Contents lists available at Crown Academic Publishing

International Journal of Multidisciplinary Sciences and Advanced Technology

Journal home page: http://www.ijmsat.com

Breast Lumps Patterns among Young Libyan Females Attending Breast Clinic at Tripoli Central Hospital

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Original article Received 11 October 2020, Accepted 15 November 2020, Available online 22 November 2020

ABSTRACT

Breast lumps are the most common breast problems among young females in developing countries. Proper diagnosis of breast lumps in young women should be taken seriously as the diagnosis in this age group is more challenging. The present study aims **t**o describe the different patterns of breast lumps among young Libyan females and identify their related risk factors. This was a cross-sectional study included Libyan women younger than 40 years and who attended the breast clinic at Tripoli central hospital over a period of 14 months including the conduction of a pilot study. Data was analyzed using the SPSS program. Among a total of 350 included patients, 15 (4.3%) had breast cancer, and 335 (95.7%) had benign breast diseases, of which, 145 (41.4%) were fibroadenomas and 110 (31.4%) were breast cysts. The mean age of breast cancer cases and those with benign breast diseases was 36.53±2.89 and 26.96± 6.34 years, respectively. There was a statistically significant association ($P<0.05$) between the type of breast disease and age, age at menarche, lack of breast feeding, overweight, stress, and positive family history of cancers. This study concludes that benign breast diseases are the most common breast lesions among young Libyan females, particularly, fibroadenomas. Singularity, null parity, lack of breast feeding, obesity, and exposure to stress were the most common risk factors of breast diseases among this age group.

Key words: breast lumps, young women, breast lumps pattern, breast cancer, benign lumps.

1. Introduction

Palpable breast lump is the second most common presentation of all breast disorders, with the pain being the first (Kumar et al., 1999) Breast lump is defined as any new and unusual sense that tissue in the breast is more solid or organized than it once was (Klein, 2005). Breast lumps can be caused by infections, injuries, non-cancerous growth, and cancer. The first noticeable symptom of breast cancer is typically a lump with more than 80% of breast cancer cases are discovered when the woman feels a lump (Vogel, 2010). Breast cancer is the most common invasive cancers in women (International Agency for Research on Cancer, 2008), and represents 16% of all female cancers (Jeremy, 2006). The number of cases worldwide has significantly increased since the 1970s, a phenomenon partly attributed to the modern lifestyle (Imagines Corporation, 2006; WHO, 2007). Breast malignancy is a rare but serious cause of breast lump in young women aged between 20 to 50 years of age (Saslow et al., 2007), with only 5% of all breast cancers occurring in women under 40 years of age (Jeremy, 2006). Most of breast lumps are benign and physiological in approximately 90% of young women, particularly the fibrocystic changes, fibro adenomas and cysts (Schnitt and Collins, 2010). Since a majority of the benign lesions are not associated with an increased risk for subsequent breast cancer, unnecessary surgical procedures can be avoided. However, high risk patients with an increased risk of malignancy need a prompt treatment, a follow-up and awareness regarding the risk of breast cancer. According to GLOBOCAN-generated data,

more than 146,660 new cases of breast cancer have been diagnosed in women younger than 40 years worldwide, with an age-standardized rate per 100,000 (ASR) of 6. Early onset breast cancer trends vary among populations and areas of the world. Although 77% of the cases occurred in developing countries, the ASR for women below the age of 40 was marginally higher in developed countries (8.8 *vs.* 5.4). Overall, GLOBOCAN-generated rates of breast cancer in women less than 40 years in different countries have shown relatively stable annual rates, ranging from an ASR of 1.1 to 17. The lowest rates come from Eastern and Southern Africa, while the highest rates are recorded in Europe and North America (Imagines Corporation, 2006). The precise number of cancer cases diagnosed each year in Libya is unknown since a complete cancer registry has not yet been established in a number of areas. The Libyan breast cancer incidence was evaluated as 18.8 to 20.7 per 100,000 female individuals according to previous studies (Bader et al., 2011; Elzouki et al., 2018). However, data is lacking about breast diseases including cancer among young Libyan females.
The main risk factors of breast cancer include, female sex, older age, having an inherited genetic mutation (Laren et al., 2003), personal history of breast or ovarian cancer, family history of breast cancer, a previous biopsy showing hyperplasia, lobular carcinoma in situ, exposure to large amounts of radiation at young age, null parity, having the first child after age 35, postmenopausal hormones use (current or recent use) of estrogen or estrogen plus progesterone, overweight, high bone density, high alcohol intake, menopause after the age of 55, early menarche (younger than 12 years), current or recent use of contraceptive pills (WHO, 2007). However, 75% of women diagnosed with breast cancer, in fact, have no known risk factor. Diagnosis of breast lumps in young women should be taken seriously; because the diagnosis in this age group is more challenging due to the dense breast tissue making the clinical evaluation of such lumps difficult (Pritchard, 2009). Therefore, young women are usually at a more advanced stage when diagnosed. There may also be biologic factors contributing to a higher risk of disease recurrence for young women with breast cancer (Michael et al., 2007). The present study hopes to introduce a probable benefit to the Primary Health Care in regard to the breast diseases among young Libyan females, as the family physician is expected to play an important role in breast lumps evaluation and risk factors assessment. Therefore, this study aimed to describe the different patterns of breast lumps in young Libyan women and identify the risk factors related to breast lumps in this age group.

