

## Survey on Knowledge and Awareness towards the Association between Breast Cancer and Life Style Modifications in Northern Saudi Arabia

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### Original Research Article

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**Abstract:** Modifiable lifestyle breast cancer risk factors can be actively influence by women in order to reduce or increase their breast cancer risk, which strongly depend on individual's knowledge. Therefore, the aim of the present study was to evaluate the level of knowledge and awareness towards the association between breast cancer and life style modifications in Northern Saudi Arabia. This is a cross sectional survey included 559 Saudi volunteers living in the city of Hail, Northern Saudi Arabia. Knowledge and awareness towards modifiable lifestyle factors and breast cancer risk was evaluated using different variables during interview. Out of 559 study subjects only 14.5% were found to know that there are some dietary types, which can reduces the risk of breast cancer and the remaining 85.5% ignore that. About 37.4% indicated that they knew body weight is a risk factor for breast cancer. The level of knowledge and awareness toward breast cancer and lifestyle related risk factors are very poor in Northern Saudi Arabia.

**Keywords:** Breast cancer, Saudi Arabia, Awareness, lifestyle.

### INTRODUCTION

Breast cancer is the most common cancer among females in both developing and developed world [1]. Several risk factors may be involved, and individual choices regarding life style employ an effect on most factors associated with the occurrence of cancer. It is estimated that the majority of malignant cancers, as much as 70%, are the outcome of the harmful effect of factors related with diet, life style, or those present in the adjacent environment [2]. Lifestyle modification has a variety of health benefits with few associated risks and is appropriate for all women regardless of breast cancer risk [3].

Lifestyle changes are shown to be important in the prevention of breast cancer. Diet, physical activity, smoking, alcohol use, and vitamin and mineral use are key factors influencing the risk of breast cancer among women. Because these factors are related to each other, it is difficult to assess their individual roles in breast cancer. Some of these factors are alterable, meaning that women can decrease their risk for breast cancer by changing their behavior [4].

It was reported that fat intake [5], red meat and caffeine consumption [6,7] are associated with an increased risk of breast cancer. Smoking [8,9], and Alcohol [10] use are important risk factors for breast cancer. Obesity and weight gain during middle adulthood are associated with increased risk of breast cancer [11]. Night shift work is known to increase the risk of breast cancer by increasing melatonin levels [12]. It is shown that perceived stress can increase the risk of breast cancer when combined with other risky behaviors such as inadequate physical activity, alcohol intake, smoking, low green tea intake, and high meat

and seafood intake [13]. Several researchers have reported an increase in the risk of breast cancer in patients who are using digoxin [14].

On the other hand, some studies have reported that the risk of breast cancer decreases with increased physical activity [15,] some minerals [16] and vitamins intake [17]. Twelve months of breastfeeding is associated with a 4.3% decrease in breast cancer risk [18].

The Saudi cancer registry reported in 2009 that the frequency of breast cancer is the highest among all types of cancer among Saudi women aged 30-59 years [19]. Several well-established breast cancer risk factors are still un-clarified for its potential role in the etiology of breast cancer in Saudi Arabia [20]. Therefore, the aim of the present study was to evaluate the level of knowledge and awareness towards the association between breast cancer risk and life style modifications in Northern Saudi Arabia.

**MATERIALS AND METHODS**

This is a descriptive study conducted in Hail region, Northern Saudi Arabia to assess the knowledge and awareness towards breast cancer, data about breast cancer were collected from 559 Saudi volunteers living in the city of Hail, Saudi Arabia. Participants were randomly selected by simple random method regardless to age, gender and education.

Purposeful questionnaire was designed and used for obtaining of the necessary data. The following information were obtained from each participant: age, sex, do you think that some food can prevent breast cancer, do you think that some food can cause breast cancer, don't food can prevent or cause breast cancer, Know some food can prevent and cause breast cancer, overweight or obesity increase the risk of breast cancer.

**DATA ANALYSIS**

Statistical Package for Social Sciences (SPSS version 16) was used for analysis and to perform

Pearson Chi-square test for statistical significance (P value). The 95% confidence level and confidence intervals were used. P value less than 0.05 was considered statistically significant.

