RESEARCH ARTICLE

Knowledge and Perceptions of Common Breast Cancer Risk Factors in Northern Saudi Arabia

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Abstract

   Background: Breast cancer is the second leading cause of cancer death in women around the world. The degree of adoption of a preventive lifestyle offers valuable information for planning appropriate intervention programs for improving women's health. The objective of the present study was to assess the levels of breast cancer related knowledge among a Northern Saudi population. **Methodology:** In this cross sectional study, data were obtained from 566 Saudi volunteers living in the city of Hail, the Kingdom of Saudi Arabia (KSA). **Results:** With regard to breast cancer risk factors, 427/566 (75.4%) of participants answered in the affirmative to whether breast cancer could be inherited. For early puberty and late menopause, 209/566 (37%) were in agreement with increased risk, for low and delayed child birth, 261/566 (46%), and for overweight and obesity, 210/566(37%). For the question of whether natural breast feeding can reduce the risk of breast cancer, only 35/566 (6.2%) said yes. **Conclusion:** There is a general lack of knowledge regarding several BC risk factors among the northern Saudi community which necessitates urgent implementation of educational programs.

Keywords: Breast cancer- awareness- prevention- Saudi Arabia

Introduction

   Breast cancer (BC) continues to be a major public health problem worldwide in both developed and developing countries. It is the second leading cause of cancer death in women around the world (Ferlay et al., 2015). Although, BC rates are increasing in developed as well as developing countries, there is marked geographical variation in incidence rates, being highest in the developed world and lowest in the developing countries in Asia, Middle East, and Africa (IARC, 2008). BC carries significant socio-economic, emotional, and public health consequences.

   BC incidence rates in Arab women have increased during the last 24 years, but women are still being diagnosed with BC at more advanced stages of the disease (Al-Saad et al., 2009; Miller 2010; Brown et al., 2012; Othman et al., 2015). Despite the low cancer incidence in the KSA, the country must be prepared to face the challenge of predictable increase in cancer burden attributed to growth and aging of population (Ibrahim et al., 2008).

   In the Kingdom of Saudi Arabia (KSA), breast cancer is considered as the most common malignancy and represents the second leading cause of cancer deaths after lung cancer (Saggu et al., 2015). In Saudi Arabia, studies reported insufficient awareness about breast cancer and its early detection methods, which have a negative influence on the practice of breast self-examination among females (Radi, 2013).

   Although multiple risk factors may enhance the likelihoods of developing breast cancer, but lifestyle factors appear to have a greater impact on it. Prevention has been recommended as an effective way to decrease the burden of BC (Khazaee-Pool et al., 2014a; Khazaee-Pool, et al., 2014b). Furthermore, a health-promoting lifestyle has been recommended for BC prevention (Magné, et al., 2011; Khazaee-Pool et al., 2017).

   A number of BC risk factors have been recognized in different geographical regions and ethnic groups (Rosner et al., 1994; Lipworth, 1995). These include genetic, reproductive, environmental and socioeconomic risk

factors, (Dumitrescu and Cotarla 2005) obesity, young age at menarche, late age at first child, short period of lactation and being physically inactive (Jemal et al., 2011; Naser et al., 2014).

Examining BC preventive lifestyles offers valuable information for planning appropriate intervention programs for improving women's healthy lifestyle. Community educational programs that implement thoroughly Knowledge regarding these risk factors absolutely prevent many cases and render early detection of others. Therefore, the aim of the present study was to assess the levels of breast cancer related knowledge among Northern Saudi population.

Materials and Methods

This is a cross sectional study, data were obtained from 566 Saudi volunteers living in the city of Hail, the Kingdom of Saudi Arabia (KSA). Participants were randomly selected by simple random regardless to age, gender and education.

