IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 7 Ver. 15 (July. 2018), PP 63-69
www.iosrjournals.org

Trends in Demographics and Reproductive Factors in Breast Cancer in Egypt: A Story of 25 Years

Omnia M. Abo-Elazm[1]*, Dalia Bilal[1], Eman Gouda[2], Mosaad M. El Gammal[3], Salem Eid Salem[3]andNelly H. Alieldin[1]

[1](Department of Biostatistics and Cancer Epidemiology, National Cancer Institute, Cairo University, Egypt)
[2] (Department of Pathology, National Cancer Institute, Cairo University, Egypt.)
[3] (Department of Medical Oncology, National Cancer Institute, Cairo University, Egypt.)
*Corresponding author:Omnia M. Abo-Elazm

Abstract:Background*: Several factors have been associated with the international variation in breast cancer incidence rates, these include epidemiologic, reproductive, hormonal and lifestyle factors. Trends in these risk factors are important to demonstrate changes over time.****Patients and methods:*** *This is a cross-sectional study that included 200 breast cancer patients diagnosed during the year 2015 (group III) for the aim to compare their epidemiologic, reproductive and hormonal characteristics with two previous studies conducted in 1990(group I) and 2005 (group II).****Results****: Over the past 25 years, the mean age of the patients at diagnosis became significantly older, p=0.009; (45.7, 46.1 and 49.1 years for group I, II and III respectively). The mean age at menarche became significantly younger over time (13.5, 12. 5and 12.6 years for group I,IIand III respectively; p=0.003) and the percentage of patients had their menarche under the age of 12 years was significantly higher in groups II and III compared to group I (P= 0.001) while the age at menopause became significantly older (45.7, 48.5 and 48.2 years for group I,IIand III respectively, p=0.006). The percentage of patients got married after the age of 25 years old showed significant increase; it was 8.2%, 18.9% and 19.8% for group I, IIandIII respectively, p=0.005. Consequently, age at first full term pregnancy was significantly increased also while breast feeding tends to increase significantly over time. The percentage of oral contraceptive pills intake significantly increased; it was 46.5%, 51.6 and 61% in group I, IIandIII respectively, p=0.013, while the percentage of working women significantly increased over time.****Conclusion****: There are significant changes in reproductive and hormonal pattern in Egyptian females diagnosed with breast cancer over the past 25 years. These trends should be taken into account when planning for any future national breast cancer screening or prevention plans.*

Date of Submission: 16-07-2018 Date Of Acceptance: 30-07-2018

I. Introduction

Breast cancer is the most frequent malignant tumour in females. Its morbidity and mortality continue to increase, despite remarkable progresses in the field of early diagnosis and adjuvant therapy. In the United States (US), breast cancer is the most common among females representing 30% of all cancers, the second most common cause of cancer deaths in women, and the main cause of deaths in women aged 40 to 59 years (1). In Egypt, according to population-based registry in three governorates, breast cancer was the most common cancer among females (32.9%) and thesecond common of both sexes.At NCI, Cairo University, breast cancer ranked the first in females (38.8%) and in both genders (19.6%) according to NCI-Hospital based registry(2).

Several factors have been reported to be associated with the international variation in breast cancer incidence ratesincluding differences in reproductive, hormonal and lifestyle factors. Contributing factors also include differences in population size, age structureand availability of early detection and screening services(3).Postponement of childbearing or having no children, which were part of family planning policies in many countries as Brazil, India and China added also to the increase in breast cancer incidence. With declining parity, the lifetime duration of breastfeeding will also decrease representing increased risk for breast cancer (4).

Factors affecting the risk of breast cancer are diverse and are not limited to reproductive history.It was found that the working women tend to delay the first birth together with low parity and a short duration of breast feeding. Therefore, breast cancer risk reduction due to increase effects of reproductive factors are not expected in the coming future. It is thus particularly important to consider the patient's specific reproductive history in the diagnosis and treatment of breast cancers (5). The aim of this work is to find a trend in epidemiologic features of breast cancer patients attending National Cancer Institute, Cairo University, throughcomparison with previous two studies conducted over the past 25 years at the same Institute (unpublished data).