2. Methodology:

Study design

This was a descriptive cross-sectional study conducted over a period of 14 months including the conduction of a pilot study.

Study settings

The study had been conducted in the Breast Clinic at Tripoli Central Hospital (TCH), Tripoli- Libya over a period of one year from November 2011 to November 2012.

Study Population:

This study included Libyan women aged 15 to 40 years, who presented with diffuse nodularity or palpable breast lumps with or without other associated symptoms like pain, nipple discharge, and skin changes. All of those women have been already diagnosed according to the protocol of the breast clinic in TCH and were under treatment and follow up and all have given informed consent to participate in the study. Women who were older than 40 years, have not been diagnosed yet, have physiological swelling (pregnant women, breast feeding women), those with post traumatic breast lumps, or with post infective breast swelling and those who refused to participate were all excluded.

Diagnostic Tools:

The diagnosis of each case was based on history, general and local clinical examination and on the use of appropriate diagnostic tool. Ultrasonography is routinely performed as initial imaging to differentiate between benign and malignant cases using the 7.5 MHz probe on ALOKA SSD 1400 and GE LOGIC 500 ultrasound machine with both transverse and longitudinal real time imaging protocol of solid masses. A standardized final assessment for the features of the lesions was based on the guidelines of the American College of Radiology. Mammogram was also done but only for cases who aged between 30 and 40 years. Mammographic findings were summarized using the Breast Imaging Reporting and Data Scoring System (BIRADS) which devised by the American College of Radiology. This system is based on mass irregularity, density, speculation, and presence or absence of micro calcification. Cases that have been diagnosed to have malignant lesions were confirmed by either true cut or excisional breast biopsy with histopathology reports. This study did not depend on the fine needle aspiration cytology in the diagnosis.

Data collection methods:

Data was collected from patients' medical records. Information which were not available in the records were collected from the patients by personal interviews during their follow up visits using a specific designed pretested self-administrative questionnaire. The questionnaire included socio-demographic information and the history of exposure to risk factors including, menstrual period history, age at first full term pregnancy, lactation history, family history of malignancy, history of OCCP and hormonal therapy, past medical history of malignancy and benign breast diseases,

breast self-examination, previous exposure to radiation, exposure to stress, obesity and smoking and alcohol consumption. Obesity was assessed by measuring the body mass index (BMI), which was calculated by body weight in kilograms divided by the height square in meter and the patients were classified underweight if BMI <18.5 kg/m^2, normal weight if BMI 18.5 -24.9 kg/m^2, overweight if BMI 25-29.9 kg/m^2, and obese if BMI 30-39.9 kg/m^2) (Lee and Nieman, 2007).

Pilot study:
A pilot study was conducted on 50 patients over a period of two weeks, to test the acceptance and clearness of the questionnaire, and to estimate the average time needed to fill in the questionnaire. However, there was no need for any amendments.

Statistical analysis
Data was translated from English to Arabic language and was analyzed using the SPSS program version 19. Descriptive statistics including means, median, frequencies, and percentages were used for all continuous and categorical variables as appropriate. Chi-square test was used to compare between the two categories of breast lumps (benign and malignant). The level of significance was considered as P value of <0.05.

3. Analysis and Results:

Distribution of breast diseases among the study participants:

The total number of study participants was 350 young Libyan women. Figure 1 shows that, 335 participants (95.7%) had benign breast diseases and 15 participants (4.3%) had breast cancer.

