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Assessment of breast cancer risk factors among women of reproductive age group in Oshogbo using Gail model

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The study identified the risk factors associated with breast cancer development and determined its prevalence. A cross sectional design using mixed method was adopted for the study. It was conducted in 22 Primary Health Care centres (PHCs) in Osogbo and Olorunda Local government areas of Osun State. A purposive sampling technique was used to select four hundred child bearing age women (19 - 44 years) who brought their babies for immunization at the 22 PHCs in the two selected local government areas in Osogbo. Respondents from each PHC were selected by proportionate sampling. Two instruments were used for data collection. The Short Form Breast Cancer Risk Questionnaire was used to collect data on the Socio-demographic profile and other relevant data related to breast cancer risk factors. In depth interview was also used to collect data on risk factors associated with breast cancer from 10 women selected from 3 PHCs out of the 22 PHCs which were randomly selected through balloting method. The Gail model which is a mathematical model was used to estimate individual five year absolute breast cancer risk. Women with score of 1.67% and above were categorized as high risk, 1.49 to 1.66% as average risk and a score < 1.49% as low risk. The rationale for using Gail model in the study is to classify the distribution of risk factors in the study according to the level of risks, (high, average and low) as explained above i.e. Women with score of 1.67% and above were categorized as high risk, 1.49 to 1.66% as average risk and a score < 1.49% as low risk. The logistic regression further revealed that family history of breast cancer increased significantly the odds of having higher risk of breast cancer development (OR = 1.12, 95% CI = 0.06–11.46, p-value = 0.002). However, increase in average duration of breastfeeding reduced significantly the odds of having higher risk of breast cancer (OR = 0.98, 95% CI = 0.97 - 1.00, p-value-0.013). The Gail model calculation revealed that 2.3% were at high risk, 2% were at average risk while 95.7% were at low risk. The researcher used the statistical modelling method (logistic regression) to examine the relative importance of each risk factor in predicting the outcome. This study concluded that the key risk factors for breast cancer development were presence of family history and short duration of breastfeeding.

Key words: Assessment, breast cancer, reproductive age, risk factors, Gail model.

INTRODUCTION

In 2017, an estimated 252,710 new cases of invasive breast cancer will be diagnosed among women and 2,470 cases will be diagnosed in men. In addition, 63,410 cases of *in situ* breast carcinoma will be diagnosed among women. Approximately 40,610 women and 460 men are expected to die from breast cancer in 2017, (American Cancer Society, 2017). The incidence of cancer is increasing worldwide. A steady increase in incidence has been observed in most developed and developing counties. Apart from incidence, cancer related deaths are also increasing.

There are over 230,000 new cases of breast cancer of breast cancer each year in the United State as at 2015. About 40,000 fatalities occur in United State every year from this particular form of cancer. The risk of breast cancer increase with age, and in the United State approximately one out of eight women will get breast cancer at some point in their lives. The physical, emotional and financial cost of this disease is staggering (Erhabor et al., 2016).

With 1.7 million new cases diagnosed in 2012, constituting 12% of all new cancer cases and 25% of all cancers in women, breast cancer remains the commonest site-specific malignancy affecting women and the most common cause of cancer mortality in women worldwide. According to the National Breast Cancer Foundation (2016). Breast cancer is the most commonly diagnosed cancer in women. It is the second leading cause of cancer death among women. One in eight women in the United States will be diagnosed with breast cancer in her lifetime which means each year it is estimated that over 252,710 women in the United States will be diagnosed with breast cancer and more than 40,500 will die. On average, every 2 min a woman is diagnosed with breast cancer and 1 woman will die of breast cancer every 13 min.

Although breast cancer in men is rare, an estimated 2,470 men will be diagnosed with breast cancer and approximately 460 will die each year. There has been limited existing data and new research on breast cancer in Africa. As such, most information comes from small clinical and pathology case series; whose inherent biases have influenced current understanding of the pattern and characteristics of breast cancer in Africa (Parkin et al., 2012).

