MEDICAL SCIENCE

Comparative assessment of breast cancer prevalence between women in Saudi Arabia and Egypt

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ABSTRACT

Background and Aims: Globally, lung cancer is the most cause of fatalities for women, followed by breast cancer (BC). Since survival corresponds negatively with the stage of cancer at diagnosis and delayed BC identification leading to high fatality rate. This study aims to evaluate the occurrence of breast malignancy among females in Saudi Arabia (KSA) and Egypt. Also, compare between causes, risk factors of breast cancer and treatment. *Methods:* A cross sectional study was done among females in KSA and Egypt, data was collected from patients in the BC center through interviews. Online questionnaire was distributed to evaluate the prevalence and awareness level of females about BC clinical signs, methods of examination & risk factors of BC. *Results:* The total participants were 1089 women (546 Saudis and 543 Egyptians), women with BC (5.5% Saudis and 6.7% Egyptians). There was a significance difference among Saudis and Egyptians who are having BC in all demographic characteristics measured. The presence of BC within relatives from the first and second degree, age of menarche, age of menopause, aging, obesity was considered as risk factors of BC. Low level of awareness level about BC was observed. *Conclusion:* Young and old ages of Saudi and Egyptian females with BC, with relatively little information about it. Effective interventions could improve the implementation of successful programs about prevention, screening, early detection and treatment of BC. Programs for university and high school students should teach breast self-examination techniques.

Keywords: Breast Cancer, Self-examination of the breast, Risk factors, Saudi Arabia, Egypt.

1. INTRODUCTION

Breast cancer is the most predominant malevolence (Kamdar et al., 2013; Seedhom and Kamal, 2011) and the subsequent foremost cause of mortality after lung cancer (Mulshine and D'Amico, 2014) among females worldwide. It

is the second-leading cause of death worldwide; it was responsible for 9.6 million deaths reported in 2018 and accounts for about one in six deaths worldwide. Around seventy percent of deaths from cancer occur in poor countries (WHO, 2018). Among all cancers, BC is the most common in women (Bellah et al., 2016; Islam et al., 2016). Studies reveal that Breast cancer deaths, representing 15% of total cancer death among women (Rahman et al., 2019; Ferlay et al., 2015). Breast Cancer costs more than 85 billion dollars annually (Vafaee-Najar et al., 2013). Delay in cancer diagnosis is a major factor in increasing mortality rate, as the survival rate is directly related to the stage of cancer at diagnosis (Fentiman, 2001). About 80% of invasive cases of BC were present in women above 50 years-old (Li et al., 2020). BC is the most common malignancy in women in KSA (Alghamdi et al., 2013). According to the most recent statistics 31% with regional disease breast cancer and 13% with metastatic disease were diagnosed (Ministry of Health, 2022; Saudi Health Council, 2018). This leads to a poorer prognosis and lower potential for a cure.

Often, symptoms start to appear when the tumour grows and causes changes in the contour or consistency of the breast. The most changes that found among women with BC are breast ulceration, nipple abnormalities and breast infection or inflammation, breast pain, Axillary lump, breast swelling and breast rash, breast bruising, oedema of upper limb. Some women tended to have symptoms such as non-specific breast abnormalities, back pain, musculoskeletal pain, chest pain and fatigue or weakness (Koo et al., 2017). Many risk factors can influence breast cancer development including family history (Kaminska et al., 2015). The complicated process of BC management was including surgery, radiation, chemotherapy, hormone therapy and biological therapies (Łukasiewicz et al., 2021).

Previous study of BC among Saudi females from year 2004 to 2016 reported that the number of BC cases has risen. The highest increases in breast cancer cases were recorded in Najran with annual percent change (APC) equal (+8.8), followed by Qassim (+6.9) and Hail (+6) but the lowest was observed in Makkah region (+2.3) per year (Albeshan and Alashban, 2021). The data available of cancer rates at national and regional levels of Egypt reported that age-standardized incidence rates per 100,000 were 166.6 (both sexes), 175.9 (males) and 157.0 (females). Female breast cancer in the second rank (32.0%). By 2050, a three folds upsurge in cancer relative to 2013 will be predicted (Ibrahim et al., 2014). Other study in Alexandria, Egypt observed some defects in the record system, delay in diagnosis and treatment and non-adherence to the targeted therapy in many patients (Rostom et al., 2022). So, the aim of this study is to evaluate the prevalence breast cancer among females in Saudi Arabia and Egypt. Also, to compare between the causes, risk causes of BC, treatment, onset of self-examination, menarche and menopause.

2. METHODS

Study Design

This cross-sectional comparative study was done between women with or without BC in Egypt and KSA. This study contains two aims; first one deals with females with BC who visiting centers of BC healthcare and from hospitals for BC examination, treatment and follow up after BC surgery either in Egypt or Saudi Arabia. Data was collected from patients through interview contain questions about their demographic characteristics and clinical status, causes of BC, methods and time of their examination, age of diagnosis with BC and methods of treatment. The participants were well-informed about the nature of the study and inform them that the participation is voluntary.