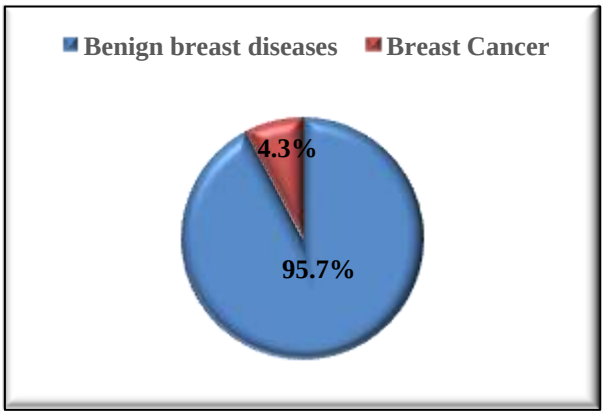

Figure 1: Distribution of breast diseases among the study participants

Type of breast diseases among the study participants:

Table 1 demonstrates that fibroadenomas were the most frequent (41.4%) benign breast lumps, while intraductal papilloma represented the lowest frequency (4%). Additionally, 4.3% have breast cancer.

Table 1: Distribution of different types of breast diseases among the study participants

Diagnosis	Frequency (Percentage)
Fibro adenomas	145 (41.4%)
Breast cysts	110 (31.4%)
Fibrocystic changes	66 (18.9%)
Intraductal papilloma	14 (4.0%)
Breast Cancer	15 (4.3%)

Socio-demographic characteristics in relation to the type of breast disease:
Table 2 shows that, the age of study participants ranged between 16 and 39 years, the mean age was 27.4 years. The age category of 22 and 27 years was the most frequent (32.6%). The majority of breast cancer cases (86.7%) aged between

34-39 years. Furthermore, Table 2 reveals that 87% of cases were single, and 13% were married. There was a significant association between marital status and the type of breast disease (p<0.001).

Table 2: Socio-demographics in relation to the type of breast disease among the study participants

	Benign breast disease Frequency (%)	Breast cancer Frequency (%)
16 – 21 years	75 (22.4%)	0 (0%)
22 – 27 years	114 (34%)	0 (0%)
28 – 33 years	75 (22.4%)	2 (13.3%)
34 – 39 years	71 (21.2%)	13 (86.7%)
al status		
Married	35 (10.4%)	11 (73.3)
Single	300 (89.6%)	4 (26.7%)

The distribution of risk factors of breast diseases among study participants:
Table 3 demonstrates that, menstrual period was irregular among 9.1% of cases, while most of cases (90.9%) were had regular period, the difference was statistically significant (p<0.001). Also, the mean age at menarche of the study participants was 12.05± 0.826 years. By further analysis**,** 93.4% of breast cancer cases had early age at menarche (8-12 years; P<0.0001). Table 3 also shows that, among the 350 participants, only 5 women reached the menopausal age (1.4%) at younger age, all of the menopausal cases have had breast cancer. The results showed that only 11.4% of the cases reported history of pregnancy and Figure 2 presents the age at the first pregnancy, the mean was 25.42 ± 4.53 years. Additionally, Table 3 reveals that 33.3% of women who have breast cancer and 3.7% of women with benign breast disease had breast fed their babies and the difference was statistically significant (P=0.041). Likewise, there was a statistically significant association between hormonal drugs history and type of breast cancer. There was also a significant statistical association between the type of breast disease and positive family history of malignancy (P<0.0001). Moreover, Table 3 shows that past medical history of malignancy (either breast or other malignancy) and past medical history of benign breast diseases among study participants have also shown significant statistical association with the type of breast disease (P<0.0001 and P= 0.001, respectively). Concerning previous exposure to radiation, there was a significant statistical differences between previous exposure to mammogram and radiotherapy with the type of breast disease (P<0.0001). Exposure to stress has also revealed a significant statistical association with the type of breast disease. A signicant statistical asociation was also observed between high BMI and the type of breast disease (P=0.019). Table 3 also indicates that, 26% of cases were practicing breast self-examination, and there was a significant statisical difference (P<0.0001). There was no history of active smoking and alcohol consumption among all of the study participants.

