Original Article

Mammography Screening Utilization Behavior among Egyptian Female Employees in Alexandria

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Abstract

Background: Breast cancer (BC) has become a health priority due to its increasing incidence. It is curable when detected at an early stage, so there is an urgent need for its early detection. Mammography screening (MS) is the main recommended test for early detection of BC.

Objectives: The aim of the study was to assess MS utilization behavior among female employees and to identify some factors based on the Health Belief Model that determines the likelihood of MS utilization behavior in terms of: health beliefs, knowledge about BC and its risk factors, and access and need for MS.

Methods: The study was conducted among 400 female employees aged 40 years and older in four workplace sectors in Alexandria using a cross sectional approach. A predesigned interview questionnaire was used to collect socio-demographic data, habits, reproductive history, family history, culture affiliation, access to MS, reproductive health screening behavior, MS utilization behavior, need for MS, knowledge about BC and MS, perceptions towards BC and MS, perceived threat (susceptibility and severity), perceived benefits and perceived barriers to MS, (personal barriers, economic barriers, health care system barriers).

Results: More than two thirds of females (69.7%) had bad MS utilization. Seventy two percent of females had poor knowledge about BC protective factors, signs and symptoms and risk factors of BC and about MS. The perception of the studied females was high concerning susceptibility and seriousness of BC and benefits of screening but there were some perceived personal, economic and health care system barriers to MS. Multiple linear regression analysis of the factors predicting MS utilization shows that age, accessibility, perceived need, total knowledge of BC, MS, and occupation sector were the significant predictors.

Conclusion: The majority of female employees had poor knowledge about BC and MS. Increasing the females' knowledge about BC and accessibility to screening areas are important strategies influencing their decisions about whether or not to participate in cancer preventive practices.

Key words: Breast cancer, mammography screening, screening utilization

INTRODUCTION

Breast cancer (BC) was reported to be the second most common cancer in the world and, by far, the most frequent cancer among women with an estimated 1.67 million new cancer cases diagnosed in 2012 (25% of all cancers).[1] Globally, the highest BC incidence rates continue to be observed in high-income countries, including countries in Northern America, Australia, and Northern and Western Europe, with intermediate rates in Central and Eastern Europe, Southern America, and the Caribbean, and the lowest incidence rates in Middle and Eastern Africa, Eastern and South-Central Asia, and Central America.[2] The incidence of BC has risen dramatically during the last four decades.[3] About 55% of the global burden is currently existing in developed countries, but incidence rates are rapidly rising in developing countries.[4] According to the national population based cancer registry of Egypt, the age standardized incidence rate of breast cancer (2008-2011) was 48.8/100,000 among females.[5] The incidence of BC was 3-4 times higher in urban districts than in rural districts.[6] The World Health Organization (WHO) in 2013 estimated that the number of deaths due to BC globally will reach 560,000 by 2015.[7] It ranked as the fifth cause of death from all cancers and the second most common cause of female cancer-related mortality worldwide.[1] In Egypt (2012), BC was the leading cause of cancer related mortality, accounting for 29.1% of the total mortality from cancer.[7]

The etiology of BC is not well known. However, several risk factors have been shown to impact an

individual's risk of developing BC and their ultimate prognosis. These well-established risk factors include older age, family history, oral contraceptives, nullparity, hormone replacement therapy, and early menarche, late first full-term pregnancy, late menopause, dense breast tissue, and tobacco smoking.[8]

Breast cancer is curable when detected at an early stage. Women with early stage disease have an excellent prognosis with a 100% five years survival rate for stage 0 and I, while those with metastatic disease at diagnosis have a five years survival of around 20%, so it is important for women to be aware of the importance of early detection through screening.[9]

Mammography is the main test recommended for early detection of BC. For many years, the American Cancer Society (ACS) recommended annual mammograms starting at age 40, but in recent years, there has been a growing concern that annual mammograms starting at age 40 may do more harm than good for many women. The United States Preventive Services Task Force (USPSTF), an expert group that reviews the latest research findings, recommends that MS for most women start at age 50 years rather than 40 years, and that the frequency be every two years (instead of annually) through the age of 74 years. In 2015, the ACS recommended that women at average risk of BC start mammography at 45 years, and undergo annual mammograms from 45 to 54 years, and continue to undergo MS biennial after that. It is still needed at almost any age if a lump is found.[10,11] The USPSTF recommends that asymptomatic average risk women aged 50-74 years receive biennial BC screening with mammography, and that the decision to screen before 50 years of age should be an individual one incorporating patient values and context.[12,13]

