

Factors Associated with the Prevalence of Breast Cancer Risk: Perception of Northern Saudi Civic

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Abstract

Background: The incidence of breast cancer is increasing in Saudi Arabia, chiefly in distant provinces with cases assigning advanced stages of the disease. This study aimed to evaluate the level of knowledge towards external exposure related to breast cancer risk factors in Qurayyat, Northern Saudi Arabia. **Methodology:** This descriptive study included 724 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 were further investigated for the presence of breast lumps. **Results:** In comparison of females vs. males, as for the point “Do you know food increases or decreases the risk of BC”, 92 (15%) women stated “Yes (Some prevented BC)” vs. 24 (24%) of the men; 78 (12.5%) women stated “Yes (Some caused BC)” vs. 25 (25%) of the men. Referring to the socket “Overweight or obesity increases the risk of BC”, 290 (46.5%) women stated “Yes” vs. 53 (53%) of the men. As for the inquiry “Viruses can increase the risk of BC”, 370 (60%) women stated “Yes” vs. 49 (49%) of the men. **Conclusion:** There is a lack of breast cancer awareness in Northern Saudi Arabia with the existence of many women with undetected breast lumps. BSE is cost-effective, and it can be implemented in such inaccessible areas.

Keywords

Breast Cancer, Breast Self-Examination, Awareness, Saudi Arabia, Risk Factors

1. Introduction

Females' breast cancer is one of the most frequent diseases and the leading cause of cancer-related mortality worldwide. In recent years, the prevalence of breast cancer is increasing in Saudi Arabia, particularly amongst younger women. This increase is attributed to the relative increase in the early detection and partially to the frequent exposure to several risk factors, which differ for different demographical factors [1]. In spite of the latest demands to step up the search for new breast cancer risk factors, targeting the existence information could prevent a lot of cases each year [2]. Tobacco, alcohol, type of dietary consumption, physical inactivity, overweight, occupation, infection, radiation (ionizing and solar) and use of hormones are major risk factors [3] [4].

Several epidemiological studies support the risk of radiation exposure to breast cancer etiology. However, the level of the risk is dose-dependent. Radiation exposure takes place before the age of 20 years, carrying the highest risk. Other features have an impact on the magnitude of dose-specific risk involving reached age, age at first full-term birth, parity, and possibly a history of benign breast disease, exposure to radiation while pregnant, and genetic factors [5]. Radiation-induced breast cancer risk from digital mammography screening is determined by dose changeability from screening and diagnostic, beginning age, and screening rate. Females with big breasts may be at greater radiation-induced risk [6].

Cigarette smoking is linked to an increased risk of breast cancer, particularly among those initiated smoking at adolescent or peri-menarcheal ages. Also, women with a family history of breast cancer gain a more significant risk with smoking [7] [8]. Obesity or overweight is a well-established risk for developing breast cancer, particularly in postmenopausal females with worse outcomes in all ages [9].

The increasing incidence of breast cancer in Saudi Arabia might be attributed to the low public knowledge and awareness toward breast cancer risk factors. Yet, there is a shortage of knowledge regarding the Saudi women level of consciousness. Therefore, the present study aimed to evaluate the level of understanding of external exposure related to breast cancer risk factors in Qurayyat, Northern Saudi Arabia.

2. Materials and Methods

This descriptive study included 724 Saudi volunteers living in the city of Qurayyat, Northern Saudi Arabia. Participants were targeted in different public settings in the city. Participants were and 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 were investigated for the presence of breast lumps. Males' participants were involved in serving as an internal control for the obtained information regarding breast cancer previous knowledge. A purposeful questionnaire was de-

signed and used for securing of the necessary data. Besides the demographical data, the questionnaire included: “Do you know food increases or decreases the risk of BC”, “Overweight or obesity increases the risk of BC”, “The risk of BC may be associated with individual’s weight”, “Viruses can increase the risk of BC”, “Cigarette smoking is a risk of BC”, “Radiation exposure is a risk for BC”, “Do you know food increases or decreases the risk of BC”, “Overweight or obesity increases the risk of BC”, and “Use of cosmetics 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 724 responded volunteers, 624 were females, and 100 were males (internal control). The mean age of the contributed women was $36 \pm \text{STD } 10.5$ years with a range of 17 to 70 years old.

High frequency of participants was at the age group < 30 years followed by 30 - 39 and 40 - 49 years constituting 239 (33%), 186 (25.7%) and 119 (16.4%), respectively, as shown in **Figure 1**.

The vast majority of the study subjects were with university level of education 411 (56.7%) trailed by secondary level 133 (18.4%). Females were predominantly with university level 385 (62%); hence, males were in excess at secondary level 32 (32%), as shown in **Figure 2**.