Purposeful questionnaire was designed and used for collection of the required data. The following information were obtained from each participant: age, sex, BC may be inherited, hormonal exposure (Estrogen (RE)) increase the risk of BC, do you think that some food can prevent BC, do you think that some food can cause BC, don't food can prevent or cause BC, Know some food can prevent and cause BC, early puberty and late menopause increase the risk of BC, delayed and repeating child birth increase the risk of BC, natural breast feeding decreases the risk of BC, overweight or obesity increase the risk of BC, cosmetics increase the risk of BC, radiation exposure increases the risk of BC, cigarette smoking and some viruses increase the risk of BC.

Data analysis

Statistical Package for Social Sciences (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

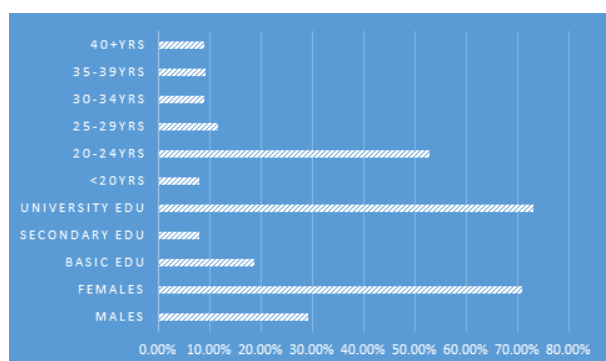Each participant was asked to sign a written ethical

Figure 1. Description of The Study Population by Demographical Characteristics

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, KSA) Research Board.

Results

This surveyed 566 volunteers living in city of Hail, Northern Kingdom of Saudi Arabia (KSA), their ages ranging from 14-52 years with a mean age of 26 years. Out of 566 participants, 165/566 (29.2%) were males and 401/566 (70.8%) were females. Out of the 566 participants, 106-566 (18.7%) were with basic education level, 46/566(8.1%) were with secondary education and 414/566 (73.1%) were with university education level. With regard to the age, the majority of the study population were at age group 20-24 years representing 299/566(52.8%), followed by age ranges 25-29, 35-39, 30-34,40+ and <20 years constituting 67/566(11.8%), 52/566(9.2%), 51/566(9%), 51/566(9%) and 46/566(8.1%), respectively, as shown in Figure 1.

The distribution of males and females was relatively comparable among all age groups. For males the majority were at age group 20-24 years followed by 25-29 representing 129/165 (78.2%) and 18/165 (10.9%)
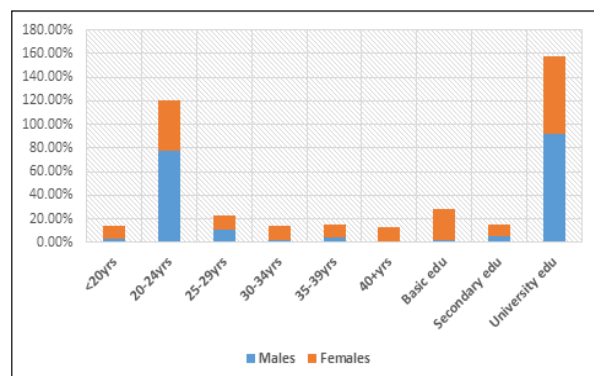

Figure 2. Description of the Study Population by Age, Education and Sex

Table 1. Distribution of the Study Population by Age, Education and Sex

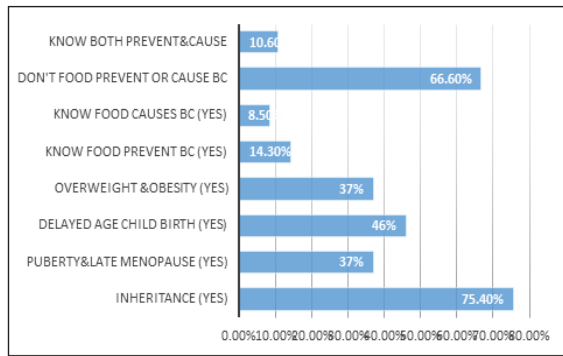| Variable	Category	Males	Females	Total
Age				
	<20 years	6	40	46
	20-24	129	170	299
	25-29	18	49	67
	30-34	4	47	51
	35-39	7	45	25
	40+	1	50	51
	Total	165	401	566
Education				
	Basic	4	102	106
	Secondary	9	37	46
	University	152	262	414
	Total	165	401	566

