BREAST CANCER KNOWLEDGE AND SCREENING PRACTICES AMONG FEMALE SECONDARY SCHOOLS TEACHERS IN IBADAN NORTH II LOCAL GOVERNMENT AREA, IBADAN, NIGERIA

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To Almighty God, the one who was, who is and who is to come.

ABSTRACT

Breast Cancer (BC) is the most common type of cancer in women worldwide. Nigeria has the highest number of patients with advanced primary breast cancer which is often associated with high mortality. Teachers as role models and change agents may influence routine screening by young females, under their tutelage but few studies exist on knowledge of BC and screening practices among them. This study was designed to investigate knowledge of breast cancer and screening practices of female Senior Secondary School (SSS) teachers in Ibadan, Nigeria.

The study was cross-sectional in design and involved all the 411 female SSS teachers in Ibadan North Local Government Area. A semi-structured questionnaire was used to assess breast cancer awareness, knowledge of BC; self reported practice of Self Breast Examination (SBE), Clinical Breast Examination (CBE) and Mammography as well as factors influencing screening practices. Knowledge of BC was measured using a 30-point scale with 0-14 poor, 15-21 fair, and 22-30 good knowledge of BC respectively. Descriptive statistics and Chi-square test were used to analyse data and level of statistical significance was set at $p = 0.05$.

The response rate was 74.7%. Respondents' mean age and years in service were 39.8±8.5 and 12.0±8.5 years respectively. Majority of the respondents (79.8%) were married, 70.0% had first degrees and 46.0% had masters degrees, while 78.8% were class teachers. Majority (93.2%) had heard of BC and the leading sources of information were television (66.4%), radio (42.0%) and health care providers (32.6%). Some (42.7%) knew someone who practiced SBE while 24.1% and 23.8% knew someone that had gone for CBE and mammography respectively. Most (76.2%) claimed to have heard about SBE and 10.7% knew the appropriate age for commencing SBE. The mean knowledge score of BC was 8.8 ± 4.5. About 86.3% had poor knowledge, 13.0% had fair knowledge and 0.7% had good knowledge of BC. Some respondents believed that BC could be cured (42.3%) and 64.5% believed that BC was a disease of young girls.

There was no statistically significant difference in the knowledge of BC and the age of respondents. Out of the 111 respondents who had ever practiced SBE only 27.6% examined their breast monthly. Of the 73 and 163 respondents who have heard of mammography and CBE 1.6% and 4.6% had ever gone for either of the screening respectively. Sixty seven percent of the respondents were willing to be screened for BC if offered the opportunity. 34.8% did not practice BC screening because they did not know how it is done, 20.5% did not feel the need to perform screening once there are no symptoms of BC and 36.2% did not like CBE.

Awareness of breast cancer was high; knowledge was poor while screening practices was low. There is a need to organize series of health education programmes aimed at improving knowledge of breast cancer among female teachers with emphasis on the importance of practicing self breast examination, clinical breast examination and mammography.

Keywords: Breast cancer, Secondary School Teachers, Breast screening practices.
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CERTIFICATION

I certify that Ayoola Ayobami OJEWUSI carried out this research work in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria

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Table of contents

CHAPTER THREE: METHODOLOGY

CHAPTER FOUR: RESULTS

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

DCIS	Ductal carcinoma in situ
LCIS	Lobular carcinoma in situ
DNA	Deoxyribonucleic Acid
ER	Estrogen receptor
PR	Pathology report
EGFR	Epithelial growth factor
BRCA1	Breast cancer 1
BRCA2	Breast cancer 2
FNAC	Fine-needle aspiration cytology
NHI	National Health Institute
NCI	National Cancer Institute
CDC	Center for Disease Control
WHO	World Health Organisation
ACS	American Cancer Society
HRT	Hormone replacement therapy
IARC	International Agency for Research on Cancer
BSE	Breast Self Examination
CBE	Clinical Breast Examination
USPSTF	U. S. Preventive Services Task Force,
TLNM	Tumor, Lymph nodes, Metastasis
AJCC	American Joint Committee on Cancer
IUAC	International Union against Cancer
HBM	Health Belief Model