**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 College of Medicine (University of Hail, Saudi Arabia) Research Board.

**RESULTS**

This study investigated 559 participants, their ages ranging from 15 to 50 years with a mean age of 26 years. Out of the 559 participants, 165 (29.2%) were males and 394 (70.5%) were females, giving males' females' ratio of 1.00 to 2.38.

**Table-1: Distribution of the study population by demographical characteristics**

Variable	Category	Males	Females	Total
Age	<20 years	30	65	95
	21-24yrs	105	138	243
	25-29yrs	18	49	67
	30-34yrs	4	47	51
	35+yrs	8	95	103
	Total	165	394	559
Education	Basic	4	102	106
	Secondary	9	37	46
	university	152	255	407
	Total	165	394	559

The distribution of the study population showed that most of the respondents were at age group 21-24 years followed by 35+, representing 243/559(43.5%) and 103/559(18.4%), in this order. For males, the majority of participants were found in age range 21-24 years by <20, 25-29 and 35+ years constituting 105/165(63.6%), 30/165(18.2%), 18/165(10.9%) and 8/165(4.8%), respectively. For females, the majority of participants were found in age range 21-24 years followed by 35+, < 20, 25-29, and 30-34 years constituting 138/394(35%), 95/394(24%), 65/394(16.5%), 49/394(12.4%), and 47/394(11.9%), respectively as indicated in Table 1, Fig 1.

With regard to education level, the majority of the study subjects were with university level of education followed by basic and secondary education levels, representing 407/559(72.8%), 106/559(19%) and 46/559(8.2%), respectively. For males, out of 165, 152/165 (92.2%) were at university level, 9/165 (5.4%) were at secondary level and 4/165(2.4%) were at basic level. For females, 255/394 (64.7%) were at university level, 102/394(26%) were at basic level and 37/394(9.3%) were at secondary level, as indicated in Table 1, Fig 1.

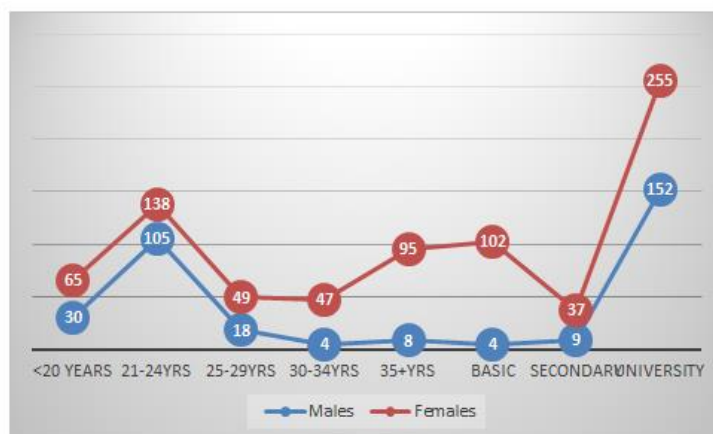


Fig-1: Description of the study population by age, sex and education

Table-2: Distribution of the study population by knowledge about the relationship between breast cancer and diet and body weight

Variable	Category	Males	Females	Total
Do you know food that can prevent or reduce the risk of breast cancer				
	Yes	25	56	81
	NO	140	338	478
	Total	165	394	559
Do you know food that can cause or increase the risk of breast cancer				
	Yes	11	37	48
	NO	154	357	511
	Total	165	394	559
Do you ever heard about any food that can prevent or cause cancer				
	Yes	13	41	54
	No	152	353	505
	Total	165	394	559
Do you think body weight is a risk factor for breast cancer				
	Yes	65	144	209
	No	100	249	349
	Total	165	393	558
If the body weight is a risk factor for breast cancer: when it is				
	Increased	85	197	282
	Decreased	27	20	82
	Both	25	105	130
	Total	137	322	459

When we asked the participants the question “Do you know food that can prevent or reduce the risk of breast cancer?” Only 81/559(14.5%) said yes and the remaining 478(85.5%) answered no. Out of the 165 males, 25/165(15.2%) and 56/394(14.2%) of the males and females were found to know that there are some foods that can prevent or reduce the risk of breast cancer.