Figure 3. Description of the Study Population by Positive Response BC Risk Factors
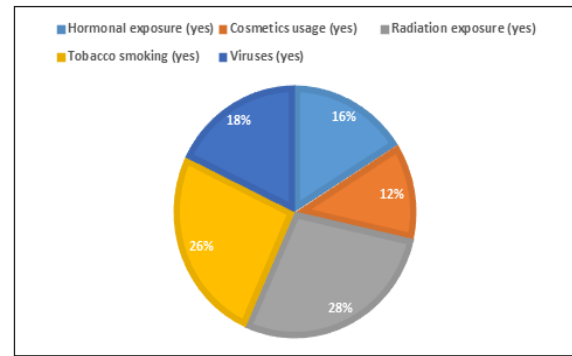

Figure 4. Description of the Study Population by Positive Response (Yes) BC Risk Factors

respectively. For females the majority were at age range 20-24 years followed by 40+ constituting 170/401 (42.4%) and 50/401 (12.5%) in this order, as indicated in Table1, Figure 2.

With regard to the education level, the majority males were at university level followed by secondary school level representing 152/165 (92%) and 9/165 (5.5%) respectively. Moreover, the majority of females were at university level followed by basic education level constituting 262/401 (%) and 102/401 (%) respectively, as indicated in Table 1, Figure 2.

With regard to breast cancer risk factors, when asking participants, whether breast cancer can be inherited or not, 427/566 (75.4%) answered yeas and the remaining 139/566 (24.6%) answered no. For early puberty and late menopause, whether they risk for breast cancer, 209/566

(37%) agree and the remaining 357 (63%) disagree. For low and delayed child birth, whether they risk for breast cancer, 261/566 (46%) agree and the remaining 305 (54%) disagree. For natural breast feeding, whether it can reduce the risk of breast cancer, only 35/566 (6.2%) agree and the remaining 531/566 (93.8%) disagree. For overweight and obesity, whether it can increase the risk of breast cancer, only 210/566 (37%) agree and the remaining 356/566 (63%) disagree.

When asking them about their knowledge and perception about food, 81/566 (14.3%) were found to know that certain types of food can prevent or reduce the

Table 2. Distribution of the Study Population by Sex and Breast Cancer Risk Factors

Variable	Category	Males	Females
Think some food prevent BC	Yes	25	56
Think some food cause BC	Yes	11	37
Don't food prevent or cause BC	Yes	116	261
Know some food prevent and cause BC	Yes	13	45
	Total	165	399
Early puberty and late menopause increase the risk of BC			
	Yes	70	139
	NO	93	257
	Total	163	396
Delayed and repeating child birth increase the risk of BC			
	Yes	90	171
	No	72	226
	Total	162	397
Natural breast feeding decreases the risk of BC			
	Yes	13	23
	No	150	375
	Total	163	398
Overweight or obesity increase the risk of BC			
	Yes	100	255
	No	65	145
	Total	165	400

Table 3. Distribution of the Study Population by Sex and Breast Cancer Risk Factors

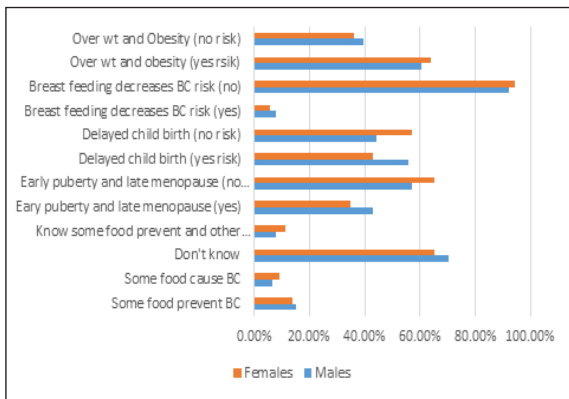| Variable	Category	Males	Females
Inheritance			
	Yes	132	290
	No	33	106
	Total	165	396
Hormones			
	Yes	85	185
	No	77	203
	Total	162	388
Cosmetics			
	Yes	92	117
	No	70	280
	Total	162	397
Radiation			
	Yes	146	327
	No	18	69
	Total	164	396
Smoking			
	Yes	141	287
	No	24	114
	Total	165	401
Viruses			
	Yes	89	206
	No	77	188
	Total	165	394