The second aim is to evaluate the prevalence breast cancer among females in Saudi Arabia and Egypt. Data was collected through an online questionnaire and we illustrated at the beginning of the questionnaire some phrases about the participation is not mandatory and they can stop participation at any time without any harm. Also, we said another sentence about data security which stated that all data of participants was secured, coded and kept in a locked file with the access to the researchers only. The total number of females with or without BC who completed the answers of the questionnaire and questions of the interview (about 1089 participants) from different region in Saudi Arabia and Egypt. The data was collected from October 2022 to February 2023.

Statistical analysis

It was done with SPSS (version 25 Inc, Chicago, IL, USA). Categorical variables were presented using frequencies (n) and percentages (%). P-value≤0.05 was considered statistically significant according to Pearson Chi-Square test.

Inclusion criteria

The participants were females with age of 20 years-old and above with or without breast cancer.

Exclusion criteria

Male participants were excluded and females with ageless 20-years-old, also any patients with mental disorders.

Ethical Approval

This study has been reviewed and approved by the Research Ethical Committee (REC) at the University of Hail research number (H-2022-268) dated 14/11/2022.

3. RESULTS

The total number of participants was 1089 women, 546 from KSA and 543 from Egypt. Total women with BC 204 patients (18.7%), 55 (11.2%) from Saudi women and 149 (27.4%) from Egyptian women. First, there was a significant alteration among the age of women with BC either Saudis or Egyptians at P value < 0.05 and the most affected age was 41 years-old and above (60% among Saudis) Vs (53.7% in age ranged from 20 to 30 years-old & 23.5% more than 50 years-old among Egyptians) (Table 1). There was a significant difference between married (36.4% Vs 26.8%) and un-married (63.6% Vs 73.2%) women with BC either Saudis or Egyptians at P value < 0.05 respectively and the un-married were more affected (Table 1).

Regarding the level of education and employment status was significantly difference at P value < 0.05, the most affected women from university and above form 41-(40.0% Vs 73.2%) and from Employees in addition to housewife (85.4% Vs 23.8%) either Saudis or Egyptians respectively, while students (77.2%) from Egyptians (Table 1). Saudis Vs Egyptian women with age of menarche at 12-14 years-old (63.6% Vs 71.1%) and age of menopause 41-50 years-old (34.5% Vs 14.8%) were more affected the occurrence of BC significantly at p value <0.05.

The number of births and pregnancy were also affected the occurrence of BC significantly at (p value =0.010, 0.016), the most affected women with number of births less than three (49.1% Vs 15.4%), number of pregnancies (20.0% Vs 18.1%) either Saudis or Egyptians respectively. Presence of some diseases such as Dyslipidemia (27.3% Vs 15.4%), aging (14.5% Vs 2.0%), obesity (29.1% Vs 7.4%) was considered as risk factor among women having BC from Saudis and Egyptians respectively at P-value = 0.007 (Table 1).

Table 1 Association between demographic characteristics among Egyptian and Saudi women with or without breast cancer (Total n=1089 Participants, n= 546 (Saudis), n=543 (Egyptians))

Variables (n (%))	Women with Breast Cancer n= 204			Women without Breast Cancer n=885		
	Saudis n=55	Egyptians n=149	*P- value*	Saudis n=491	Egyptians n=394	*P- value*
Age (years)						
20-30	10 (18.2)	80 (53.7)	0.035*	302 (61.5)	249 (63.2)	0.043*
31-40	12 (21.8)	18 (12.1)		77 (15.7)	85 (21.6)	
41-50	16 (29.1)	16 (10.7)		78 (15.9)	40 (10.2)	
>50	17 (30.9)	35 (23.5)		34 (6.9)	20 (5.1)	
Level of education						
Medium	12 (21.8)	30 (20.1)	0.000*	12 (2.4)	14 (3.6)	0.374
Secondary	21 (38.2)	10 (6.7)		168 (34.3)	146 (37.1)	
University & above	22 (40.0)	109 (73.2)		311 (63.3)	234 (59.4)	
Marital status						
Married	20 (36.4)	40 (26.8)	0.005*	181 (36.9)	127 (32.2)	0.151
Un-married	35 (63.6)	109 (73.2)		310 (63.1)	267 (67.8)	
Employment status						
Employee	23 (41.8)	10 (6.7)	0.005*	95 (19.4)	84 (21.3)	0.093
Student	8 (14.5)	115 (77.2)		271 (55.2)	234 (59.4)	
Housewife	24 (43.6)	24 (16.1)		125 (25.4)	76 (19.3)	
Age of menarche						
<12 years	13 (23.6)	24 (16.1)	0.009*	80 (16.3)	68 (15.2)	0.743
12-14 years	35 (63.6)	106 (71.1)		359 (73.3)	290 (73.6)	
>15 years	7 (12.7)	19 (12.8)		52 (10.6)	36 (9.2)	
Age of menopause						
<40 years	12 (21.8)	3 (2.0)	0.000*	15 (3.1)	14 (3.6)	0.384
41-50 years	19 (34.5)	22 (14.8)		81 (16.5)	75 (19.0)	

