment for cancer is prevention. Early detection of cancer can result in a decrease in morbidity and mortality. The development of risk profile and screening guidelines also enhances screening efficacy and decreases costs. Furthermore, primary prevention involves reducing the risk of cancer in individuals and groups generally considered both physically and emotionally healthy through clients behaviors related to limiting exposures to causative factors and promoting protective factors.

Regarding to secondary prevention by early detection of the potential for development or existence of a disease while an individual is asymptomatic, allows positive interference to prevent the symptomatic clinical state by emphasizing on early diagnosis via application of mammography and genetic screening, thereby shortening its duration and severity, and enabling the women to return to a former state of health at the earliest time possible. Based on the national average, the likelihood that exposure to certain factors such as, tobacco use, dietary habits, familial and genetic contribution, hormonal agents, use of immunosuppressive agents, occupational and environmental factors as well as stressful life events will influence the chance of developing breast cancer [19], [20].

This study was carried out to identify the nurse's role in early detection of breast cancer through mammography and

genetic screening and its impact on patient's outcome.

II. MATERIAL AND METHODS

A descriptive analytical design was utilized to conduct the current study. This design is frequently used to collect detailed description of existing phenomena and uses the data to justify current condition and practices to make more intelligent plans for improvement [21].

The study was conducted at Women's Imaging Unit, Radiology Department) in El Manial University Hospital. The study subjects consisted of 400 adult women, most of them working in El-Manial University Hospital (faculty members, clerical, workers & nurses) and other women recruited under the study from the surgery units (patients and their relatives). In addition a group of subjects consisting of 50 nurses: 25 diploma nurses and 25 bachelor nurses, working in surgical and intensive care units were selected for knowledge assessment about mammography and genetic screening as well as breast self examination. Another group of subjects under the study included technicians who performed mammography.

Structured questionnaires developed, by the researcher, were tested and validated by expertises in the field of radio-diagnosis and nursing, based on relevant related literature. The first study tool consisted of six parts:

- (a) The first part consists of sociodemographic data.
- (b) The second part includes items related to mammographic examination (e.g. reason for seeking examination, previous health history regarding breast biopsy, using contraceptive pills, use of immunosuppressive agents or hormonal replacement agents.
- (c) The third part consists of items related to previous cancer history in relatives.
- (d) The fourth part deals with 4 items related to life style risk factors.
- (e) The fifth part consists of 8 items dealing with mammography procedures among women before, during and after mammography.
- (f) The sixth part consists of items related to screening observation with technologist and radiologist.

Another structured questionnaire was constructed by the researcher regarding nurses knowledge and experience about mammography, genetic screening and breast self examination. Also the questionnaire included the nurse's role regarding encouraging women to become more breasts aware through conducting the mentioned modalities for early detection of breast cancer. In addition, their role regarding population awareness and relatives of breast cancer patients for conducting genetic screening.

Procedures

Once the official permission was granted to proceed with the study, the researcher initiated data collection. Women who met the criteria for inclusion (above 40 years, one week after menstrual cycle, no breast complain) were recruited from El-Manial University Hospital Cairo University. The researcher met the women before mammography screening. Initially, the purpose and the nature of the study were explained. The

interview took an average 30 minutes. The pilot study was carried out on a sample of 10 women. Based on these findings, modifications and clarifications were done in the final form of the tools.

Mammograms were obtained for all patients over the years 2005 and 2006. Cranio caudal and the medio lateral projections were done. All views were taken while the patients were standing. Accurate marking of the mammograms is very important by using the routine L (left) or R (right) markers placed toward the axilla.

Once a mammography reveals abnormalities, the woman is advised to additional investigations in the form of sonogram by dedicated breast imaging radiologists. They were 111 women who were breast imaging by mammography that revealed fibroadenoma, micro classification, bilateral fibroadenosis, ductectasia, density, mass, intra mammary lymph nodes (According to BIRADS, Normal: means that there is nothing to comment on; Benign: means cases with fibroadenoma; Probably benign: needs short term follow up to establish stability such as ductectazia-retroareolar cystic lesion and fibroadenosis; Suspicious: such as microcalcification, solid lesion for excision and lymphadenopathy and Malignant: means high probability of being cancer.

Furthermore, the researcher presented a lecture about mammography procedures to internship students of Faculty of Nursing Cairo University. Orientation to the department of Women's Imaging Units with students was conducted and benefits of mammography was stressed as early detection and follow up was also expressed to them. They were offered a booklet included all items.

