

Socio-Demographic Difference Impact on Breast Cancer Awareness Among Egyptian Women: A Cross-Sectional Study

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ABSTRACT

The World Health Organization (WHO) reports that breast cancer (BC) is the most common cancer among women worldwide, accounting for 24.2% of all female cancer cases. In 2020, around 2.3 million new cases of breast cancer were reported, establishing it as the second biggest cause of cancer-related mortality among women, following lung cancer. In Egypt, a systematic review and meta-analysis revealed that BC is the most common cancer among Egyptian women, accounting for 42% of all female cancer cases, with a significant proportion presenting at advanced stages. Moreover, BC constitutes 29% of cancer cases treated at the National Cancer Institute.

Keywords: Socio-demographic Variables (SV), Breast cancer (BC), Breast Cancer Awareness Measure (Breast CAM)

INTRODUCTION

The World Health Organization (WHO) reports that breast cancer (BC) is the most common cancer among women worldwide, accounting for 24.2% of all female cancer cases. In 2020, around 2.3 million new cases of breast cancer were reported, establishing it as the second biggest cause of cancer-related mortality among women, following lung cancer [1]. In Egypt, a systematic review and meta-analysis revealed that BC is the most common cancer among Egyptian women, accounting for 42% of all female cancer cases, with a significant proportion presenting at advanced stages [2]. Moreover, BC constitutes 29% of cancer cases treated at the National Cancer Institute [3].

A notable increase in BC incidence has been observed in women aged 50 years and older, with the highest rates among those aged 70 years and older. This demographic shift is partly due to the rising proportion of the elderly population in Egypt, which grew from 3.7% in 2006 to 9.3% in 2014 [2].

The rising incidence rates can be attributed to several reproductive and hormonal risk factors, including early menarche, delayed menopause, advanced maternal age at first childbirth, low parity, reduced or absent breastfeeding, menopausal hormone therapy, and oral contraceptive use. Lifestyle factors such as increased alcohol consumption, obesity, and sedentary behavior also contribute to this trend. Improved awareness and enhanced screening methods have further impacted incidence rates, with developed countries reporting BC incidence rates 88% higher than those in developing countries [4]. However, mortality rates have been declining in many regions due to advancements in early detection and treatment [5].

Screening and Early Detection

Screening for breast cancer can significantly reduce morbidity and mortality rates and improve survival outcomes. Methods for detecting BC include mammography, ultrasound, and magnetic resonance imaging (MRI). If BC is suspected, a biopsy may be performed to obtain tissue samples for further analysis [6].

Early detection through screening is crucial as it facilitates less invasive treatments and better outcomes by identifying the disease before significant tumor progression. Mammography remains the most recommended imaging technique for breast cancer screening, particularly for women over 40 years of age [7].

Awareness and Knowledge

Awareness of breast cancer risk factors and personal risk perception are vital for motivating women to engage in preventive measures, early detection, and effective disease management.

In contrast, limited awareness about breast cancer and its risk factors can hinder participation in screening programs [8]. Despite advancements in survival rates in many developed countries, the five-year survival rate in Egypt remains relatively low, ranging from 28% to 68% [9, 10]. This disparity is primarily due to late-stage diagnoses [11].

Study Objective

This study sought to investigate the relationship between socio-demographic variables and breast cancer awareness among women in Egypt.

Methodology

Study Design

A cross-sectional quantitative study approach was utilized.

Sampling

A convenience sampling method was used, involving 211 women from various socio-demographic backgrounds in Egypt. Participants were between 17 and 40 years old and were selected randomly from healthcare facilities for non-cancer-related investigations or treatments. Women with a prior diagnosis of breast cancer, those undergoing cancer treatment, and cancer caregivers were excluded.

Ethical Considerations

The study followed the ethical guidelines set forth in the Declaration of Helsinki. Ethical approval was obtained from the Clinical Research Ethics Committee of the Faculty of Physical Therapy, Modern University for Technology and Information, Egypt, in October 2023 (Approval No: REC/2111/MTI.PT/2310292). Informed consent was obtained from all participants after explaining the study's aims and procedures.