Various factors affect the rates of MS including social, economic, and biological factors.[14] Age, educational level, income, ethnic origin, insurance status, marital status, and health status are important factors influencing the uptake of screening services for BC. Other factors include socioeconomic characteristics, utilization of health services, health-related behavior, and self-assessed health status. [15]

Mammography screening rates in developed countries range between 15 and 79%.[16] while they are less than 5% in developing countries [17] In Egypt, till now, routine MS is not a common practice. It is not considered as a routine screening procedure and most doctors use it as a diagnostic procedure.[18]

The study was conducted to assess the mammography utilization behavior among female employees and to identify some factors based on the Health Belief Model that determine the likelihood of mammography utilization behavior in terms: health beliefs, knowledge about breast cancer and its risk factors, access and need for mammography screening.

METHODS

The study was conducted in the following workplaces in Alexandria governorate namely Alexandria Directorate of Education and its districts' offices, Alexandria University Administration and its faculties, Alexandria Directorate of Health Affairs and its districts' offices, and Alexandria Directorate of Social Solidarity and its districts' offices. These four workplaces were randomly selected from a list of workplace sectors in Alexandria.

A cross sectional approach was carried out for implementation of the study. Female employees aged 40 years and older who accepted to participate were included in the study. The sample size was determined using Epi info, version 7.1.5.0, 2015. Based on the assumption that the MS utilization rate among female employees was 50%, the precision was 5%, the minimum required sample size was 384 at 95% confidence level and was rounded to 400 females. The sample was equally divided between the previously mentioned workplaces in Alexandria governorate. In each workplace, females were consecutively recruited until reaching the required sample.

A predesigned interviewing questionnaire was used to collect data from the employees including their personal data, reproductive history and history of breast problems and family history of BC. Other data included the health belief model (HBM) constructs which is based on the culture affiliation, access to MS, reproductive health screening behavior, mammography screening utilization behavior, perceived and actual need for MS, knowledge about BC and MS, perceptions towards BC and mammography perceived threat (susceptibility and severity), perceived benefits of MS and perceived barriers to MS (personal barriers, economic barriers and health care system barriers).

Perceived need for MS is defined as what female employees think and believe about their needs to be or say they want while actual need for MS is the expert opinion regarding appropriate standards, required levels of service and what constitutes an acceptable health status level for a community.

A pilot study was carried out among a sample of 10 women to test reactions of the respondents to the research procedures and to the questions, define appropriateness of format and wording of the questionnaire and define any items that are in need for modification, detect any difficulties or confusing questions, estimate the average time needed for filling the interviewing questionnaire and test any difficulties that may rise throughout the study. The pilot study revealed that the time needed to carry out the

interview was 25 - 35 minutes, the questions were clear and easy to understand, there was a need for modifying the format of some questions to increase the feasibility of data processing and analysis.

Data Management and Statistical Analysis

The collected data were reviewed for accuracy and completeness. Data entry and analysis were done using statistical package for social Sciences (SPSS), version 17 statistical software. Descriptive statistics were used for summarization of data. Frequency distribution, cross tabulations and graphs were done. For quantitative variables, mean and standard deviation were calculated.

The knowledge score was measured on 0-1 scale for each item. Score 1 was given for each correct answer, score 0 was given for incorrect or unknown. The total score was then calculated and categorized into score percent according to the number of questions and then reclassified into: poor knowledge (50% or less), fair knowledge (more than 50% to less than75%), and good knowledge (75% or more).

Regarding utilization, the score percent which equals (Actual score / total score) x 100. The score % was then categorized into three different levels: poor utilization (score % ≤ 33.3%), fair utilization (score % > 33.33% - 66.67%) and good utilization (score % > 66.67%).

The HBM constructs consisted of four subscales (perceived susceptibility to BC, severity of BC, benefits of MS, and barriers to MS. Each item is measured on a 5 point scale ranging from 1 that mean strongly disagree to 5 that mean strongly agree. The total perceived score and score for each perception domain were given by summing the discrete scores for items regarding each domain then the score was transformed into score percent as follows: low perceptions mean score % ≤ 33.3%, moderate perceptions mean score % >33.3% - 66.6%, and high perceptions mean score %>66.6%.