II. Patients and Methods

This is a cross-sectional study that included 200 females with breast cancer diagnosed during the year 2015.Patients were asked to respond to a predesigned questionnaire including questions on demographic features, previous primary non-malignant breast diseases, family history, hormonal and reproductive history. The collected data in the study (Group III) were compared with data from previous 2 studies. The first one was conducted in 1990 and included 150 patients (Group I) while the second was in 2005 and included 126 patients (Group II). The study was approved from the ethical committee institutional review board (IRB) at National Cancer Institute.

III. Statistical methods

Data were analysed using SPSS version 22win statistical package. Numerical data were expressed as mean and standard deviation (SD), median and range as appropriate. Qualitative data were expressed as frequency and percentage. Chi-square test or Fisher's exact test were used to examine the relation between qualitative variables. Chi-square test for trend was used to examine trend between three study groups (1990, 2005 and 2015). Z test was used for pairwise comparison with Bonforoni adjusted p value.Analysis of variance (ANOVA) calculator for summary data between the three study groups were done by online calculator (www.danielsoper.com).Another calculator for comparing means was used to detect the significant group(www.medcalc.org). A p value ≤0.05 was considered significant and all tests were 2 tailed.

IV. Results

By comparing epidemiologic features among the three study groups, we found a significant increase in the age of the patients between studies through this time period (45.7, 46.1 and49.1 years for group I, II and III respectively; p=0.004), (Figure 1). There wassignificant difference between group I and III as well as between groups II and III (P=0.009 and p=0.041respectively) but no significant difference between group I and II (table 1).

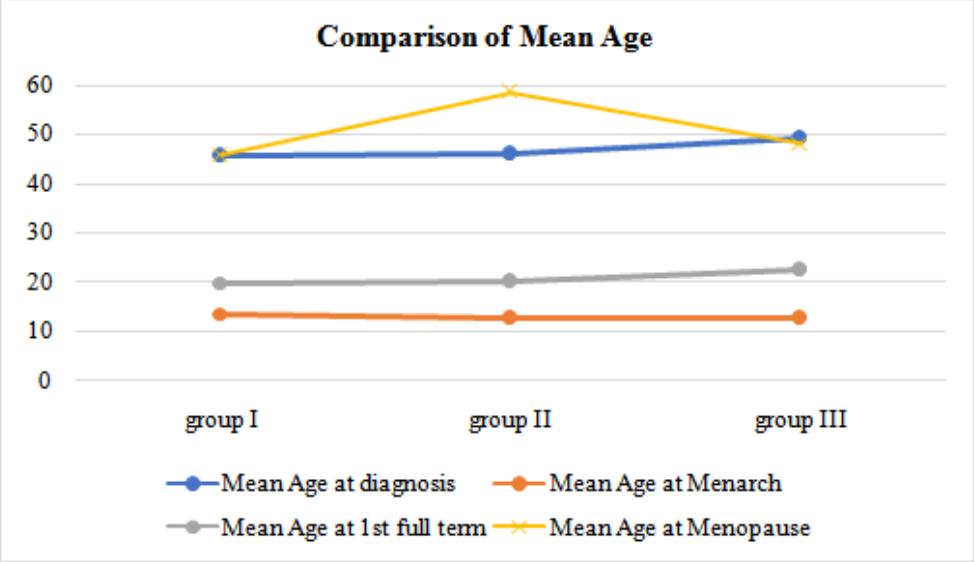

Figure (1): Comparison of the mean age of patients between the three-study groups.