Figure 5. Description of the Study Population by Positive Response (Yes) BC Risk Factors and Sex

risk of breast cancer, 48/655 (8.5%) were found to know that certain types of cause or increase the risk of breast cancer, 377/566 (66.6%) don't know any food that can prevent or cause cancer and the remaining 60/566 (10.6%) were found to know that certain types of food can prevent or lower the risk of breast cancer and other can cause or increase the risk, as shown in Figure 3.

With regard to hormonal exposure (estrogen) after menopause, 270/566 (47.7%) believe that it increases the risk of breast cancer and the remaining 296/566 (52.3%) don't believe that. About 210/566 (37%) think that intensive and prolonged use of certain cosmetics can increase the risk of breast cancer and the remaining 356/566 (63%) don't.

With regard to radiation exposure, 473/566 (83.6%) think that exposure to radiation may increase the risk of breast cancer and the remaining 93/566 (16.4%) don't. Moreover, 428/566 (75.6%) believe that smoking is a risk factor for breast cancer and the remaining 138/566 (24.4%) don't. Around 301/566 (53%) think that certain types of viruses can contribute to the etiology of breast cancer and the remaining 265/566 (47%) don't, as shown in Figure 4.

With regard to the knowledge toward different BC risk factors and sex. Out of 165 males 25 (15.2%), 11 (6.7%), 116 (70.3%) and 13 (7.9%) participants believe that some food prevent BC, some food cause BC, don't food prevent or cause BC, know some food prevent and cause BC, respectively. Out of 399 females 56 (14%), 37 (9.3%), 261 (65.4%) and 45 (11.3%) participants believe that some food prevent BC, some food cause BC, don't food prevent or cause BC, know some food prevent and cause BC, respectively.

Out of 163 males, 70 (43%) believe that early puberty and late menopause increase the risk of BC and the remaining 93 (57%) don't. Out of 396 females, 139 (35%) believe that early puberty and late menopause increase the risk of BC and the remaining 257(65%) don't.

Out of 163 males, 90 (55.6%) believe that delayed and repeating child birth increase the risk of BC and the remaining 72 (44.4%) don't. Out of 397 females, 171 (43%) believe that early puberty and late menopause increase the risk of BC and the remaining 226 (57%) don't.

Out of 163 males, 13 (8%) believe that natural breast feeding decreases the risk of BC and the remaining 150
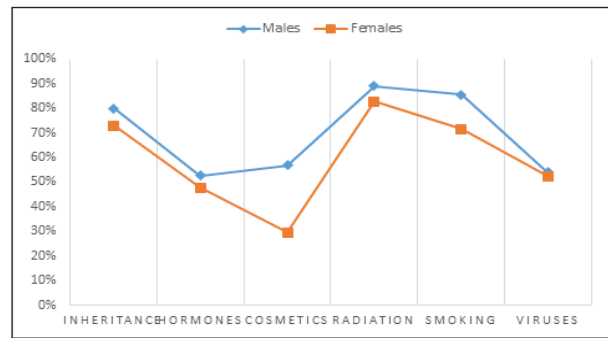

Figure 6. Description of the Study Population by Positive Response (Yes) BC Risk Factors and Sex

(92%) don't. Out of 398 females, 23 (5.8%) believe that early puberty and late menopause increase the risk of BC and the remaining 375 (94.2%) don't.

Out of 165 males, 100 (60.6%) believe that overweight or obesity increase the risk of BC and the remaining 65 (39.4%) don't. Out of 400 females, 255 (63.8%) believe that early puberty and late menopause increase the risk of BC and the remaining 145 (36.2%) don't, as indicated in Table 2, Figure 5.

