Breast cancer awareness and breast self-examination in Northern Saudi Arabia

A preliminary survey

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ABSTRACT

الأهداف: إلقاء الضوء على الوعي العام في مجتمع حائل بخصوص العوامل المؤدية الى سرطان الثدي والتصور العام لوجود حالات مرضية و درجة ممارسة الفحص الذاتي للثدي.

الطريقة: تم إجراء دراسة مقطعية لعينة من سكان مدينة حائل ومناطقها الريفية خلال الفترة من سبتمبر 2010م وحتى فبراير 2012م. وتم إجراء المقابلات الشخصية مع استخدام استبيان وصفي. تم تحليل البيانات باستخدام الإحصائيات الوصفية والاستنتاجية على حد سواء لتقييم العلاقة بين المتغيرات.

النتائج: ضم البحث 1000 مشارك و كان منهم 87.7% من الإناث و 7.2% من الذكور و 5.1% مشارك بدون ذكر الجنس وقد تراوحت أعمار المشاركين بين 66–12 عام. وقد تبين أن 44% من المشاركين لم يكن لديهم علم بسرطان الثدي كنمو غير طبيعي، بالإضافة إلى أن 78% لم يكن لديهم علم بتعدد أسبابه. كما أن 4.8% فقط من المشاركين اختاروا "التقدم في العمر" كعامل مسبب لسرطان الثدي و 61.5% اظهروا مستوى منخفض في الوعي حول سرطان الثدي. وكان 73% من المشاركين على معرفة شخص مريض بسرطان الثدي و50.1% اوضحوا بأن اكتشاف المرض لهؤلاء كان في "مرحلة متأخرة" وبشكل رئيسي عن طريق الصدفة (27.5%). وقد تبين أن 50.1% من الإناث المشاركات (16>) لا يمارسون الفحص الذاتي للثدي و أن"الخوف" هو السبب الرئيسي.

خاتمة: أظهرت هذه الدراسة قلة المعرفة بسرطان الثدي وخوف ممارسة الفحص الذاتي للثدي في منطقة حائل.

Objectives: To elicit knowledge of breast cancer, perception of occurrence, and behavior in relation to breast self-examination (BSE).

Methods: A cross-sectional survey was carried out at the Department of Pathology, Medical College, University of Hail, Hail, Kingdom of Saudi Arabia for local occupants from Hail city and its rural neighborhood between September 2010 and February 2012. A personal interview-administered descriptive questionnaire and both descriptive and inferential statistics were used.

Results: A total of 1000 participants agreed to be involved, out of which 87.7% were females, 7.2% were males and 5.1% had undisclosed gender. The age range for participants was 12-66 years. Out of all participants, 44% did not know that breast cancer is an abnormal growth and 78% failed to recognise its multi-factorial nature, with "Increased age" being the least recognised single risk factor 4.8%. Scores showed that 61.5% had a low level of breast cancer related knowledge. Out of the participants who knew of someone who had breast cancer 73%, 50.1% said the disease was discovered at a "Late stage" mainly by "Chance". Data for BSE indicated that 50.1% of female participants >16 years old did not practice BSE, and "Fear" was the main declared perceived reason.

Conclusion: This study demonstrates a low level of fundamental knowledge of breast cancer and fear to practice BSE.

Breast cancer represents 16% of all female cancers in the world.[1,2] It is a leading cause of death for women with cancer in all regions of the developing world.[3] In the Kingdom of Saudi Arabia (KSA) available data show a region-dependent disease incidence rate, with the highest reported rate in the western region of KSA, reaching up to 32.17 cases per 100,000, and the lowest in the eastern region of the country (Jizan) reaching up to 2.6 cases per 100,000, making breast cancer the most common cancer among Saudi women with an overall estimate of 21.6 cases per 100,000 in 2007.[4-7] Recent reports suggest that infiltrating duct carcinoma (Non-Otherwise Specified, NOS) is the most common morphology reported, reaching up to 79.4% of all cases in KSA.[7] Risk factors for breast cancer are well documented for European and American populations, with age over 65 years being the prominent factor after being an adult female.[8-10] Other factors include lack of exercise, poor diet, alcohol consumption, pollution, use of contraceptives, and hereditary factors. Early detection of breast cancer through mammography combined with physical examination has been shown to prevent approximately 20-40% of all deaths from breast cancer among women undergoing regular screening.[11,12] In regions where there is low utilization of mammography screening, breast self-examination (BSE) proves to be an easy and cost-effective method that has an important part to play in the early detection of breast cancer. Failure to practice BSE has been associated with delay in presentation, and thereafter with poor long-term survival.[13,14] Several studies conducted in different regions of Saudi Arabia have explored female knowledge and attitude towards breast cancer and BSE.[15-25] Major factors identified included lack of knowledge regarding the common risk factors for breast cancer, and lack of understanding of the importance of BSE. Alam[18] concluded that knowledge of BSE among women in Riyadh was high, however, 58% of their participants did not practice BSE. Interestingly in his study, knowledge of breast cancer, risk factors and protective factors for breast cancer was concluded to be moderate. In a second study, the level of knowledge for school students in Jeddah was concluded to be limited; however, no data on BSE was available.[21] Ravichandran et al[20] associated increase of practise of BSE with education. However, 77% of female participants did not practice BSE

