

# Assessment of Levels of Knowledge towards Hormonal Related Breast Cancer Risk Factors in Qurayyat, Northern Saudi Arabia

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## Abstract

**Background:** Continued exposure to sex hormones such as estrogen is a critical risk for subsequent breast cancer. Thus the present study aimed to assess the levels of knowledge towards hormonal related breast cancer risk factors in Qurayyat, Northern Saudi Arabia. **Methodology:** This descriptive study included 737 Saudi volunteers living in the city of Qurayyat, Northern Saudi Arabia. For females, only those agreeing to participate in the breast self-examination workshop were included, and non-respondents were included in the questionnaire. **Results:** For the question apropos “*Inheritance as a risk factor for BC,*” 405/607 (66.7%) females signposted certainly “Yes,” as well as, 70/130 (54%) males signposted certainly “Yes.” The odds ratio (OR) and 95% confidence interval (95% CI) were not statistically significant, but the level of knowledge was relatively higher among females OR (95% CI) = 1.4321 (0.9597 to 2.1370), P = 0.0786. “Are early puberty and late menopause risk factors for breast cancer?” No statistical significant differences were eminent between males and females, OR (95% CI) = 0.8878 (0.5932 to 1.3287), P = 0.5629. **Conclusion:** Saudi women are enthusiastically willing to raise their knowledge and awareness of breast cancer prevention and control. Although women have greater knowledge about breast cancer risk factors compared to men, still some gaps need to be filled.

## Keywords

Breast Cancer, Hormones, Risk Factors, Estrogen, Saudi Arabia, Alquriat

## 1. Introduction

Breast cancer is the commonest, complex, and heterogeneous neoplasm and the most common cause of cancer death among females worldwide [1] [2]. Although the information on the epidemiology of breast cancer is frequently changing, it is increasingly dominant females' cancer, accounting for 25.1% of all cancers, according to GLOBOCAN [3]. The prevalence of breast cancer is higher in the developed world compared to developing countries with the most significant mortality in the later. Education of women, early detection, and increasing awareness are the primary prevention and control measures, particularly for the less developed countries [4]. Such efforts have reduced the age-standardized mortality, as well as, improved the relative survival for many countries. The recent positive changes in the epidemiology of breast cancer are strongly linked to early detection programs, such as mammography screening [5].

In Saudi Arabia, breast cancer is the commonest females' cancer with a prevalence of 21.8% [6], and it represents the 9<sup>th</sup> leading cause of death in the country [6] [7] [8]. In recent years there was a significant increase in the number of new patients with breast cancer, particularly among younger females population compared to new patients in Western nations [9]. Sex hormones extra exposure, exactly estrogen is incriminated in the etiology of breast cancer. The majority of breast cancer risk factors may interact through hormone-related pathways, particularly estrogen, which is firmly connected to the elevated risk of breast cancer in postmenopausal women [10]. Consequently, the present study aimed to assess the levels of knowledge towards hormonal related breast cancer risk factors in Qurayyat, Northern Saudi Arabia.

## 2. Materials and Methods

This descriptive study included 757 Saudi volunteers living in the city of Qurayyat, Northern Saudi Arabia, during the period from October 2018 to February 2019. Sample size was calculated using software calculator.net: available at: <https://www.calculator.net/sample-size-calculator.html>. Participants were targeted in different public settings in the city. Participants were randomly selected by simple random method regardless of age, gender, education level or occupation. For females, only those agreeing to participate in the breast self-examination workshop were included, and non-respondents were included in the questionnaire. A total of 130 men were enrolled as an internal control. Males' participants were added to serve as an internal control for the obtained information regarding breast cancer previous knowledge. A purposeful inquiry was designed and used for getting the necessary data. Besides, age, sex, and education level, the questionnaire included questions: Inheritance as a risk factor for BC; early puberty and late menopause are risk factors for BC; delayed childbirth is a risk for BC; natural breastfeeding is a risk for BC; hormonal usage is a risk for BC.

## 2.1. Data Analysis

Statistical Package for Social Sciences (version 16) was used for analysis and to perform a Pearson Chi-square test for statistical significance (P-value). The 95% confidence level and confidence intervals were used. A p value less than 0.05 was considered statistically significant.