Table 3 summarizes the distribution of the study population by sex and breast cancer risk factors. For inheritance as a risk factor, 33 (20%) out of 165 males don't know, whereas, 106 (26.8%) out of 396 females don't know, that breast cancer has inherited genes. For hormonal exposure (ER) as a risk factor, 77 (46.7%) out of 165 males don't know, whereas, 203 (52.3%) out of 397 females don't know. For some cosmetics as a risk factor, 70 (42.4%) out of 165 males don't know, whereas, 280 (70.5%) out of 396 females don't know. For radiation exposure as a risk factor, 18 (10.9%) out of 165 males don't know, whereas, 69 (17.4%) out of 396 females don't know. For tobacco smoking as a risk factor, 24 (14.5%) out of 165 males don't know, whereas, 114 (28.4%) out of 401 females don't know. For some viruses as a risk factor, 77 (46.7%) out of 165 males don't know, whereas, 188 (47.7%) out of 394 females don't know, as shown in Figure 6.

Discussion

The present study assessed the knowledge and perception of the northern Saudi population towards some common BC risk factors. Due to low response of the less educated individuals, the great majority of the participants were with university level of education. This may give rise to the highest level positive knowledge and perception towards the evaluated risk factors. On the other hand most of the study population were at relatively younger age. This may give rise to relatively higher level negative knowledge and perception towards the evaluated risk factors. Moreover, the response of males was very low, since most think that BC is a women issue.

Although many developing countries have implemented preventive efforts to fight BC with variable levels of success, but new breast cancer rates are still in elevation in many countries.

In the present study 24.6% of the study subjects

believed that BC can't be inherited, though this fact was established for decades (Apsalikov et al., 2016; Kuchenbaecker et al., 2017). About 63% of the study subjects think that early puberty and late menopause don't increase the risk of breast cancer, which is relatively higher percentage. Early puberty and/or late menopause, later age at first pregnancy as well as a family history are well established BC risk factors (Espié et al., 2013). Around 54% of the study subject believe that age at first child birth (late age pregnancy) is not a risk factor of BC. Although several studies showed that the risk factors most strongly associated with breast cancer including age, place of residence, family risk, genetics, reproductive history, hormones exposure, tobacco use, alcohol intake, physical activity, participation in screening and breast density (Tapia et al., 2017; Peiris et al., 2017).

On the other hand only 6.2% of the participants believe that natural breast feeding can reduce the risk of breast cancer. Breastfeeding reduces women's risk of breast cancer. Since exclusive breastfeeding has a stronger hormonal effect, it could theoretically result in a greater reduction in breast cancer risk than any breastfeeding mode. No meta-analysis has examined breast cancer risk by breastfeeding mode (Unar-Munguía et al., 2017).

In the present study, 63% of the participants believe that overweight and obesity don't increase the risk of BC. There is growing scientific evidence linking excess body weight to BC risk, particularly among postmenopausal women (Kruk, 2014; Munsell et al., 2014).

Approximately 66.6% of the participant don't whether there are certain types of food can prevent or increase the risk of BC. Vitamin C intake has been inversely associated with breast cancer risk in case-control studies (Hutchinson et al., 2012). Mate' intake showed strong inverse associations with some high-risk hormone-related factors: early menarche, nulliparity, low breastfeeding, long reproductive years and high number of ovulatory cycles (Ronco et al., 2017). Several epidemiological investigations have been conducted to evaluate the relationship between dietary cholesterol intake and risk of breast cancer. A meta-analysis indicated that dietary cholesterol was associated with an increased risk of breast cancer (Li et al., 2016).