Data Collection

Data collection occurred from October to December 2023 using a questionnaire designed to assess breast cancer awareness among Egyptian women. The questionnaire was adapted from the Arabic version of the Breast Cancer Awareness Measure (Breast CAM) [12, 13]. Subjects who met the criteria were verbally invited to participate in the study. One of the researchers introduced the questionnaire to the participants and collected the data, consenting and explaining to candidates the purpose of the study and giving them the liberty to refuse participation or withdraw at any time and their questions about the study were clearly answered. The 32-question instrument was divided into four sections: socio-demographic characteristics (6

questions including age, education level, marital status, occupation, residence and family history), knowledge of breast cancer warning signs (12 questions), knowledge of breast cancer screening and self-examination (5 questions), and psychological and financial barriers to screening (9 questions). Responses were recorded on a two-point scale ("Yes" or "No"), and the questionnaire took approximately 20-25 minutes to complete.

Statistical Analysis

Data were organized, coded, and analyzed using Microsoft Office Excel and IBM SPSS Statistics for Windows (Version 15). Descriptive statistics, Pearson correlation, and Chi-Square tests were employed, with a significance level set at $p < 0.05$. Missing data were treated as a lack of awareness.

Results

Demographic Characteristics

The study included 211 Egyptian women aged 17 to 40. Of these, 52.1% were from Cairo, while the remaining 47.9% were from other governorates. Educational levels varied: 4.3% were uneducated, 23.2% had partial education, and 72.5% were well-educated. Marital status was distributed as 64.9% single and 35.1% married. Employment status showed that 64.5% were not working, and 35.5% were employed. A family history of breast cancer was reported by 19.9% of participants.

Awareness of Breast Cancer Signs

Analysis revealed significant correlations between breast cancer awareness and socio-demographic factors (Table 1) such as age ($p = 0.002$), educational level ($p = 0.001$), and marital status ($p = 0.003$). Younger participants (<25 years) and those with higher educational levels showed better awareness (Table 2). For instance, 83.1% of participants under 25 years had good awareness, compared to 16.9% with poor awareness.

Table 1: Level of Awareness and Knowledge of Breast Cancer Signs Relationship to Participant Demographic Factors

Variables	r	P
Age	0.214*	0.002*
Educational Level	0.222*	0.001*
Marital status	0.202*	0.003*
Working	0.127	0.066
Residence	0.002	0.972
Family History of Breast Cancer	0.065	0.349

*Correlation is significant at the 0.01 level (2-tailed).

Table 2(a): Level of Awareness and Knowledge of Breast Cancer Signs Association with Participant Demographic Factors

Variables	Good Awareness n (%)	Poor Awareness n (%)	Total n (%)	P
Age	less than 25 years old 103 (83.1%)	21 (16.9%)	124 (58.8%) of total	0.002*
	more than 25 years old 56 (64.4%)	31 (35.6%)	87 (41.2%) of total	
	Total 159 (75.4%) of total	52 (24.6%) of total	211 (100%)	
Educational Level	Not Educated 4 (44.4%)	5 (55.6%)	9 (4.3%) of total	0.001*
	Partially Educated 31 (63.3%)	18 (36.7%)	49 (23.2%) of total	
	Well Educated 124 (81.1%)	29 (18.9%)	153 (72.5%) of total	
	Total 159 (74.9%) of total	52 (25.1%) of total	211 (100%)	
Marital status	Single 112 (81.8%)	25 (18.2%)	137 (64.9%) of total	0.003*
	Married 47 (63.5%)	27 (36.5%)	74 (35.1%) of total	
	Total 159 (75.4%) of total	52 (24.6%) of total	211 (100%)	
Working	Not working 108 (79.4%)	28 (20.6%)	136 (64.5%) of total	0.066
	Working 51 (68%)	24 (32%)	75 (35.5%) of total	
	Total 159 (75.4%) of total	52 (24.6%) of total	211 (100%)	