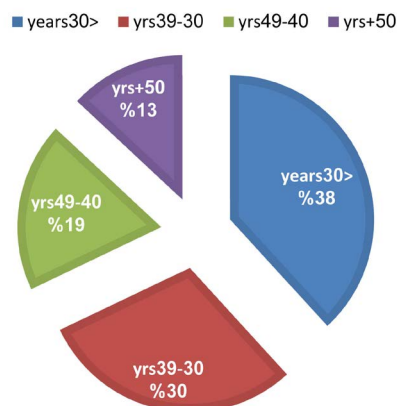


Figure 1. Females by age.

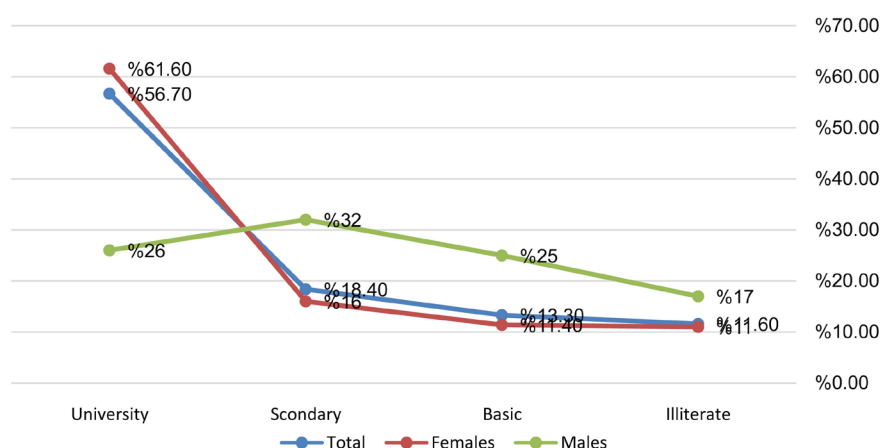


Figure 2. Study population by education.

Out of 624 recruited women, 473 (75.8%) agreed to participate in breast self-examination (BSE), as well as, to do the training. The results of BSE showed 33 (7%) breast lumps and 59 (12.5%) likeness vicissitudes (see **Figure 3**).

In comparison of females vs. males, the point “Do you know food increases or decreases the risk of BC”, 92(15%) women stated “Yes (Some prevent BC)” vs. 24 (24%) of the men; 78 (12.5%) women stated “Yes (Some cause BC)” vs. 25(25%) of the men, as indicated in **Table 1** and **Figure 4**.

Referring to the socket “Overweight or obesity increases the risk of BC”, 290 (46.5%) women stated “Yes” vs. 53 (53%) of the men. The point “The risk of BC may be associated with individual’s weight”, 264 (42.3%) women specified vs. 16 (16%) of the men, as indicated in **Table 1** and **Figure 4**.

The inquiry “Viruses can increase the risk of BC,” 370 (60%) women stated “Yes” vs. 49 (49%) of the men, as indicated in **Table 1** and **Figure 4**.

Concerning the point “Cigarette smoking is a risk of BC,” 444 (71.5%) women stated “Yes” vs. 50 (50%) of the men, as indicated in **Table 1** and **Figure 4**.

The question “Radiation exposure is a risk for BC”, 482 (77.8%) women stated “Yes” vs. 41 (41%) men, as indicated in **Table 1** and **Figure 4**.

The Point “Use of cosmetics is a risk of BC”, 354 (57.4%) women replied “Yes” vs. only one man, as indicated in **Table 1** and **Figure 4**.

As regard to the association between age and response to the BC risk factors, as it was summarized in **Table 2**. The inquiry “Do you know food increases or decreases the risk of BC”, point “Some foods can prevent BC”. The positive response was relatively stated similar among all age ranges with a slight increase in the age group 30 - 39 years.

The inquiry “Overweight or obesity increases the risk of BC”, “Yes” responses were predominantly indicated by the age groups < 25 years, 30 - 39 and 40 - 49 years (see **Table 2** and **Figure 5**).

Indicating “Yes” virus infection can be a risk of BC, cigarette smoking, radiation exposure, and cosmetics usage were decreasingly notified by the age groups < 25 years, 30 - 39 and 40 - 49 years (see **Table 2** and **Figure 5**).