Analysis of Data

Descriptive statistics as well as inferential statistics were used to analyze data obtained in this study. The descriptive statistics included frequency, percentage distribution, mean and standard deviation. The inferential statistics included chi square. A probability level of 0.05, 0.01, and 0.001 were considered as the level of significance* [21].

III. RESULTS

The highest percentage of women's age (66.25%) ranged between 40-<50 years followed by 28.75% from 50-<60 and (4.25%) from 60-<70 and the rest of women were above 70 years with a mean age 46.93 ± 6.47 . as regards marital status, the majority of women (80%) were married while the minority (3.75%) were single.

Table II indicated that mammography detected 12 cases (3%) out of the 400 of malignant lesions, diagnosed with mammography and breast ultrasound. However, 29 cases (7.25%) out of the 400 were benign fibroadenoma. In addition, 55 cases (13.75%) out of the 400 were probably benign as ductectasia, retroareolar cystic lesion, and fibroadenosis. As well, 15 cases (3.75%) out of the 400 were suspicious as microcalcification, solid lesion for excision, and lymphadenopathy.

TABLE I
FREQUENCY AND PERCENTAGE DISTRIBUTION OF SOCIODEMOGRAPHIC CHARACTERISTICS AMONG THE STUDY SAMPLE

No = 400		
Variables	No	%
Age years		
40-	265	66.25
50-	115	28.75
60-	17	4.25
70+	3	0.75
Mean \pm SD	46.93 \pm 6.47	
Marital Status		
Single	15	3.75
Married	320	8.00
Divorced and Widowed	65	16.25
Occupation		
Employee	17	4.25
Clerical	64	16.00
Workers	54	13.5
Housewife	233	58.25
Nurses	32	8.00
Level of Education		
Cannot read and write	145	36.25
Primary and preparatory	85	21.25
Secondary	112	28.00
University	35	8.75
Post graduate	23	5.75

TABLE II
FREQUENCY AND PERCENTAGE DISTRIBUTION REGARDING TO MAMMOGRAPHY RESULTS (BIRADS) AMONG WOMEN UNDER THE STUDY (N=400)

Variables	No	%
Normal	289	72.25
Benign	29	7.25
Probably benign	55	13.75
Ductectasia	18	4.50
Retroareolar cystic lesion	11	2.75
Fibroadenosis	26	6.50
Suspicious	15	3.75
Microcalcification	5	1.25
Solid lesion for excision	2	0.50
Lymphadenopathy	8	2.00
Malignant	12	3.00

Table III shows that among malignant cases, 1.75% of women their age ranged between (40- < 50), followed by 50- < 60, 60- < 70 and above 70 which represented 0.5%, 0.5% and 0.25% respectively. However, among benign cases, 5.25% of their age ranged between 40-< 50 and 1.75% from 50-< 60 and only 0.25 % above 60 years. Among suspicious cases, 2% their age ranged between 40- < 50 years, while 0.25% from 50 - < 60 and 1.25% above 60 years with a mean 46.93 ± 6.47 . The calculated chi square revealed statistically significant difference as regards age and BIRADS ($X^2=47.094$, $P<0.05$).

TABLE III
RELATIONSHIP BETWEEN BIRADS (MAMMOGRAPHY RESULTS) AND RISK FACTORS THAT CANNOT BE ALTERED

BIRADS Mammography results											Variables
X ²	Malignant	n=12	Suspicious	n=15	Probably benign	n=55	Benign	n=29	Normal	n=289	
	%	No	%	No	%	No	%	No	%	No	
47.094*	1.75	7	2	8	8	32	5.25	21	49.3	197	Age (years)
	0.5	2	0.3	2	5.5	22	1.8	7	21	82	40-
	0.5	2	1	4	0.3	1	0.3	1	2.3	9	50-
	0.3	1	0.3	1	0	0	0	0	0.3	1	60-
											70+
											X± SD
											Age/menarche (menarche)
2.817	1.25	5	1	4	3	12	2.5	10	19.8	79	Before 12
	1.75	7	2.75	11	10.8	43	4.75	19	52.5	210	After 12

* Significant at P < 0.05

Normal: There is nothing to comment on. Benign: Fibroadenoma

Probably benign: Short term follow up is recommended to establish stability (ductectasia- retroareolar cystic lesion- fibroadenosis)

Suspicious: Microcalcification, solid lesion for excision & lymphadenopathy.

Malignant: High probability of being cancer.