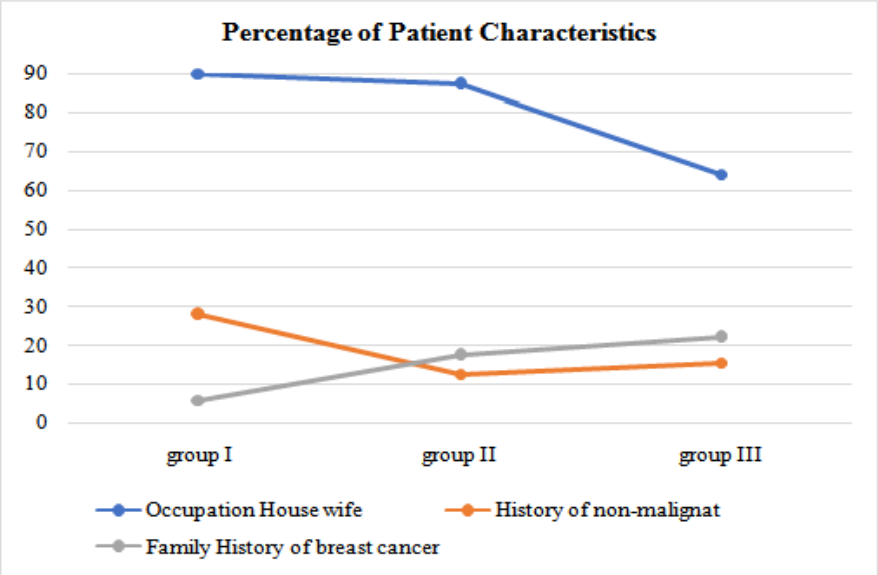

Figure (2): Percentage of patient characteristics in the three-study group.

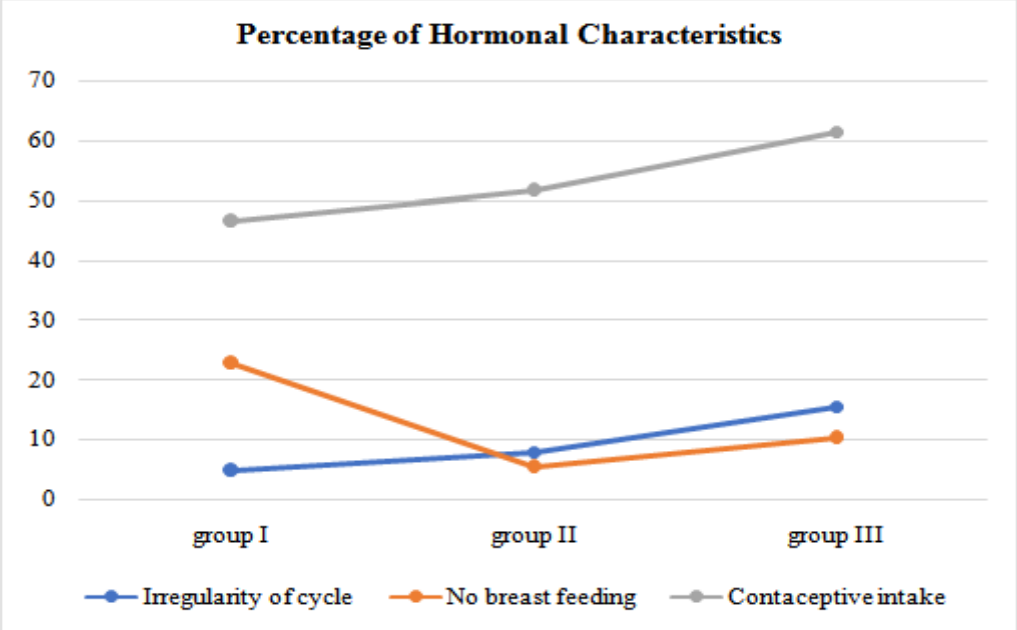

Figure (3): Percentage of hormonal characteristics in the three-study group

The percentage of house wife women became significantly lower ingroup III in comparison to groups I and II (90%, 87.3 and64% for groups I, II and III respectively; p = 0.003). the percentage of patients witha history of 1ry non-malignant breast disease was significantly decreased (28%, 12.7% and15% for groups I, IIandIII respectively; p=0.005) while the presence of family history was significantly increased through these 3 studies (6%, 17.5% and 22% for group I, II andIII respectively; P=0.001), (Figure 2).There were no significant trends regarding changes in the residence distribution between urban and rural nor incidence of marital status (p=0.345and p=0.482 respectively) (table 1).

Patients in group III had irregular menstrual cycles (15.5%), which is significantly more common than those in group I (4.7%), P value < 0.001 but not different with group II, p=0.09, (Figure 3). Age at menarche showed a significant decrease over the last 25 years, the mean age at menarche of group I was significantly older than group II and III (13.5, 12.5 and 12.6 years respectively); p< 0.001, while no significant change between group II and III, p=0.473. The percentage of patients whose age at menarche was under the age of 12 years was significantly higher in groups II and III in comparison to group I; (P= 0.001), (table 2).