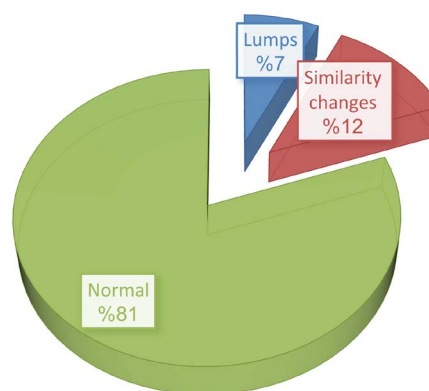


Figure 3. Results of BSE screening.

Table 1. Study subjects by gender and BC risk factors.

Variable	Females	Males	Total
<i>Do you know food increases or decreases the risk of BC</i>			
Yes (Some prevent BC)	92	24	116
Yes (Some cause BC)	79	25	104
I don't know	347	37	384
I know Both	106	14	120
Total	624	100	724
<i>Overweight or obesity increases the risk of BC</i>			
Yes	290	53	364
No	326	44	349
	616	97	713
<i>The risk of BC may be associated with an individual's weight (wt)</i>			
With increased wt.	264	16	280
With decrease wt.	99	25	124
Both	158	56	214
Total	521	97	618
<i>Viruses can increase the risk of BC</i>			
Yes	370	49	419
No	247	48	295
Total	617	97	714
<i>Cigarette smoking is a risk of BC</i>			
Yes	444	50	494
No	177	48	225
Total	621	98	719
<i>Radiation exposure is a risk for BC</i>			
Yes	482	41	523
No	138	55	193
Total	620	96	716
<i>Use of cosmetics is a risk for BC</i>			
Yes	354	1	355
No	263	1	264
Total	617	2	619

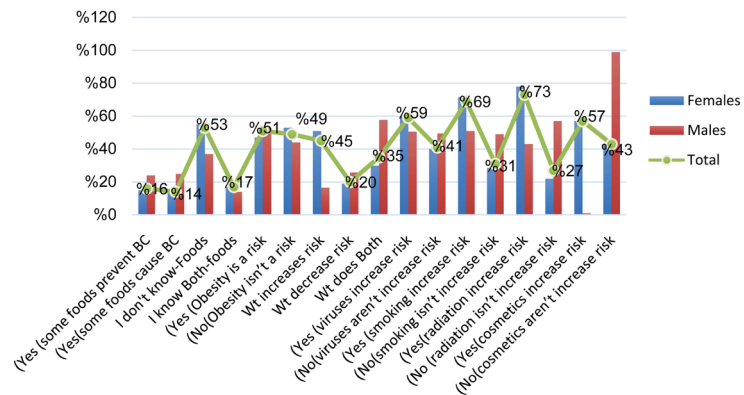


Figure 4. Gender by BC risk factors.

Table 2. Age by BC risk factors.

Variable	<30 years	30 - 39	40 - 49	50+	Total
<i>Do you know food increases or decreases the risk of BC</i>					
Yes (Some prevent BC)	22	25	22	23	92
Yes (Some cause BC)	25	25	16	13	79
I don't know	141	102	67	39	349
I know Both	51	33	14	7	105
Total	239	185	119	82	625
<i>Overweight or obesity increases the risk of BC</i>					
Yes	97	95	62	36	290
No	140	89	53	46	296
Total	237	184	115	82	618
<i>The risk of BC may be associated with an individual's weight</i>					
With increased wt	107	90	40	28	265
With decrease wt	34	33	18	14	99
Both	62	29	39	29	159
Total	203	152	97	71	523
<i>Viruses can increase the risk of BC</i>					
Yes	160	98	67	45	370
No	77	87	50	35	244
Total	237	185	117	80	619
<i>Cigarette smoking is a risk of BC</i>					
Yes	167	136	89	53	445
No	72	49	29	28	174
Total	239	185	118	81	449
<i>Radiation exposure is a risk for BC</i>					
Yes	173	151	101	59	484
No	64	34	17	23	138
Total	237	185	118	82	622
<i>Use of cosmetics is a risk for BC</i>					
Yes	121	115	70	49	355
No	117	69	46	32	264
Total	238	184	116	81	619

The distribution of the study population by the BC risk factors and education status was summarized in **Table 3** and **Figure 6**. The question “Do you know food increases or decreases the risk of BC”, was mostly positively stated by university participants, both for preventing BC and causes, representing 53/116 (45.7%) and 54/104 (52%), in this order. “Overweight or obesity increases the risk of BC”, “Yes” answer as stated by 195/343 (57%), 60/343 (17.5%), and 46/343 (13.4%) of the university, secondary, and basic, correspondingly. “Viruses can increase the risk of BC”, “Cigarette smoking is a risk of BC”, “Radiation exposure is a risk for BC”, and “Use of cosmetics is a risk for BC” were increasingly responded “Yes” with the increase of the level of education, starting from illiterate, basic, secondary, and university, one-to-one (see **Table 3** and **Figure 6**).