and no association with breast cancer knowledge was investigated. Although education is important, other factors may hinder BSE practice. Nafissi et al[26] carried out a study on 650 females in Iran, and found 13% of females had neglected BSE because of "forgetting" or "fear". Similarly, a more recent study in Australia involving 253 undergraduate students showed reasons for not practicing BSE that include "forgetting", "lack of time", "laziness", and "lack of confidence".[27] Other factors contributing to the lack of BSE practice were seen in a UK study involving 200 female graduates.[28] These included believing that BSE lacks effectiveness or benefit, and that breast cancer is unlikely to happen to them. A recent study in Saudi Arabia addressed factors, other than education, that would prevent breast clinical examination by health care professionals and found that apart from patients not complaining, embracement and fear were important factors.[29]

The region of Hail, an area populated with highly consanguineous families and located 727 km north of Riyadh and 391 km South of Al Jouf, registers shortage in health care facilities compared to other regions in the Kingdom.[30] The age-standardized rate of female breast cancer in Hail was estimated to be 12.5 cases per 100,000 for the year 2007,[7] making breast cancer a disease of high relevance in the region. However, no awareness study was previously conducted in Hail. This study aimed to evaluate the level of breast cancer awareness in Hail by appraising the basic knowledge of breast cancer, perception of breast cancer occurrence, and behavior in relation to BSE, in addition, possible reasons for not practicing BSE were investigated.

Methods. *Study design and subjects.* This was a cross-sectional survey conducted at the Department of Pathology, Medical College, University of Hail, Hail, Kingdom of Saudi Arabia that assessed knowledge, attitude towards breast cancer and practice among occupants recruited from the region of Hail, north of KSA. One thousand participants were recruited over a period of 18 months from September 2010 to February 2012. No national population database listing of households in the local government area was available; therefore sampling was based on a non-probability technique where participants were recruited from within the university, relatives of students, random customers visiting the local market, and employees in the local hospital. For participants who declined participation, other participants were selected until the sample size of 1000 participants was reached. Since the estimated population size of Hail province during that selected period was 570,000,[31] this sample size

provided a confidence level of 95% with confidence intervals (CI) at 3.1%. Third- and fourth-year medical students involved in recruiting participants were trained in delivering a personal-assisted interview prior to administering the questionnaire to the participants. A gynecologist was available to advise participants upon their requests, and awareness leaflets enclosing the common symptoms and signs of breast cancer were provided after the completion of questionnaire.

Ethical consideration. Informed consent was obtained from participants prior to completing the questionnaires. The students made sure a full explanation of the study was provided to participants with the emphasis on the right of the subject not to participate or disclose information and confidentiality. Permissions were obtained from the local authorities as well as the University of Hail and the Medical College Council Committee, in compliance with the Helsinki Declaration, and in collaboration with Centre of Excellence In Genomic Medicine Research (CEGMR) bioethics committee at King Abdulaziz University. The latter body ethically approved the project and granted it ethical approval.

