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Breast Cancer Awareness and Approach toward Exposure to Diverse Patterns of Hormones among Women in Northern Saudi Arabia

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Abstract **Background:** Several studies have well-established the relationship between breast cancer and etiological hormonal factors. Therefore, the aim of this study was to determine breast cancer related awareness and approach toward exposure to diverse patterns of hormones among women in Northern Saudi Arabia. **Methodology**: This is a cross sectional survey included 400 Saudi females' volunteers living in the city of Hail, Northern Saudi Arabia. Knowledge, awareness and approach toward exposure to diverse patterns of hormones and breast cancer risk were evaluated using different variables during interview. **Results:** On asking the participants the question "Does the over exposure to hormones (ER) increases the risk of breast cancer" Out of 387 respondents, 47.5% answered yes increases the risk of breast cancer. On asking the participants the question "Does early puberty and late menopause increase the risk of breast cancer" Out of 395 respondents, 35.2% answered yes increases the risk of breast cancer. **Conclusion**: Knowledge of hormonal breast cancer risk factors is not so strong so as to achieve the intended values in Northern Saudi Arabia. Knowledge of breast cancer risk factors can powerfully participate to the breast cancer prevention struggles, which will have the chief results mainly if started at an early age and continued over a lifetime.

Keywords: *breast cancer, Awareness, risk factors, hormones, Saudi Arabia*

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1. Introduction

Breast cancer is a prevalent disease affecting all areas of the patients' lives [1]. Breast cancer incidence in countries with higher development is greater, while mortality is greatest in countries with less development [2]. Epidemiological characteristics of breast cancer seem to be dissimilar in developing countries compared to Western countries, with remarkably large proportions of young patients, male patients and aggressive forms of the disease. Such epidemiological characteristics result mostly from unusual risk factor profiles, which are distinctive for several developing countries and comprise notably fast alterations in reproductive behaviors. These characteristics have important implications for breast cancer control and treatment [3].

The relation between estrogen production and breast cancer development is well-known since 1896 when George Beatson reported that removal of the ovaries from premenopausal women with advanced breast cancer produced a dramatic decrease in tumor size [4], and the development of contraceptive drugs further inspired research on the estrogen system [5].

The relation between estrogens and breast cancer is built on the observation that an increased exposure to E2 in women during lifetime (early menarche, delayed menopause, null parity) was linked to an increased risk of developing breast cancer and ovariectomy was used to treat severe forms of the tumor [4].

About 2/3(rd) cases of breast cancer are related to hormone mediated malignancy itself. A hormone receptor positive breast cancer represents cells displaying rigorous proliferation upon hormonal exposure. BRCA1 is the predominant marker gene responsible for estrogen regulation [6]. Observations on the role of ovarian hormones in breast cancer growth, as well as interest in contraception, stimulated research into the biology of estrogens. The identification of the classical receptors ERα and ERβ and the transmembrane receptor GPER and the resolution of the structure of the ligand bound to its receptor established the principal molecular mechanisms of estrogen action. The presence of estrogen-like compounds in many plants used in traditional medicine or ingested as food ingredients, phytoestrogens, as well as the estrogenic activities of many industrial pollutants and pesticides, xenoestrogens, have prompted investigations into their role in human health. Phyto- and xenoestrogens bind to the estrogen receptors with a lower affinity than

the endogenous estrogens and can compete or substitute the hormone. Xenoestrogens, which accumulate in the body throughout life, are believed to increase breast cancer risk, especially in cases of prenatal and prepuberal exposure whereas the role of phytoestrogens is still a matter of debate. At present, the application of phytoestrogens appears to be limited to the treatment of post-menopausal symptoms in women where the production of endogenous estrogens has ceased [7].

The pattern of breast cancer in the Kingdom of Saudi Arabia is very disturbing. It usually presents at advanced stages and more frequently in young pre-menopausal women in comparison to western countries [8,9]. The deprived knowledge and incorrect beliefs about breast cancer prevention among women are responsible for a negative perception of the curability of a cancer detected early and of the usefulness of the avoiding risk factors.