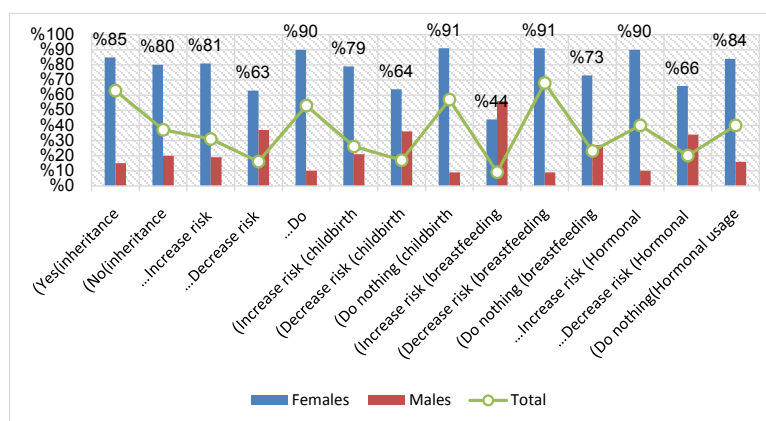
## 2.2. Ethical Consent

Each participant was asked to sign a written ethical consent during the questionnaire's interview. The informed ethical consent form was designed and approved by the ethical committee of the Applied Medical Science (Qurayyat, Jouf University, Saudi Arabia) Research Board.

## 3. Results

Out of the 757 approached women, 473/757 (62.5%) responded to partake in breast self-examination training. The mean age of the contributors was  $35.7 \pm 10.5$  years with a minimum of 17 and a maximum of 72 years old. A total of 130 men were enrolled as an internal control. The question relevant "*Inheritance as a risk factor for BC*," 405/607 (66.7%) females signposted certainly "Yes," as well as, 70/130 (54%) males signposted certainly "Yes." The odds ratio (OR) and 95% confidence interval (95% CI) was not statistically significant, but the level of knowledge was relatively higher among females OR (95% CI) = 1.4321 (0.9597 to 2.1370),  $P = 0.0786$ , as indicated in **Table 1**, **Figure 1**.

The question "*Whether early puberty and late menopause are risk factors for BC*," 190/623 (30.5%), 77/623 (12.4%), and 356/623 (57%) of the females replied "Yes" increase the risk of BC," "Yes decrease the risk of BC," and "No do nothing," respectively. About 43/130 (33%), 44/130 (34%), and 43/130 (33%) of the males replied "Yes increase the risk of BC," "Yes decrease the risk of BC," and "No do nothing," in that order. No statistical significant differences were eminent between males and females, OR (95% CI) = 0.8878 (0.5932 to 1.3287),  $P = 0.5629$  (see **Table 1**, **Figure 1**).



**Figure 1.** Gender and hormonal-related breast cancer risk factors.

**Table 1.** Distribution of study subjects by gender and hormonal-related breast cancer risk factors.

Variable	Females	Males	Total
<i>Role of inheritance in BC</i>			
Yes	405	70	475
No	202	50	252
Total	607	130	727
<i>Early puberty and late menopause are risk factors for BC</i>			
Increase the risk of BC	190	43	234
Decrease the risk of BC	77	44	122
Do nothing	356	43	397
Total	623	130	753
<i>Delayed childbirth is a risk</i>			
Increase the risk of BC	148	40	188
Decrease the risk of BC	90	50	140
Do nothing	386	40	426
Total	624	130	754
<i>Natural breastfeeding</i>			
Increase the risk of BC	31	40	71
Decrease the risk of BC	469	44	513
Do nothing	122	46	168
Total	618	130	752
<i>Hormonal usage</i>			
Increase the risk of BC	268	30	298
Decrease the risk of BC	99	52	151
Do nothing	250	48	298
Total	617	130	747

The question “*Whether delayed childbirth is a risk for BC,*” 148/624 (24%), 90/624 (14.4%), and 386/624 (62%) of the females replied “Yes increase the risk of BC,” “Yes decrease the risk of BC,” and “No do nothing,” correspondingly. Around 40/130 (31%), 50/130 (38%), and 40/130 (31%) of the males replied “Yes increase the risk of BC,” “Yes decrease the risk of BC,” and “No do nothing,” in that order. No statistical significant differences were eminent between males and females, OR (95% CI) = 0.6996 (0.4617 to 1.0601), P = 0.0920 (see **Table 1, Figure 1**).