Tools for collecting data. The questionnaire was first developed and translated to Arabic based on information in the literature, searched through PubMed search engine on risk factors and common methods of early detection. Items were selected from the Breast Cancer Perceptions and Knowledge Survey.[32] The provisional questionnaire was pretested on a sample of women selected from the students' families. Due to the complications of this test including the inability and reluctance to complete answers, the questionnaire was simplified to contain the following sections: 1) socio-demographic characteristics, such as, age in years, gender, and occupational status; 2) knowledge of breast cancer nature and risk factors, this part was composed of 3 choice-type questions designed to elicit participant's knowledge in 3 main areas; and the basic nature of the disease, causing physiological factors, and possible causing behaviors. The participants had to choose factors related to the disease and an option of "I do not know" was available. Correct responses were given one point for choosing each of: breast cancer is an abnormal growth; breast cancer can be caused by "contraceptives"; high fat content diet; inheritance; lack of exercise; pollution; increased age; chronic stress; while other options including "I do not know" were given nil, yielding a maximal score of 8 points. The calculated reliability coefficient (Cronbach's alpha) of such scoring was 0.272; 3) perception of occurrence: This section elicited the respondents' experience of occurrence of disease in relatives and acquaintances, and when applicable the stage of discovery (This part was explained to participants as: early stage is a localised small lump approximately less than 2 cm of mass, or as declared by the patient),[33] success of treatment and reasons that may have led to discovery. Five closed-ended questions were included and participants had to choose from (Yes/ No/ I do not know) or to choose from a given list of factors; 4) BSE awareness and practice: 5 closed-ended questions were included in this section and participants had to choose from (Yes/ No/ I do not know) to show whether they had been informed of BSE, practice it, or are willing to discuss it with others. Questions used to elicit reasons of practice BSE or for the level of participant's willingness to discuss BSE with others had a given list of factors to choose from.

Data analysis was carried out using Statistical Package for the Social Sciences version 15 (SPSS Inc, IBM, Chicago, IL, USA). A study identification number identified each respondent. Both descriptive and inferential statistics were used as fitting.[34] Categorical data were expressed using frequencies, proportions, and percentages. Pearson chi-square test of independence, chi square test of significance, and the estimation of odds ratio (OR) with 95% CI were also used to report univariate analysis. Numerical data including knowledge scores were reported using medians, means, and standard deviations. The median summated score for the knowledge section (total of 8 points) was 2.0 with a 75th percentile of 3.0. Therefore, a cut off point of 3.0 was employed to classify the included participants into a less knowledgeable group ($\leq$3 points) and a more knowledgeable group ($\geq$3 points). For analysis of influence of age or occupation on knowledge scores, all questionnaire forms with undeclared occupation/ age items were discarded (n=225), thus a total of 775 subjects were included. For analysis for the influence of age/occupation/knowledge scores/being informed of BSE on BSE practice and communication, questionnaire forms with undeclared occupation, age, or gender items, and all forms filled out by males or females 16 years of age and under were discarded (n=306), thus a total of 694 subjects were included. A $p<0.05$ was applied as a level of significance.

Results. Out of the 1000 participants who agreed to complete the questionnaire, 877 (87.7%) females and 72 (7.2%) males were involved. The participants' age ranged between 12-66 years, with a mean of (26.5 ± 8.2) years and were grouped into 5 different sets: $\leq$16 (28 participants, 2.8%); 17-19 (142 participants, 14.2%); 20-29 (389 participants, 38.9%); 30-39

Table 1 - Results of direct univariate logistic regression analysis for the impact of age and occupation on the level of breast cancer knowledge scores for 755 participants included in a study conducted in Hail, Kingdom of Saudi Arabia.

Variables	Knowledge scores (N [%])		Univariate logistic regression analysis							P for χ^2
	<3 (N=472)	≥3 (N=303)	B	SE	OR	(95% CI)	P-value	χ^2		
Age								8.763		0.067
≤16	21 (75.0)	7 (25.0)	Reference							
17-19	83 (61.9)	51 (38.1)	0.612	0.471	1.84	(0.73-4.64)	0.194			
20-29	232 (63.6)	133 (36.4)	0.542	0.450	1.72	(0.71-4.15)	0.228			
30-39	98 (57.3)	73 (42.7)	0.804	0.463	2.23	(0.90-5.54)	0.082			
40 or older	38 (49.4)	39 (50.6)	1.125	0.492	3.08	(1.17-8.08)	0.022			
Occupation								15.156		0.002*
School student	35 (76.1)	11 (23.9)	Reference							
University student	168 (58.3)	120 (41.7)	0.742	0.369	2.01	(1.02-4.32)	0.044			
Housewife	92 (73.0)	34 (27.0)	0.094	0.413	1.1	(0.49-2.47)	0.821			
Employed	244 (57.3)	182 (42.7)	0.872	0.363	2.39	(1.17-4.87)	0.016			

B - logit B coefficient, SE - standard error, OR- odds ratio, CI - confidence interval.
Occupation significantly influences knowledge scores. *significant

Table 2 - Factors and treatment outcomes of breast cancer and knowledge on their stage of discovery of affected persons included in a study conducted in Hail, Kingdom of Saudi Arabia.