More so, (Centre for Disease Control and Prevention, 2018) stated that "Breast Cancer is the most common cancer in women, no matter the race or ethnicity, the most common cause of death from cancer among Hispanic women, the second most common cause of death from cancer among white, black, Asian/Pacific Islander, and American Indian/Alaska Native women." The prevalence of breast cancer in women aged 15 and over in Sub-Saharan Africa was estimated at 23.5 per 100,000 women in 2008(up to 19.3 per 100,000 in Cameroon). During the same period, an estimated 35,427 women died from breast cancer, with a crude mortality rate of 12.8 per 100,000 women (10.7 per 100,000 women in Cameroun) (Ferlay et al., 2012). These figures are low compared to a reported 92 per 100,000 in the USA and 81 per 100,000 in Canada, in an earlier period- 1998-2002 (Boyd et al., 2010).

However, the relatively low rate in low income countries, including most African countries, is on a steady rise. This, coupled with typical late diagnosis that worsens prognosis makes breast cancer an increasingly worrisome public health issue. In Nigeria, female breast cancer is recognized as major cause of morbidity and mortality with incidence rate ranging from 36.3 to 50.2/100,000 live birth (Said et al., 2017). More so, "Late presentation of patients at advanced stages when little or no benefit can be derived from any form of therapy is the hallmark of breast cancer." Reasons given include poverty, under-education, lack of knowledge and poor access to care, (Okobia et al., 2006). Indeed the ratio of mortality to incidence in Africa is 0.73, compared to below 0.23 in North America and 0.354 in Latin America and the Caribbeans (Komen et al., 2009).

Risk factors associated with breast cancer development include unmodifiable ones such as female sex, increasing age, a history of breast cancer in close relatives especially in mothers and siblings. Non-modifiable ones include early menarche before the age of 14 years or menopause later than the age of 55 years. Other risks include being overweight, using hormone replacement therapy, oral contraceptives, alcohol intake, nulliparity or having first child after age 35. Generally, literature have documented that an increased or prolonged oestrogenic exposure poses a risk.

Self-breast examination, encouraged for early detection of breast cancer in symptomatic women with significant risks factors, is reliable as a self-screening tool for early diagnosis (Demirkiran et al., 2007) but it does not decrease cancer mortality rate (Howard and Scott, 2006). A study conducted by Olugbenga-Bello et al. (2011) on "Awareness and breast cancer risk factors: perception and screening practices among females in a tertiary institution in Southwest Nigeria", found, about two thirds (67.9%) of those who had heard of breast cancer knew that there were screening methods available. Of these, awareness of clinical breast examination led at 93.2%; breast self-examination was next with 91.6%, only a third 32.8% were aware of mammography as a screening method. Further, about half of respondents who were

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aware of breast cancer practice breast self-examination. Only 28 (7.6%) of the respondents had ever visited any clinic for breast cancer screening, and 85.7% (Gail et al., 2008) of the visit was for clinical breast examination while mammography was rarely done (14.3%) (Olugbenga et al., 2011). This study assessed and documented risk factors for development of Breast Cancer in Sub-Saharan Africa specifically localised to Osogbo, a city in South West Nigeria. Its target is to create awareness in susceptible patients for early detection and prompt treatment and to help redress the lack of risk factor information on risk factors for breast cancer development.

STATEMENT OF THE PROBLEM

Breast cancer is becoming an important health concern among middle aged women with its accompanied death in Osogbo. Going by the hospital-based record of the Ladoke Akintola University of Technology Teaching Hospital, Osogbo (LAUTECH), Osogbo, there were 165 cases of breast cancer between 2005 and 2014 in which all of them presented late to the hospital, which leads to high mortality. Many risk factors for breast cancer development have been identified in literature, but there is need to establish which of these risk factors are peculiar to this environment in the development of breast cancer. Meanwhile it is not impossible that those factors could be prevalent in this environment. Hence, using the standardized instrument, risk factors that are prevalent to this environment can be isolated.

METHODS

Study design

The study employed a descriptive cross sectional design. A mixed method design was used. Quantitative data was collected with a standard instrument. The qualitative was conducted to supplement and strengthen the data collected from the quantitative. The study provided information on the risk factors that were detected in women of child bearing age, the prevalence and the distribution of the risk factors according to level of risks factors were noted.