>50 years	11 (20.0)	17 (11.4)		75 (15.3)	46 (11.7)	
Present till now	13 (23.6)	107(71.8)		320 (65.1)	259 (65.7)	
No. Of births						
<Three	27 (49.1)	23 (15.4)		52 (10.6)	64 (16.2)	
≥Three	9(16.4)	13 (8.7)	0.010*	121 (24.6)	73 (18.5)	0.040*
None	19 (34.5)	113(75.8)		318 (64.8)	257 (65.2)	
No. Of pregnancies						
<Three	11 (20.0)	27 (18.1)		40 (8.1)	54 (13.7)	
≥Three	9(16.4)	9 (6.0)	0.016*	133 (27.1)	83 (21.1)	0.039*
None	35(63.6)	113 (75.8)		318 (64.8)	257 (65.2)	
Suffering from other Diseases						
Obesity	16 (29.1)	11 (7.4)		35 (7.1)	36 (9.1)	
Dyslipidemia	15 (27.3)	23 (15.4)	0.007*	24 (4.9)	35 (8.9)	0.031*
Aging	8 (14.5)	3 (2.0)		4 (0.8)	16 (4.1)	
Don't suffer	16 (29.1)	112 (75.2)		428 (87.2)	307 (77.9)	

**Significant difference at p value ≤0.05*

The quantifiable characteristics of women with or without BC among Saudis and Egyptians. All characteristics were showed significant difference among women with BC (P-Value <0.05) either from Saudis or Egyptians such as causes of BC, presence of other cancers, presence of relatives from first or second or from both sides, spreading of BC to other organs, signs of BC and methods of treatment. Regarding the causes of BC, we found that uses of contraceptives and breast feeding among Saudis, while pregnancy and breast feeding are the main causes of BC (Table 2) (Figure 1). About 32.7% of Saudis patients had relatives from second degree Vs Egyptian patients (67.1%) had relatives from first and second degree. Concerning the sign of BC, we found that Saudi patients observed a change in breast shape (45.5%), while in Egyptians they found painless mass in breast (48.3%) and lump under the armpit (37.6%). The method of treatment was somewhat similar between Saudis and Egyptian patients but with different percentages. About 69.1% Vs 100% underwent breast surgery followed by chemical treatment (61.8% Vs 100%) followed by radiotherapy (54.5% Vs 57%) (Table 2).

Table 2 Association between clinical characteristics of breast cancer among Egyptian and Saudi women with or without breast cancer (Total n=1089 Participants, n= 546 (Saudis), n=543 (Egyptians))

Variables (n (%))	Women with Breast Cancer n= 204			Women without Breast Cancer n=885		
	Saudis n=55	Egyptians n=149	*P- value*	Saudis n=491	Egyptians n=394	*P- value*
Causes of BC						
Contraceptives	14 (25.5)	15 (10.1)		103 (21.0)	69 (17.5)	
Trauma in breast	4 (7.3)	9 (6.0)		14 (2.9)	7 (1.8)	
Pregnancy	4 (7.3)	36 (24.2)		74 (15.1)	51 (12.9)	
Breast feeding	15 (27.3)	39 (26.2)	0.010*	66 (13.4)	43 (10.9)	0.687
Radiation	13 (23.6)	26 (17.4)		31 (6.3)	29 (7.4)	
Smoking	5 (9.1)	24 (16.1)		21 (4.3)	10 (2.5)	
None	0 (0.0)	0 (0.0)		289 (58.9)	251 (63.9)	
Do you have other cancers						
Lung	13 (23.6)	4(2.7)		5 (1.0)	4 (1.00)	
Colon	9 (16.4)	5 (3.4)		5 (1.0)	5 (1.30)	
Uterus	4 (7.3)	5 (3.4)	0.009*	3 (0.6)	3 (0.80)	0.921
Cervices	2(3.6)	6 (4.0)		1 (0.2)	3 (0.80)	
Others	3 (5.5)	4 (2.7)		9 (1.8)	5 (1.30)	
None	24 (43.6)	125 (83.9)		468 (95.3)	374 (94.9)	