Variables	Stage of discovery	
	Early (N=287)	Late (N=367)
Factors perceived to influence discovery stage		
Personal awareness	(28.2)	(16.6)
Destiny	(18.8)	(18.5)
Chance	(14.3)	(27.5)
Financial circumstances	(14.3)	(0.3)
Family awareness	(13.2)	(6.0)
Community awareness	(13.2)	(12.3)
Fear	(7.3)	(12.5)
Multiple reasons	(2.8)	(2.5)
Do not know	(1.7)	(3.8)
Treatment outcome in relation to discovery stage		
Successful, N=493 (Early: 246, Late: 247)	(85.7)	(67.3)
Not successful, N=142 (Early: 34, Late: 108)	(11.9)	(29.4)
Do not know, N=19 (Early: 7, Late: 12)	(2.4)	(3.3)

Percentages were calculated either out of participants who declared "Late" or those who declared "Early" stage of discovery. Data for respondents who declared that they do not know is not shown.

is an abnormal growth. Seven hundred and eighty participants (78%) chose a single physiological factor and only 220 participants (22%) chose multiple physiological causes. Importantly, when choosing risk factors participants mostly chose "Contraceptives" (188 participants, 18.8%) followed by Poor diet (131 participants, 13.1%), Inheritance (121 participants, 12.1%), Lack of exercise (105 participants, 10.5%), Pollution (85 participants, 8.5%), Smoking (51 participants, 5.1%), and the least chosen factor was "Increased age" (48 participants, 4.8%). A few participants chose "I do not know" (51 participants, 5.1%) in relation to this question. For behavioral factors a majority of 280 participants (28%) thought that "Wearing unsuitable clothing" was the major cause of breast cancer, followed by "Being cursed by an evil spirit" (253 participants, 25.3%), "Chronic stress" (141 participants, 14.1%), "Being suspicious" (124 participants, 12.4%), "Laughing excessively" (22 participants, 2.2%), "Multiple behaviors" (110 participants, 11.0%), and a few chose "I do not know" (70 participants, 7.0%) in relation to behavioral factors. When calculating the knowledge scores of all participants, 615 participants (61.5%) scored <3 and only 385 participants (38.5%) scored ≥3. When analyzing the influence of socio-demographic characteristics for 775 participants who declare their full information, occupation (χ^2=15.156, *p*=0.002) significantly influences knowledge scores (**Table 1**). In particular, being a university student increases breast cancer knowledge significantly compared to being a school student (OR= 2.01, *p*=0.044), and the level of knowledge is further elevated by being employed (OR=2.39, *p*=0.016). In contrast, age does not

(179 participants, 17.9%); and ≥40 (80 participants, 8.0%). Forty-six participants (4.6%) were labelled as "school student", 288 (28.8%) were classed as "university student", 126 (12.6%) were "housewife", while the highest group of 426 participants (42.6%) were "employed". A few participants felt reluctant to provide their gender (51 participants, 5.1%), age (182 participants, 18.2%), or their occupation (114 participants, 11.4%). Out of 1000 participants, only 560 participants (56%) were aware that breast cancer

appear to be a factor (χ^2=8.763, *p*=0.067). When the participants were asked whether there was a possibility of occurrence of this disease in their family, most of the 474 participants (47.4%) thought it could occur, 305 participants thought it would not be possible (30.5%), and 221 participants (22.1%) did not know. In contrast, only 132 participants (13.2%) stated that they know someone in their family who had the disease, 601 participants (60.1%) confirmed being acquainted with a person who had breast cancer, and 267 participants (26.7%) did not know of any affected persons. Out of all the respondents who declared knowing of someone with breast cancer (N=733), 287 participants (39.2%) indicated that the disease was discovered early and 367 participants (50.1%) indicated that the disease was discovered late, while 79 participants (39.2%) did not

know. **Table 2** shows factors and treatment outcomes perceived to be associated with stage discovery of breast cancer. Out of the 287 participants who said that the disease was discovered at an early stage, 81 participants (28.2%) said it was because of "Personal awareness". In contrast, out of the 367 participants who said the disease was discovered at a late stage, most of the 101 participants (27.5%) declared that the disease was discovered by "chance". When reporting the perception of treatment success by the respondents who knew of someone with breast cancer and knew the disease timing at discovery, the majority of those who said that the treatment was unsuccessful (N=142) said the timing of the disease's discovery was late (N=108), **Table 2**. Importantly, a significant relationship between perception of treatment success and understanding of

Table 3 - Factors that may influence breast self-examination(BSE) practice among females >16 years of age included in a study conducted in Hail, Kingdom of Saudi Arabia.