When we asked the participants the question “Do you know food that can cause or increase the risk of breast cancer?” Only 48/559(8.6%) said yes and the remaining 511(91.4%) answered no. Out of the 165 males, 11/165(6.7%) and 37/394(9.4%) of the males and females were found to know that there are some foods that can cause or increase the risk of breast cancer.

When we asked the participants the question “Do you ever heard about any food that can prevent or cause cancer?” Only 54/559(9.7%) said yes and the remaining 505(90.3%) answered no. Out of the 165 males, 13/165(7.9%) and 41/394(10.4%) of the males and females were found to be heard about foods that can prevent or reduce the risk of breast cancer.

When we asked the participants the question “Do you think body weight is a risk factor for breast cancer?” Only 209/558(37.4%) said yes and the remaining 349(62.6%) answered no. Out of the 165 males, 65/165(39.4%) and 144/393(36.5%) of the males and females were found to believe that body weight is a risk factor for breast cancer.

When we asked the participants the question “If the body weight is a risk factor for breast cancer: when it is”, About 282(61.4%), 82(17.8%) and 130(28.3%) assumed yes when increased, decreased and both (increases & decreases), respectively. Out of 137 males’ respondents, 85(62%), 27(19.7%), and

25(18.2%) assumed yes when increased, decreased and both (increases & decreases), respectively. Out of 322 females’ respondents, 197(61.2%), 20(6.2%), and 105(32.6%) assumed yes when increased, decreased and both (increases & decreases), respectively.

**Table-3: Distribution of the education of the study population by knowledge about the relationship between breast cancer and diet or body weight**

Variable	Category	basic	Secondary	University	Total
Do you know food that can prevent or reduce the risk of breast cancer					
	Yes	11	3	67	81
	NO	94	42	340	476
	Total	105	45	407	557
Do you know food that can cause or increase the risk of breast cancer					
	Yes	11	5	32	48
	NO	94	40	375	509
	Total	105	45	407	557
Do you ever heard about any food that can prevent or cause cancer					
	Yes	78	34	262	374
	No	27	11	145	183
	Total	105	45	407	557
Do you think body weight is a risk factor for breast cancer					
	Yes	33	25	151	209
	No	72	21	256	349
	Total	105	46	407	558
If the body weight is a risk factor for breast cancer: when it is					
	Increased	46	15	221	282
	Decreased	2	2	43	47
	Both	35	17	78	130
	Total	83	34	342	459

Table 3 summarizes the distribution of the education of the study population by knowledge about the relationship between breast cancer and diet or body weight. On asking the participants “Do you know food that can prevent or reduce the risk of breast cancer?” 11/105 (10.5%), 3/45(6.7%) and 67/407(16.5%), of those at basic education, secondary and university level of education respectively, answered yes. On asking the participants “Do you know food that can cause or increase the risk of breast cancer?” 11/105 (10.5%), 5/45(11%) and 32/407(7.9%), of those at basic education, secondary and university level of education respectively, answered yes. On asking the participants “Do you ever heard about any food that can prevent or cause cancer?”, 78/105 (74.3%),34/45(75.6%) and 262/407(64.4%), of those at basic education, secondary and university level of education respectively, answered yes, as shown in Fig 2.

On asking the participants “Do you think body weight is a risk factor for breast cancer?” 33/105 (31.4%), 25/45(55.6%) and 151/407(37%), of those at basic education, secondary and university level of education respectively, answered yes. On asking the participants “If body weight is a risk factor for breast cancer: when it is increased?” 46/83 (55.4%), 15/34(44%) and 221/342(64.6%), of those at basic education, secondary and university level of education respectively, answered yes. When it is decreased?” 2/83 (2.4%), 2/34(5.9%) and 43/342(10.6%), of those at basic education, secondary and university level of education respectively, answered yes. Both when it is increased or decreased?”, 35/83 (42.2%),17/34(50%) and 78/342(22.8%), of those at basic education, secondary and university level of education respectively, answered yes, as indicated in Table 3, Fig 2.