Diagnosis of BC with relatives						
First degree	11 (20.0)	18 (12.1)	0.007*	41 (8.4)	34 (12.9)	0.041*
Second degree	18 (32.7)	18 (12.1)		60 (12.2)	58 (14.7)	
First & second degree	14 (25.5)	100 (67.1)		14 (2.9)	16 (4.1)	
None	12 (21.8)	13 (8.7)		376 (76.6)	269 (68.3)	
Diagnosis of other cancer with relatives						
First degree	16 (29.1)	26 (17.4)	0.010*	68 (13.8)	65 (16.5)	0.117
Second degree	20 (36.4)	27 (18.1)		94 (19.2)	91(23.1)	
First & second degree	10 (18.2)	5 (3.4)		30 (6.1)	30 (7.6)	
None	9 (16.4)	91 (61.1)		298 (60.8)	229 (58.1)	
If BC spread to other organs						
Yes	16 (29.1)	78 (52.3)	0.020*	186 (37.9)	165 (41.9)	0.038*
No	19 (34.5)	9 (6.0)		47 (9.6)	53 (13.5)	
I Don't know	20 (36.4)	62(41.6)		258 (52.5)	176 (44.7)	
Sign of BC						
Continuous breast Pain	6 (10.9)	0(0.0)	0.030*	10 (2.0)	4 (1.0)	0.788
Change in breast shape	25 (45.5)	7 (4.7)		14 (2.9)	16 (4.1)	
Painless mass in breast	10 (18.2)	72 (48.3)		5 (1.0)	5 (1.3)	
Lump under the armpit	10 (18.2)	56 (37.6)		4 (0.8)	2 (0.5)	
Presence of discharges	4 (7.3)	14 (9.4)		6 (1.2)	2 (0.5)	
I Don't know	0 (0.0)	0 (0.0)		452 (92.1)	365 (92.6)	
Method of treatment						
Breast Surgery	38 (69.1)	149 (100.0)	0.000*	30 (6.1)	27 (6.8)	0.514
Chemical	34 (61.8)	149 (100.0)		27 (5.5)	17 (4.3)	
Hormonal	10 (18.2)	8 (5.3)		19 (3.9)	13 (3.2)	
Radiation	30 (54.5)	85 (57.0)		21 (4.3)	29 (7.4)	
Biological	0 (0.0)	0 (0.0)		10 (2.0)	12 (3.0)	
I Don't know	0 (0.0)	0 (0.0)		439 (89.4)	346 (87.8)	

**Significant difference at p value ≤0.05.*

The degree of women adherence to investigation and their clinical knowledge about BC. There was a significant difference in all parameters between Saudis and Egyptians women with BC (P- value <0.050) concerning regular BC investigation, causes of refusing to BC investigation, the time of BC investigation, the methods of BC examination and the age of diagnosis with BC (Table 3).

Among Saudis and Egyptians respectively, regular BC examination (54.5% Vs 70.5%), of women with BC were regular in their examination, the causes of refusing to do BC examination was no family history (20.0% Vs 12.1%), the time of BC investigation was 5 days after menstruation (30.9% & 35.6%). Also, women using different methods of BC examination; mammogram were (23.6% Vs 47.0%), self-investigation (27.3% Vs 18.1%) and clinical examination (20% Vs 20.8%). The age of patient's diagnosis with BC was varied; 20-29 years-old (20.0 Vs 53.7%), 30-39 years-old (27.3% Vs 12.1%) and 50-59 years-old (23.6% Vs 18.8%) among Saudis and Egyptians respectively (Table 3) (Figure 2).

Concerning the awareness of women without BC from KSA Vs Egypt, only the demographic characteristics in Table 1, that showed significant differences were age (p value =0.043), number of births (p value =0.040) pregnancies (p value =0.039), suffering from other diseases (p value =0.031). Regarding the awareness of women without BC from KSA Vs Egypt, all previous clinical characters showed not significantly difference except for some parameters such as presence of BC with relatives (p value =0.041) and spreading of BC to other organs (p value =0.038).

The awareness of women without BC from KSA Vs Egypt, all previous clinical characters in Table 2 revealed no significantly difference between the two nationalities except for one parameter which about the causes of refusing to do BC investigation (p value =0.043), the cause of refusing was they did not know the method of investigation (18.9% Vs 19.3%) and others said no cause for doing it (54.8% Vs 44.9%).