Variables	Practice BSE (N=694) n (%)		Univariate logistic regression model						
	Yes (N=346)	No/DN (N=348)	B	SE	OR (95% CI)		*P*-value	χ^2	*P* for χ^2
Age									
17-19	53 (39.6)	81 (60.4)	Reference					9.421	0.024
20-29	167 (49.7)	169 (50.3)	-0.412	0.208	0.66	(0.44-0.99)	0.047		
30-39	87 (56.5)	67 (43.5)	-0.685	0.24	0.5	(0.31-0.81)	0.004		
40 or older	39 (55.7)	31 (44.3)	-0.654	0.299	0.52	(0.29-0.93)	0.029		
Occupation									
School student	6 (33.3)	12 (66.7)	Reference					19.523	<0.001*
University student	112 (41.9)	155 (58.1)	-0.368	0.515	0.69	(0.25-1.9)	0.475		
Housewife	47 (46.1)	55 (53.9)	-0.536	0.538	0.59	(0.2-1.68)	0.319		
Employed	181 (59.0)	126 (41.0)	-1.055	0.513	0.35	(0.13-0.95)	0.04		
BC knowledge scores									
<3, n=415	185 (44.6)	230 (55.4)	Reference					11.537	<0.001*
≥3, n=279	161 (57.7)	118 (42.3)	-0.528	0.156	0.59	(0.43-0.8)	0.001		
Informed of BSE									
No/DN	18 (11.7)	136 (88.3)	Reference					127.511	<0.001*
Yes	328 (60.7)	212 (39.3)	-2.459	0.266	0.09	(0.05-0.14)	2.27 E^{-20}		

DN - 'Do not know'. B - logit B coefficient, SE - standard error, OR- odds ratio, CI - confidence interval, BC - breast cancer, E^{-20} - <0.001, *significant

Table 4 - Factors perceived by the respondents (females ≥16 years) to influence practice and communication of breast self-examination (BSE) participants included in a study conducted in Hail, Kingdom of Saudi Arabia.

Variables	Practice (%)		Communicate (%)	
	Yes (N=328)	No/DN (N=210)	Yes (N=378)	No/DN (N=162)
Personal awareness	(55.5)	(19.0)	(39.2)	(14.8)
Family awareness	(11.3)	(2.9)	(9.0)	(5.6)
Fear	(11.0)	(26.7)	(14.6)	(18.5)
Community awareness	(10.7)	(6.2)	(24.3)	(9.9)
Financial circumstances	(4.0)	(1.0)	(0.5)	(0.6)
Destiny	(2.1)	(6.2)	(3.2)	(7.4)
Chance	(1.8)	(7.1)	(2.6)	(9.3)
Multiple reasons	(2.1)	(0.0)	(1.6)	(1.2)
Do not know (DN)	(1.5)	(31.0)	(5.0)	(32.7)

timing of discovery was apparent (χ^2=30.552, *p*<0.001). Out of 694 participants qualified for BSE analysis, 346 participants (49.9%) practiced BSE, 311 participants (44.8%) did not practice BSE, and 37 participants (5.3%) did not know. Age (χ^2=9.421, *p*<0.024), occupation (χ^2=19.523, P<0.001), knowledge scores (χ^2=11.537, *p*<0.001) and being "Informed of BSE" (χ^2=127.511, *p*<0.001) significantly influenced practice (**Table 3**). Out of 540 participants who were informed about BSE, 328 participants (60.7%) practiced BSE, 202 participants (37.4%) did not practice the method, and 8 participants (1.9%) did not know. The BSE-informed participants who practiced the method (328 participants) perceived that the motivation for their actions was mainly in the context of "Personal awareness" (182 participants, 55.5%) (**Table 4**). The majority of those who were informed about BSE and did not practice it were unsure of their reason (65 participants, 31%), however, "Fear" was the prominent perceived declared reason (53 participants, 26.7%). It is worthy to note that a majority of 378 participants (70%) within the informed BSE group (N=540), said they were willing to communicate to others about BSE, mainly because of "Personal awareness" (148 participants, 39.2%) (**Table 4**); while 162 participants (30%) were reluctant to communicate to others about BSE, mainly because of "Fear" as a declared reason (30 participants, 18.5%); and 53 participants (32.7%) did not know why they would not converse with others regarding BSE.