Table 3: Distribution of risk factors of breast diseases among the study participants

Risk Factor	Benign breast disease (n=335) Frequency (%)	Breast cancer (n=15) Frequency (%)	Total Frequency (%)	P value
Menstrual period				<0.001
Regular period	312 (93.1%)	6 (40%)	318 (90.9%)	
Irregular period	23 (6.9%)	9 (60%)	32 (9.1%)	
Age at menarche				<0.0001
8-10 years	3 (0.9%)	4 (26.7%)	7 (2%)	
11-13 years	327 (97.6%)	10 (66.7%)	337 (96.3%)	
14-17 years	5 (1.5%)	1 (6.6%)	6 (1.7%)	

Reached the age of menopause	0	5 (1.4%)		
Lactation history				0.041
Yes	1 (3.7%)	3 (33.3%)	4 (11.1%)	
No	26 (96.3%)	6 (66.7%)	32 (88.9%)	
History of hormonal drugs use				
OCCPs use	14 (4.2%)	3 (20%)	17 (4.9%)	0.03
HRT use	4 (1.2%)	8 (53.3%)	12 (3.4%)	<0.0001
Infertility treatment use	13 (3.9%)	7 (16.7%)	20 (5.7%)	<0.0001
Family history of malignancy				
Breast cancer	6 (1.8%)	13 (86.7%)	19 (5.4%)	<0.0001
Ovarian cancer	2 (0.6%)	7 (46.7%)	9 (2.6%)	<0.0001
Uterine cancer	4 (1.2%)	10 (66.7%)	14 (4%)	<0.0001
Other cancers	1 (0.3%)	5 (33.3%)	6 (1.7%)	<0.0001
Past history of malignancy	1 (0.3%)	3 (20%)	4 (1.1%)	<0.0001
Past history of benign breast disease	40 (11.9%)	7 (20%)	47 (13.4%)	0.001
Previous exposure to radiation				
X-ray exposure	323 (96.4%)	15 (100%)	338 (96.6%)	0.61
Mammogram	3 (0.9%)	10 (66.7%)	13 (3.7%)	<0.0001
Radiotherapy	0 (0%)	3 (20%)	3 (0.8%)	<0.0001
Exposure to stress				
Loss of job	29 (8.7%)	9 (60%)	38 (10.9%)	<0.0001
Loss of partner	4 (1.2%)	3 (20%)	7 (2%)	<0.002
Late marriage	239 (71.3%)	6 (40%)	245 (70%)	<0.013
Sever social conflict	52 (15.5%)	12 (80%)	64 (18.3%)	<0.0001
BMI				
Normal	21 (6.5%)	4 (26.7%)	25 (7.4%)	
Over weight and obesity	301 (93.5%)	11(93.3%)	312 (92.6%)	0.019
Breast self-examination				<0.0001
Yes	78 (23.3%)	13 (86.7%)	91 (26%)	
No	257 (76.7%)	2 (13.3%)	259 (74%)	

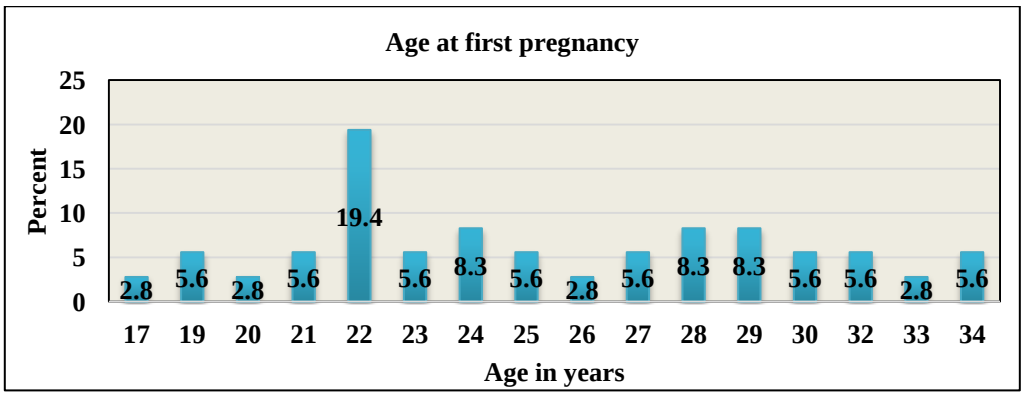

Figure 2: Age distribution at first full term pregnancy among the study participants