The question “*Whether natural breastfeeding is a risk for BC,*” 31/618 (5%), 469/618 (75%), and 122/618 (20%) of the females replied “Yes increase the risk of BC,” “Yes decrease the risk of BC,” and “No do nothing,” correspondingly. Around 40/130 (31%), 44/130 (34%), and 46/130 (35%) of the males replied “Yes

increase the risk of BC,” “Yes decrease the risk of BC,” and “No do nothing,” in that order. The knowledge of the females on the subject of “natural breastfeeding,” as a factor lowering the risk of BC was found statistically significant, OR (95% CI) = 5.9914 (3.9899 to 8.9968),  $P < 0.0001$  (see **Table 1, Figure 1**).

The question “*Whether hormonal usage is a risk for BC,*” 268/617 (43.4%), 99/617 (16%), and 250/617 (40.5%) of the females replied “Yes increases the risk of BC,” “Yes decrease the risk of BC,” and “No do nothing,” correspondingly. Around 30/130 (23%), 52/130 (40%), and 48/130 (37%) of the males replied “Yes increases the risk of BC,” “Yes decrease the risk of BC,” and “No do nothing,” in that order. The knowledge of the females on the subject of “Hormonal usage,” as a factor hovering the risk of BC was found statistically significant, OR (95% CI) = 2.5597 (1.6519 to 3.9664),  $P < 0.0001$  (see **Table 1, Figure 1**).

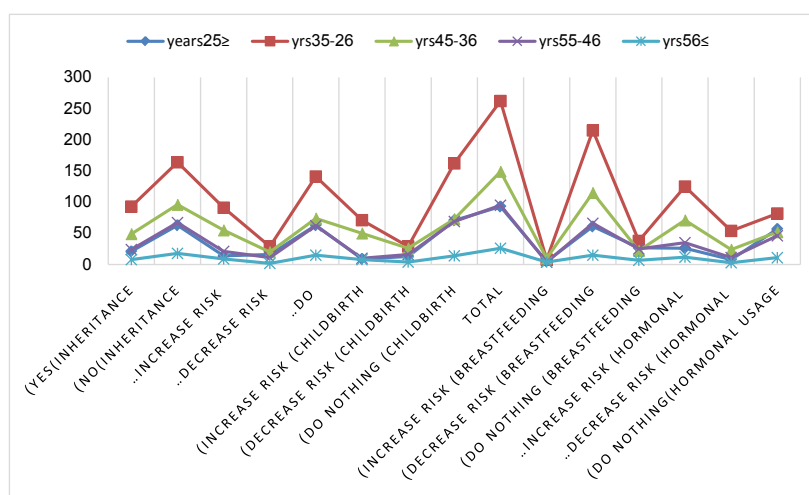
Knowledge regarding “*Inheritance as a risk for BC,*” predominantly merit by age group 26 - 35 years 93/195 (48%) followed by 36 - 45 years 45/195 (23%) and 46 - 55 years 24/195 (12.3%).

Knowledge regarding “*Early puberty and late menopause are risk factors for BC,*” suggestion “increased the risk of BC” was predominantly specified by age group 26 - 35 years 91/190 (48%) followed by 36 - 45 years 55/190 (29%) and 46 - 55 years 21/190 (11%).

Knowledge regarding “*Delayed childbirth is a risk,*” submission “increased the risk of BC” was predominantly stated by age group 26 - 35 years 71/148 (48%) followed by 36 - 45 years 50/148 (34%) and 46 - 55 years 10/148 (7%).

Knowledge regarding “*Natural breastfeeding,*” submission “increased the risk of BC” was predominantly stated by age group 36 - 45 years 10/31 (32%) followed by 26 - 35 years 8/31 (26%) and  $\leq 25$  years 5/31 (16%).

Knowledge regarding “*Hormonal usage, as BC risk factor,*” idea “increased the risk of BC” was predominantly specified by age group 26 - 35 years 125/269 (46.5%) followed by 36 - 45 years 71/269 (26.4%) and 46 - 55 years 35/269 (13%), as shown in **Table 2, Figure 2**.