TABLE IV
RELATIONSHIP BETWEEN BIRADS (MAMMOGRAPHY RESULTS) AND RISK FACTORS THAT CANNOT BE ALTERED

BIRADS Mammography results											Variables
X ²	Malignant	n=12	Suspicious	n=15	Probably benign	n=55	Benign	n=29	Normal	n=289	
	%	No	%	No	%	No	%	No	%	No	
31.213*	1.25	5	1.75	7	8.5	34	3.25	13	57.3	229	Previous Cancer history in families
	1.8	7	2	8	5.3	21	4	16	15	60	
* 13.748	2.75	11	3.75	15	13.3	53	7	28	71.5	286	Genetic screening of women
	0.3	1	0	0	0.5	2	0.3	1	0.8	3	
* 37.134	2.8	11	3.8	15	13	52	7	28	72	288	Genetic screening among family
	0.3	1	0	0	0.8	3	0.3	1	0.3	1	

* Significant at P < 0.05

In relation to previous cancer history in families It is apparent that there was a statistically significant difference among women under the study who had previous cancer history in their families in relation to BIRADS (X²=31.213,

P<0.05). Also the same table revealed that there was statistically significant difference among women under the study who performed genetic screening and those who didn't, in relation to BIRADS (X²=13.748, P<0.05).

TABLE V
RELATIONSHIP BETWEEN BIRADS (MAMMOGRAPHY RESULTS) AND RISK FACTORS THAT CAN BE ALTERED

BIRADS Mammography results											Variables
X ²	Malignant	n=12	Suspicious	n=15	Probably benign	n=55	Benign	n=29	Normal	n=289	
	%	No	%	No	%	No	%	No	%	No	
27.496	0.75	3	2.25	9	7.75	31	3	12	42.25	169	Receiving medical Treatment
	2.25	9	1.5	6	6	24	4.25	17	30	120	
	0	0	.25	1	.75	3	1.25	5	3.75	15	
	2	8	.75	3	2.75	11	1.75	7	17.25	69	
	.25	1	.25	1	1.75	7	1	4	7.25	29	
	0	0	.25	1	0.25	1	0	0	.75	3	
	0	0	0	0	.5	2	.25	1	1	4	

*Significant at P < 0.05

HRT = hormone replacement therapy

Regarding to women receiving medical treatment, it is apparent from Table V that 24 out of total sample (400) were receiving HRT (hormone replacement therapy); among those 15 were normal, 5 benign, 3 probably benign and only one case was suspicious representing 3.75%, 1.25%, 0.75%, and 0.25% respectively. As regards malignant cases 8 (2%) were

receiving hypertensive medications and one case (0.25%) was receiving diabetic medication and the rest did not receive any medication. There was no statistically significant difference among women regarding to receiving medical treatment in relation to BIRADS (X²=27.496, P>0.05).

TABLE VI
RELATIONSHIP BETWEEN BIRADS (MAMMOGRAPHY RESULTS) AND RISK FACTORS THAT CAN BE ALTERED

X ²	BIRADS Mammography results										Variables
	Malignant	n=12	Suspicious	n=15	Probably benign	n=55	Benign	n=29	Normal	n=289	
	%	No	%	No	%	No	%	No	%	No	
27.11*	2.75	11	3.75	15	13.8	55	6.5	26	72	288	No
	0.3	1	0	0	0	0	0.8	3	0.3	1	Yes
2.906	3	12	3.75	15	13.3	53	6.75	27	72	288	No
	0	0	0	0	0.5	2	0.5	2	0.3	1	Yes
17.484*	1.75	7	3.75	15	13.3	53	5.75	23	63.3	253	No
	1.3	5	0	0	0.5	2	1.5	6	9	36	Yes

*Significant at P < 0.05

Regarding to tobacco use, the same Table VI shows that 5 malignant cases representing 1.25%, and 6 benign cases (1.5%) were smokers and the rest were either normal or probably benign. The calculated chi-square revealed statistically significant difference among nonsmoker and smoker women in relation to BIRADS ($X^2=17.484$, $P<0.05$).