This study aimed to determine breast cancer related awareness and approach toward exposure to diverse patterns of hormones among women in Northern Saudi Arabia.

2. Materials and Methods

In this descriptive cross sectional study, essential identification data about breast cancer risk factors were obtained from 400 Saudi females 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, breast cancer may be inherited, hormonal exposure (Estrogen (RE)) increase the risk of breast cancer, early puberty and late menopause increase the risk of breast cancer, delayed and repeating child birth increase the risk of breast cancer, natural breast feeding decreases the risk of breast cancer.

2.1. 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.

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

3. Results

This cross-sectional survey included 400 females living in the city of Hail, Northern Saudi Arabia, their ages ranging from 14 to 52 with a mean age of 28 years. The great majority of the study subjects were found at age group 21-24 years followed by 35+, < 20 years, 25-29 and 30-34 years representing 145, 95, 64, 49, and 47 respectively as shown in Figure 1.

With regard to the relationship of the study population by age and level of education, the great majority of the study subjects were found at university level representing 262/400(65.5%) followed by basic and secondary levels constituting 101/400(25.3%) and 37/400(9.2%), in this order. Most of the individuals with basic level of education were found among age range 35+ years followed by 30-34, and 25-29 years, representing 44/101(43.6%), 25/101(24.8%) and 20/101 (19.8%), respectively. Most of the individuals with secondary level of education were found among age range <20 years followed by 35+ and 25-29 years, representing 24/37(64.7%), 7/37(18.9%) and 5/37(13.5%), respectively. Most of the individuals with university level of education were found among age range 21-24 years followed by 35+ years and <20 years, representing 139/262(53.1%), 44/262(16.8%) and 34/262(13%), respectively, as indicated in Table 1, Figure 2.

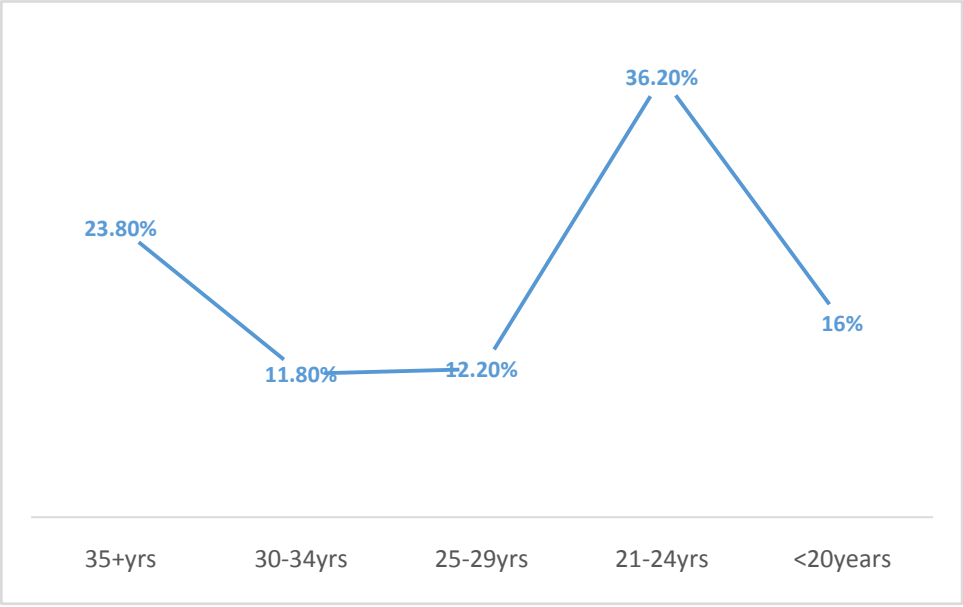

Figure1. Description of the study population by age

Table 1. Distribution of the study subjects by age, education and level of knowledge about breast cancer