But age at marriage in females showed a trend to increase over that time period. The percentage of patients got married after the age of 25 years was significantly increased through time; it was 8.2%, 18.9% and

19.8% for group I, II and III respectively, p=0.005. Consequently, age at first full term pregnancy was significantly increased also. About two third of patients (66%) got their first full term baby after age of 20 years in 2015 compared to only half and one third in 2005 and 1990 respectively, p < 0.001. The same was observed regarding the mean age at menopause, which showed significant increase over time. It was 45.7, 48.5 and 48.2 years in the years 1990, 2005 and 2015 respectively; P= 0.006 (table 2).

Table (1): Epidemiologic features of three breast cancer groups diagnosed at 1990, 2005 and 2015.

Epidemiologic features of breast cancer		Groups						P value
		I N= 150		II N= 126		III N= 200		
		No	(%)	No	(%)	No	(%)	
Age (years)	Mean ±SD	45.7 ± 9.9 (a)		46.1 ± 9.9 (a)		49.1 ± 11.1 (b)		0.004
Residence	Rural	74	(49.3)	33	(26.2)	105	(52.5)	0.345
	Urban	76	(50.7)	93	(73.8)	95	(47.5)	
Occupation	House wife	135	(90) (a)	110	(87.3) (a)	128	(64.0) (b)	< 0.001
Marital status	Married	116	(77.3)	112	(88.9)	162	(81.0)	0.482
	Un-married	34	(22.7)	14	(11.1)	38	(19.0)	
History of 1ry non-malignant breast disease	Yes	42	(28.0) (a)	16	(12.7) (b)	31	(15.5) (b)	0.005
Family history of breast cancer	Yes	9	(6.0) (a)	22	(17.5) (b)	44	(22.0) (b)	<0.001

No significant change was noticed regarding parity while breast feeding tends to increase significantly over time. Women who didn't breast fed their children became significantly lower in group IIand III (5.4%and10.1% respectively) than in group I (22%), p= 0.003. The percentage of oral contraceptive pills intake significantly increased over time. It was 46.5%, 51.6 and61% in group I, IIandIII respectively; p=0.013 while no significant difference was noticed regarding the pattern or duration of oral contraceptive pills intake (table 2).

Table (2): Reproductive and hormonal pattern of three breast cancer groups diagnosed at 1990, 2005 and 2015

Fertility and hormonal factors		Group						P value
		1990		2005		2015		
		No	(%)	No	(%)	No	(%)	
		n =150		n = 126		n= 200		
Age at Menarche	≤12 years	39	(26.0) (a)	77	(61.1) (b)	118	(59.0) (b)	< 0.001
	Mean ±SD	13.5 ±1.34		12.5 ± 1.4		12.6 ± 1.1		< 0.001
Regularity of cycle	Irregular	7	(4.7) (a)	10	(7.9) (a,b)	31	(15.5) (b)	0.001
Age at Marriage		n= 146		n= 122		n= 192		
	> = 25 years	12	(8.2) (a)	23	(18.9) (b)	38	(19.8) (b)	0.005
Age at 1st full term		n= 142		n= 112		n=188		
	> 20 years	47	(33.1) (a)	62	(55.4) (b)	124	(66.0) (b)	< 0.001
Parity		n= 146		n= 122		n= 192		
	Nulliparity	9	(6.2)	10	(8.2)	4	(2.1)	0.067
	Abortion	79	(54.1)	47	(38.5)	100	(52.1)	0.861
Breast feeding		n= 137		n= 112		n= 188		
	No	31	(22.6) (a)	6	(5.4) (b)	19	(10.1) (b)	0.003
OCP		n= 146		n= 122		n= 192		
Intake		68	(46.5) (a)	63	(51.6) (a,b)	118	(61.5) (b)	0.013
Pattern	Continuous	46	(31.5)	49	(40.2)	87	(45.3)	0.450
Duration	> = 4 years	34	(23.2)	35	(28.7)	74	(38.5)	0.086
Age at (years) Menopause		n= 64		n= 49		n= 100		
	Mean ±SD	45.7 ±4.3 (a)		48.5 ±3.7 (b)		48.2 ± 6.6 (b)		0.006

V. Discussion

Objectives of this study were to find trend in epidemiologic features within three-time periods that involve two and half decades.In the current study, we showed that the mean age at presentation in women with breast cancer who were diagnosed and treated at NCI became progressively older along the past 25 years. This trend may reflect both population growth and/or demographic change mainly due to aging of population. It is expected that population growth alone would increase the number of incident cases by 55.2% in 2015 and to 67.2% in 2050 (6).

