

# Risk factors of breast cancer among the primary health-care attendees in Eastern Saudi Arabia

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## Abstract

**Background:** Breast cancer has been the most common cancer among the Saudi female subjects for the last decades.

**Objective:** To screen primary health-care (PHC) attendees for the risk factors of breast cancer in Eastern Saudi Arabia and assess their practice for the early detection of the disease.

**Materials and Methods:** A cross-sectional study was conducted in the PHC centers of Al-Khobar city. Women attending the PHC centers aged 25 years and older were included in the study. Six hundred PHC attendees were selected from five health centers by proportionate allocation to the average population served by each health center. Data were collected by an interview questionnaire, which was composed of three sections: sociodemographic information, risk factors among PHC attendees, and practice for the early detection of breast cancer. The cancer risk was calculated by a cancer risk calculator and classified into low, moderate, and high risk.

**Result:** About 7% of the study sample showed a moderate to high risk of developing breast cancer. The most common risk factor of breast cancer among the PHC attendees was the use of contraceptive pills (51.2%), followed by obesity (42.8%), breastfeeding for a period less than 12 months (24.3%), age of puberty less than 12 years (18.7%), history of breast cancer in the second degree relatives (9.5%), menopause (9.3%), and the use of hormonal replacement therapy (8%). Among the avoidable risk factors, obesity was significantly more common among the less-educated women, while breastfeeding for less than 12 months was more common among the highly-educated women. Moreover, the most common practiced measure for the early detection of breast cancer was breast self-examination (44.6%), followed by mammogram (16.3%) and, last, clinical examination (11.6%).

**Conclusion:** A substantially large proportion of female PHC attendees showed the avoidable risk factors of breast cancer. Moreover, more than half of the population was not involved in screening for the early detection of the disease. This situation demands the attention of medical and public health workers.

**KEY WORDS:** Breast cancer, Saudi females, primary health-care attendees


## Introduction

Worldwide, breast cancer is the most frequently diagnosed life-threatening cancer in women and the leading cause of cancer deaths, comprising 23% of the estimated

annual 4.7 million female subjects diagnosed with cancer. The World Cancer Report from the WHO suggests that cancer rates are set to increase globally at an alarming rate over the next decade.<sup>[1]</sup>

It is now well established that early detection of breast cancer results in a better survival rate. Deaths owing to breast cancer can be reduced through mammography, which detects breast cancer at earlier stages. It was estimated that, it can prevent, approximately, 20%–40% of breast cancer deaths.<sup>[2]</sup>

Moreover, the age-standardized incidence rate for advanced-stage breast cancer is lower in the screened group analyzed by clinical examination when compared with the unscreened group.<sup>[3]</sup>

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A monthly breast self-examination (BSE) provides a relatively simple, low-cost method of early detection of breast cancer and can be performed in conjunction with mammography and clinical breast examination (CBE).<sup>[4]</sup> Approximately, 70% of all the breast masses are self-detected, yet, many women do not follow this important monthly practice.<sup>[5,6]</sup>

Breast cancer is influenced by multiple risk factors, which can be classified into four groups: first, family history/genetic background; second, hazardous effects of hormonal exposures, such as early age of menarche, late menopause,<sup>[7]</sup> low number of children and nulliparity, getting the first child after the age of 30, little or no breastfeeding, and long-term use of hormonal replacement therapy (HRT);<sup>[8,9]</sup> third, is high breast density, which has been shown to be one of the most significant markers of breast cancer risk;<sup>[10]</sup> and fourth is a history of benign proliferative breast disease.<sup>[11]</sup> Recently, there is emerging evidence that an overall caloric intake and obesity with weight gain, in particular, are related to increased breast cancer risk with different effects for premenopausal and postmenopausal women.<sup>[12,13]</sup>

Despite the relatively low incidence of breast cancer in Saudi Arabia when compared with other countries, it has been found to be the most common cancer among the Saudi female subjects for the past 12 years (Saudi Cancer Registry, 1994–2005). Data on female patients with invasive breast carcinoma reported from different regions in Saudi Arabia show that, most patients belonged to the 40–50 years age group and were predominantly premenopausal.<sup>[14]</sup> Attention has to be given to the increased incidence of breast cancer in young Saudi women by assessing the tasks of early detection and preventive programs. In addition, correlation between the common risk factors and breast cancer must be identified.