Table 2(b): Level of Awareness and Knowledge of Breast Cancer Signs Association with Participant Demographic Factors

Variables		Good Awareness n (%)	Poor Awareness n (%)	Total n (%)	P
Residence	Cairo	83 (75.4%)	27 (24.6%)	110 (52.1%) of total	0.972
	Other Governorates	76 (75.2%)	25 (24.8%)	101 (47.9%) of total	
	Total	159 (75.4%) of total	52 (24.6%) of total	211 (100%)	
Family history	Yes	34 (80.9%)	8 (19.1%)	42 (19.9%) of total	0.349
	No	125 (74%)	44 (26%)	169 (80.1%) of total	
	Total	159 (75.4%) of total	52 (24.6%) of total	211 (100%)	

* Chi Square: Significant at the 0.01 level (2-tailed).

Knowledge of Breast Cancer Examination and Screening

No significant correlations were found between awareness of breast cancer examination and screening and socio-demographic

factors ($p>0.005$) (Table 3). Chi-square results confirmed no significant associations (Table 4).

Table 3: Level of Awareness and Knowledge of Breast Cancer Examination and Screening Relationship to Participant Demographic Factors

Variables	r	P
Age	0.003	0.968
Educational Level	0.106	0.126
Marital status	0.031	0.659
Working	0.045	0.520
Residence	0.070	0.309
Family history of breast cancer	0.074	0.285

*Correlation is significant at the 0.01 level (2-tailed)

Table 4: Level of Awareness and Knowledge of Breast Cancer Examination and Screening Association with Participant Demographic Factors

Variables		Good Awareness n (%)	Poor Awareness n (%)	Total n (%)	P
Age	less than 25 years old	83 (66.9%)	41 (33.1%)	124 (58.8%) of total	0.968
	more than 25 years old	58 (66.7%)	29 (33.3%)	87 (41.2%) of total	
	Total	141 (66.8%) of total	70 (33.2%) of total	211 (100%)	
Educational Level	Not Educated	6 (66.7%)	3 (33.3%)	9 (4.3%) of total	0.126
	Partially Educated	27 (57.5%)	22 (42.5%)	49 (23.2%) of total	
	Well Educated	108 (70.5%)	45 (29.5%)	153 (72.5%) of total	
Marital status	Total	141 (66.8%) of total	70 (33.2%) of total	211 (100%)	0.659
	Single	93 (67.9%)	44 (32.1%)	137 (64.9%) of total	
	Married	48 (64.9%)	26 (35.1%)	74 (35.1%) of total	
Working	Total	141 (66.8%) of total	70 (33.2%) of total	211 (100%)	0.520
	Not working	93 (68.4%)	43 (31.6%)	136 (64.5%) of total	
	Working	48 (64%)	27 (36%)	75 (35.5%) of total	
Residence	Total	141 (66.8%) of total	70 (33.2%) of total	211 (100%)	0.309
	Cairo	77 (70%)	33 (30%)	110 (52.1%) of total	
	Other Governorates	64 (63.4%)	37 (36.6%)	101 (47.9%) of total	
Family history	Total	141 (66.8%) of total	70 (33.2%) of total	211 (100%)	0.285
	Yes	31 (73.8%)	11 (26.2%)	42 (19.9%) of total	
	No	110 (65%)	59 (35%)	169 (80.1%) of total	
Total		141 (66.8%) of total	70 (33.2%) of total	211 (100%)	

* Chi Square: Significant at the 0.01 level (2-tailed).

Psychological and Financial Barriers

No correlation was identified between psychological and financial barriers to screening and socio-demographic factors

($p>0.005$). (Table 5). Chi-square results confirmed no significant associations (Table 6).

Table 5: Relationship Between Barriers to Breast Cancer Examination and Screening and Participant Socio-Demographic Factors

Variables	r	P
Age	0.042	0.539
Educational Level	0.106	0.127
Marital status	0.033	0.629
Working	0.001	0.987
Residence	0.039	0.576
Family history of breast cancer	0.088	0.202

*Correlation is significant at the 0.01 level (2-tailed).