**Figure 2.** Age and hormonal-related breast cancer risk factors.

**Table 2.** Distribution of study subjects by age and hormonal-related breast cancer risk factors.

Variable	≤25 years	26 - 35	36 - 45	46 - 55	≥56	Total
<i>Inheritance as a risk for BC</i>						
Yes	21	93	49	24	8	195
No	63	164	96	67	18	408
Total	84	257	145	91	26	603
<i>Early puberty and late menopause are risk factors for BC</i>						
Increase the risk of BC	14	91	55	21	9	190
Decrease the risk of BC	16	29	20	11	2	78
Do nothing	63	141	74	62	15	355
Total	93	261	149	94	26	623
<i>Delayed childbirth is a risk</i>						
Increase the risk of BC	9	71	50	10	8	148
Decrease the risk of BC	13	29	26	16	4	88
Do nothing	71	162	73	69	14	389
Total	93	262	149	95	26	625
<i>Natural breastfeeding</i>						
Increase the risk of BC	5	8	10	4	4	31
Decrease the risk of BC	61	215	115	66	15	472
Do nothing	27	38	22	25	7	119
Total	93	261	147	95	95	622
<i>Hormonal usage</i>						
Increase the risk of BC	26	125	71	35	12	269
Decrease the risk of BC	8	54	24	11	3	100
Do nothing	57	82	52	46	11	128
Total	91	261	147	92	26	617

As regards to the inquiry “*whether inheritance as a risk for BC,*” around 252/727 (34.7%) participants replied “Yes,” including 130/252 (51.6%), 62/252 (24.6%) and 38/252 (15%) subjects with the university, secondary and basic levels of educations, respectively.

As regards to the enquiry “*Early puberty and late menopause are risk factors for BC,*” around 233/727 (32%) participants replied “Yes,” including 140/233 (60%), 39/233 (16.7%) and 34/233 (14.6%) subjects with university, Basic and secondary levels of educations, correspondingly.

As regards to the inquiry “*whether Delayed childbirth is a risk,*” around 189/727 (26%) participants replied “Yes,” including 110/189 (58%), 33/189

(17.5%) and 32/189 (17%) subjects with the university, basic and secondary levels of educations, respectively.

As regards to the inquiry “*whether natural breastfeeding,*” around 71/727 (9.8%) participants replied “Yes,” including 33/71 (46.5%), 20/71 (28%) and 11/71 (15.5%) subjects with the university, basic and secondary levels of educations, respectively.

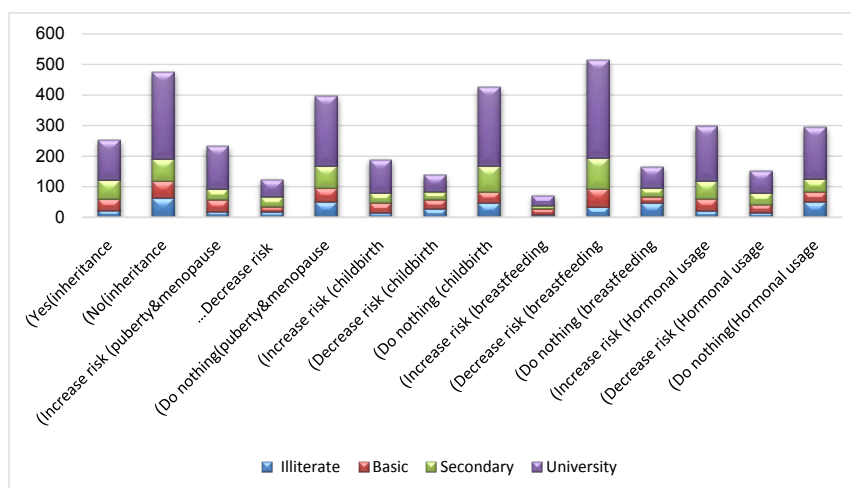
As regards to the enquiry “*whether natural breastfeeding,*” around 300/727 (41.3%) participants replied “Yes,” including 179/300 (60%), 59/300 (20%) and 41/300 (14%) subjects with university, basic and secondary levels of educations, respectively, as indicated in **Table 3, Figure 3.**

#### 4. Discussion

Breast is a highly responsive organ to the levels of hormones, particularly estrogen (ER). Prolonged and increased exposure to ER is known to be risk factors for breast cancer.

The present study attempted to highlight the pertained knowledge and awareness levels of Saudi women toward exposure to variable ER-related conditions. At present, there is amassing regarding the role of endogenous ER as a risk for the development of breast cancer. ERs and ERs-related metabolites were extensively investigated in both premenopausal and postmenopausal women, and the results showed substantial hormonal deviations [10].

In the present study, 66.7% of the participated women stated that the inheritance of breast cancer genes is a critical risk factor for breast cancer. Family history is an essential factor for the determining of the overall risk of breast cancer. A family history score depends on noticed breast cancers in a family, and the following prediction may offer a better view of breast cancer incidence than classical parameters based solely on affected relatives [11]. Individuals carrying a mutation in BRCA1/BRAC2 genes have an elevated lifetime risk of breast cancer (60% - 85%) compared to 12.5% of women with intact BECA genes [12].