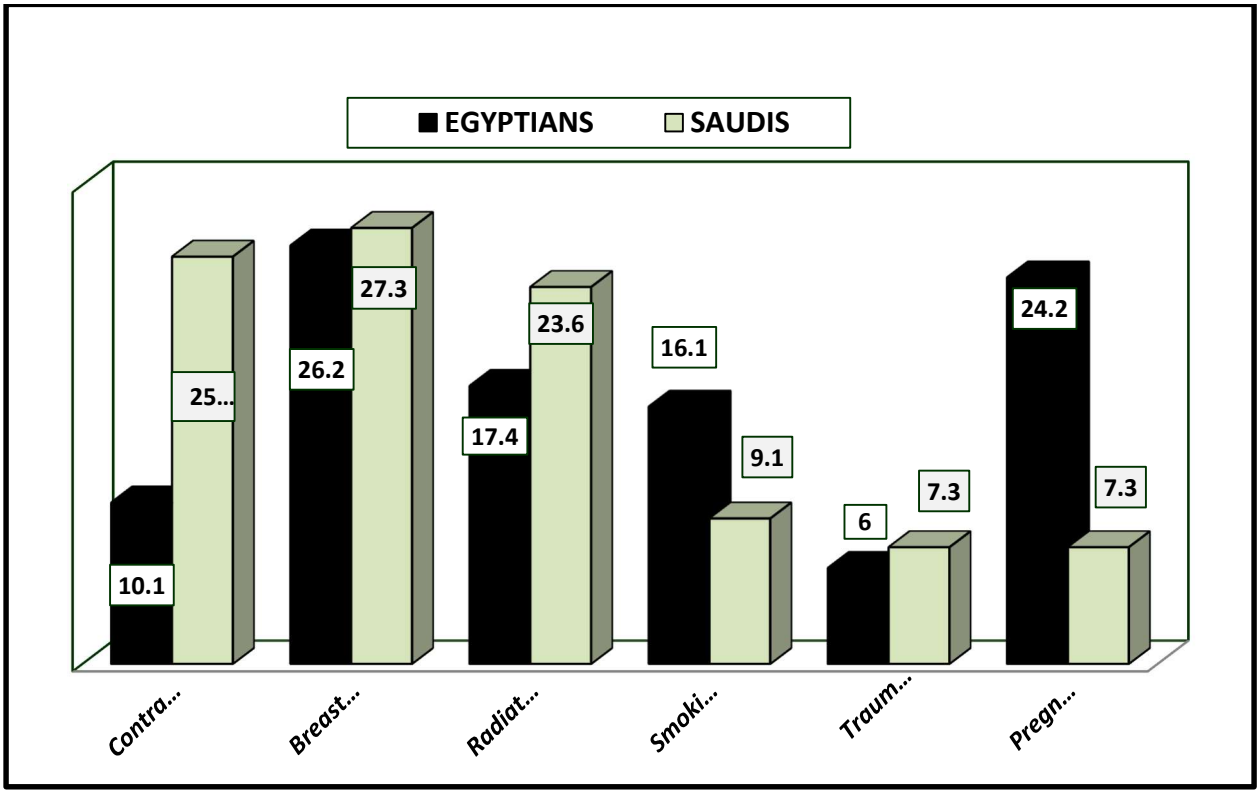

Figure 1 Causes of breast cancer in participant women (%)

Women without BC from KSA Vs Egypt, most of participants having little knowledge about BC risk factors either among Saudis or Egyptians but with varied percentages, such as they refused to do BC investigation (about 80%) because they did not know the methods (about 19%), without causes (about 50%). Also, they did not know the time of investigation (about 70%) and the methods of investigation (about 80%) or the age of diagnosis (about 85%) (Table 3).

Table 3 Assessment of patients Knowledge about Breast Cancer among Egyptian and Saudi women (Total n=1008 Participants, n= 546 (Saudis), n=462 (Egyptians))

Variables (n (%))	Women with Breast Cancer n= 204			Women without Breast Cancer n=885		
	Saudis n=55	Egyptians n=149	*P*- value	Saudis n=491	Egyptians n=394	*P*- value
Do you make regular BC examination						
Yes	30 (54.5)	105 (70.5)	0.025*	83 (16.9)	52 (13.2)	0.127
No	25 (45.5)	44 (29.5)		408 (83.1)	342 (86.8)	
Cause of refusing to do BC examination						
No family history	11 (20.0)	18 (12.1)	0.000*	49 (10.0)	44 (11.2)	0.043*
Not expose to BC	4 (7.3)	2 (1.3)		20 (4.1)	17 (4.3)	
I don't know the method	9 (16.4)	52 (34.9)		93 (18.9)	76 (19.3)	
I don't have time	2 (3.6)	0 (0.0)		46 (9.4)	48 (12.2)	
Not important	17 (30.9)	0 (0.0)		14 (2.9)	32 (8.1)	
No cause	12 (21.8)	77 (51.7)		269 (54.8)	177 (44.9)	
Time of BC examination						
5 days before menstruation	8 (14.5)	14 (9.4)	0.000*	23 (4.7)	22 (5.6)	0.614
5 days after menstruation	17 (30.9)	53 (35.6)		104 (21.2)	89 (22.6)	
During menstruation	14 (25.5)	4 (2.7)		11 (2.2)	13 (3.3)	
I don't know	16 (29.1)	78 (52.3)		353 (71.9)	270 (68.5)	

Method of BC examination						
Laboratory tests	1 (1.8)	6 (4.0)		6 (1.2)	4 (1.0)	
Clinical investigation	12 (20.0)	31 (20.8)		9 (1.8)	7 (1.8)	
Self-investigation	15 (27.3)	27 (18.1)		23 (4.7)	20 (5.1)	
Radiation	8 (14.5)	11 (7.4)	0.021*	10 (2.0)	8 (2.0)	0.914
Biopsy	4 (16.4)	4 (2.7)		5 (1.0)	3 (0.8)	
Mammogram	13 (23.6)	70 (47.0)		18 (3.7)	16 (4.1)	
MRI	2 (3.6)	0 (0.0)		7 (1.4)	7 (1.8)	
None	0 (0.0)	0 (0.0)		406 (82.7)	317 (80.5)	
Age of diagnosis with BC						
20-29	11 (20.0)	80 (53.7)		25 (5.1)	10 (2.5)	
30-39	15 (27.3)	18 (12.1)		21 (4.3)	14 (3.6)	
40-49	11 (20.0)	16 (10.7)	0.043*	10 (2.0)	25 (6.3)	0.115
50-59	13 (23.6)	28 (18.8)		3 (0.6)	5 (1.3)	
≥60	5 (9.1)	7 (4.6)		3(0.6)	2 (0.5)	
None	0 (0.0)	0 (0.0)		429 (87.4)	338 (85.8)	