TABLE VII
COMPARISON BETWEEN NURSES KNOWLEDGE AND PERCEIVED ROLE ABOUT POPULATION'S AWARENESS REGARDING MAMMOGRAPHY, GENETIC

SCREENING & BSE					
Items	Group I		Group II		χ ² X
	Diploma nurses		Bachelor's		
	No=25		nurses No=25		
	No	%	No	%	
Population's awareness regarding mammography and genetic screening					
No	8	32	8	32	0.00
Yes	17	68	17	68	
Instruction to relative's about mammography					
No	15	60	4	16	10.01 *
Yes	10	40	21	84	
Instruction to relative's about genetic screening					
No	13	52	0	0	17.30 *
Yes	12	48	25	100	

* Significant at P < 0.05

df 1- 3.84 df 2 - 5.99

TABLE VIII
FREQUENCY AND PERCENTAGE DISTRIBUTION RELATED TO WOMEN DURING MAMMOGRAPHY

Variables	No=400	
	No	%
Feeling of pain during breast compression		
No	55	13.75
Yes	345	86.2
Among yes response		
Mild	113	28.25
Moderate	199	49.75
Severe	33	8.25
Feeling of shame		
No	124	31.00
Yes	276	69
Technologist cooperation and explanation regarding technique		
No	12	3.00
Yes	388	97.00

Concerning nurse's knowledge and perceived role about population's awareness regarding mammography and genetic screening, Table VII indicates that an equal relatively high percentage of nurses in both groups (68%) expressed that they have a role regarding population's awareness in

mammography and genetic screening, while the rest expressed no role for nurses regarding these points.

Concerning relative's instruction about genetic screening Table VII revealed that around half of nurses in group I (48%) expressed that they will instruct relatives about genetic screening while all nurses in group II stressed that they will instruct them. There was a statistically significant difference between both groups of nurses in relation to relative's instruction about genetic screening ($X^2=17.30$, $P<0.05$).

According to pain during breast compression, Table VIII reveals that the majority of women (86.2%) felt pain in the form of mild, moderate and severe (28.25%, 49.75% & 8.25% respectively), while a minority (13.75%) had no pain during breast compression. Also it is apparent from Table VIII that 69% of women felt of shame during mammography procedure, while (31%) didn't feel shame.

Regarding to technologist's cooperation, most of women under the study (97.0%) expressed that there was cooperation and explanation from the part of technologist during procedure while the minority (3%) reported no cooperation.

IV. DISCUSSION

Breast cancer is by far the most common malignancy among women worldwide, and 41% of all new cases are diagnosed in developing countries, furthermore, as the population increases in age, the number of new cases in these countries is expected to increase dramatically [20]. Certain factors such as tobacco use, dietary habits, familial and genetic contributions, hormonal agents, use of immunosuppressive agent, occupational and environmental factors as well as stressful life events will influence the chance of developing breast cancer [21]. Nurses have an important role in early detection of breast cancer. So, when the role of the nurse is explicitly identified, further studies can begin to determine the effectiveness of nursing practice in terms of women health regarding early detection through screening practices. The efficacy of nurse's role in the present study relies on detection of 3% of the studied sample diagnosed with malignancy and 7.3% diagnosed with benign fibroadenoma as well as follow up for other cases either annual or every 6 months.

As regards age, all women under the study were above forty years, ranging between 40 to above 70 years with a mean of 46.93 ± 6.47 . These results are in agreement with other researchers, who stated that getting older than forty years is considered a risk factor for breast cancer that cannot be altered

[7]. In this respect [23]-[25] mentioned that the incidence of breast cancer rises between age 45 – 55 then it begins to rise again quite sharply. As regards the level of education, it was stated that some educated women failed to practice breast cancer screening according to guidelines [13]. It is observed in the current study that educated women had knowledge deficit about screening guidelines. So, it is important to reinforce screening practices among all levels.

Concerning age of starting menstrual cycle as a risk factor for breast cancer that can't be altered, the study finding showed that the majority of women started their menstrual cycle after 12 years in relation to BIRADS. There was no statistically significant difference among women under the study who started their menstrual cycle before or after 12 years. This finding is inconsistent with [20], [22], [23] who stated that early onset of menstruation before 12 years old is considered a risk factor for breast cancer that can't be altered. Similarly [19] reported that the older age of menarche is the lower the risk of breast cancer. For each one-year delay in menarche, the risk decreases by around 5%. In this respect [1] added that women who started menstruating at an early age (before age 12) have a slightly higher risk of breast cancer.

Regarding to previous cancer history in families, this study finding revealed that slightly more than one quarter of women under the study had family history of cancer equally distributed between cervix / uterus and breast cancer. Among of malignant cases, more than half women had a family history, (either for breast or for uterus / cervix). (There was a statistically significant difference among women in relation to BIRADS). As regards relation to relatives, malignant cases with first degree slightly exceeded those with second degree relatives. The finding of the present study was supported by scattered studies as those of [26]-[28], [22] and the Center for Disease Control and Prevention CDC, (2006), which stated that positive family history of breast cancer including close relative, increases significantly women with risk of developing breast cancer. In an Egyptian study carried out by [19]; they stated that familial aggregation can be attributed in part due to the shared physical, environmental and lifestyle factors.