To confirm the reliability of the HBM instrument, the Cronbach's α coefficient was calculated to estimate the proportion of true scores obtained relative to errors. The Cronbach's α coefficient equals 90.1% for BC and MS knowledge (43 items) 90.1% of this score is considered (true score variance). This proved excellent reliability of this subscale in the questionnaire for measuring knowledge. The Cronbach's α coefficient equals 69.7% for perceived threats, 82.5% for perceived benefits and 74.0% for perceived barriers. This proved acceptable reliability of this subscale in the questionnaire for measuring perceived threats, perceived benefits and perceived barriers.

Ethical considerations

The study was approved by the Ethics Committee of the High Institute of Public Health, Alexandria University. The researchers complied with the International Guidelines for Research Ethics. Verbal consent was obtained from the study participants after explanation of the purpose and benefits of research. Anonymity, confidentiality and voluntary participation were stressed upon. There was no conflict of interest.

RESULTS

The study included 400 female employees aged 40-60 years. The mean age was 50.9 ± 5 years. More than half (55.5%) were menopausals. The majority (86.8%) were married. Females with secondary education constituted 47.5% and those with university or post graduate education were 42%. When the female employees' were asked about their income, 81.7% mentioned that the income was sufficient, 18.3% mentioned that it was insufficient. Regarding habits, 55% of the studied females were not performing exercise and only three confessed that they smoke regularly.

Table 1 shows the distribution of female employees according to their MS utilization and some personal characteristics. It appears from the table that the majority of females (279 (69.7%)) were bad utilizers. Females who were working in the university sector have significantly higher rates of good and fair utilization of MS (77%) while those working in the other sectors had lower rates of good and fair utilization (20% for health sector, 14% for social security sector and only 1% education sector). The difference was highly significant. Only 14.5% of those who were illiterate or have levels of education less than secondary were good or fair MS utilizers. This rate increased to 32.6% for those with secondary education and 31.0% for those with university or higher levels of education. However, the difference was not statistically significant. MS utilization increased when age increased with a statistically significant difference between the studied groups (p<0.05). The studied females with sufficient income had better behavior than those with insufficient income. The difference between the studied groups was not statistically significant (p>0.05). Postmenopausal females had better utilization. The difference between the studied groups was statistically significant (p<0.05). The table also shows that when accessibly increases the utilization increases. The difference between the studied groups was statistically significant (p<0.05). The table also shows that MS utilization increases by increasing the knowledge of BC and MS. The difference between the studied groups was statistically significant (p<0.05).

Figure 1 shows the distribution of female employees according to the perception scores of the HBM. Nearly three quarters (75.5%) had high perceived susceptibility to BC, less than one quarter (24.0%) had moderate perceived susceptibility, only

two had low perceived susceptibility to BC. Regarding perceived seriousness of BC, the majority of the studied females (90.3%) had high perceived seriousness. As regards the perceived benefit of screening, 82.7% had high perception towards the benefit of screening. Regarding the perceived overall barriers to MS, around two thirds (64.3%) had high perceived barriers to the screening.

Regarding the perceived susceptibility to BC, (Table 2) shows that 59.7% of the studied female agreed that BC is unavoidable, 66.7% mentioned that they may get BC and 82.3% agreed that they are likely to get BC as others. The table also shows that females who agreed that BC represents an economic burden on the family and society were 95%, BC represents a psychological burden to family members were 94%, BC is a serious disease were 93.3%, BC causes death if untreated were 68.7%. BC would affect work and social life were 61%, and BC affects sexual relationship constituted 52.5%. As regards perceived benefits of screening, the percent of the studied females who agreed that BC can be cured if detected early amounted to 83%. Those who agreed that the period of treatment can be reduced if detected early were 79.3%. Those who agreed that surgical intervention can be reduced if BC is detected early were 73.5%. Regarding that mammography can detect BC early before it is palpable, 61.3% agreed.