A study in Lebanon showed a steeper increase in breast cancer incidence which was found between 2004 and 2010 and largely confined to women above age of 40 years. It was explained that this increase is corresponding to the target population of the national awareness campaign. They also found that Age-Standardized Incidence Rates was elevated which may be attributed to an improved awareness of breast cancer early signs, since the initiation of the annual national breast cancer awareness campaigns in 2002 (7).

The percentage of working women increased significantly over time. This increase may reflect changes in educational and socioeconomic characteristics. This is in contrast to a study conducted in US to examine trends in breast cancer by race, healthcarecoverage, and socio-economic status (SES) before the Great Recession (2003–2005), during the recession(2007–2009), and post-recessionperiod (2010−2012). It reported that percentage of employed breast cancer patients, before recession was 85.9%, during the recession was 85.4% and after the recession was 83.9% (8). Despite this increase noticed in Egyptian females, the percentage of working women still far lower than the American women mainly due to differences in the structure and beliefs of the families from both countries. Although marital status didn't show significant trend for change over the three study periods, though percentage of unmarried in group I (including widows and divorced) was unexceptionally high which may be attributed to educational and socioeconomic factors.

History of primary non-malignant breast disease was significantly higher in group I as compared to group II and group III, this could be explained by more rapidly growing tumour in the latter groups. By comparing our figures to that in the US, comparable estimates were found specifically to the recent two study periods. Two large databases in US have found that history of benign breast biopsy was reported by 17.1% of Breast Cancer Surveillance Consortium (BCSC) and by 23.5% of Collaborative Breast Cancer Study cases (CBCS) (9).

Family history of breast cancer is widely recognized as an important risk factor for breastcancer. About 13-19% of women diagnosed with breast cancer have an affected first-degreerelative compared to 8-12% of women without breastcancer(10). We found that family history of breast cancer in 2015 at National Cancer Institute was 22% which was similar to that reported by Collaborative Breast Cancer Study which was 21% (9). The current study showed a trend of increased proportion of breast cancer patients with positive family history over last 25 years.This came in agreement with a previous study describing secular changes in the proportion of women with a self-reported first-degree family history of breast cancer over the past three decades. The study reported increased prevalence of first degree family history over time from 12.3% in 1996 to 16.0% in 2010 (9). Increased prevalence of patients with positive family history in our study as well as other studies could be explained by increased mammography screening rates. Increased uptake of screening mammographyhas resulted in an increase in breast cancer incidence especially in early-stagedisease. Consequently, more women now report a family history of breast cancer(11).

Breast cancer risk factors that are more prevalent in developed countries than developing ones include having children (if any) at an older age, inappropriate breastfeeding, use of oral contraceptives and postmenopausal hormone-replacement therapy, obesity with high body mass index, poor physical activity and excessive alcohol consumption (12).In the present study, it showed significant trend indecrease age at menarche by an average of 0.9 years from 13.5 years in group I to 12.6 years in group III similar to results from a study that found mean age at menarche inthe USto declinefrom 13.3 years, to 12.4 years, with a significant declinein the age of menarche by an average of 0.9 year(13). Again the same trend was noted in Korean (14)and a Chinese (14) studies that found a drop of 1.1 years in the mean age at menarche over a 30-year period and such a drop would be associated with a 5% increase in breast cancer incidence rates.

In a study to examine trends in US women born from 1912 to 1969. They observed an increase in the average age at menopause from 49.1 years in 1915–1919 birth cohort to 50.5 years in the other birth cohort (15). Menarche and menopause mark the onset and cessation of ovarian activity associated with reproduction and affect breast cancer risk. Data from 117 epidemiological studies, including women with invasive breast cancer concluded that breast cancer risk increased for every year younger at menarche and for every year older at menopause. The younger women were at menarche, the greater was their subsequent risk of breast cancer, the relative risk (RR)increasing by a factor of 1.050 (95% CI 1.044–1.057, $p<0{\cdot}0001$) and the older age at menopause the greater the risk, the RR increasing by a factor of 1.029 (95%CI 1.025-1.033) (16).