Concerning genetic screening among women, the results of the present study revealed that most of women under the study didn't do genetic screening while only the minority did it, and were nearly equally distributed between positive and negative). A among positive cases, only one case was malignant. Research has shown considerable variability in cancer risk, reporting that individuals with mutations in BRCA 1/2 have anywhere from 40% to 85% cumulative risk of developing breast cancer [29]. In a similar study, [30] added that mutations in the BRCA1 and BRCA2 genes explain at least 10% of breast cancer cases diagnosed before age 40 years. There was a statistically significant difference among those who did it and who didn't in relation to BIRADS. As regards genetic screening among relatives, the results of this study revealed that only a minority of women's relatives did genetic screening and that the majority of these women were positive while a minority was negative. Similarly, [28] reported that breast cancer susceptibility, genes BRCA-1 and

BRCA-2 have been identified as accountable for less than 10% of all cases of breast cancer. [31] stated that two genes called BRCA-1 and BRCA-2 have been identified that appear to be responsible for the majority of familial breast cancer syndromes. There was a statistically significant difference among women in relation to BIRADS.

As regards receiving medical treatment, the result revealed that receiving hormone replacement therapy (HRT), hypertensive, diabetic, hypertensive and diabetic, as well as immunosuppressive medications were considered risk factors for breast cancer that can be altered. The high percentage of women under the study were receiving hypertensive medication followed by diabetic, HRT and immunosuppressive. However, there was no statistically significant difference in relation to BIRADS. This finding was to some extent supported by [32], [33] who highlighted that the effect of HRT on normal breast tissue received little attention and didn't appear to be influenced by the duration of treatment. On the other hand, [34] clarified that HRT can be effective in reducing the frequency of breast carcinoma in high risk women. In this respect, [35] pointed out that exogenous estrogen moderately increases risk for breast cancer with high dose therapy for menopausal symptoms. Similarly, [36] concluded that the use of daily estrogen longer than 4 years slightly increases the risk of developing breast cancer. In addition [25] mentioned that although the cause of breast cancer is unknown but several factors correlate with its occurrence such as hormonal effects. Similarly, [35] stated that taking HRT (long term use of estrogen with progesterone for menopause) is considered risk factor for breast cancer.

As regards diabetic drugs, there is still contradiction about this point. However [37] pointed out to the role of energy and calories and the role of a dispose tissue in the regulation of insulin like growth factor which is a focus of research today. In a similar study the researchers mentioned that the use of immunosuppressive agents is considered risk factor that influences the chance of developing breast cancer [17]. The results of the present study revealed that one benign case received immunosuppressive medication while the rest of cases were for probably benign. In relation to hypertensive medication, the study showed that 8 malignant cases were receiving hypertensive medication but no studies were carried out regarding to this point in order to support or contradict the results. There was no statistically significant difference among women receiving medication and those who did not in relation to BIRADS.

In relation to exposure to chemical agents during work, the study results indicated that there was a statistically significant difference among women in relation to BIRADS. One malignant case was exposed to chemical agents. This finding was supported by another researcher who stated that exposure to environmental factors rather than inherited genetic factors accounts for most cases of breast cancer [18]. However, this finding is incongruent with the National Cancer Institute (NCI) 2004 which stated that no sufficient evidence of a link between breast cancer risk and exposure to environmental pollutants such as pesticides and polychlorinated biphenyls

(PCBs) [16].

As regards tobacco use and BIRADS, the results of the present study revealed that a relatively high percentage of smoker women among the study sample were diagnosed with malignancy. This finding was supported by other investigators who mentioned that exposure to certain factors such as tobacco use will influence the chance of developing breast cancer [18], [20]. In the same line the [38] reported that smoking is the greatest risk factor for cancer. It has also found that breast tissue cells undergo a change in heavy smokers, thereby leading to a greater risk of breast cancer because smoking affects hormonal metabolism and this mechanism induces a change in breast cells. However, other investigators added that most studies found no link between active cigarette smoking and breast cancer [1]. Though active smoking has been suggested to increase the risk of breast cancer in some studies, the issue remains controversial.