Table 1: Distribution of female employees according to their mammography screening utilization and some personal characteristics (Alexandria, 2016)

Personal Characteristics	Mammography Screening Utilization							Significance *p* value
	Bad		Fair		Good			
	No. (n=279)	%	No. (n=85)	%	No. (n=36)	%	Total n=400	
Occupation sector								
Education	90	90.0	5	5.0	5	5.0	100	$\chi^2_{df=6}$=143.86
Social Solidarity	86	86.0	9	9.0	5	5.0	100	$p_{(MC)}$=0.000*
Health Affairs	80	80.0	13	13.0	7	7.0	100	
University	23	23.0	58	58.0	19	19.0	100	
Age category								
40-	42	91.3	2	4.3	2	4.4	46	$\chi^2_{df=6}$=25.396
45-	82	73.9	15	13.5	14	12.6	111	$p_{(MC)}$=0.000*
50-	92	65.7	34	24.3	14	10.0	140	
55+	63	61.2	34	33.0	6	5.8	103	
Level of education								
Illiterate	18	81.8	3	13.6	1	4.5	22	
Read and write	9	90.0	1	10.0	0	0.0	10	$\chi^2_{df=12}$=11.792
Primary or Preparatory education	8	80.0	1	10.0	1	10.0	10	$p_{(MC)}$=0.451
Secondary education								NS
University and post graduate	128	67.4	43	22.6	19	10.0	190	
education	116	69.0	37	22.0	15	8.9	168	
Income								$\chi^2_{df=2}$=4.060
Insufficient	58	79.5	10	13.7	5	6.8	73	$p_{(MC)}$=0.131
Sufficient	221	67.6	75	22.9	31	9.5	327	NS
Menopause								$\chi^2_{df=6}$= 7.289
Premenopausal	135	75.8	27	15.3	16	8.9	178	$p_{(MC)}$= 0.025*
Postmenopausal	144	64.9	58	26.1	20	9.0	222	
Access to MS								
Poor	122	89.7	11	8.1	3	2.2	136	$\chi^2_{df=6}$= 106.064
Fair	121	78.6	26	16.9	7	4.5	154	$p_{(MC)}$= 0.000*
Good	36	32.8	48	43.6	26	23.6	110	
Total knowledge about BC and MS								
Poor	238	82.6	40	13.9	10	3.5	288	$\chi^2_{df=6}$=98.984
Fair	41	39.8	41	39.8	21	20.4	103	$p_{(MC)}$=0.000*
Good	0	0.0	4	44.4	5	55.6	9	

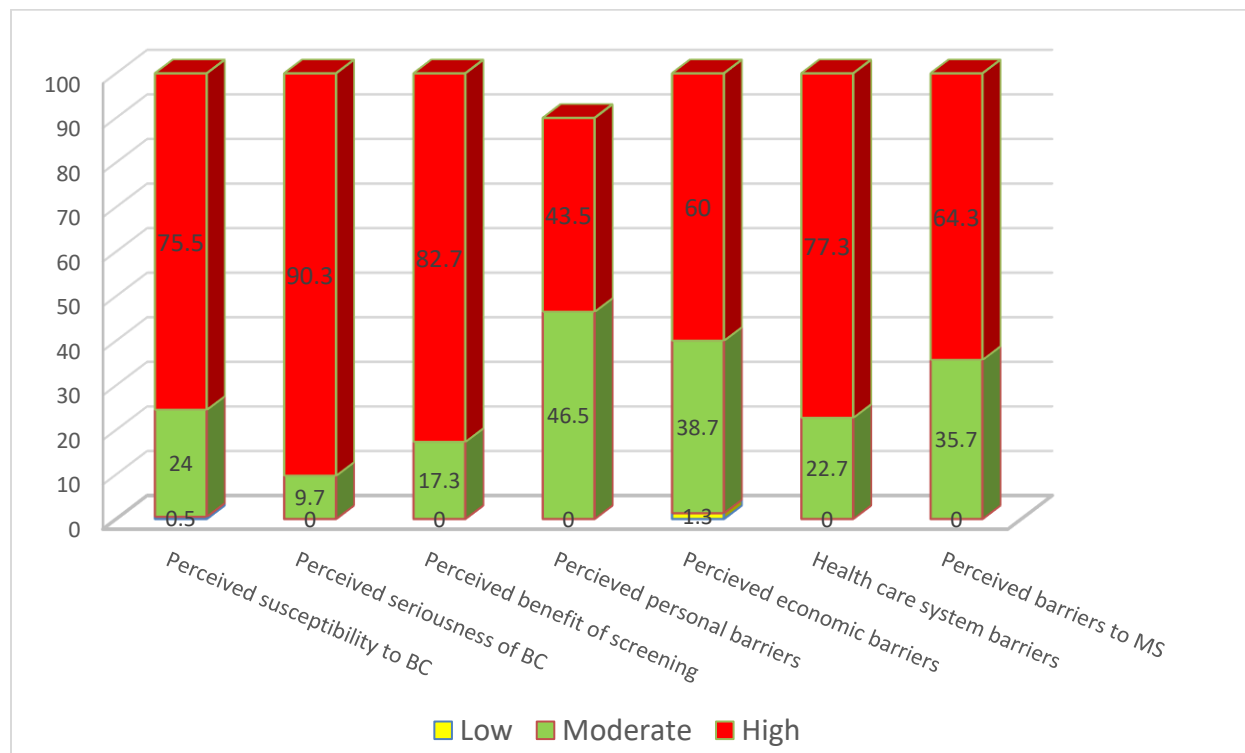MC: Monte Carlo correction for Chi-square *p* value.