Study setting

This study was conducted in Osogbo, the capital of Osun state. Osun state came into existence on the 27th of August, 1991. It is one of the 36 States that make up Nigeria. It covers an area of about 140 km^2 and lies at a height of 366 m above sea level. The population is about 288,343 according to year 2006 population census. Osogbo has two local governments (Osogbo and Olorunda local governments) with their headquarters in Osogbo. Osogbo Local Government has 15 political wards while Olorunda Local Government has 11 political wards. Going by the information gathered from the two local governments, there are 9 primary health care centres in Osogbo local government, while Olorunda local government has 13 Primary Health Care facilities totaling 22 Primary Health Care facilities in the two local governments. Hence, the 22 Primary Health Care facilities in the two local governments were selected and used for the study.

Sampling technique

A purposive sampling technique was adopted to select participants in this study. The criteria for choosing the subjects are: women within child bearing range 19 to 44 years attending antenatal and child welfare clinics of some selected Primary Health Care Centres in Osogbo and Olorunda. The procedures were as follows, women in Osogbo were selected according to their age range. The women were purposively selected to be between 19-44 years only. Women outside the inclusion criteria were not selected. The population of women of child bearing age projected from 2006 census to 2013 in Osogbo local government was 47,760, while that of Olorunda local government was 40,255 totaling 88,015 with age range between 15 and 44 years available in NPC file (from the National Population Commission office, Osogbo). According to study on women Health by WHO, it put the reproductive age at (19-44years) and adult women at (20- 59 years) women (Health fact sheet No 334, updated September, 2013).

Sampling: Women of child bearing age that met the study inclusion criteria at the study site were included in the study.

Validity

The validity of the adapted and modified standard instrument ('Short form breast Cancer Risk Questionnaire) was established through face and content validity criteria by my supervisor, co-supervisor and other experts in the field of Nursing research, ensuring that there were no ambiguities and that the content covered all relevant areas related to the information needed. The instrument was further cross-checked carefully to ensuring that there were no ambiguities, and necessary corrections effected.

Reliability

The instrument was tested for reliability at selected PHCs in Ile- Ife. Using Cronbach's alpha to ascertain the reliability of the research instrument, reliability coefficient of 0.75 was obtained. Hence, the instrument was found appropriate and reliable.

Instrument and data analysis

Two instruments were used for data collection. A modified structured questionnaire adapted from "The Short Form Breast Cancer Risk Questionnaire" and a focus group discussion guideline. The data collected was fed into Statistical Package for Social Sciences (SPSS) version 17 and analyzed using descriptive statistics, Gail model calculation and logistic regression. Qualitative data was analyzed using content analysis.

Ethical issues

The main ethical issues in this project were participant protection, confidentiality, and informed consent. This research did not pose risks of placing participants in physical danger or causing emotional/mental distress. All participants read, understood and signed a consent form that included the project aims, assurance of confidentiality. The study was approved by the Ethical review board of the Obafemi Awolowo University, Ile-Ife and Ethical clearance was obtained from the ethics and research committee, Institute of Public Health, Obafemi Awolowo University, Ile-Ife, with the Ethics

Committee assigned number; HREC NO- IPHOAU//12/259.

RESULTS AND DISCUSSION

Four hundred women participated in the study with a mean age of 31.5 ± 1.9 years. A large proportion (41%) of the respondents were within 31 – 36years age group. 64.8% attained menarche between the ages of 9-14years and majority (62.8%) had their first live births within the age bracket 25- 30years.

While 3.3% of the respondents have never been pregnant, more than two-thirds (76.5%) have had 1-3 pregnancies and 1-3 children (74.3%). 12.5% had their first child birth above age 30 years. Only 1.3% has had one of their ovaries removed. None has had bilateral oophorectomy. More than a fifth (23.3%) of the respondent's first degree relations have had breast cancer with said relation being respondent's mother 60.3% of them. Over a quarter (26.7%) of the respondents' mothers were dead, 52.3% of these deaths being traceable to breast cancer. 10.5% of the respondents have never breastfed a child. Majority (89.5%) had breastfed one or more of their children with their ages at first breastfeeding being within the 25-30 years' bracket in 65.1%. A larger proportion (39.4%) of the respondents breastfed their children for an average of 19-24 months.

Only 3.5 and 0.8% of the respondents have had breast biopsy and mammogram done respectively. The study identified risk factors and documented their prevalence as follows: attaining menarche between 9-14 years of age (64.8%); having first child after age 30 years (12.5%); nulliparity (3.3%); history of never having breast feed (10.5%) and having had a breast biopsy done (3.5%). Others were- a history of breast cancer in a first-degree relation (mothers or sisters) (23.3%).