Considering the growth and aging of the population in Saudi Arabia, cancer rates are expected to increase considerably. This will add an enormous burden to the health care-utilization costs. The aim of this study was to screen the primary health-care (PHC) attendees for the risk factors of breast cancer in Eastern Saudi Arabia and assess their practice for the early detection of the disease.

## Materials and Methods

A cross-sectional study was conducted in five PHC centers in Alkhobar, Eastern Province of Saudi Arabia; health centers with the largest catchment areas were included in the study. The study population comprised women aged 25 years and older attending the PHC centers. The minimum sample size was calculated by Epi Info at expected frequency of  $10\% \pm 3\%$  and at 95% confidence level, which was found to be 384. Accordingly, 600 PHC attendees were randomly selected from the five health centers by proportionate allocation to the women served by each center. The study participants were interviewed after explaining the aim of study and assuring about the confidentiality of the collected data. The interview questionnaire was composed of three sections

covering: sociodemographic information, risk factors among PHC attendees, and practice for the early detection of breast cancer. The weight and height of all the participants were measured, and the body mass index (BMI) was calculated. Obesity was considered if  $BMI > 30 \text{ kg/m}^2$ .

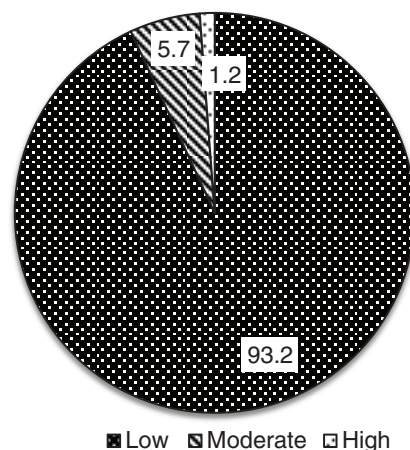
The risk calculator of the following website (<http://cancer-australia.nbocc.org.au/risk/yourrisk.html>) was used to calculate the level of breast cancer risk; it has been categorized into low, moderate, and high. Collected data were entered using statistical package SPSS software, version 16 and verified. Statistically significant relations for qualitative data were tested by  $\chi^2$ -test. Fisher's exact *P* was considered if more than 25% of the cells showed an expected count less than 5. While, for quantitative data, one way ANOVA test was used for statistical analysis. *P* value less than 0.05 was considered significant.

## Result

Six hundred women attending the five PHC centers of Alkhobar participated in the study. Their mean age was  $35.98 \pm 9.056$  years. About 85% were married, 9% were single, and the rest were widows or divorced. About 40% of them received university or postgraduate education, 26% high school education, 22% elementary or middle school education, while the rest were illiterate or could just read and write. About 68% of the women were housewives, 16% were working in the nonmedical field, and 12% in the medical field; while the rest were students.

Figure 1 illustrates that, about 6% of the study sample showed moderate risk of developing breast cancer and 1% showed a high risk.

According to Table 1, there is a proportional relationship between the possibility of developing breast cancer and age. The mean age of high-risk group (46.8 years) was significantly higher than that of the moderate-risk group (37.2 years).



**Figure 1:** Level of breast cancer risk among women attending the PHC centers in Alkhobar.

**Table 1:** Mean age of PHC attendees by level of breast cancer risk

Level of risk	$\mu$	Mean	SD	$Z$	$P$
Low	559	35.79	8.993	4.801	0.009
Moderate	34	37.21	9.111		
High	6	46.83	8.954		
Total	599	35.98	9.056		

According to Figure 2, the most common risk factor of breast cancer among the PHC attendees was the use of contraceptive pills (51.2%), followed by obesity (42.8%), breastfeeding for a period less than 12 months (24.3%), age of puberty less than 12 years (18.7%), history of breast cancer in the second degree relatives (9.5%), menopause (9.3%), and the use of HRT (8%).

Regarding avoidable risk factors of breast cancer, it was found that obesity was significantly more common among the less-educated groups, while breastfeeding for less than 12 months was significantly higher among the highly-educated groups [Table 2].

Table 3 shows the distribution of early detection measures of breast cancer by the level of risk among PHC attendees. About 45% of the women were doing regular BSE, 11.6% were going regularly for clinical examination, and 16.3% were doing regular check-up by mammogram. The latter was significantly higher among the moderate to high-risk group when compared with the low-risk group (40% and 14.2%, respectively).