Variable	Category	<20 years	21-24	25-29	30-34	35+	Total
Education							
	Basic	6	6	20	25	44	101
	Secondary	24	0	5	1	7	37
	University	34	139	24	21	44	262
	Total	64	145	49	47	95	400
Rate your current knowledge about breast cancer							
	Nothing	7	11	12	6	18	54
	Poor	23	37	15	14	36	125
	average	26	65	16	22	25	154
	good	7	30	6	5	16	64
	Total	64	145	49	47	95	400
Do you care to know about breast cancer?							
	Yes	8	19	6	6	4	43
	No	53	126	41	41	89	350
	Total	61	143	47	47	93	393
Is the breast cancer the commonest females' cancer in Saudi							
	Yes	54	128	42	38	81	343
	No	8	4	6	7	6	31
	Don't know	1	13	0	2	6	22
	Total	63	145	48	47	93	396

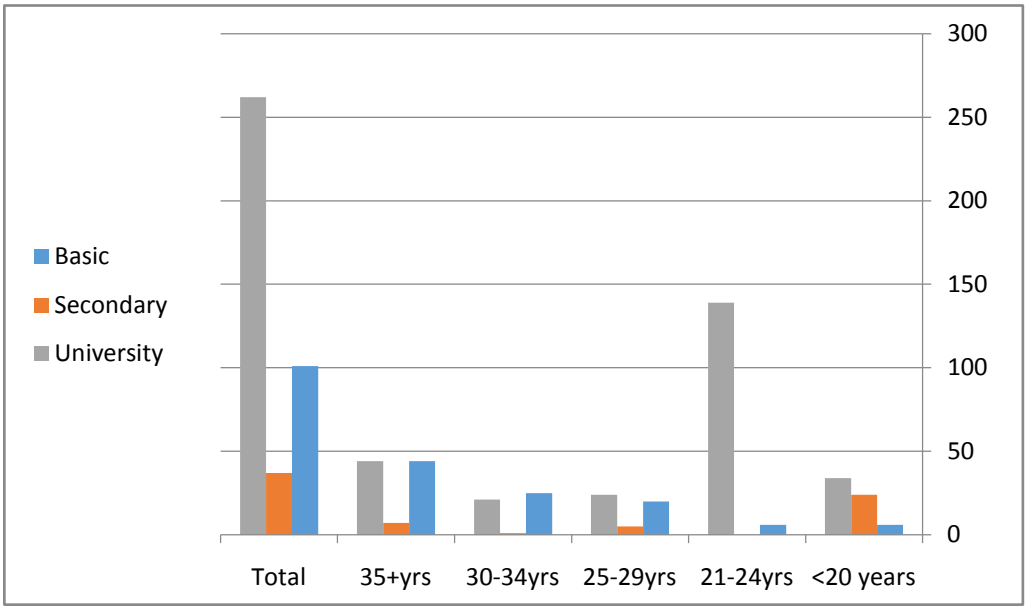

Figure 2. Description of the study population by age and level of education

When the participants were asked “Rate your current knowledge about breast cancer" Out of the 400 respondents, 154/400(38.5%), 125/400(31.3%), 64/400(16%) and 54/400(13.5%) have stated average, poor, good and know nothing, correspondingly. With regard to the age, out of the 154 individuals with average level, 65/154(42.2%), 26/154(16.9%), 25/154(16.2%) were found at age ranges, 21-24 years, <20 years, and 35+ years, respectively. For those indicated poor, the majority were found at age group 21-24 years followed by 35+ and <20 years, constituting 37/125(29.6%), 36/125(28.8%) and 23/125(18.4%), respectively. For those indicated good the majority were found at age group 21-24 years followed by 35+ years, constituting 30/64(46.9%), 16/64(25%), respectively, as indicated in Table 1.

When the participants were asked “Do you care to know about breast cancer?" Out of the 393 respondents, 43/393(10.9%) have stated yes, and the remaining 350/393(89.1%) have stated no. Out of the 43 positively stated, the majority of them were found at age group 21-24 years followed by < 20 years, constituting 19/43(35.8%) and 8/43(18.6%), respectively, as indicated in Table 1.

When the participants were asked “Is the breast cancer the commonest females' cancer in Saudi?" Out of the 396 respondents, 343/396(86.6%) have stated yes, 31/396 (7.8%) have stated no and 22/396 (5.6%) stated don't know. Out of the 343 positively stated, the majority of them were found at age group 21-24 years followed by 35+ years, constituting 128/343(37.3%) and 81/343 (23.6%), respectively, as indicated in Table 1.