The Gail model, used for risk assessment, revealed that nine of the respondents, constituting 2.3% are at a high-risk level of developing breast cancer (a score above 1.67%). Eight (2%) are at an average risk level for development of breast cancer (scores between 1.49-1.66%). 386 (95.7%) have a low risk of developing breast cancer (they have score below 1.49%, which is the standard low risk value for the development of breast cancer according to the Gail model. Hence, majority of the respondent have a low risk of developing breast cancer).

The study observed significant relationships between history of breast feeding and level of risk for breast cancer development ($p = 0.013$) as well as between breast cancer history in first degree relations and level of risk for breast cancer development ($p = 0.002$). Hence, type 1 errors were cited. The study however found no significant relationship between age at menarche or age at first childbirth and risk for breast cancer development (p values of 0.453 and 0.800 respectively). Similarly, a p value of 0.862 nullified significant relationship between number of pregnancies and risk for breast cancer development.

Table 1 shows the socio-demographic profile of the respondents. 400 women participated in the study. Their ages ranged from 19 to 44 years with mean of 31.5 ± 1.9. Larger proportions (41%) of the respondents were within 31-36 years age group. Majorities were Christian (53.5%), married (56.5%), educated up to higher institutional level (64.8%).

Table 2 shows the reproductive characteristics of the respondents. Majority of the respondents (64.8%) attained menarche at the age of 9-14years. Majority (62.8%) had their first live birth within the age bracket 25-30 years, (12.5%) had their first child birth above age 30. (3.3%) of the respondents have never been pregnant, more than two-third has had between one to three pregnancies (76.5%) and one to three children (74.3%), 22.8% of the respondents have had 4-6 pregnancies while, 0.8% have had more than 6 pregnancies. Majority (91.3%) are still having menstrual period. Only (1.3%) has had ovarian surgery involving removal of one of their ovary. The blank categories appeared because there were four hundred respondents and majority, (91.3%) 365 respondents are still having menstrual period, while, (8.8%) 35 respondents are having irregular period/ hormonal supplement.

Table 3 shows the breastfeeding history of the respondents. Majority (89.5%) of the respondent had breastfed one or more of their children with the age at first breastfeeding within 25- 30 years (65.1%). Larger proportion (39.4%) of the respondent breastfed their children for an average of 19-24 months.

Table 4 shows the breastfeeding history of the respondents. 10.5% of the respondents have not breastfed any child before. Majority (89.5%) of the respondent had breastfed one or more of their children with the age at first breastfeeding within 25- 30 years (65.1%). Larger proportion (39.4%) of the respondent breastfed their children for an average of 19-24 months. Table 5 shows respondent family history of breast cancer. More than one-fifth (23.3%) of the respondent's first degree relation had had breast cancer with majority (60.3%) of the relation being respondent's mother. More than one-fourth (26.7%) of the respondent's mothers were dead and in majority (52.3%), the cause of their mothers death being breast cancer.

Table 6 shows the distribution of respondents according to the level of risk as calculated using the Gail model, which revealed that nine (2.3%) have high risk level of developing breast cancer, they have a score above 1.67% which is standard for Gail model high risk value, eight (2%) have average risk level of developing breast cancer, they a score between 1.49-1.66% which is the standard average value level for developing breast cancer according to the Gail model, while, 386 (95.7%) have low risk level of developing breast cancer, they have score below 1.49%, which is the standard low risk

Table 1. Socio demographic profile of the respondents.

Variable	Frequency (n) n = 400	Percentage
Age range (in years)	**Mean=31.5 ±1.9**	
19 – 24	40	10
25 – 30	148	37
31 – 36	164	41
37 – 40	32	8
41 – 44	16	4
Religion		
Christianity	214	53.5
Islam	183	45.8
Traditional Worshippers	3	0.8
Marital status		
Presently Married	226	56.5
Cohabiting with someone as husband	131	32.8
Separated	30	7.5
Divorced	9	2.3
Never married	4	1
Educational qualification		
Not literate	10	2.5
Primary school leaving certificate	15	3.8
Secondary school certificate	77	19.3
Higher institution(NCE,OND, BSc)	259	64.8
Master's Degree	34	8.5
PhD or other advanced degree	5	1.3
Household income (in Naira)		
Less than 20,000	53	13.3
20,000 – 49,999	81	20.3
50,000 – 99,999	97	24.3
100,000 – 149,999	83	20.8
150,000 – 199,999	33	8.3
200,000 – 249,999	12	3
250,000 – 299,999	6	1.5
300,000 or more	7	1.8
Don't know	28	7
People supported by total household income		
1 – 2 people	133	33.3
3 – 4 people	197	49.3
5 – 6 people	58	14.5
7 – 8 people	4	1
9 – 10 people	5	1.3