Table 3. Study subjects by the BC risk factors and education status.

Variable	Illiterate	Basic	Secondary	University	Total
<i>Do you know food increases or decreases the risk of BC</i>					
Yes (Some prevent BC)	20	21	22	53	116
Yes (Some cause BC)	18	21	11	54	104
I don't know	42	46	81	215	384
I know Both	3	8	19	89	119
Total	83	96	133	411	723
<i>Overweight or obesity increases the risk of BC</i>					
Yes	42	46	60	195	343
No	40	48	70	210	370
Total	82	94	130	407	713
<i>The risk of BC may be associated with individual weight</i>					
With increased wt.	23	31	43	183	280
With decrease wt.	10	27	31	56	124
Both	46	29	30	109	214
Total	79	87	104	348	618
<i>Viruses can increase the risk of BC</i>					
Yes	37	59	72	251	419
No	46	35	59	155	295
Total	83	94	131	406	714
<i>Cigarette smoking is a risk of BC</i>					
Yes	50	73	89	282	494
No	33	22	44	126	225
Total	83	95	133	408	719
<i>Radiation exposure is a risk for BC</i>					
Yes	53	65	82	323	523
No	30	30	49	84	193
Total	83	95	131	407	716
<i>Use of cosmetics is a risk for BC</i>					
Yes	39	44	65	207	355
No	26	27	36	175	264
Total	65	71	101	382	619

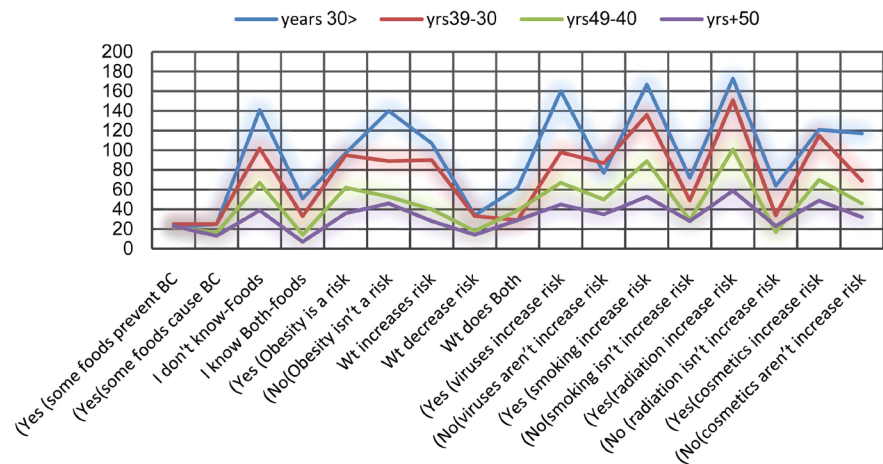


Figure 5. Age by BC risk factors.

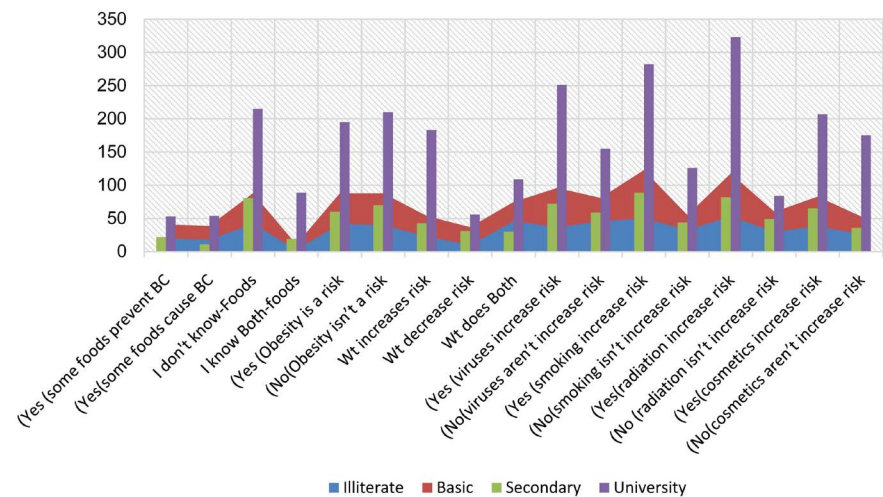


Figure 6. Education levels by BC risk factors.

4. Discussion

The incidence of breast cancer is increasing in Saudi Arabia, predominantly in inaccessible regions with cases imparting advanced stages of the disease, which might be attributed to the feebleness in the awareness and early detection efforts. Consequently, the present study aimed to strengthen the efforts of prevention and early detection through the implementation of BSE, as well as, to raise the level of awareness in Northern Saudi Arabia.