Table 2. Distribution of the study subjects by age and level of knowledge about the relationship between breast cancer and hormonal exposure.

Variable	Category	<20 years	21-24	25-29	30-34	35+	Total
Does the over exposure to hormones (ER) increases the risk of breast cancer							
	Yes	24	90	19	17	34	184
	No	15	29	12	10	20	86
	Decreases the risk	18	24	17	19	39	117
	Total	57	143	48	46	93	387
Does early puberty and late menopause increase the risk of breast cancer							
	Yes	17	72	13	12	25	139
	No	40	51	26	29	59	205
	Decreases the risk	6	22	8	6	9	51
	Total	63	145	47	47	93	395
Does delayed child birth increases the risk of breast cancer							
	Yes	19	76	22	17	37	171
	No	41	58	22	26	48	195
	Decreases the risk	4	10	4	4	8	30
	Total	64	144	48	47	93	396
Does delayed natural breast feeding decreases the risk of breast cancer							
	Yes	46	121	41	42	85	335
	No	11	16	6	3	3	39
	increases the risk	7	7	1	2	6	23
	Total	64	144	48	47	94	397

Table 2, summarizes the distribution of the study subjects by age and level of knowledge about the relationship between breast cancer and hormonal exposure. On asking the participants the question "Does the over exposure to hormones (ER) increases the risk of breast cancer" Out of 387 respondents, 184, 84 and 117 answered Yes increases the risk of breast cancer, No and decreases the risk of breast cancer, respectively. The majority of those stated Yes were found among age group 21-24 years followed by 35+ years representing 90/184 (48.9%) and 34/184(18.5%), respectively.

On asking the participants the question "Does early puberty and late menopause increase the risk of breast cancer" Out of 395 respondents, 139, 205 and 51 answered yes increases the risk of breast cancer, No and decreases the risk of breast cancer, respectively. The majority of those stated Yes were found among age group 21-24 years followed by 35+ years representing 72/139 (51.8%) and 25/139(18%), respectively.

On asking the participants the question "Does delayed child birth increases the risk of breast cancer" Out of 396 respondents, 171, 195 and 30 answered yes increases the risk of breast cancer, No and Decreases the risk of breast cancer, respectively. The majority of those stated Yes were found among age group 21-24 years followed by 35+ years representing 76/171(44.4%) and 37/171(21.6%), respectively.

On asking the participants the question "Does delayed natural breast feeding decreases the risk of breast cancer" Out of 397 respondents, 335, 39 and 23 answered Yes increases the risk of breast cancer, No and Decreases the risk of breast cancer, respectively. The majority of those stated Yes were found among age group 21-24 years followed by 35+ years representing 121/335(36%) and 85/335(25.4%), respectively.

Table 3. Distribution of the study subjects by education and level of knowledge about the relationship between breast cancer and hormonal exposure

Variable	Category	Basic	Secondary	University	Total
Does the over exposure to hormones (ER) increases the risk of breast cancer					
	Yes	42	7	135	184
	No	23	12	51	86
	Decreases the risk	35	11	71	117
	Total	100	30	257	387
Does early puberty and late menopause increase the risk of breast cancer					
	Yes	24	12	103	139
	No	67	21	117	205
	Decreases the risk	9	2	40	51
	Total	100	35	260	395
Does delayed child birth increases the risk of breast cancer					
	Yes	36	8	127	171
	No	61	22	112	195
	Decreases the risk	4	5	2	30
	Total	101	35	260	396
Does delayed natural breast feeding decreases the risk of breast cancer					
	Yes	89	26	220	335
	No	5	7	27	39
	increases the risk	6	3	14	23
	Total	100	36	261	397