Discussion. Community-based studies addressing breast cancer awareness and BSE in Hail have not been documented, and no screening programs for breast cancer were available for the public during the study period in this region. This is an initial study providing preliminary data regarding knowledge and perception of breast cancer within a selected non-probability sample from residents of Hail. When testing the level of knowledge, results indicated a low level of awareness for the basic nature of the disease. More than a third of the participants did not know that breast cancer is essentially an abnormal growth; the majority did not know that breast cancer is a multi-factorial disease and "Increased age" was the least chosen factor. Interestingly, unlike data in Jeddah or Riyadh where participants ranked "Smoking" as the most chosen risk factor,[18,20] data in this study shows "Contraceptives" as the highest chosen single risk factor, indicating regional variation of perceived risk factors and suggesting a concern in Hail related to contraceptives. Notably, no studies in

KSA appear to provide an option to choose multiple risk factors, even though breast cancer is a multi-factorial disease. In addition, no studies in KSA appear to investigate believes that are associated with breast cancer. In a Nigerian study, 40% thought that "breast cancer is caused by evil spirits", a result comparable to ranking "being cursed by the evil spirit" as the second most important behavioral factor in this study.[35]

Nearly half the participants thought breast cancer could occur in their family. However, when asked about actual occurrence, only 13.2% stated they had someone in their family who had breast cancer, suggesting a high perceived risk of breast cancer. In a recent study in Riyadh,[34] 19.5% of women had perceived a higher risk to be affected with breast cancer compared to their peers. This advocates that the level of concern for breast cancer occurrence is different even between neighboring regions within KSA. Despite the association between clinical presentation delay and survival, studies in several countries have shown that 20-30% of women wait for 3 months or longer before presenting to a health clinic with breast symptoms.[36-38] Our data show that 50.1% of participants who knew of someone with breast cancer perceive disease detection to be late, suggesting that women in Hail are delaying their clinical presentation, or that breast cancer identification was impeded by medical practice. Interestingly, participants who indicated that the discovery timing was "Late", perceived "Chance" as the major contributing reason followed by "Destiny". Leaving diagnosis to chance may be a factor driven by believing symptoms to be harmless or temporary.[39] Reasons for discovery by "Destiny" could be explained in the context of Hail's conservative religious culture. Religious women may communicate symptoms to God only and delay seeking medical advice, then believing it is their destiny that the disease was discovered late.[40,41] Education and BSE practice is likely to play an important role in preventing the delay of clinical presentation.[42-44] Importantly, consistent with the notion that delayed detection contributes to a poor long-term survival, participants in this study affirm a significant relationship between treatment success and stage of discovery.

Most importantly, the data in this study suggest that the decision to practice BSE is complex and influenced by several factors including age, occupation, knowledge of breast cancer, and awareness of BSE. In addition, "Fear" appears to be associated with reluctance to practice and communicate regarding BSE. More studies in the future are needed to explain the nature of such associations.

An important limitation the authors faced were the unavailability of high quality Arabic formulated knowledge measure tools designed with a consideration for the education level and cultural style of Hail occupants. Questions were simplified as much as possible to enable all participants, regardless of educational level, to read and answer the questions and thus enable the involvement of a large number of participants. In addition, types of questions were limited as breast cancer remains to be a taboo issue for discussion in public in Hail. Another limitation was sampling as no population database listing of households in the local government area was available and the distribution of the forms to the public outside the university was challenging, and required official approval by the regional authority. In addition, the number of declined participation was not recorded, and the data available from reluctant individuals may have shifted paradigm of the trends seen in this study.

In conclusion, the data presented in this study show a low public understanding of breast cancer and a reluctance to practice BSE. This highlights a need to increase the level of breast cancer awareness in Hail's region, perhaps through developing workshops aimed at women with little access to education, or those who are unemployed, as well as young girls at schools. Such workshops should also focus on consequences related to delay of presentations as well as intense emotions related to outcomes of BSE. Such workshops will raise the level of awareness, reduce fear of BSE, and increase practice, thus enable early detection of the disease and better prognosis.

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