About 52.3% of the participants in the present study believe that hormonal exposure (estrogen) after menopause is not a risk factor of BC. Hormonal contraceptives and hormone replacement therapies are classified as carcinogenic to humans (group 1) by the International Agency for Research on Cancer (IARC) (Grevers et al., 2012). Around 37% persons think that intensive and prolonged use of certain cosmetics can increase the risk of breast cancer. Role of hair dyes in the etiology of breast cancer has occasionally raised concern but some studies found that use of hair dyes is associated with breast cancer incidence. Remnants of prohibited aromatic amines have been found in many hair dye products, and elevated levels of DNA-adducts of these amines have been detected from breast epithelial cells of hair dye users. However, the IARC working group has concluded that there is inadequate evidence for carcinogenicity of personal hair dye use and limited evidence in experimental animals for

carcinogenicity of hair colorants (Heikkinen et al., 2015). Furthermore, many cosmetic products have been reported as carcinogenic particularly for breast (Darbre et al., 2014; Myers et al., 2014).

In the current study 83.6% think that exposure to radiation may increase the risk of breast cancer. Epidemiological studies have indicated an increasing incidence of radiation induced secondary cancer (SC) in breast cancer patients after radiotherapy (RT), most commonly in the contra-lateral breast (CLB) (Athiyaman et al., 2016). The occupational X-ray radiation exposure was associated with increasing cancer risk, which indicates that proper intervention and prevention strategies may be needed in order to bring down the occupational cancer risk (Wang et al., 2015).

Moreover, 75.6% of the study subjects believe that tobacco smoking is a risk factor for breast cancer and the remaining 138/566(24.4%) don't. It was reported that passive smoking is associated with an increased risk of breast cancer, and the risk seems to increase as the level of passive exposure to smoke increases. Women with passive exposure to smoke in the workplace have a higher risk of breast cancer than those exposed to their husband's smoking (Chen et al., 2014).

About 53% of the study population in the present study think that certain types of viruses can contribute to the etiology of breast cancer and the remaining 265/566(47%) don't. There have been several reports on the role of human papillomavirus (HPV) in the etiology of breast cancer. It was reported that that women who develop viral warts are at a significantly higher risk of developing breast cancer than women who have not diagnosed with viral warts (Atique et al., 2017).

In a study assessed the levels of breast cancer awareness among Saudi females, and to compare between house wives and employee's women regarding knowledge and practical of breast cancer. The majority of participants showed good knowledge regarding risk factors of breast cancer (93.3%), family history, contraceptive hormones, wearing tight bra, obesity, late menopause, and bearing the first child after age 30 years, (75%, 71.7%, 63.7%, 55.3%, 43.7%, 41.3%, respectively) (Mohammed et al., 2014). Another study from found that, about 26.4% believe that breast cancer affect females only, hence, 4.3% believe that breast cancer affect males only. Also the knowledge in regard to the breast cancer inheritance was very low, only 7.9% believed that breast cancer can be inherited (Ahmed et al., 2017).

In cross-sectional survey performed on male high school students across schools in Jeddah concluded that, knowledge of BC among male high school students in Saudi Arabia is still limited, and, therefore, programs and activities need to be established to increase awareness among high school students (Al-Amoudi et al., 2016). Another study evaluated the level of breast cancer awareness and perceived barriers to seeking medical care among Saudi women, using internationally validated tool, emphasized the critical need for an effective national breast cancer education program to increase public awareness and early diagnosis (Al-Khamis, 2016). Another study to identify breast cancer knowledge, practice and screening

barriers among women attending primary health centers (PHC) in Madinah, Saudi Arabia, concluded that the high levels of poor knowledge about cancer breast observed in this study reflect the need for greater efforts to increase breast awareness education (Al-Zalabani et al., 2016). In other regions of Saudi Arabia; Al-Qassim it has been reported that the level of awareness of the females regarding breast cancer and BSE is not adequate and a health education program about breast cancer should be introduced in the region (Jahan et al., 2006).

The limitations of this study were its cross sectional settings, as well as, the clustering of participants among educated relatively younger age section.

In conclusion, the findings of the current study may help health experts and policy makers to be aware of the vital role of cultural and operational strategies in breast cancer prevention and control. Moreover, the findings of the present study will improve our understanding of the perspectives of the factors that influence BC prevention in relation to lifestyle.

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