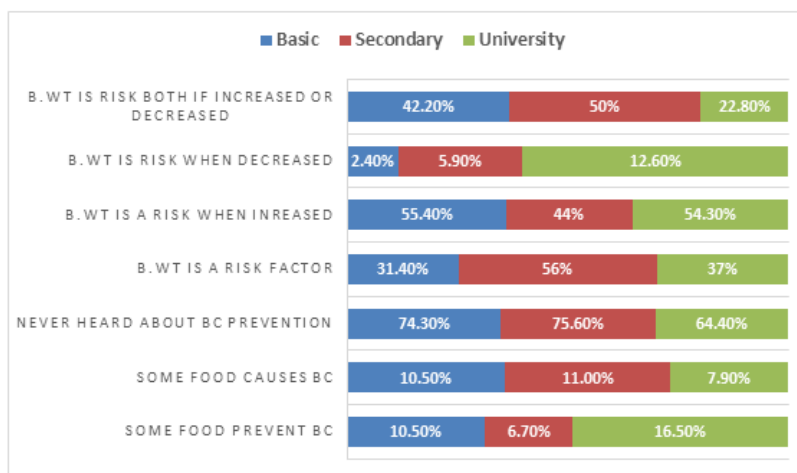


Fig-2: Description of the education of the study population by knowledge about the relationship between breast cancer and diet or body weight

Table-4: Distribution of the age of the study population by knowledge about the relationship between breast cancer and diet or body weight

Variable	Category	<20years	21-24	25-29	30-34	35+	Total
Do you know food that can prevent or reduce the risk of breast cancer							
	Yes	21	68	14	11	21	135
	NO	74	174	53	39	82	422
	Total	95	242	67	50	103	557
Do you know food that can cause or increase the risk of breast cancer							
	Yes	16	15	4	3	10	48
	NO	79	227	63	74	93	509
	Total	95	242	67	50	103	557
Do you ever heard about any food that can prevent or cause cancer							
	Yes	58	159	49	36	72	374
	No	37	83	18	14	31	183
	Total	95	242	67	50	103	557
Do you think body weight is a risk factor for breast cancer							
	Yes	47	86	21	18	37	209
	No	47	157	46	33	66	349
	Total	94	243	67	51	103	558
If the body weight is a risk factor for breast cancer: when it is							
	Increased	36	144	28	24	50	282
	Decreased	9	26	7	3	2	47
	Both	27	43	20	11	29	130
	Total	72	213	55	38	81	459

Table 4 summarizes the distribution of the age of the study population by knowledge about the relationship between breast cancer and diet or body weight. On asking the participants” Do you know food that can prevent or reduce the risk of breast cancer?” Out of the 135 persons answered yes, the majority were at age group 21-24 followed by both < 20years & 35+ representing 68/135(50.4%), 21/135(15.6%), in this order.

On asking the participants” Do you know food that can cause or increase the risk of breast cancer?” Out of the 48 persons answered yes, the majority were at age group <20 years followed by 21-24 and 35+

representing 16/48(33.3%), 15/48(31.3%) and 10/48(20.8%) correspondingly.

On asking the participants” Do you ever heard about any food that can prevent or cause cancer?” Out of the 374 persons answered yes, the majority were at age group 21-24 years followed by 35+ years and <20years, representing 159/374(42.5%), 72/374(19.3%) and 58/374(15.5%), correspondingly.

On asking the participants” Do you think body weight is a risk factor for breast cancer?” Out of the 209 persons answered yes, the majority were at age group 21-24 years followed by <20 years and 35+,

representing 86/209(41%), 47/209(22.5%) and 37/209(17.7%), correspondingly.

On asking the participants "If the body weight is a risk factor for breast cancer: when it is increased?" Out of the 282 persons answered yes, the majority were at age group 21-24 years followed by 35+ years and <20 years, representing 144/282(51%), 50/282(17.7%) and 36/282(12.8%) respectively.

When it is decreased?" Out of the 47 persons answered yes, the majority were at age group 21-24 years followed by <20 years and 25-29 years, representing 26/47(55.3%), 9/47(19%) and 7/47(14.9%), respectively. When it is increased or decreased?" Out of the 130 persons answered yes, the majority were at age group 21-24 years followed by 35+ years and <20 years, representing 43/130(33%), 29/130(22.3%) and 27/130(20.7%) respectively.