value for the development of breast cancer according to the Gail model. Hence, majority of the respondent have a low risk of developing breast cancer.

Table 7 show logistic regression used in testing the hypotheses, which shows the odds ratios estimating the simultaneous and associations between possible risk

Table 2. Reproductive characteristics of the respondents.

Variable	Frequency (n) (n = 400)	Percentage
Age at Menarche (in years)	**Mean = 13.7 ± 3.1**	
9 – 14	**259**	**64.8**
15 – 16	124	31
≥ 17	15	3.8
Don't know	2	0.5
Age at first live birth (in years)	**Mean = 28.3 ± 5.7**	
19 – 24	86	21.5
25 – 30	251	62.8
>30	**50**	**12.5**
Unspecified	13	3.3
Number of pregnancies		
None	**13**	**3.3**
1 – 3	306	76.5
4 – 6	91	22.8
>6	3	0.8
Number of children (Parity)		
None	39	9.9
1 – 3	297	74.3
4 – 6	63	15.8
>6	1	0.3
Menstrual period history		
Still having menstrual period	365	91.3
Irregular period/hormonal supplement	35	8.8
Menstrual period have stopped permanently	-	-
Never menstruated	-	**-**
Ovarian surgery		
One ovary removed	**5**	**1.3**
Nil ovary removed	395	98.8

factors and level of risk of breast cancer using Gail model. Presence of family history of breast cancer increases significantly the odds of having higher risk of breast cancer (odds ratio [OR] – 1.12, 95% CI – 0.06–11.46, p-value = 0.002). That is, there is 11.2% increase risk for respondents who have first degree relative with breast cancer over those who have none. However, increase in average duration of breastfeeding reduce significantly the odds of having higher risk of breast cancer (OR – 0.98, 95% CI–0.97- 1.00, p-value-0.013). That is, by each increase in one month of breast feeding, from 12months above, there will be two percent decrease in risk of having breast cancer. Other variables were not statistically significant as shown in the table.

DISCUSSION

The study identified the risk factors associated with breast cancer development and determined its prevalence. It also described the distribution of the risk factors in the study population according to the level of risks (High, Average and Low). This was done with a view to documenting the prevalence of risk factors for breast cancer development among childbearing women. Breast cancer risk increases with age, with half of the women diagnosed annually (2006-2010) being aged 61 and over (Chu et al., 2012). The level of risk is also related to a female's reproductive history. An early menarche (first period), late menopause, late first birth or

Table 3. Respondent's breastfeeding history.

Variable	Frequency (n) n = 400	Percentage
Breastfeed any child before		
Yes	358	89.5
No	42	10.5
Age at first breastfeeding (in years) n = 358	**Mean = 28.1 ± 5.2**	
19 – 24	71	19.8
25 – 30	233	65.1
>30	54	15.1
Average duration of breastfeeding in all the children (in months) n = 358		
6 – 12		
13 – 18	108	30.2
19 – 24	109	30.4
	141	39.4

Table 4. Respondent's breast health history.

Variable	Frequency (n) n = 400	Percentage
Number of breast biopsy done		
None	386	96.5
One time	**14**	**3.5**
Ever had any mammogram done		
Yes	3	0.8
No	397	99.3

nulliparity (never giving birth) all increase the risk of getting breast cancer. Breast feeding can have a protective effect. Breastfeeding can lower breast cancer risk, especially if a woman breastfeeds for longer than 1 year. There is less benefit for women who breastfeed for less than a year, which is more typical for women living in countries such as the United States.