**Figure 3.** Education and hormonal-related breast cancer risk factors.

**Table 3.** Distribution of study subjects by education and hormonal-related breast cancer risk factors.

Variable	Illiterate	Basic	Secondary	University	Total
<i>Inheritance in BC</i>					
Yes	22	38	62	130	252
No	63	56	73	283	475
Total	85	98	135	411	727
<i>Early puberty and late menopause are risk factors for BC</i>					
Increase the risk of BC	19	39	34	140	233
Decrease the risk of BC	17	18	31	57	123
Do nothing	51	44	74	228	397
Total	87	101	139	425	753
<i>Delayed childbirth is a risk</i>					
Increase the risk of BC	14	33	32	110	189
Decrease the risk of BC	27	31	24	56	138
Do nothing	46	38	83	260	428
Total	87	102	139	424	754
<i>Natural breastfeeding</i>					
Increase the risk of BC	7	20	11	33	71
Decrease the risk of BC	33	61	100	320	516
Do nothing	47	20	28	71	166
Total	87	101	139	423	752
<i>Hormone usage</i>					
Increase the risk of BC	20	41	59	179	300
Decrease the risk of BC	15	27	37	73	153
Do nothing	51	32	42	169	294
Total	86	100	138	421	747

The question “Whether early puberty and late menopause are risk factors for BC,” about 30.5% of the females replied “Yes” increase the risk of BC. This relatively lower percentage is indicating poor knowledge in this segment. It was well established that early puberty, late menopause, and later age at first pregnancy are risk factors for breast cancer [13].

The question “Whether delayed childbirth is a risk for BC,” only 14.4% of the females replied, “Yes decrease the risk of BC.” Modifications in family designs could, however, clarify the elevated risk since giving birth to a first child late in life and bearing few children both upsurge the risk of breast cancer [14].

The question “Whether natural breastfeeding is a risk for BC,” 75% of the females replied, “Yes decreases the risk of BC.” The combination of extended breastfeeding and extra childbirth lowers breast cancer risk powerfully, and that



women who practiced either two or more childbirths and breastfed for  $\geq 13$  months can decrease their breast cancer risk by approximately 50% [15].

The question “Whether Hormonal usage is a risk for BC,” 43.4% of the females replied, “Yes increases the risk of BC.” Endogenous estradiol and estrone are concomitant causally to amplified risks of breast cancer [16]. The proof is growing proposing that totaling progestogens to estrogens can raise the risk of breast cancer. Nonetheless, there is an indication that the natural progesterone and dydrogesterone, perhaps furthermore the transdermal use of synthetic progestogens, may have reduced risks, but this needs to be verified in additional clinical trials [17].

Concerning the relationship between age and knowledge about hormonal related breast cancer risk factors, higher levels of knowledge were identified among age groups 26 - 35 years and 36 - 45 years. These groups represent a section of the Saudi community with a broad culture, better education, and accumulative knowledge. During our search, we didn't come across studies investigated the role of age in the spread of awareness. Low deployment of breast cancer screening has been significantly linked to woman's age (OR = 2.55; 95% CI = 1.71 - 3.83), upper educational rank (OR = 2.98; 95% CI = 2.05 - 4.34), greater family income (OR = 1.96; 95% CI = 1.31 - 2.93), consuming hormonal contraception (OR = 1.46; 95% CI = 0.99 - 2.13) and positive history of former breast (OR = 12.16; 95% CI = 6.89 - 21.46 [18].

On the other hand, higher levels of awareness were noticed among educated women (university level and secondary). Those less educated showed fewer awareness levels. Therefore, planned educational programs should target less educated women. A recent study from Saudi Arabia indicated educational interventions targeting raising breast cancer awareness and addressing barriers should be merged as the central part of the screening program in Saudi Arabia [18]. This calls for educational campaigns to boost breast cancer screening. Addressing the barriers for breast cancer screening is a public health authoritative [19].

In the present study, men showed low levels of awareness in all factors regarding breast risk. Though the incidence of men breast cancer is deficient, the men education may further improve the level of women awareness toward breast cancer and its associated risk factors with respect to the social construction of the Saudi community.

## 5. Conclusion

Saudi women are enthusiastically willing to raise their knowledge and awareness toward breast cancer prevention and control. Although women have greater knowledge about breast cancer risk factors compared to men, still some gaps need to be filled.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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