In this study, the researcher conducted the mammography technique for all the studied women, which may clarify the importance of nurse's role during procedure in order to grasp women's attention during procedure performance by using calm statements. In this respect, other investigator stated that some women do find mammography to be uncomfortable due to friendliness and sensitivity of the mammography technologists [13]. So, it is very important for technologists to deal friendly with women during mammography and enhancing their knowledge regarding using calming self statement and learning distraction technique to use during mammography.

Regarding to women feelings during mammography, the current study revealed that the highest percentage of women expressed a feeling of shame during the procedure. Concerning explanation regarding technique, the majority of them didn't ask any question related to technique and expressed that this is a new technique and it is the first time they heard about it. However, the rest of the sample asked questions related to frequency of mammography and effect of radiation. In relation to technologist's cooperation and explanation regarding techniques, most of women under the study expressed cooperation from technologist while the minority reported the opposite.

This finding is supported by [39] who reported that embarrassment, unpleasantness of procedure and lack of privacy are barriers to mammography. Reference [40] added that the setting for conducting mammography should be peaceful with some kind of beauty. It should be hospitable and warm. Each woman should feel that she is unique and important as a member of our family. It should be emphasized that peace of mind will be granted to the women who have a normal mammography. Women should be informed that health care providers are not just looking for early lesions, but providing peace of mind to the women with a benign mammography. Concerning these points, the researcher had to emphasize on training staff to be attentive and gentle to the women, and to answer carefully all their questions intelligently.

In the Breast Imaging Unit at El-Manial University Hospital

in Cairo University all technologists agree that communication is very important during mammography and helps in grasping women attention for reassurance. In this respect, [40] stated that communication skills based on love and sincerity need to be developed. So, it is important for the nurse to be involved in this field in order to obtain tangible results because every life saved is a real success.

The results revealed that there was no statistically significant difference between diploma and bachelor nurses as regards their knowledge about mammography and genetic screening. Reference [41] recommended that nurses should encourage population about genetic counseling and testing because they greatly influence women's health. So, the researcher views that nurse's must have knowledge about breast disease, mammography screening, tumor markers as well as treatment must be updated through seminars dealing with these items.

Concerning population's awareness regarding mammography and genetic screening, the study results indicated that an equal percent between both groups of almost one third of nurses expressed that they had a role regarding population awareness. This finding is consistent with [42] who emphasized that all levels of practitioners must continue to remind and update women about screening practices and nurses should encourage population about life style changes and genetic counseling and testing. There was no statistically significant difference between both groups of nurses as regards their perceived role regarding population's awareness about mammography, genetic screening and BSE.

V. CONCLUSION

To summarize, nurses play a significant role on early detection of breast cancer through mammography as the researcher detected 3% of women diagnosed with malignancy. Risk factors and their relationship to mammography results were discussed. In addition, nurses' knowledge and perceived role about mammography and genetic screening as well as BSE were discussed.

Recommendations:

More nursing research need to be conducted in order to increase nurse's knowledge who greatly influence women's health care regarding breast disease, screening and early treatment. Also identify women with high risk for seeking examination as early as possible (Mammography and tumor marker). In addition obtain tangible results regarding decrease in mortality rate. So follow up should be initiated for probably benign and suspicious cases. In addition student nurses should be informed about screening practices to translate their knowledge into practice during training in hospitals. Furthermore all level of practitioners must continue to remind women about screening practices (Nurses, technologists, physician, social worker, and physiotherapist). Above all interdisciplinary screening and diagnostic chain among nursing field must be developed including: Team for risk evaluation, team for clinical examination and technical diagnostic procedures such as mammography and breast

ultrasound. Also further studies with more diverse on how to influence breast health behavior among women.

ACKNOWLEDGMENT

The author would like to thank to all radiologists and technologists at Woman's Imaging Unit for giving me attention and support in the completion of this study.