Huo et al. (2008) in a study on 'Parity and Breast feeding are protective against breast cancer in Nigerian women', reported that parity was associated with risk (p value = 0.02), but age at first child birth was not significant (p value = 0.16). Importantly, breast cancer risk decreased by 7% for every 12 months of breastfeeding (p value = 0.005). Similarly, in this study, it was observed that an increase in average duration of breastfeeding significantly reduced the odds of having breast cancer (OR – 0.98, 95% CI–0.97 - 1.00, p-value-0.013). A 2% decrease in risk is observed in risk per month of breastfeeding above 12 months.

Posited explanations for the protection breastfeeding offers include the reduced exposure to oestrogen found with breastfeeding and its usual tag-along, amenorrhoea (added to the 9 missed periods during pregnancy). In addition, lactating mothers tend to eat more nutritious foods and follow healthier lifestyles (limit smoking and alcohol use) while breastfeeding (BreastCancer.Org, 2015).

Additionally, a significant family history, such as having a mother diagnosed with breast cancer before age 40 years or having two or more close relatives on the same side diagnosed with breast cancer, increases risk of developing the disease. Approximately 5% of breast cancers are inherited via faulty genes, usually BRCA1 or BRCA2 which pose significant risks of developing the disease (American College of Radiology, 2008). The presence of these faulty genes can be detected and are accompanied by a strong family history of breast cancer. Women and men with a family history of breast cancer, especially in a first-degree relative (parent, child, or sibling), are at increased risk for the disease, compared

Table 5. Respondent's family history of breast cancer.

Variable	Frequency (n) n = 400	Percentage
First degree relation who have had breast cancer		
Yes		
No	**93**	**23.3**
	307	76.8
Relation who have had breast cancer (n = 93)		
Mother		
Sister	56	60.3
	37	39.7
Mother alive or dead		
Alive	268	67
Dead	107	26.7
Unspecified	25	6.3
Cause of Mothers death (n = 107)		
Breast Cancer	**56**	**52.3**
Cervical Cancer	11	10.3
Other cause of death	40	37.4

Table 6. Distribution of respondents according to the level of risk as calculated.

Variable	Using the Gail model	
	Frequency (n) n = 400	Percentage
Level of Risk		
High Risk (>1.66%)	9	2.3
Average Risk (1.49 – 1.66%)	8	2
Low Risk (<1.49%)	386	95.7

to women without a family history, risk of breast cancer is about 2 times higher for women with one affected first-degree female relative and 3-4 times higher for women with more than one first-degree relative (Ogundiran et al., 2010). Risk is further increased when the affected relative was diagnosed at a young age or if the cancer was diagnosed in both breasts (American Cancer Society, 2017).

Hopper et al. (2018) also revealed in their study that family history is another important risk factor for breast cancer that could not exist without there being a very strong gradient in underlying familial risk. To explain an overall average estimate of a 2-fold increased risk associated with having an affected first-degree relative, there must be at least a 20-fold inter-quartile risk ratio across the underlying familial causes. The findings of this study are in tandem with this; respondents with history-positive first degree relatives have a 11.2% increased risk of having breast cancer compared to those who are not (p-value = 0.002).

Other factors that can increase the risk of developing breast cancer according to literature are: Exposure to oestrogen through Hormone Replacement Therapy. A history of a typical hyperplasia of the breast and lobular or ductal carcinoma *in situ* are also associated with increased risk.

Conclusion

This study concluded that the risk for breast cancer is low in this study population. Family history of breast cancer was found to be highly associated with high risk of breast cancer while, duration of breastfeeding after 12 months reduces the risk for breast cancer development. Hence, importance of adequate breastfeeding should be emphasized in reduction of breast cancer development. More so, nurses can assist women in understanding the

Table 7. Logistic Regression Analysis of possible Risk Factors and level of Risk of Breast Cancer using Gail model.

Independent variable	Outcome = Higher risk		
	Odds ratio	95% CI	p-value
Age attained menarche	1.101	0.856 – 1.417	0.453
Age of first child birth			
<30 years**			
≥30 years	1.334	0.144 – 12.398	0.8
Number of pregnancy	0.96	0.603 – 1.527	0.862
Breastfeeding			
No**			
Yes	0.706	0.706 – 0.144	0.668
Age at first child breastfeeding			
<30years**			
≥30years	0.77	0.77 – 6.746	0.774
Average duration of breast feeding			
<12 month**			
≥12 month	0.98	0.97-1.00	**0.013***
Use of contraceptives			
No**			
Yes	0.759	0.250 – 2.304	0.626
Age at first contraceptive use			
<30 years**			
≥30 years	0.672	0.173 – 2.612	0.567
Family history of breast cancer			
No**			
Yes	1.12	0.06 -11.46	**0.002***