Figure 1: Distribution of female employees according to perception of health belief model items

Table 2: Distribution of female employees according to their perception of breast cancer susceptibility, severity and their benefit from screening (Alexandria, 2016)

Perceptions towards BC	Female Employees					
	Agree		Uncertain		Disagree	
	No.	%	No.	%	No.	%
Perceived susceptibility to BC						
Breast cancer is unavoidable	239	59.7	68	17.0	93	23.3
Being about getting BC	267	66.7	105	25.5	31	7.7
Being likely to get BC as others	329	82.3	62	15.5	9	2.3
Perceived seriousness of BC						
BC is a serious disease	373	93.3	23	5.7	4	1.0
BC causes death if untreated	275	68.7	96	24.0	29	7.3
Breast has to be removed if BC is detected	254	63.5	45	11.3	101	25.3
BC affect in sexual relationship	210	52.5	118	29.5	72	18.0
BC represents psychological burden to family members	376	94.0	19	4.7	5	1.3
BC represents economic burden on the family and society	380	95.0	19	4.7	1	0.3
BC would affect work and social life	224	61.0	96	24.0	60	15.0
Perceived benefit of screening						
BC can be cured if detected early	332	83.0	61	15.3	7	1.7
Mammography can detect BC early before it is palpable.	245	61.3	123	30.7	32	8.0
Surgical intervention can be reduced if BC detected early	294	73.5	102	25.5	4	1.0
The period of treatment can be reduced if BC is detected early.	317	79.3	80	20.0	3	0.7
Mammography prevents anxiety	225	56.3	150	37.5	26	6.3
Mammography is effective in detecting abnormalities in breasts	194	48.5	195	48.7	11	2.7

When the studied females were asked about their perceived personal, economic, and health care system barriers to MS, 81% were not having enough knowledge about BC screening (81%), 75.5% feared of positive result, 72% feared of treatment, 70.3% were not having free time, 66.5% thought it was painful, 65.8% were being embarrassed from the procedure and 49.3% do not know where the test is done (Table 3). As regards economic barriers to MS, it appears from table 3 that 75% mentioned long distance to mammography centers, 70% cost of mammography and 60% inability to take time off from work were the economic barriers. The table also shows that the perceived health care barriers were the need for adequate explanation by doctors (79.8%), embarrassment when facing a male doctor (75.3%), lack of privacy during screening (73.5), unsuitable screening hours (67.8%), need for physician referral (64%), and waiting for long time (58%) and distrusting the result (57%).

Table 4 shows the relation between MS utilization and perception towards BC and MS. The table shows that the higher the HBM perceptions (perceived susceptibility to BC, severity, benefits, and social support) the higher the MS utilization. However, the differences were not statistically significant.

Table 5 shows the relation between MS utilization and perceived need, actual need and intention to utilize the MS service. The table show that the utilization increases with the increase in the perceived need. The difference between the studied groups was statistically significant ($p<0.05$). As regards the actual need, utilization was higher for those with moderate risk. The difference between the studied groups was statistically significant ($p<0.05$). Concerning intention to utilize MS, the sure the intention the better the utilization. The difference was statistically significant.

Multiple linear regression analysis of the factors predicting MS utilization shows that age, accessibility, perceived need, total knowledge of BC and MS were the significant predictors. The coefficient of multiple determination for the regression model was 0.573 (Table 6).