REFERENCES

- [1] American Cancer Society(ACS), Located in http://www.imaginis.com/Breasthealth/bc_risks.asp, 2006.
- [2] G.P. Gui, R.K. Hogben, G. A. Walsh, R. Hern, and R. Eeles, The incidence of breast cancer from screening women according to predicted family history risk: Does annual clinical examination add to mammography, *Eur J Cancer*, vol. 37, no.3, p.1668. 2001
- [3] B. Bagni, A. Franceschetto, & A. Casolo, Scintimammography with 99mTc-MIBI and magnetic resonance imaging in the evaluation of breast cancer, *European Journal Nuclear Medicine Mol Imaging*, vol.30, 2003, pp.1383 – 1388
- [4] L.Esserman, D. Wolverton, & N. Hylton, Magnetic resonance imaging for primary breast cancer management: Current role and new applications, *Endocrine Related Cancer*, vol.9, pp. 141-153. 2002.
- [5] C. Yarbrow, International nursing and breast cancer., *Breast Journal*, vol.9, no.13, p. 34. 2003.
- [6] U. Bick, An integrated early detection concept in women with a genetic predisposition for breast cancer. *Radiology*, August, vol.37, no.8 , 1997.
- [7] P. Rubin, & J. William, Clinical oncology A Multidisciplinary approach for physicians and students , 8th ed. Philadelphia: W.B. 2001.
- [8] D. Sutton, P.A. Robinson, J.P.Jenkins, E.R. Davies, J. Murfitt, & R.L. William, The breast: Textbook of radiology and imaging 7th ed. London: Churchill Livingstone. 2003.
- [9] L.W. Bassett, & C.H. Kim, Breast imaging: Mammography and sonography, *MRI Clinic NANM*, vol. 9, 2001, pp.251 – 271.
- [10] W.H. Vogel, The advanced practice nursing role in a high-risk. *Breast Cancer Clinical*, vol.30 no.1, p.115. 2003.
- [11] A. Ganuly, K. Leady, A.Marshall, R.Dhulipal , L.Godmilow, & J. Ganuly Genetic testing for breast cancer susceptibility: Frequency of BRCA-1 and BRCA-2 mutations, *Genetic testing* vol.1, no.2, pp.85-90.1997.
- [12] N. Loman, G. Johansson, U. Kristoffersson, & H. Ollsson, Family history of breast and ovarian cancers. *Journal of NCI*, vol. 16, no.15, 1215 – 1223, 2001.
- [13] S. Leslie, P.Deriggi, S. Gross, E.Durant, C. Smith, & J. Veshnesky Knowledge, attitudes & practice surrounding breast cancer screening in educated Appalachian women. *Oncology Nursing Forum*, vol.30, no. 4, p. 33, 2003.
- [14] N. Leslie, Role of the nurse practitioner in breast and cervical cancer prevention. *Cancer Nursing*, vol.18, no.4, p. 2511, Aug. 1995.
- [15] N. Bjurstam, National screening programme in Sweden. *Sixth Europa Donna pan-European Conference*, vol. 8, no. 9, pp.7-8 Nov. 2003.
- [16] H. Geweifel, Breast imaging reporting and data system (BI-RADS), five years experience in Cairo. *Published thesis. Cairo University*, Egypt, 2004.
- [17] S.Sanjose, M. Leone, V. Berez, A. Izquierdo, R. Font, J. Brunet, T. Louant, L.Vilardell, J.Borras, P.Viladiu, F.Bosch, G.Lenoir, & O. Sinilnikova, Prevalence of BRCA 1 and BRCA 2 germline mutations in young breast cancer patients: A population based study, *Int. Journal Cancer*, vol.106, no.4, pp. 588 – 93, 2003.
- [18] J.K. Itano, & K.N. Taoka, Core curriculum for oncology nursing, 3rd ed. USA: W.B. Saunders, 1998.
- [19] S.Omar, G. Contesso, & H.Khaled, Epidemiology of breast cancer, *Breast Cancer*, vol. 4, no. 1, pp. 1-8, 2001.
- [20] S.L. Rubbin, V. Kumar, R.S. Cortan, The female genital system and breast: Rubbins basic pathology, 7th ed., Philadelphia, London W.B. Saunders, Company, 2003.
- [21] G.H. Wood, & J.H.Harber, Nursing research: methods, critical appraisal, and utilization, 5th ed. St. Louis: Mosby, 2002.
- [22] A. Linton, & N. Maelius, Introduction to medical surgical nursing 3rd ed., Philadelphia: Saunders Company, 2003.
- [23] H.James, M.Sharon, S. Slender, D. Smith, P. Stewart, & W. Paula, Balck women's perception of breast cancer and mammography. *Journal of Community Health*, vol.17 no.4, pp.191 – 203, 1992.
- [24] S.M. Lewis, I.C. Collier, & M.M. Heitkemper, Medical Surgical nursing: Assessment and management of clinical problems, 4th ed. St.Louis, Mosby company, 1996.