*Significant **Reference category, CI = Confidence interval.

risk factors, apart from the unavoidable risk factors such as age, positive family history of breast cancer, increased age at first child birth however, nurses can help women by avoiding further risks by encouraging regular check-ups and, every effort has to be taken to encourage positive behaviour towards promotion of health among women especially when it comes to breast cancer issue. Individual should adopt a healthy lifestyle such as healthy diet, rich in fresh fruits, vegetables, high fibre, diet, low fat, exercise and screening. Health care professionals including grassroots level health care workers have to play a significant role in educating the public especially the high risk women and the involvement of family and community should be facilitated.

On the other hand, government should go beyond policy formulation but show sustained willingness for implementation. Government should be proactive in controlling tobacco use, increase public awareness, community mobilization on the knowledge about risk factors on cancer early detection, screening and treatment. Government should also strengthen the existing cancer registries to ensure accurate and complete data collection; there should also be collaboration with the existing NGOs.

RECOMMENDATIONS

The following recommendations are proposed to improve upon the current situation of the healthcare services to help improve lowering the chance of breast cancer development.

(i) The risk factors for breast cancer development are an

additional facet that nurses should incorporate into teaching women since the primary function of the nurse is prevention and health education.

(ii) Every effort has to be taken to encourage positive behaviour towards exclusive breast feeding during the first six months of life and subsequently till 24 months as this has protective effect against breast cancer

(iii) Women with first degree relatives who have had breast cancer should be encouraged to go for breast screening (biopsy).

(iv) Health care professionals including grassroots level health care workers have to play a significant role in educating the public especially the high risk women and the involvement of family and community should be facilitated.

(v) Nurses must teach women about breast self-awareness to detect breast problems and emphasize routine screenings.

(vi) Women aged 40 years and older should have a yearly screening mammogram. Women in their 20s and 30s are advised to have a clinical breast examination with their regular physical examination at least every three years and annually thereafter

(vii) Health institutions should organize a yearly workshop/seminar for health care providers on risk factors for breast cancer development so as to update the knowledge of health care providers

(viii) Health care providers should create awareness about the risk of developing breast cancer to the women of child bearing age at each visit to both Ante natal, Post natal and, child welfare clinics.

(ix) There should be policy formulation and implementation on free breast examination and screening procedures for women of child bearing age, so that this could be done at their visit to the clinics.

(x) Government should provide breast screening at low or no cost in other to encourage the women to go for screening procedures.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

American Cancer Society (2017). Breast Cancer Facts & Figures 2017-2018. Atlanta: American Cancer Society, Inc. 2017. Available at https://www.cancer.org/.../cancer-facts-and statistics/breast-cancer-facts-and –figures.

American College of Radiology (2008). *CR* Practice Guideline for the performance of Screening, and Diagnostic Mammography. Retrieved *f*rom http://www.acr.org/~/media/3484CA30845348359BAD4684779D492D.pdf.

Bello TO, Olugbenga-Bello AI, Oguntola AS, Adeoti M.L, Ojemakinde OM (2011). Knowledge and Practice of Breast Cancer Screening Among Female Nurses and Lay Women in Osogbo. Nigeria. Research gate West African Journal of Medicine. June 2012. http://www.researchgate.net/publication//225273243

Boyd NF, Minkin S, Martin LJ, Tam CY, Hislop G, Hanley AJ (2010). Risk factors for Breast Cancer in Postmenopausal Caucasian and Chinese-Canadian women. Breast Cancer Research. http://breast cancer research.com/content/12/1/R2

BreastCancer.org (2015). 7 East Lancaster Avenue, 3rd Floor Ardmore. PA 19003 Breast cancer.org - All rights reserved.

Centre for Disease Control and Prevention (2018). Breast Cancer Statistics. US Department of Health and Human Services 1600 Clifton Road Atlanta, GA 30329-4027 USA 800- CDC- INFO (800-232-4636), TTY: 888-232-6348.

Centre for Population Health and Health Disparity (2011). The Health Disparity Theoretical Framework. Supported by the National Cancer Institute, American Journal Public Health 101(Suppl 1):S74-S81.