**Significant difference at p value ≤0.05.*

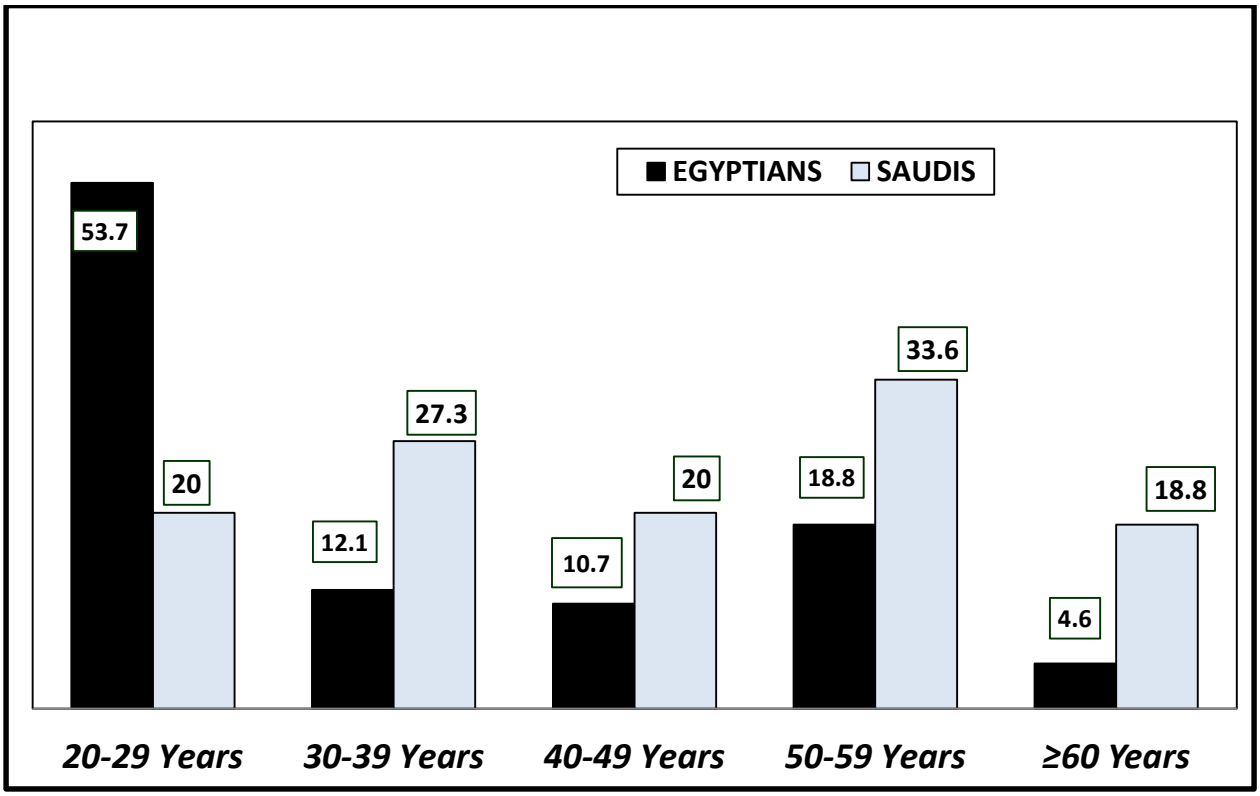

Figure 2 Age of diagnosis of breast cancer in participant women (%)

4. DISCUSSION

In this research, the total number of contributors was 1089 women, 546 from KSA and 543 from Egypt. The total number of female patients with BC was 204 (18.7%), fifty-five (11.2%) from KSA and 149 (27.4%) from Egyptian women. The study revealed that there was a significant variation amongst the age of women either Saudis or Egyptians (P value <0.05) and the most affected age was ≥41 years-old (60% among Saudis and characterized with change in breast shape) Vs 53.7% at age 20-30 years-old among Egyptians and characterized with painless mass in breast & lump under the armpit). Early detection was observed in Egyptian women so; they underwent removal of the small tumour due to presence of some centres for detection of BC such as Bahia Foundation for BC. Patients with BC >50 years-old (30.9% Vs 23.5%) among Saudi and Egyptian Patients. Other study performed between 2001 and

2008 revealed that women between the ages of 30 and 44 (about 38%) and 45 to 59 (about 31%) reported the highest frequency of BC cases (Alghamdi et al., 2013). Other significant finding in Saudis women showed BC incidence about 43.0% of cases detected during 2009-2016 were among women aged 45–59 years, whereas 30% of cases were reported among women aged 30–44 years (Albeshan and Alashban, 2021). This was related to the early diagnosis through the BC screening program established by Ministry of Health (MOH) that was introduced in 2010. Currently, about 80% of subjects with breast cancer are over aged >50 while more than 40% of them are 65 years old (Siegel et al., 2014; Mc-Guire et al., 2015).