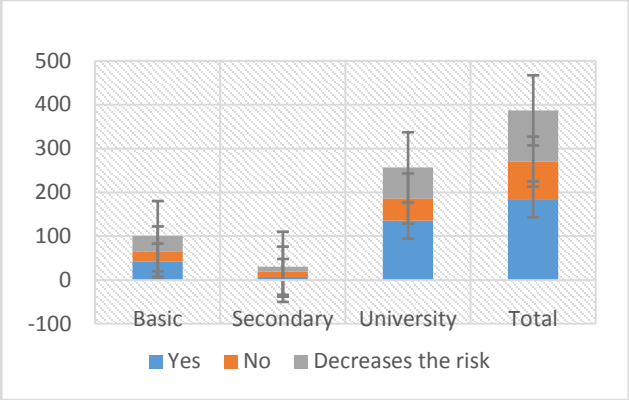

Figure 3. Does the over exposure to hormones (ER) increases the risk of breast cancer

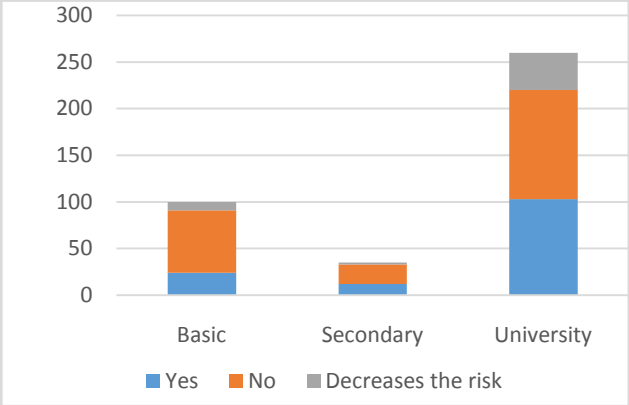

Figure 4. Does early puberty and early menopause increase the risk of breast cancer?

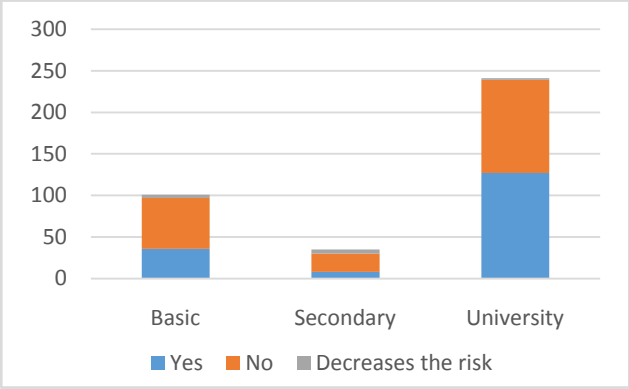

Figure 5. Does delayed child birth increases the risk of breast cancer

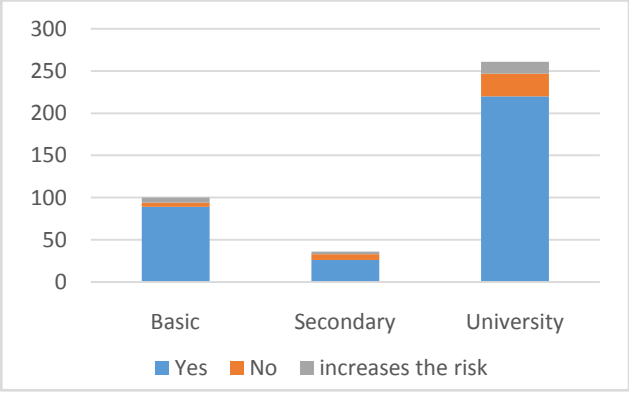

Figure 6. Does delayed natural breast feeding decreases the risk of breast cancer

Table 3 summarizes the distribution of the study subjects by education and level of knowledge about the relationship between breast cancer and hormonal exposure. When asking the respondents the question "Does the over exposure to hormones (ER) increases the risk of breast cancer" Out of the 184 stated "Yes", 135, 42 and 7 were at university level, basic and secondary level, respectively, as shown in Figure 3. When asking the respondents the question "Does early puberty and late menopause increase the risk of breast cancer" Out of the 139 stated "Yes", 103, 24 and 12 were at university level, basic and secondary level, respectively, as shown in Figure 4. When asking the respondents the question "Does delayed child birth increases the risk of breast cancer" Out of the 171 stated "Yes", 127, 36 and 8 were at university level, basic and secondary level, respectively, as shown in Fig 5. When asking the respondents the question "Does delayed natural breast feeding decreases the risk of breast cancer" Out of the 335 stated "Yes", 220, 89 and 26 were at university level, basic and secondary level, respectively, as shown Figure 6.