The higher breast cancer risk in women with a late menopause is most likely explained by both the longerduration and higher level of exposure to estrogen and progesterone experienced by these women. They

also may experience a larger number of anovulatory cycles resultingin a lack of cyclic progesterone(17). There are many speculated causes of delays in age at menopause, but no one hypothesis has gained widespread support. Potential delays in age at menopause may be associated with genetic, social, environmental, and/or hormonal exposure associations. As breast cancer is a multifactorial disease, its risk is associated with an increased tendency to postpone the first childbirth, combined with a low parity and short duration of breastfeeding (5). The present study showedthat age at marriage of patients in 2015 was significantly older whencompared to the previous two studies and eventually age at first full term pregnancy became significantly older, where both represent important determinants for risk of breast cancer.

In the National health survey of India, two different population studied at 1998-1999 and 2005- 2006 and reported that age at first full term pregnancy showed an evidence of increase overtime (18). Other studies done in Brazil for two groups of patients in 1996 and 2006 also documented an increase in age at first full term pregnancy (4). Similarly, in Nigeria the median age at first full term pregnancy increased from 18.5 to 20.3 year over a period of twenty years (19).We can claim that family planning programs in Egypt could add to the risk of breast cancer.In a study done by Jansen, Herrán, and Villamor 2015, anincrease in breast cancer incidence was found to be between 8% and 20% due to a range of reduction in parity from1 to 2.5 births. Another finding by the same author was that breastfeeding a child for 1 year provides a 4.3% reduction in breast cancer risk for the mother, independent of the protective effect of the pregnancy itself.

The present study also found that breast feeding, in the two recent groups was significantly lower than older group. In Kazakhstanduring the middle of the 20th century, it was reported that breast cancer in Slavic women is three times more frequent than Kazakh women which remained the same over timemostly due to preservation of their reproductive function. Kazakh women marry at younger age, they usually have more pregnancies and fewer abortions, often practice breastfeeding and their lactation period is longer(21). Moreover, many studies recommend prolonged breastfeeding as a protective behaviour against breast cancer, though the optimal interval is not identified(5,22).Breastfeeding is considered as one of the most important protective factors against breast cancer, claiming that it would seem simple and trivial procedure and animportant aspect in prevention of breast cancer(7).

Results of the current study showed that usage of oral contraceptive pills increased significantly over the past 25 years (45.3%, 50% and 59.0%). Although different contraceptive methods are easily accessible at low prices and without a prescription, contraceptive use rate varies in different regions. In the present study, the rate of OCP use was 59% in 2015 which was similar to that found in Lebanon (58%) (7). These numbers were relatively low when compared to another EMRO country (73.8% in Iran) and Western countries; France: 81.8% and US: 72.8%. Collaborative reanalysis of data on 53, 297 women with breast cancer and 100, 239 women without breast cancer from 54 epidemiological studies found that the relative risk of breast cancer in women using birth control pills was 10 to 30 percent (or 1.1-1.3-fold) higher than that of women who had never used these control pills. Once women stopped taking the pill, however, their risk began to diminish and returned to normal within about 10 years (Collaborative Group on Hormonal Factors in Breast Cancer, 1996). In most of the studies in this analysis, the women were taking older, higher-dose versions of the pill, and so one area under active study is how today'slower-dose pills might affect the risk of breast cancer. The evidence to date hasn't been able to answer this question confidently (22).

Many lifestyle changes had occurred during modernization; thus, if the younger adult generation has a 1-year delay in menarche, two less births and average age at first full term birth 2 years older than the previous generation, these changes would combine to produce a 25% increase in breast cancer incidence (4).So, these trends should be taken into account during planning of any national prevention program as they may contribute to the increased incidence in breast cancer.

VI. Conclusion

There are significant changes in reproductive and hormonal pattern in Egyptian females diagnosed with breast cancer over the past 25 years. These trends should be taken into account when planning for any future national breast cancer screening or prevention plans.

References

[1]. Siegel R, Ward E, Brawley O, Jemal A. Cancer statistics, 2011: the impact of eliminating socioeconomic and racial disparities on premature cancer deaths. CA Cancer J Clin. 2011;61(4):212–36.
[2]. www.cancerregistry.gov.eg.
[3]. Youlden DR, Cramb SM, Dunn NAM, Muller JM, Pyke CM, Baade PD. The descriptive epidemiology of female breast cancer: an international comparison of screening, incidence, survival and mortality. Cancer Epidemiol. 2012 Jun;36(3):237–48.
[4]. Mccormack VA, Boffetta P. Today's lifestyles, tomorrow's cancers: Trends in lifestyle risk factors for cancer in low- and middle-income countries. Ann Oncol. 2011;22(11):2349–57.
[5]. Kobayashi S, Sugiura H, Ando Y, Shiraki N, Yanagi T, Yamashita H, et al. Reproductive history and breast cancer risk. Breast Cancer. 2012;19(4):302–8.
[6]. Ibrahim AS, Khaled HM, Mikhail NN, Baraka H, Kamel H. Cancer incidence in egypt: results of the national population-based