Table 6(a): Level of Barriers to Breast Cancer Examination and Screening Association with Participant Demographic Factors

Variables		High Level of Barriers n (%)	Low Level of Barriers n (%)	Total n (%)	P
Age	less than 25 years old	45 (36.3%)	79 (63.7%)	124 (58.8%) of total	0.539
	more than 25 years old	28 (32.2%)	59 (67.8%)	87 (41.2%) of total	
	Total	73 (34.6%) of total	138 (65.4%) of total	211 (100%)	

Table 6(b): Level of Barriers to Breast Cancer Examination and Screening Association with Participant Demographic Factors

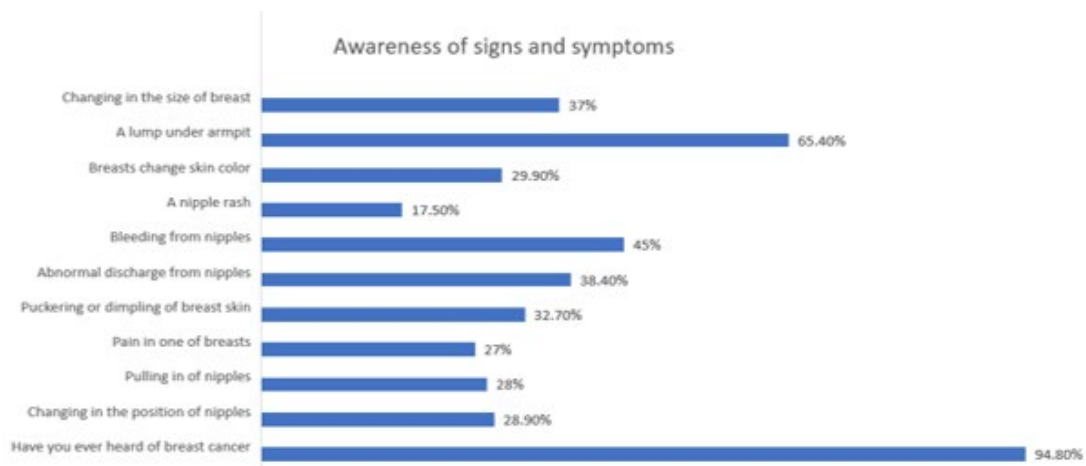
Variables	High Level of Barriers n (%)	Low Level of Barriers n (%)	Total n (%)	P	Variables
Educational Level	Not Educated	6 (66.7%)	3 (33.3%)	9 (4.3%) of total	0.127
	Partially Educated	17 (34.7%)	32 (65.3%)	49 (23.2%) of total	
	Well Educated	50 (32.7%)	103 (67.3%)	153 (72.5%) of total	
	Total	73 (34.6%) of total	138 (65.4%) of total	211 (100%)	
Marital status	Single	49 (35.8%)	88 (64.2%)	137 (64.9%) of total	0.629
	Married	24 (32.4%)	50 (67.6%)	74 (35.1%) of total	
	Total	73 (34.6%) of total	138 (65.4%) of total	211 (100%)	
Working	Not working	47 (34.5%)	89 (65.5%)	136 (64.5%) of total	0.987
	Working	26 (34.5%)	49 (65.5%)	75 (35.5%) of total	
	Total	73 (34.6%) of total	138 (65.4%) of total	211 (100%)	
Residence	Cairo	40 (36.4%)	70 (63.6%)	110 (52.1%) of total	0.576
	Other Governorates	33 (32.7%)	68 (67.3%)	101 (47.9%) of total	
	Total	73 (34.6%) of total	138 (65.4%) of total	211 (100%)	
Family history	Yes	11 (26%)	31 (74%)	42 (19.9%) of total	0.202
	No	62 (36.7%)	107 (63.3%)	169 (80.1%) of total	
	Total	73 (34.6%) of total	138 (65.4%) of total	211 (100%)	

* Chi Square: Significant at the 0.01 level (2-tailed).