In this study, women with BC in Saudis Vs Egyptian women their age of menarche was at 12-14 years-old and the age of menopause 41-50 years-old. Our results were in accordance with the results of Khalis et al., (2018) who stated that epidemiological studies confirmed that young age at menarche is associated with increased risk of breast cancer, Menarche and menopause, as well as their timing and the resulting hormonal imbalance, are indicators of a probable BC induction. Early pregnancy (in the twenties) and subsequent increases in birthrate are associated to breast cancer less likely. Moreover, pregnancy itself offers protection from possible cancer (Husby et al., 2018). Another risk factor for breast cancer is an early age during menarche, which is linked to tumor stage and lymph node immersion (Orgéas et al., 2008).

In this research, the number of births and pregnancy were also affected the occurrence of BC significantly (p value <0.05), the most affected women with number of births and pregnancies less than three among Saudis or Egyptians. These findings corroborated those of earlier studies that showed a marginally increased risk of BC in women without children or who have their first child beyond the age of 30. Moreover, women who have several pregnancies and/or have children at a young age have a lower risk of developing breast malignancy (Kaminska et al., 2015; Sun et al., 2017; Ozsoy et al., 2017).

Also, we found that dyslipidemia, aging and obesity might be considered as risk factor among women having BC from Saudis and Egyptians. According to a study by Feng et al., (2018) rather than being inherited, genetic changes that arise due to aging and lifestyle-related risk factors may account for around 85% of breast cancers in women with no obvious family history of the disease. Several variables, including an aging population (which had a 50% increase in age from 1999 to 2013) (Bawazir et al., 2019), as well as a swift change in socioeconomic and traditional lifestyle (Bazarbashi et al., 2017); have been linked to the rise in breast cancer prevalence in Saudi Arabia.

The rising incidence of obesity among females, a risk factor that is consistently connected to the susceptibility to breast cancer, is a prominent example of this transition (Bazarbashi et al., 2017). The majority of these women were identified as overweight or obese in a recent survey of women receiving breast screenings in Riyadh, Saudi Arabia. According to a significant survey conducted by the Ministry of Health, (2022) and Albeshan et al., (2020) 33.5% of Saudi women were obese and 28% of them were overweight. In addition to genetic predisposition, other Western lifestyle-related risk factors for BC, such as inactivity, a poor diet and rising rates of smoking and caloric intake, may also contribute to this upward trend in breast cancer frequency (Bazarbashi et al., 2017; Althubiti et al., 2018; Jazieh et al., 2019).

Regarding the causes of BC, we found that uses of contraceptives and breast feeding among Saudis, while pregnancy and breast feeding are the main causes of BC. These findings were at odds with those of previous research, which indicated that prolonged breastfeeding periods similarly reduced the risk of cancer (Xie et al., 2022). Hormones are often used in birth control methods, which may raise the risk of BC (Bazarbashi et al., 2017; Althubiti et al., 2018; Jazieh et al., 2019). Also, radiation was deemed to be a cause of cancer in our study. This is consistent with prior research that found that radiation therapy in patients before 30 years-old have a higher chance of developing breast cancer (Ng and Shuryak, 2014).

We found a significance difference in suffering from other cancers among Saudi and Egyptian patients (P value = 0.000). These results support research by Schacht et al., (2014), positive past of BC proliferate the likelihood of developing new malignant lesions in the breasts. Moreover, benign breast changes, considerably raises the risk (Hartmann et al., 2005; Dyrstad et al., 2015). The primary causes of BC in this study were determined to be first- or second-degree relatives, with a significant difference between Saudi and Egyptian patients (P value <0.05). These findings are in line with a study by Collaborative Group on Hormonal Factors in Breast Cancer, (2001) which found that 13–19% of people with breast cancer report having a first-degree family. Also, as the number of impacted first-degree relatives rises, so does the chance of breast cancer; the risk may even be larger if the affected relatives are younger than 50 years old (Shiyanbola et al., 2017; Baglia et al., 2018; Brewer et al., 2017). It is commonly known that if a woman has a first-degree relative who has been diagnosed with breast cancer, her risk of getting the disease practically doubles (Collaborative Group on Hormonal Factors in Breast Cancer, 2001).