4. Discussion

In the present study, we evaluated breast cancer related awareness and approach toward exposure to diverse patterns of hormones among women in Northern Saudi Arabia. Breast cancer is influenced by multiple risk factors, which include the risk factors such as those linked to the hazardous effects of hormonal exposures such as early age at menarche, late age at menopause [10], fewer number of children and null parity, late age at first birth [11], little or no breastfeeding and long-term use of hormone replacement therapy (HRT) [12,13,14,15].

In the present study, on asking the participants the question "Does the over exposure to hormones (ER) increases the risk of breast cancer" Out of 387 respondents, 184 /387(47.5%) answered Yes increases the risk of breast cancer. Although, this percentage was lower than what was expected but it seemed relatively reasonable in a population. Estrogen hormones have an extensive impact on both normal development and tumorigenesis of the breast [16]. The IARC first established that there was adequate evidence that estrogen-only menopausal hormone therapy (MHT) was carcinogenic to human since 1999 [17]. In a subsequent report published in 2012, IARC also reported that there was sufficient evidence that estrogen plus a progestogen (combined MHT) was carcinogenic [18]. In a study reanalyzed around 90% of the global epidemiological evidence on the relationship between breast cancer risk and hormone replacement therapy (HRT) usage, breast cancer risk was found to increase in women using HRT and increases with increasing duration of use [19]. There is a paucity of data regarding HRT from KSA, the only one study undertaken this topic in 2003 and reported a prevalence rate of HRT of 5% [20]. A recent study from KSA have reported long term use of oral contraceptive pills (OCP) in KSA and its association within creased breast cancer risk [21].

On asking the participants the question "Does early puberty and late menopause increase the risk of breast cancer" Out of 395 respondents, 139 answered yes increases the risk of breast cancer. Menarche and

menopause denote the start and end, correspondingly, of reproduction age, and both affect breast cancer risk [22]. Although, the mechanisms underlying this association are not well understood, but may be due to elevated levels of estrogen both earlier [23] and later [24] in life in girls with earlier menarche.

On asking the participants the question "Does delayed child birth increases the risk of breast cancer" Out of 396 respondents, 171 answered yes increases the risk of breast cancer. It was strongly proven that women having their first birth before the age of 18 years old have only about one-third the breast cancer risk of those whose first birth after the age of 35 years. The influence of age at first birth in reducing breast cancer risk involves testing of varieties of etiological hypotheses [25].

On asking the participants the question "Does delayed natural breast feeding decreases the risk of breast cancer" Out of 397 respondents, 335 answered yes increases the risk of breast cancer. Results of a meta-analysis showed a protective effect of ever breastfeeding against breast cancers with hormone receptor-negative, which are more frequent in younger females and commonly have a poorer prognosis than other sub-types of breast cancer [26].The World Health Organization (WHO) has endorsed limited breastfeeding for 6 months after birth [27]. The existing practice of Saudi infants' feeding is extremely far from compliance with even the most conservative WHO endorsements of limited breastfeeding for 4–6 months. A study from Saudi Arabia showed that bottle feeding was introduced by 1 month of age to 51.4% of children and to 90% by 6 months of age [28]. These findings at least show that high pro-portions of Saudi mothers practice breastfeeding for short period of time, which may increase the risk of breast cancer.

5. Conclusion

In general knowledge of hormonal breast cancer risk factors is not so strong so as to achieve the intended values in Northern Saudi Arabia. Knowledge of breast cancer risk factors can powerfully participate to the breast cancer prevention struggles, which will have the chief results mainly if started at an early age and continued over a lifetime. Gaps in knowledge are rendered anticipated and deserve respected responsiveness to clarify prevention.

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