General Awareness About Breast Cancer, Warning Signs and Symptoms

Most participants (94.8%) had heard of breast cancer, yet 65% lacked awareness of its warning signs and symptoms. Correctly

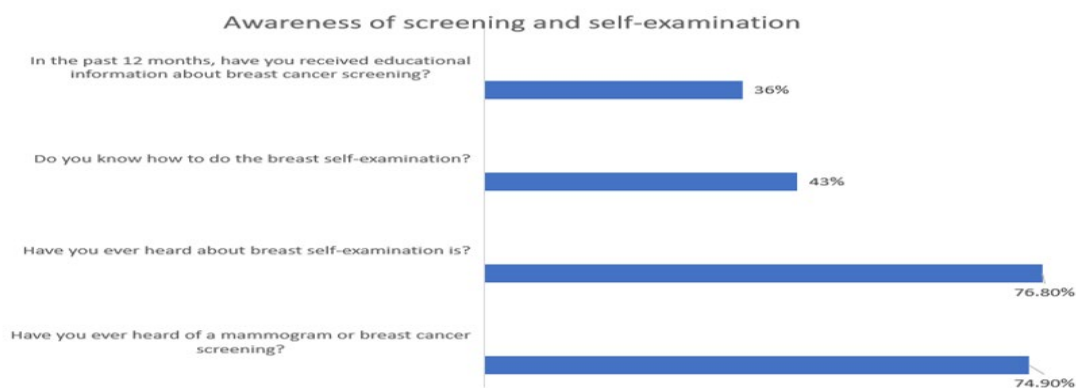
identified signs included armpit lumps (65.4%), nipple bleeding (45%), and nipple discharge (38.4%) (Figure 1).

**Figure 1:** Knowledge About Breast Cancer and Warning Signs and Symptoms

Breast Self-Examination (BSE)

Seventy-six point eight percent of participants had heard of BSE, and 74.9% were aware of mammograms. However, only 43%

reported performing BSE, and 36% had received educational information on breast cancer screening (Figure 2).

**Figure 2:** Knowledge and Awareness of BSE

Barriers to Breast Cancer Screening

Most participants (65.4%) had neither psychological nor financial barriers to breast cancer examination and screening. Among the participants who faced difficulties; around 24.7% had

psychological barriers and around 14% had financial barriers. Common barriers included a busy lifestyle (41.7%) and fear of visiting a doctor (31.3%) (Figure 3).