Regarding the sign of BC, we found that Saudi patients observed a change in breast shape in nearly half of them, while in Egyptians they found painless mass in breast and lump under the armpit in more than ¾ of them. These findings confirmed those of Koo et al., (2017) who discovered that breast lumps were the most known symptom was next by breast tenderness (6%) and non-

breast symptoms like back pain and weight loss were extremely uncommon. A higher percentage of women with non-lump breast symptoms waited 90 days or more before seeking medical care (Koo et al., 2017).

In this research, the methods of examination were differed, 27.3% diagnosed with Self-investigation, other 20% with mammogram and others with clinical investigation among Saudi patients, while 47% of Egyptians diagnosed with mammogram, other by radiation (14.7%) and Self-investigation (11.4%). A related study revealed that Saudi female students' understanding of breast self-examination is inadequate. Some nipple discharge is anticipated and breast self-examination revealed lumps under the arm that were felt carefully (Albeshan et al., 2023). A mammography, which is advised for women 50 and more, could find lumps that many patients cannot detect. The risk of BC in Saudi women was significantly correlated with increased mammographic density (Aloufi et al., 2022). It is advisable to include BSE knowledge and training in programs for university students as well as middle and high school students.

In this study, the methods of treatment were varied but most of them underwent surgical removal of the tumour followed by chemical or radiation or hormonal and the percentages were differed from Saudi and Egyptian patients. The recommendations for treating patients with early breast tumour depend on the size of the tumour, the practicality of surgery, the clinical profile and the patient's desire to preserve the breast (Cardoso et al., 2019). Mastectomy patients frequently have rapid breast reconstruction and sentinel lymph node biopsy with lymph node excision are used to remove the affected lymph nodes (Morrow et al., 2001). Other study conducted in Egypt reported that 4835 individuals undergone breast surgery, with modified radical mastectomy representing for 72.2% of cases and breast conservative surgery for 25%. Axillary surgery was carried out, with sentinel lymph node dissection occurred in 3.3% of cases, while dissection of the axillary lymph nodes in 96.1% (Rostom et al., 2022). The breast tumors' characteristics should be taken into consideration while choosing the best treatment option; chemotherapy may also be employed in cases of secondary breast cancer. The selection of the right medication is crucial since various molecular BC subtypes respond differently to antitumor medications (Rouzier et al., 2005).

The effectiveness of preoperative chemotherapy and postoperative chemotherapy is comparable (Fisher et al., 1998). Furthermore, radiation is a form of local BC treatment that is often given following surgery and/or chemotherapy. It is done to ensure that every malignant cell is removed, decreasing the probability of a breast cancer recurrence. Moreover, radiation therapy is beneficial for patients with metastatic or terminal breast cancer (Yang and Ho, 2013). Patients with the Luminal-molecular subtype of breast cancer may receive this therapy as either neoadjuvant or adjuvant therapy; it is operational in cases of BC recurrence or metastasis. The goal of treatment is to reduce oestrogen levels or stop oestrogen from stimulating BC cells (Lumachi et al., 2011; Tremont et al., 2017).

Concerning women's awareness of BC with age as a variable, there was a significant differences among women without BC from KSA Vs Egypt were age from 20-30 years-old (p value =0.043) and these findings concur with those of Qedair et al., (2022) who observed that participants had a higher level of adequate knowledge and awareness of BC and about 50% of the them were aged 20 to 39. Concerning the level of education, most of participants from university degree and above either from Egypt or KSA followed by secondary school degree and they have good awareness about BC without significance difference between two nationalities. Our results agreed with the other findings from earlier research on BC awareness and knowledge in Saudi Arabia that higher levels of education are associated with adequate BC knowledge and awareness (Qedair et al., 2022; Radi, 2013; Al-Otaibi et al., 2017).

Most of participants having low degree of information about BC risk factors either among Saudis or Egyptians but with varied percentages, such they refused to do BC investigation because they did not know the methods and others without causes. Also, they did not know the time of investigation and the methods of investigation or the age of diagnosis. These results were in accordance with other study in Egypt and KSA (Rostom et al., 2022, Qedair et al., 2022). As a result, the public has been made aware of screening paths that reduce the number of women with BC and primary care clinicians have received information about them. Initiatives to improve the implementation of a successful program for the prevention, BC screening, early recognition and cure of BC had also been pushed forward.

5. CONCLUSION

Our study shows that high percentage of women in Saudi Arabia and Egypt with breast cancer of young and old ages, they have very low levels of knowledge about breast cancer. The implementation of a successful program for the prevention, screening, early detection and treatment of breast malignancy has been amended by employing good interventions and strategies. It is advisable to include breast self-examination knowledge and training in programs for university students as well as middle and high school pupils.

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Author Contributions

MRM, conceptualization, supervision, work design, reviewing relevant literature, analysis and writing and editing the scientific paper; DSBA and RAHA, conceptualization, data collection from Saudi Arabia, work design, reviewing relevant literature and writing and editing the manuscript; MEH, OGA and SGA conceptualization, data collection from Egypt, work design, work design, reviewing relevant literature and writing and editing the manuscript. All authors read and approved the final manuscript.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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