Chu QD, Henderson AE, Ampil F, Li BD (2012). Outcome for patients with triple-negative breast cancer is not dependent on race/ethnicity. International Journal of Breast Cancer 6 p. http://dx.doi.org/10.1155/2012/764570

Demirkiran FN, Balkaya S, Memis G, Turk S, Ozvurmaz, Tuneyurek P (2007). How do nurses and teachers perform self breast examination Are they reliable sources of information? BMC Public Health 7:96-96

Erhabor O, Abdulrahaman Y, Retsky M, Forget P, Vaidya J, Bello O, Ibiong L (2016). Breast Cancer in Nigeria Diagnosis Management and Challenges. Published By Author House UK. Liberty Drive. Blooomington. IN47403.USA' (c) Research Gate 2018. 1663. Available at https://www.researchgate.net/.../305000477.

Ferlay J, Bray F, Forman D, Center MM, Ward E, Parkin DM (2012). Global Cancer Statistics, CA Centre Journal Cinical 61(2):69-90.

Gail MH, Brinton MA, Byar DP, Corle DK, Green, SB, Schairer, C, Mulvihill J (2008). Model of breast cancer risk, prediction and implications for chemoprevention. National Cancer Institute 93:358-366.

GLOBOCAN (2012). Cancer incidence, Mortality and Prevalence, Worldwide, Ed Version 1.0. Lyon: IARC .Press. Cancer Base. No 5

Hopper JL, Dite GS, MacInnis RJ, Liao Y, Zeinomar N, Knight JA, Southey MC, Milne RL, Chung WK, Giles GG, Genkinger JM (2018). Age-Specific Breast Cancer Risk by Body Mass Index and Familial Risk: Prospective Family Study Cohort (ProF-SC) Breast Cancer Research 20(1):132.

Howard F, Scott FS (2006). Breast self-examination when research contradicts accepted practice. *AWHONM,* Lifelines 10:66-70.

Huo D, Adebamowo C, Ogundiran TO, Akang EE, Campbell O, Adenipekun A, Olopade O (2008). Parity and Breastfeeding are protective against breast cancer in Nigerian women.BJC, British Journal of Cancer. Cancer Research U.K.

International Agency for Research on Cancer (IARC) (2013). Hand book of cancer. 7th Ed. Lyon: IARC.

Komen SG, Richard I, Mohar A, Njelekela MA, Piot P, Gupta GR, Seffrin J (2009). Breast Cancer in the Developing World: Meeting the unforeseen challenge to women, health and equity. An international meeting organized by the Dana Farber Cancer Institute, the Harvard School of Public. Health, and the Brigham and Women´s Hospital Boston 3-5 November, 2009. Breast Cancer in the Developing World.

National Breast Cancer Foundation (2016). Breast Cancer Facts, Facts about Breast Cancer in the United State National Breast Cancer Foundation, Inc. 2016. http//www.population.gov.ng

National Population Pommission. Nigeria National Population Census (2006). Cited 2012 December 15. Available from http//www.population.gov.ng

Okobia MN, Bunker CH, Okonofua FE, Osime U (2006). Knowledge attitude and practice of Nigerian women towards breast cancer; a cross sectional study. World Journal of Surgical Oncology 4:11.

Ogundiran TO, Huo D, Adenipekun A, Campbell O, Oyesegun R, Akang E, Olopade OI (2010). Case-Control Study of Body Size and Breast Cancer Risk in Women. AJE. American Journal of Epidemiology. http:/aje.oxford journals.org/.

Olugbenga-Bello A, Oladele EA, Bello TO, Ojo JO, Oguntola AS (2011). Awareness and Breast Cancer Risk Factors; Perception and screening practices among females in a Tertiary Institution in South West Nigeria.

Parkin DM, Ferlay J, Hamid-Sherif M, Sitas J, Thomas JD, Wabinga H, Whelan SL (2012). Cancer in Africa. New York: Oxford University Press.

Said MA, Henry HS, Ewunonu E, Oguntebi, I, Mohammed L (2017). Breast Cancer Mortality in a Resource-Poor Country: A 10-year experience in a tertiary institution. Sahel Med Available from http://www.smjonline.org/article.asp?issn=1118-8561,year=2017;volume=20;issue