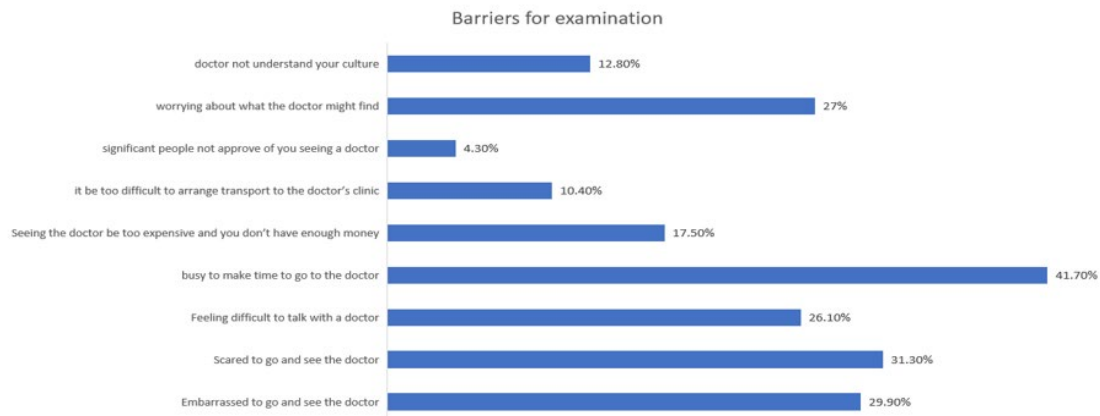


FIGURE 3: Barriers to Breast Cancer Screening

Discussion

Breast cancer remains the predominant malignancy among women in Egypt, despite having lower incidence rates compared to Western nations. The significant disparity in survival rates can be attributed to late-stage presentations. Effective early detection strategies, as demonstrated by successful screening programs in the UK, could improve outcomes in Egypt [14]. Access to advanced technologies and targeted therapies in the public sector is limited, making it more practical and cost-effective to focus on early detection and diagnosis to enhance survival rates and lower mortality. The outcome of the United Kingdom's national breast screening program exemplifies how early diagnosis and screening can enhance cure rates by facilitating the downstaging of breast cancer presentation [15]. The study highlighted that although most participants had heard of breast cancer, knowledge about warning signs was inadequate. Younger, well-educated, single women displayed better awareness. The study also found that psychological barriers, such as fear and busy schedules, hindered screening participation. The study revealed that only 43% of participants reported engaging in BSE, and approximately 36% had received educational information about breast cancer screening. Notably, there was no significant correlation between these practices and socio-demographic factors. Despite identifying psychological barriers, such as fear of a cancer diagnosis and a demanding lifestyle, no substantial relationship between these barriers and socio-demographic variables was observed. The primary obstacles to screening were related to concerns about discovering cancer and time constraints. These findings align with a 2021 study by Abdelaziz A., et.al [9], which examined breast cancer awareness among 704 Egyptian women. This study found that 69% of participants had limited knowledge of risk factors, and only 44% achieved scores above 50% in screening awareness, indicating inadequate knowledge. Caregivers in this study demonstrated significantly better awareness across all domains ($p < 0.001$) [13]. Similarly, research on breast cancer awareness among female university students in Pakistan, published by Hussain I. [16], highlighted that participants had minimal knowledge of breast cancer symptoms, such as

painless, palpable lumps and masses under the armpit. The study attributed this lack of knowledge to social norms, where modesty and embarrassment hinder breast examinations, labeling breast cancer as a socially stigmatized condition. Socioeconomic and cultural determinants, such as age, employment level, knowledge deficiency, surgical apprehension, and dependence on traditional medicines, frequently lead to late-stage cancer diagnosis in Pakistani women. A 2019 study by Rahman S. A. et al. [17] at the University of Sharjah found that less than half of the participants were knowledgeable about breast cancer warning signs, and many seldom performed BSE. Common reasons for not performing BSE included forgetting and lack of knowledge on how to conduct the BSE. In contrast, this study found that younger women demonstrated higher awareness compared to those over 25 years old. This finding contrasts with research conducted in the Gaza Strip by Elshami M. et al. [18], which indicated that older women exhibited better awareness and knowledge of breast changes and age-related risks. Nonetheless, overall awareness among both adolescents and women in Gaza remained suboptimal, with poor performance in BSE.

Furthermore, a 2015 study by the Egyptian Ministry of Health and the Demographic and Health Survey project reported that only 2% of Egyptian women had undergone clinical screening (mammography, ultrasound, or clinical breast examination), and merely 6% had performed BSE within the past year. This low rate of screening is attributed to a combination of factors, including shortcomings in healthcare services and socio-cultural barriers such as financial constraints, cultural attitudes, and fear of the disease. Egyptian women's screening uptake is greatly affected by a fundamental factor: a lack of understanding regarding breast cancer and the significance of early screening [19].

Conclusion

Breast cancer awareness among Egyptian women is suboptimal, with significant knowledge gaps despite high awareness of the disease. Improved educational interventions targeting younger, well-educated women and addressing psychological and logistical barriers are essential. A national awareness program, integrated into

educational institutions and healthcare settings, is crucial to enhance breast cancer screening practices and reduce mortality rates.

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Conflict of Interest Declaration

The authors declare that there were no conflicts of interest associated with this research. All financial support and resources for the study were provided without any influence on the research outcomes or conclusions.

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