4. Discussion

The majority of females included in the present study were aged between 22 to 27 years (mean age of 27.4 years), similar to the age group included in a previous study (Olu-Eddo and Ugiagbe, 2011) in Niger (mean age of 27.5 years), and another study (Echejoh et al., 2011) in North Central Nigeria (mean age of 32.2 years). These figures indicate that breast lumps are common breast lesions in young females, with some variations in their actual incidence from one country to another. In the present study, breast cancer cases represented 4.3% of all included cases, this likely to be due to the lack of routine screening programs for women younger than 40 years. Thus, it is not surprising that women in this age group are more likely to present with a palpable mass of breast cancer. A study conducted in the United States (Anders et al., 2009) showed that 7% of women with breast cancer were diagnosed before the age of 40 years, and this disease accounts for more than 40% of all cancers among women in this age group. On the other hand, in the present study women with different types of benign breast diseases represented 95.7% of the total cases. This demonstrates that benign mammary lesions occurred more frequently than the malignant ones in young Libyan females. This figure recorded in this study for benign mammary lesions is in keeping with a study conducted in Saudi Arabia (Amrr et al., 1995), which observed a prevalence of 85.1% of benign mammary lesions. This reported prevalence in the current study for benign mammary lesions is slightly higher than that reported in the studies of (Ochicha et al., 2002) and (Anyikam et al., 2008), which reported prevalence of 73%, and 68.8% respectively. However, this was in disagreement with the findings of (Sidiqqui et al., 2003) study in Pakistan, where carcinoma of the breast was reported as the most common breast lesion seen in hospital practice. Even though the prevalence of the benign breast lesions varied in different studies, they were still the commonest in young females. In the present study, fibroadenomas have been found to be the most frequent benign breast lesions in young women. With respect to this finding, (Amrr et al., 1995) study reported similar results. Whereas (Ellis and Cox, 1984) study in England reported a lower frequency, this could be explained by that fibroadenomas are more frequent in dark-skinned populations. Furthermore, fibrocystic changes were the third-most common benign lesion in the present study. While in the studies of (Olu-Eddo and Ugiagbe, 2011) in Niger, and (Irabor and Okolo, 2011) in Nigeria, fibrocystic changes were the second-most common benign lesion after fibroadenomas. However, the studies of (Ellis and Cox, 1984) in the UK and (Ciatto et al., 1998) [25] in Italy, fibrocystic changes were the commonest benign lesion. This condition is attributed to the imbalance of ovarian hormones. The current low prevalence of fibrocystic changes in the current study can be explained partly by the fact that awareness and early presentation of patients with breast lumps is still relatively low in this area.

With regard to the marital status, 87% of young women in the present study were single, and 13% were married, probably due to the delayed age of marriage while the benign breast lumps are the predominant breast lesions in young age group. Unmarried status for females were associated with an increased risk of breast cancer according to (Marriage in the Arabic World Population reference) in the study of (Rashad et al., 2005), where the fraction of unmarried females was higher among Libyan females compared to the North African population (23.8% and 15–21%, respectively).

Regarding to the menstrual period in the current study, most of the study participants have regular period which could be explained by the effect of menstrual cycle hormones (estrogen and progesterone) and their effect on breast tissues. Furthermore, most of the included participants in this study started menstruation within the normal range of age, although an early age at menarche appeared to be related to a higher risk of breast lumps but this is not clear whether this relationship is causal or because of correlation with other early life exposures. There is an explanation for this association that women with earlier age at menarche are exposed to endogenous estrogens for a longer time, which is consistent with other studies (Lea et al., 2009). Concerning the age of menopause, 1.4% of participated women in the current study reached the menopausal age, all of them had pre-mature ovarian failure as the age of included women was under 40 years, which is consistent with the fact of increased risk of breast lumps with late age at menopause (Berkowitz et al., 1985). The history of pregnancy reported only by 11.4% of cases, and this attributed to the high

proportion of unmarried women in this study. Null parity has been found to be associated with increased risk of breast lumps (Otu, 1990; Meshram et al., 2009). The mean age at first full term pregnancy in the present study was 25.42 ±4.53 years. Comparing with study done by (Bader et al., 2011) which showed that age at first pregnancy in breast cancer patients in Nigeria was similar to that of Libyan cases 20.8 years, while Europeans had a higher mean age of 25.6 years. Younger age at first full-term pregnancy has been known as a protective factor in the lifetime risk of developing breast lumps. A possible explanation for this protective effect is the higher degree of terminal differentiation of mammary epithelial cells at first birth makes the epithelium able to metabolize carcinogens and repair DNA damage more efficiently (Russo et al., 2005). The lower frequency of breast feeding in the current study is also attributed to the high frequency of null parity. Most studies have found that long-term breast feeding is a protective factor against breast lumps (Stuebe et al., 2009).
The frequency of OCCP and hormonal therapy intake was low but the infertility treatment showed a higher frequency, and this probably due to the late age of marriage. The possibility of increasing risk of breast cancer due to OCCP usage has been researched extensively, but the results are inconsistent due to changes in pattern of use, reductions in hormone dose and temporal considerations, which made it difficult to compare different studies (Moorman, 2001; Sitruk-Ware et al., 1989). Family history is another risk-factor for breast lumps, women who have positive history of first degree relative with breast cancer have two to three times higher risk than general population, the risk is further increased if the relative was affected at an early age (Saxena et al, 2005). This supports the findings of the present study.