The existence of 7% of breast lumps in addition to 12.5% perceived breast changes in a randomized cross-sectional sample, predicts a severe liability of the disease in these remote areas. Women are recommended to practice BSE regularly and at least every month [10]. Women practice BSE is more likely to find their breast lesions at an earlier stage, which leads to early management and better prognosis. Although BSE is easy and cost-effective, some studies consider its effectiveness as an observational [11]. However, implementation of appropriate knowledge and practices on breast cancer and BSE at public setting levels are the

critical steps for effective prevention measures across the general population.

The present study mainly focused on the assessment of the level of the awareness of the Saudi public towards the relationship between exposure to nominated common risk factors and breast cancer. The inquiry “Do you know food increases or decreases the risk of BC”, 15% women stated “Yes (Some food can prevent BC)” vs. 24% of the men. Moreover, 12.5% women stated “Yes (Some foods can cause BC)” vs. 25% of the men. These findings were displaying shallow levels of awareness. In a study examined the link between dietary factors, including food matters, and nutritional habits with breast cancer risk among women proposed that grilled meat and high-cholesterol food consumption and irregular intake habits are associated with a higher risk of breast cancer [12]. In a large pooled analysis, vegetable and fruit intake were inversely linked to the risk of breast cancer [13].

The inquiry “Overweight or obesity increases the risk of BC,” 46.5% women indicated “Yes” vs. 53% of the men. These findings indicated a relatively average level of partakers’ knowledge. Several studies reported that overweight and obesity elevate the risk of breast cancer, particularly in pre- and post-menopausal females [14] [15]. Clinical studies propose that obesity, besides promoting breast cancer aggressiveness, is associated with a decline in chemotherapy effectiveness, though the process intricate still indefinable [16].

The inquiry “Viruses can increase the risk of BC”, 60% women stated “Yes” vs. 49 (49%) of the men. There is a rising form of evidence proposing that human papillomavirus (HPV) infection may play a vital role in the invasiveness of breast cancer. HPV infection may be involved in the development of some types of breast cancer [17]. The strong association between breast cancer and the Epstein Barr virus (EBV) was previously reported [18].

About the point “Cigarette smoking is a risk of BC”, 71.5% women stated “Yes” vs. 50% of the men. While epidemiological suggestion on the role of active cigarette smoking in breast cancer risk has been inconsistent, the role of smoking in breast cancer etiology was established with a particular accentuate on timing and exposure [19]. A recent study has shown that smoking-related higher breast cancer risk was comparable for the five race/ethnicity groups in the Multiethnic Cohort (MEC) research and by estrogen (ER) and progesterone (PR) receptor status [20].

As for the question “Radiation exposure is a risk for BC”, 77.8% women stated “Yes” vs. 41% men. Multiple diagnostic and therapeutic procedures involve the application of radiation. Ionizing radiation is known to promote tumorigenesis through inducing of mutations in the DNA of irradiated cells [21]. The risk of breast cancer has been linked to radiation exposure in the form of X-rays and mammography screening, but the risk depends on initiation age and exposure frequency. Females with large breasts may have a higher risk of radiation-induced breast cancer [22] [23].

The Point “Use of cosmetics is a risk of BC”, 354 (57.4%) women replied “Yes” vs. only one man. It was suggested that everyday use of certain cosmetics’

ingredients was a strongly associated with the increased risk of breast cancer. Sufficient breast cancer carcinogenicity was linked to the use of cosmetic ingredients such as ethylene oxide and xenoestrogens. Some of these products have estrogen-like effects and others causing DNA damage of the human mammary epithelial cells [24]. Allowing these cosmetics on the skin for a time permits their absorption, and if they are applied on the breast, they may be absorbed directly and thus escape the systemic metabolism. Moreover, the combined interaction of cosmetics, environmental, and some pharmacological components may extensively elevate the risk of breast cancer for many women [25].

Concerning the age, an elevated level of awareness was noticed in the middle-age group, as well as, among people with a twice greater level of education. However, these factors require further assessment since age and education were not optimized in this trail.

Although the present study presented important data for health policy makers in Northern Saudi Arabia, for better preventive and early detection measures, it has some limitations including; it cross-sectional setting, including highly educated people, and a relatively younger population with lower risk.

5. Conclusion

There is a lack of breast cancer awareness in Northern Saudi Arabia with the existence of many women with undetected breast lumps. BSE is cost-effective and can be implemented in such inaccessible areas.

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Conflicts of Interest

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

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