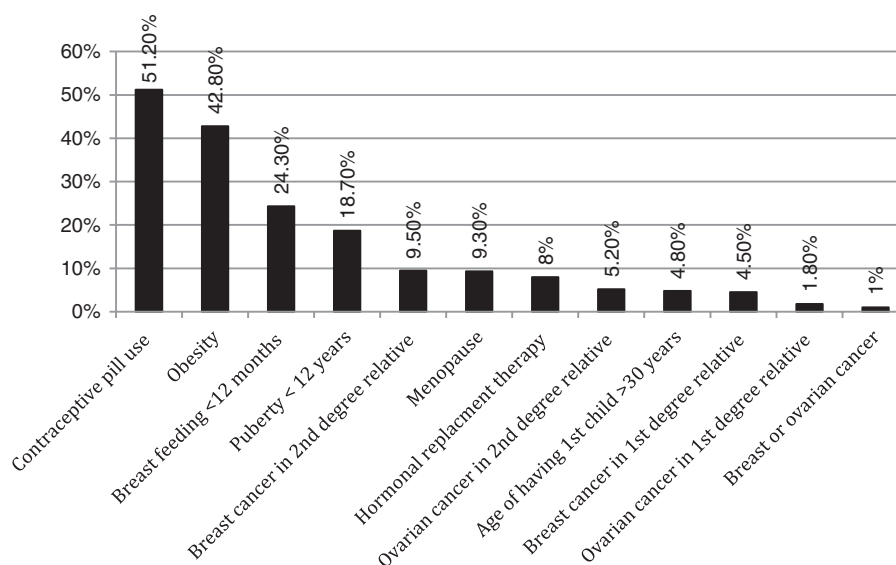
Table 4 shows the distribution of BSE by socioeconomic factors. BSE was significantly more commonly performed by university educated women (54.4%) when compared with illiterate women (25%). As for the occupation, the highest

percentage of BSE (61.1%) was observed among those working in the medical field. It was significantly higher than that of workers in the nonmedical field (42.3%). On the other hand, no significant association between clinical examination or mammogram and educational level or occupation could be detected.

## Discussion

Breast cancer is the most common cancer worldwide. It is influenced by several risk factors such as family history and hazardous effects of hormonal exposures. Family history accounts for, approximately, 15% of all breast cancer cases. A woman's risk of breast cancer is two or more times greater if she possesses a first-degree relative (mother, sister, or daughter) who developed the disease before the age of 50; the younger the relative when she developed breast cancer, the greater the risk. The risk increases by between four and six times if two first-degree relatives develop the disease.<sup>[15]</sup> The national breast cancer screening program in Saudi Arabia<sup>[16]</sup> revealed that, 11.7% of the study sample showed a positive family history of breast cancer, while this study showed that 14% of the sample showed a positive family history. The higher percentage in the Eastern province may be explained by the higher rate of consanguineous marriages.<sup>[17]</sup>

On the other hand, this study revealed a lower percentage of late age at first child birth (4.8%), when compared with the national figure (9.3%). The risk of breast cancer in women who have their first child after the age of 30 is about twice that of women who have their first child before the age of 20. The highest risk group is those who have a first child after the age of 35.<sup>[18]</sup>

**Figure 2:** Frequency of breast cancer risk factors among the PHC attendees in Alkhobar.

**Table 2:** Distribution of avoidable breast cancer risk factors by educational level among the PHC attendees

Avoidable risk factors	Educational level				Total ( $\mu = 600$ ), $\mu$ (%)	$\chi^2$	P
	Illiterate or read and write ( $\mu = 68$ ), $\mu$ (%)	Elementary or middle school ( $\mu = 133$ ), $\mu$ (%)	High school ( $\mu = 157$ ), $\mu$ (%)	University or postgraduate studies ( $\mu = 242$ ), $\mu$ (%)			
Use of Contraceptive pills	35 (51.5)	77 (57.9)	84 (53.5)	111 (45.9)	307 (51.2)	5.475	0.14
Obesity	36 (53.7)	71 (53.8)	72 (46.5)	75 (31.3)	254 (42.3)	23.707	0
Period of breastfeeding <12 months	15 (22.1)	34 (25.6)	73 (46.5)	97 (40.1)	219 (36.5)	21.091	0
Hormonal replacement therapy	6 (8.8)	9 (6.8)	17 (10.9)	16 (6.6)	48 (8.0)	2.746	0.432
Age of having the first child >30 years	3 (4.8)	2 (1.6)	7 (5.6)	12 (6.3)	24 (4.0)	3.901	0.272