Table 3: Distribution of female employees according to perceived barriers towards breast cancer screening by mammography (Alexandria, 2016)

| Perceived barriers to mammography | Female employees | | | | | |
| | Agree | | Uncertain | | Disagree | |
	No.	%	No.	%	No.	%
Perceived personal barriers						
Lack of knowledge about BC screening	325	81.0	25	6.2	51	12.8
Do not know how the test is done	136	34.0	46	11.5	218	54.5
Do not know where the test done	197	49.3	48	12.0	155	38.7
MS is unsafe	147	36.7	84	21.0	169	42.3
MS is embarrassing	263	65.8	71	17.8	66	16.4
MS is painful	266	66.5	53	13.2	81	20.3
Fear of exposure to radiation	85	21.2	86	21.5	229	57.3
Fear of positive result	302	75.5	70	17.5	28	7.0
Fear of treatment	288	72.0	70	17.5	42	10.5
Not having free time/ busy	281	70.3	53	13.2	66	16.5
Perceived economic barriers						
Too much cost	280	70.0	40	10.0	80	20.0
Far MS centers	300	75.0	50	12.5	50	12.5
Difficult accessibility by public transportation	84	21.0	84	21.0	232	58.0
Inability to take time off from work	242	60.5	74	18.5	84	21.0
Health care system barriers						
Physician referral is needed	256	64.0	22	5.5	122	30.5
Embarrassment when facing a male doctor	301	75.3	46	11.5	53	13.2
Lack of privacy during screening	294	73.5	50	12.5	56	14.0
Need for adequate explanation by doctor	319	79.8	13	3.2	68	17.0
Distrusting the results	228	57.0	82	20.5	90	22.5
Unsuitable screening working hours	271	67.8	49	12.2	80	20.0
Long time of appointment and waiting	232	58.0	68	17.0	100	25.0

Table 4: Relation between mammography screening utilization and health belief model perceptions about breast cancer and mammography screening among the studied female employees (Alexandria, 2016)

HBM perceptions	Mammography Screening Utilization						Significance p value
	Bad (n=279)		Fair (n=85)		Good (n=36)		
	No.	%	No.	%	No.	%	
Perceived susceptibility to BC							
Low	2	100	0	0.0	0	0.0	$\chi^2_{df=6}=2.143$
Moderate	68	70.8	22	22.9	6	6.3	$p_{(MC)}=0.648$NS
High	209	69.2	63	20.9	30	9.9	
Perceived severity of BC							
Low	0	0.0	0	0.0	0	0.0	$\chi^2_{df=6}=0.435$
Moderate	29	74.4	7	17.9	3	7.7	$p_{(MC)}=0.828$NS
High	250	69.3	78	21.3	33	9.1	
Perceived benefits of MS							
Low	0	0.0	0	0.0	0	0.0	$\chi^2_{df=6}=0.313$
Moderate	49	71.0	15	21.7	5	7.3	$p_{(MC)}=0.894$ NS
High	230	69.5	70	21.1	31	9.4	
Perceived barriers to MS							
Low	0	0.0	0	0.0	0	0.0	$\chi^2_{df=6}=1.613$
Moderate	99	69.2	30	21.0	14	9.8	$p_{(MC)}=0.465$NS
High	180	70.0	55	21.4	22	8.6	
Perceived social support							
Low	7	77.8	2	22.2	0	0.0	$\chi^2_{df=6}=1.510$
Moderate	83	67.5	29	23.6	11	8.9	$p_{(MC)}=0.849$NS
High	189	70.5	54	20.2	25	9.3	

MC: Monte Carlo correction for Chi-square p value.

Table 5: Mammography screening in relation to perceived need and intention to its utilization (Alexandria, 2016)

	Mammography Screening						Significance p value
	Bad (n =279)		Fair (n =85)		Good (n =36)		
	No.	%	No.	%	No.	%	
Perceived need							
Low	154	79.8	25	13.0	14	7.2	$\chi^2_{df=6}=27.211$
Moderate	77	68.8	27	24.1	8	7.1	$p_{(MC)}=0.000$ *
High	48	50.5	33	34.7	14	14.8	
Actual need							
Low	186	72.9	43	16.9	26	10.2	$\chi^2_{df=6}=8.517$
Moderate	93	64.1	42	29.0	10	6.9	$p_{(MC)}=0.014$*
Intention to utilize MS							
No	42	97.7	1	2.3	0	0.0	
Not sure	129	70.9	33	18.1	20	11.0	$\chi^2_{df=6}=24.345$
Sure	108	61.7	51	29.1	16	9.2	$p_{(MC)}=0.000$*

MC: Monte Carlo correction for Chi-square p value.