- [25] P. Hopwood, Western lifestyle and breast cancer risk. 4th European breast cancer conference, *European Breast Cancer Coalition*, 2004.
- [26] R. Sattin, G. Rubin, & L. Webster, Family history and risk of cancer breast. *JAMA*, vol.253, pp.1908 – 1913, 1985.
- [27] O. Meirik, E.Lund, & H. Adami, Oral Contraceptive use and breast cancer in young women. *Lancet*, vol.2, pp.650 – 653, 1986.
- [28] H.C. Wilcox, Breast Cancer and gene testing: Risk, rationale and responsibilities of primary care providers. *Breast Cancer Center*, Mercy Medical Center, Baltimore, Maryland 21202, USA ,Pubmed indexed for Medline, 1998.
- [29] S. Hayley, B. Thompson, B.Heiddis, C. Buck, J. Guevarra, D. Bovbjerg, C. Avellaneda, K. Brown, & K. Offit, Psychosocial predictors of BRCA counseling and testing decision among urban African American women. *Cancer Epidemiology Biomarkers and Prevention*, vol.11 no.2, pp.1579-1585, 2002.
- [30] S. Sanjose, M.Leone, V. Berez, A. Izquierdo, R. Font, J. Brunet, T. Louant, L. Vilardell, J. Borras, P. Viladiu, F.Bosch, G. Lenoir, & O.Sinilnikova, Prevalence of BRCA 1 and BRCA 2 germline mutations in young breast cancer patients: A population based study. *Int. Journal Cancer*, vol. 106, no.4, pp. 588 – 93. 2003.
- [31] G.B. Mann, and P.I. Borgen, Breast cancer genes and the surgeon. *Journal Surg. Oncol*, vol.67 no.4, pp. 267 – 74, 1998.
- [32] K.J. Walker, J. M. Price-Thomas, & W. Candlish, Influence of Antiestrogen tamoxifen on normal breast tissue. *Breast Journal Cancer*, vol.64, pp.764 – 768, 1991.
- [33] E.L. Rosen, & M.S. Soo, Tissue harmonic imaging sonography of breast lesion: Improved margin analysis, conspicuity, and image quality compared to conventional ultrasound, *Clinical Imaging*, vol.25, no. 6, p.379, 2001.
- [34] B. Fisher, J.P. Constantino, & D.L. Wickerham, Tamoxifen for prevention of breast cancer. Report of the National Surgical Adjuvant Breast and Bowel Project. *Journal of National Cancer Institute*, vol.90, no.18, pp. 1371 – 1388, 1998.
- [35] W.D. DuPont, & D.L. Page, Risk factors for breast cancer in women with proliferative breast disease. *National English Journal of Medicine*, vol.312, pp. 146 – 151, 1985.
- [36] W.H. Vogel, The advanced practice nursing role in a high-risk, *Breast Cancer Clinical*, vol.30 no.1, p. 115, 2003.
- [37] A. Glaus, Prevention and risk factors: interpreting new data Sixth Europa Donna pan Europea Conference, vol.8, no.9, pp.16-17, Nov.2003.
- [38] European Code Against Cancer, Located in <http://imaginis.com/breasthealth/earlydetection.asp>, 2003.
- [39] S.L. Dibble, & S.A. Roberts, Improving cancer screening among Lesbians over 50: Results of a pilot study. *Oncology Nursing Forum*, vol. 30 , no.4, p. 71, 2003.
- [40] B.C. Anthony, Overcoming obstacles in implementing breast services locally. 6th European Donna Conference, 2003.
- [41] European Breast Cancer Coalition, Located in <http://gateway1.ovid.com/ovidweb.cgi>, 2003.
- [42] D.Rainsbury, Specialist breast units in the UK, *Sixth Europa Donna Conference. European Breast Cancer Advocacy. Utility for Standard Equality for All*, 2003.

Dr.Salwa Hagag Abdelaziz, Lecturer of Medical Surgical Nursing, Faculty of Nursing Cairo University, PhD 2007.

Publications:

- S.H. Abdelaziz, & E. H.Mohamed , Effect of foot massage on postoperative pain and vital signs in breast cancer patient. *Journal of Nursing Education and Practice*, Vol.4, no. 8, pp 115-124, 2014.
- N ElKarout, S.H. AbdelAziz, M. Goda, S AITuwaijri, N. Almostafa ,R. Ashour, & H. Alradi, Cultural diversity: qualitative study on Saudi Arabian women's experience and perception of maternal health services, *Journal of Nursing Education and practice*, vol. 3, no. 11, pp.172-182, 2013.
- A .AbdEl Hamed, S. Abdelaziz. & H.Gaafar, Effect of rheumatic heart disease on pregnancy outcomes among pregnant women attending delivery at El Manial University hospital, *Kasr El Ainin Medical Journal*, vol.15, no.12, pp.17-28, 2009.