**Table 3:** Distribution of early detection measures of breast cancer by level of risk among the PHC attendees

Early detection measure	Level of breast cancer risk			$\chi^2$	P
	Low ( $n = 559$ ), $n$ (%)	Moderate/high ( $n = 41$ ), $n$ (%)	Total ( $n = 600$ ), $n$ (%)		
Breast self-examination					
Yes	246 (44.1)	21 (51.2)	267 (44.6)	0.787	0.375
No	312 (55.9)	20 (48.8)	332 (55.4)		
Clinical examination					
Regular	60 (10.8)	9 (22.0)	69 (11.6)	5.191	75
Irregular	96 (17.3)	8 (19.5)	104 (17.4)		
No clinical examination	400 (71.9)	24 (58.5)	424 (71.0)		
Mammogram					
Regular <sup>a</sup>	40 (14.2)	10 (40.0)	50 (16.3)	9.246	0.007 Fisher's exact
Irregular	44 (15.6)	3 (12.0)	47 (15.3)		
No mammogram	198 (70.2)	12 (48.0)	210 (68.4)		

<sup>a</sup>The percentages were calculated for women 40 years and older ( $n = 307$ ).

**Table 4:** Distribution of breast self-examination by socioeconomic factors among the PHC attendees

Socioeconomic factors	Breast self-examination (BSE)			$\chi^2$	P
	Yes, $N$ (%)	No, $N$ (%)	Total, $N$ (%)		
Educational level					
Illiterate or read and write	17 (25.0)	51 (75.0)	68 (100)	21.466	0
Elementary or middle school	56 (42.1)	77 (57.9)	133 (100)		
High school	63 (40.1)	94 (59.9)	157 (100)		
University or postgraduate studies	131 (54.4)	110 (45.6)	241 (100)		
Occupation					
Housewife	177 (43.3)	232 (56.7)	409 (100)	12.122	0.007
Working in nonmedical field	41 (42.3)	56 (57.7)	97 (100)		
Working in medical field	44 (61.1)	28 (38.9)	72 (100)		
Student	5 (23.8)	16 (76.2)	21 (100)		

According to the American Academy of Family Physicians, the rate of death from breast cancer has declined over the last few years because of the early detection and management. Regular screening by mammogram and breast examination

can help in the early detection of breast cancer.<sup>[19]</sup> The purpose of performing BSE is to make women familiar with both the appearance and the feel of their breasts and help women to detect any changes as early as possible. In spite of controversy

about the value of BSE,<sup>[20,21]</sup> the American Cancer Society continues to support the inclusion of BSE as an early detection behavior.<sup>[22]</sup>

Two studies conducted in Central Saudi Arabia revealed that BSE was performed by about 20% of the women,<sup>[23,24]</sup> while in our study, more than 40% of PHC attendees performed BSE. Many factors have been associated with the BSE performance, such as perceived susceptibility and educational level.<sup>[25–29]</sup> In our case, the perceived susceptibility—not the educational level—might explain the higher rates of BSE, owing to higher rates of consanguineous marriages in the Eastern province,<sup>[17]</sup> while educational levels among female subjects in the Central and Eastern provinces are similar and are among the highest in Saudi Arabia.<sup>[30]</sup>

Moreover, this study revealed that, BSE examination was more commonly performed by women working in the medical field than by women working in other fields. About 60% of the women working in the medical field practiced BSE; similar findings were reported by a Saudi study conducted on nursing students,<sup>[31]</sup> indicating the importance of public awareness for reaching higher levels of practice of BSE.

About 16.1% of the women aged 40 years and older in Central Saudi Arabia reported screening by clinical breast examination, when compared with 11.6% in our study. The most commonly encountered barriers for CBE in Saudi Arabia might be shyness of being examined by male physicians and shortage of female physicians at all levels of care.

Only 10% of the women aged 40 years and older in Central Saudi Arabia reported doing a mammogram, when compared with about 16.3% in this study. In Saudi Arabia, the low utilization of mammography screening was observed, in spite of being provided for free by the Ministry of Health for all Saudi women not covered by medical insurance.

## Conclusion

In conclusion, a substantially large proportion of female PHC attendees showed the avoidable risk factors of breast cancer. Moreover, more than half of the population was not involved in screening for the early detection of the disease. This situation demands the attention of medical and public health workers.

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