Table 6: Multiple linear regression analysis of significant predictors of mammography screening utilization among female employees (Alexandria, 2016)

Significant predictors	B	t	*p* value
Age	0.028	2.131	0.034*
Accessibility	0.336	7.612	0.000*
Perceived need	-0.080	-2.066	0.039*
Total knowledge of BC and MS	0.125	9.519	0.000*

*p <0.05 (significant)
R^2 0.573   Adjusted R^2 0.556   *p* value   0.000*
F   34.285   *p* value   0.000*

DISCUSSION

Breast cancer besides being a substantial health problem, it has an enormous diverse effect on the community since women's health status has an important impact on the health of their children, family and community. In addition to the traditional roles of women as wives, mothers and primary care givers for their families, they have an important position within the social and economical lives of their communities.[19] Egyptian women do not usually come forward until the late stages of the disease, when it is often too late to assist.[20] In the current study, 30.3% of females were fair to good utilizers of MS. This finding is in line with Bener et al.[21] who reported a rate of 22.5% in Qatar. These rates are much lower than BC screening rates in USA (2010) (72.8%).[13] Although mammography screening was available to the studied females in the various sectors, but University employees reported higher attendance rates to MS than the other sectors. It appears that when the invitation was presented by the administrative level, it resulted in motivation of the employees to be screened. Furthermore, some of Alexandria University employees assumed that the screening presented by the university administration was compulsory. One of the reasons for low participation in MS by other sectors may be due to insufficient time and knowledge of women about BC and MS. Regarding the factors affecting MS utilization, the current study results showed that MS utilization increases with the increase in age. This finding is similar to Wang et al.[22] finding, that observed that when age is above 50 years, the participation in screening was better. It was also in line with Vyas et al.,[23] who reported that women aged 40 - 49 years may be less likely to be adherent to MS than women aged 50 years and above. Another study conducted by Perera et al.,[24] among Asian women revealed a similar finding: older women tended to use MS services more often. Concerning marital status, the study findings indicated that there was no significant association between MS utilization and marital status. These findings are similar to finding of Abdelaziz et al.,[18] and Secginli et al.[25] In the present study, education was not significantly associated with

MS utilization; Ersin et al.,[26] found that there was no difference detected between the educational level and the rate of having mammograms. They concluded that higher education does not mean that people will follow all the health guidelines because some highly educated people still lack the awareness to make correct health decisions. Elshamy et al.,[27] reported that years of education were not associated with increased knowledge about BC. On the contrary Perera et al.,[24] and Ozmen et al.,[28] stated that higher education is significantly associated with higher MS utilization.

The current study indicated that there was no significant association between family income and MS utilization. The same finding was reported by Abdelaziz et al.,[19] and Secginli S et al.[25] On the other hand Juon et al.,[29] found that family income was considered an important variable associated with MS utilization. Kerlikwoske et al.,[30] stated that providing free facilities in different parts of the community increases MS utilization in women. Postmenopausal women were more likely to undergo mammography than pre- menopausal women. The current study showed a significant association between menopause and utilization of MS. This finding is consistent with Perera et al.,[24] that found postmenopausal women to be more likely to undergo MS than premenopausal women.

The current study showed no significant association between cultural affiliation and MS utilization. This result is inconsistent with results of the study done by Yu et al.,[31] in the USA among immigrant Chinese women who reported that cultural affiliation was related to BC screening behavior. This difference may be due to the nature of studied sample that was employees and most of them were from moderate class areas. Access to a usual source of care was significantly associated with performing cancer screening tests.[32] The current study results show significant increase in utilization of MS when accessibility increases. This result is supported by Yu et al.,[31] study carried out among Chinese American women where access to medical services was found to be an effective factor for promoting the use of MS services. MS utilization was significantly increased by

the increase in knowledge about BC and MS. This result is consistent with Coleman et al.,[33] and Abdelaziz et al.[18] who showed a significant association between knowledge and screening practices. There was asignificant association between the perceived need to MS and MS utilization. This finding is in the same line with Gross et al.,[34] study which found that women with a higher perceived cancer risk were significantly more likely to undergo routine MS. The present study showed that the intention to utilize MS was found to be significantly associated with the use of MS. This result is in the same line with Abdelaziz et al. [18] and Pasick RJ et al., [35] who indicated that women intend to be screened if they have sufficient views about MS, and recognize that others viewed MS positively. On the basis of the HBM, subscales of perceived susceptibility, severity and benefits are positively related to health behavior such as MS behavior and perceived barriers have negative relationship. [36] Results of the current study show that the perceived susceptibility, severity, and perceived benefit increases with the increase in MS utilization, and the perceived barriers were lower in females with higher MS utilization. This finding is in agreement with findings of other studies.[31, 37,38]