cancer registry program. J Cancer Epidemiol. 2014;2014:437971.
[7]. Lakkis NA, Adib SM, Hamadeh G, El Jarrah R, Osman MH. Sociological transition and breast cancer in the Arab world: The experience of Lebanon. Asian Pacific J Cancer Prev. 2017;18(5):1357–64.
[8]. Wyatt TE, Pernenkil V, Akinyemiju TF. Trends in breast and colorectal cancer screening among U.S. adults by race, healthcare coverage, and SES before, during, and after the great recession. Prev Med Reports. 2017;7:239–45.
[9]. Shiyanbola OO, Arao RF, Miglioretti DL, Sprague BL, Hampton JM, Stout NK, et al. Emerging Trends in Family History of Breast Cancer and Associated Risk. Cancer Epidemiol Biomarkers Prev. 2017 Dec;26(12):1753–60.
[10]. Tice JA, Miglioretti DL, Li C-S, Vachon CM, Gard CC, Kerlikowske K. Breast Density and Benign Breast Disease: Risk Assessment to Identify Women at High Risk of Breast Cancer. J Clin Oncol. 2015 Oct 1;33(28):3137–43.
[11]. White A, Thompson TD, White MC, Sabatino SA, de Moor J, Doria-Rose P V, et al. Cancer Screening Test Use - United States, 2015. MMWR Morb Mortal Wkly Rep. 2017 Mar 3;66(8):201–6.
[12]. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. CA Cancer J Clin. 2011;61(2):69–90.
[13]. McDowell MA, Brody DJ, Hughes JP. Has Age at Menarche Changed? Results from the National Health and Nutrition Examination Survey (NHANES) 1999-2004. J Adolesc Heal. 2007;40(3):227–31.
[14]. Lee MH, Kim SH, Oh M, Lee KW, Park MJ. Age at menarche in Korean adolescents: Trends and influencing factors. Reprod Health. 2016;13(1):1–7.
[15]. Freedman DM, Tarone RE. Re: "From menarche to menopause: trends among US women born from 1912 to 1969". Am J Epidemiol. 2007 Oct 1;166(7):860–1.
[16]. Hamajima N, Hirose K, Tajima K, Rohan T, Friedenreich CM, Calle EE, et al. Menarche, menopause, and breast cancer risk: Individual participant meta-analysis, including 118 964 women with breast cancer from 117 epidemiological studies. Lancet Oncol. 2012;13(11):1141–51.
[17]. Zografos GC, Panou M, Panou N. Common risk factors of breast and ovarian cancer: recent view. Int J Gynecol Cancer. 2004;14(5):721–40.
[18]. Khanna G, Kapoor S. Secular trend in stature and age at menarche among Punjabi Aroras residing in New Delhi, India. Coll Antropol. 2004 Dec;28(2):571–5.
[19]. Sighoko D, Kamaté B, Traore C, Mallé B, Coulibaly B, Karidiatou A, et al. Breast cancer in pre-menopausal women in West Africa: Analysis of temporal trends and evaluation of risk factors associated with reproductive life. The Breast. 2013;22(5):828–35.
[20]. Jansen EC, Herrán OF, Villamor E. Trends and correlates of age at menarche in Colombia: Results from a nationally representative survey. Econ Hum Biol. 2015 Dec;19:138–44.
[21]. Toleutay U, Reznik V, Kalmatayeva Z, Smigelskas K. Risk factors of breast cancer in Kyzylorda oblast of Kazakhstan: A case-control study. Asian Pacific J Cancer Prev. 2013;14(10):5961–4.
[22]. Parsa P, Parsa B. Effects of reproductive factors on risk of breast cancer: a literature review. Asian Pac J Cancer Prev. 2009;10:545–50.

Omnia M. Abo-Elazm "Trends in Demographics and Reproductive Factors in Breast Cancer in Egypt: A Story of 25 Years"IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 7, 2018, pp 63-69.