Inadequate knowledge of breast cancer risk factors and poor cancer screening practice among women with family history of breast cancer lead to late stage presentation of breast cancer disease (Subramanian et al., 2013). A previously published study (Sidoni et al., 2006) observed that patients under 40 years of age with breast lumps were frequently had family history of breast cancer, more often used oral contraceptives and on average they had experienced menarche 1 year earlier than did older patients. Regarding the past history of breast lesions, positive past history of benign breast diseases was higher, similar to the findings of a Multiethnic Cohort Study (Setiawan et al., 2009) which showed that multiple occurrence and recurrence of breast lumps is related to the positive history of prior malignancy, and benign breast diseases. The frequency of breast self-examination was low in the present study which could be attributed to the low awareness of breast diseases among Libyan women as the history of breast self-examination clearly represent increased level of awareness and detection of breast lumps, a significant linear trend in observed risk with frequency of breast self-examination was revealed in a previous study (Verla-Tebit and Chang-Claud, 2007). The history of exposure to radiation in the present study was significant with the exception for the history of exposure to X-ray. The later gives a very low dose of radiation according to a previous research (Ma H et al., 2008) which has shown that around 60 cases of breast cancer in the UK each year are linked to diagnostic X-rays, and supported the hypothesis that low-dose ionizing radiation, and particularly exposures during childhood, increase the risk of breast cancer. The amount of radiation of mammogram is very small, and the risk of breast cancer is negligible compared to the benefits of diagnosing and treating breast cancer earlier. A previous study (Nekoll et al., 2008) suggested that radiotherapy for breast cancer increases the risk of getting breast cancer in the other breast. However, this small risk is balanced by the need to treat the original breast cancer. Another study (Schellong et al., 2014) found that women who were treated for Hodgkin's lymphoma in childhood or adolescence have an increased risk of developing breast cancer as young adults. In agreement with the present study, a study conducted by (Kelishadi et al., 2008) in Iran observed positive association of overweight with the risk of breast cancer in premenopausal women. However, a study by (Tehard et al., 2004) in France found an inverse association between obesity and the risk of breast cancer, and found the association of BMI with the risk of breast cancer varies by race, menopausal status, economic status, and educational and cultural level. Majority of women participated in the current study were under some kind of stress particularly stress attributed to late marriage. This is in line with a study done by (Ganz et al., 2003) which showed that women who were either married or had a stable partner were less likely to experience emotional distress. It is not known why younger breast diseases patients suffer more emotionally than older women, but it may be because younger women often have more physical demands, and life responsibility - such as taking care of young children and/or working full time (Wenzel et al., 1999). Recall bias might be a weakness point of this study, especially for information related to the family history of cancer. Another limitation is the use of current body weight of patients instead of using the weight before the onset of the disease. This could be a problematic if patients had weight loss. The strength of this study was the sufficient sample size, which gave the opportunity to confine the study population to young Libyan women and this was the first study in Libya that focused on this age group.

Conclusions:

Benign breast diseases are the most common breast lesions among Libyan females younger than 40 years. Among benign breast diseases, fibroadenomas were the commonest. Breast malignancy was rare but a serious cause of breast lumps among young women in this study. Singularity, null parity, negative history of breast feeding, obesity, and exposure to stress were the commonest risk factors of breast diseases observed in this study.

Implications:

Breast lumps screening awareness should be extended to the younger population. The younger women should be educated about breast lumps' risk factors, symptoms and diagnostic techniques. Also high risk groups should be identified and educated about the risk of breast lumps. This helps in early detection and effective approach to treatment. Further studies among young women are needed to explore unknown risk factors, and possible causes of the increasing risk of breast lumps in Libya.

Conflict of interest:

The authors have no conflicts of interest to disclose.

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