## **DISCUSSION**

Breast cancer incidence rates have increased during the recent years in Saudi Arabia, with many patients still being diagnosed at more advanced stages of the disease [21]. Several studies attributed the increased breast cancer cases to the increased exposure to breast cancer risk factors, which were adopted from western life style in addition to low prevention and early detection efforts [22, 20]. Therefore, the aim of the present study was to evaluate the level of knowledge and awareness towards the association between breast cancer and life style modifications in Northern Saudi Arabia. It noticeably that most of the study subjects in the present study were at younger age with better education levels (Most were at university). These factors may suggest better knowledge and awareness level towards breast cancer risk factors.

When we asked the participants the question "Do you know food that can prevent or reduce the risk of breast cancer?" Only 14.5% claimed that they know the relationship between diet and risk of breast cancer. These results showed very poor knowledge among participants. Diet has been shown to influence breast cancer incidence, recurrence, and prognosis [23]. Adherence to healthy dietary patterns (including whole grains, fruits, and vegetables, olive oil, and fish) seems to be favorable in not having breast cancer, among middle-aged women [24]. The consumption of total dietary fiber and fiber from vegetable and fruit was inversely associated with breast cancer risk. These inverse associations were more prominent in some subtypes of estrogen (ER) and progesterone (PR) breast cancers [25].

When we asked the participants the question "Do you know food that can cause or increase the risk of breast cancer?", only 8.6% said "yes". Several studies have investigated the association between intake

of meat cooked at high temperatures and heterocyclic amine exposure and risk of breast cancer [26,27]. Intake of animal fat, mainly from red meat and high-fat dairy foods, during premenopausal years is associated with an increased risk of breast cancer [28].

When we asked the participants the question "Do you think body weight is a risk factor for breast cancer?" About 37.4% stated "yes". Higher body mass index, pre- or post-diagnosis, was associated with a higher risk of breast cancer-specific mortality in older patients, independent of comorbidities and stage at diagnosis. Weight management should be discussed even with women aged 65 years or older to lower rates of breast cancer-specific mortality [29]. Recent large-scale studies have confirmed the effectiveness of the evidence-based recommendations against BC risk, emphasizing low-energy density diets, highly nutritious plant-based regimes, physical activity, and body/abdominal adiposity management. Better understanding of dietary inter-relationships with BC, as applied to food intake, selection, combination, and processing/preparation, and recommended patterns, for example, Mediterranean, plant-based, low energy density, and low glycemic load, with high nutrient/phytonutrient density, would increase public motivation and authoritative support for early/timely prevention, optimally merging with other dietary/health goals, for lifelong BC prevention [30].

However, the diverse response to different questions regarding the relationship between body weight and risk of breast cancer indicates very poor knowledge and awareness levels among the study population in the current study. On the basis of the available evidence [31-33], recommendations from the World Cancer Research Fund and the American Institute for Cancer Research on diet, physical activity, and weight management include: maintain adequate body weight; be physically active; limit the intake of high-energy density (ED) foods; eat mostly plant foods; limit the intake of animal foods; limit alcohol intake; limit salt and salt-preserved food intake; and meet nutritional needs through diet; and special recommendations (S1) breastfeed infants exclusively up to 6 months and (S2) after cancer treatment—follow the recommendations for breast cancer prevention.

In view of these recommendations, the Northern Saudi Arabia need intensive educational programs taking into account these measures together with community barriers. Lifestyle changes are an important factor for prevention of breast cancer. Such changes include reducing weight, adopting a suitable diet, changing unnecessary drugs, etc. Also, in women who are diagnosed and are under treatment for breast cancer, lifestyle changes can reduce the recurrence rate and increase the chance of survival.

## CONCLUSION

The level of knowledge and awareness toward breast cancer and lifestyle related risk factors are very poor in Northern Saudi Arabia. Women should be educated about the role of lifestyle changes in the prevention of breast cancer and their role in the survival and recurrence rate in patients with breast cancer. More studies are needed to assess the role of education in lifestyle changes, to decrease the incidence and recurrence of breast cancer, and to increase the survival rate.

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