As regards perceived susceptibility, a meta-analytic study by Katapodi et al.,[39] found that screening had positive association with perceived susceptibility. On the other hand, studies by Facione NC et al. and Lindberg et al., [40,41] found a negative association between perceived susceptibility and screening. In the current study, perceived susceptibility did not appear to be a significant predictor of having had a mammogram. This finding is congruent with Rahman et al. [42] study finding. Females in this study had high perceived susceptibility to BC with total score 75.5%. The highest perceived susceptibility was for the following the female likely to get BC as others (82.3%) and BC is unavoidable (59.7%). Yan et al.,[43] results showed that the majority of women believed that BC was unavoidable and 44.1% were worried about getting the disease.

As regards perceived severity, Glanz et al.,[44] reported that in cases where the perceived severity is high, the possibility of displaying the protective health behavior also increases. Females in current study had high perceived severity, especially concerning the economic burden on the family and society (95%), the psychological burden to family members (94%) and the seriousness of the disease (93.3%). Based on HBM, people perception of perceived threats depends on their knowledge about the disease.[36]

Results of the current study revealed that there was no difference between MS utilization and the perceived benefit. This is consistent with Russell et al.,[45] results. The perceived benefits of MS were: BC can be cured (83%), the period of treatment can be reduced (79.3%) and surgical intervention can be reduced (73.5%) if BC is detected early. Ibrahim et al.,[46] found that more than 80% of participants believed that BC can be cured if detected early. Okobia et al.,[47] reported that 41% of participants believed that BC is curable if detected early. Boulos et al.,[48] reported that 98.7% believed that early detection improves treatment outcome and 87.7% believed that there is an effective treatment for BC. The perceived barriers for MS were lack of knowledge about BC screening (81%), need for adequate explanation by doctor (79.8%), embarrassment when facing a male doctor (75.3%), fear of positive result (75.5%) and long distance to MS centers (75%). Yan et al.,[43] found that the lack of knowledge about screening was the major barrier that prevented many women from carrying out preventive actions. Ismail GM et al., [20] reported that the main causes for not doing MS were painful sensation (76%) and being a very expensive procedure (72%). They also added that fear from being diagnosed with BC is a barrier to MS.

CONCLUSION & RECOMMENDATIONS

Based on the results, of this study, it is clear that the majority of female employees had poor knowledge about protective factors, signs and symptoms and risk factors of BC and about MS. The perception of the studied females was high concerning susceptibility and seriousness of BC and benefits of screening. The majority of female employees in all sectors had poor MS practice which reflects limited understanding of the screening strategy despite the efforts of government.

- Increasing the females' knowledge about BC and accessibility to screening areas are important strategies influencing their decisions about whether or not to participate in cancer preventive practices.
- Perceived need, age, menopause, intention and occupation showed significant direct effects on MS utilization (p<0.05). Intention to utilize MS increased by increasing the level of education, knowledge of BC and MS, accessibility to MS and perceived need.
- Based on the results of this study, the researchers proposed some recommendations that may help in improving the MS utilization which will help in early diagnosis and treatment.
- Improving awareness about BC through education. The Ministry of Health and women development facilities should play a leading role in increasing female awareness through launching health educational programs even for illiterate and poorly educated women.
- Enhancing awareness of females about warning signs, risk factors, preventive and early detection measures for BC via all available means for example mass media, conferences, workshops, health

education at health facilities and work places, and distribution of pamphlets to women and in family recreation areas, and markets, as well as waiting areas in primary health care centers and hospitals.

- Establishing education programs for females attending different health care facilities concerning MS and its importance. This could be achieved by physicians and nurses during routine patient visits.
- Ensuring availability of free screening for BC for females aged forty years and older in all health facilities at different times to remove the financial, accessibility and unsuitable time barriers to MS.

The findings of this study show that informed consent was perceived differently by patients. The difference in perception and limited knowledge of the legal implications of signing or not signing consent form indicates that consent procedures appear inadequate and hence consenting in its current form is not informed and should be re-evaluated to achieve patient autonomy.

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