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Breast cancer is the most common cancer found in women worldwide. In 2012, 1.7 million women were diagnosed with breast cancer and there were 6.3 million women alive who had been diagnosed with breast cancer in the previous five years (GLOBOCAN 2012). Since the 2008 estimates, breast cancer incidence has increased by more than 20%, while mortality has increased by 14%. Breast cancer is also the most common cause of cancer death among women (522 000 deaths in 2012) and the most frequently diagnosed cancer among women in 140 of 184 countries worldwide. It now represents one in four of all cancers in women (GLOBOCAN 2012).

GLOBOCAN reports that more than half (57%, n = 8 million) of new cancer cases and nearly two thirds of related deaths (65%, n = 5.3 million) occurred in the less developed regions of the planet (International Agency for Research on Cancer 2012). The report notes that many developing countries are going through rapid societal and economic changes, and there is a shift toward lifestyles representative of industrialized countries. These factors, along with changes in reproductive, dietary, and hormonal risk factors, are contributing to the rising cancer rates. However, even though incidence rates of breast cancer are still highest in more developed nations, mortality is greater in less developed countries, owing to lack of access to treatment as well as early detection of the disease (International Agency for Research on Cancer (IARC) 2012).

The mortality rates for breast cancer are higher in developing countries as a result of late detection and diagnosis. Several factors are responsible for this and they include genetics, cultural and social factors such as poverty, unequal access to prompt high quality treatment, lack of screening facilities, and lack of awareness and knowledge of the disease. Breast cancer ranks second in cancer incidence and is still the second principal cause of cancer mortality among women worldwide including Nigeria (Okobia, Bunker, Okonofua, Osime, 2006).

Among Nigerian women, some of the factors that prevent early hospital presentation and thus increases mortalities include inadequate policies that seeks to protect and promote women's health and cultural taboos regarding the female body (Akpo, Akpo and Akhator, 2010). Lack of knowledge about breast cancer has also been identified as an important factor preventing women from participating in breast cancer screening (Akpo et al., 2010).

It additionally adds to delay in presentation and treatment. Therefore, it is important to understand the factors that influence patients' screening behaviours. These delays contribute to the high rates of mortality described above.

Breast cancer has been found to be the most common cancer, and also the second principal cause of cancer deaths in women worldwide as well as in Nigeria (Global Cancer Statistics 2002). The incidence of the disease appears to be rising faster in population groups that have hitherto enjoyed low incidence. The peak age of breast cancer in Nigerian women is about a decade earlier than Caucasians (Okobia, Bunker, Okonofua, & Osime, 2006). Most of the patients seek medical advice when the disease is fairly advanced. For women with symptomatic breast cancer, prolonged delay, defined arbitrarily as an interval greater than 3 months from first detection to time of diagnosis and treatment has been shown to be associated with increased tumor size and more advanced stage of disease and with poor long-term survival (Okobia et al., 2006).

Women's knowledge and views about BC and its treatment may contribute considerably to medical help-seeking behaviors Knowledge deficiency may lead to delayed presentation with advanced stages when little or no benefit is derived from any form of therapy (Ferla), Autier, Boniol, Heanue and Colombet. 2007). For presentation at an early stage, women must be "breast aware"; they must be capable of identifying symptoms of BC through routine practice of screening. The three screening methods recommended for breast cancer includes breast self-examination (BSE), clinical breast examination (CBE), and mammography. Unlike CBE and mammography, which requires hospital visit and specialized equipment and expertise, BSE is inexpensive and can be carried out by the women themselves. Cancer screening tests play a pivotal role in reducing breast cancer related mortalities (Tang, Solomon & McCracken 2000). The American Cancer Society (ACS) 2008 recommends CBE and mammography in the early detection of breast cancer. According to ACS recommendations, women should know how their breasts normally feel and report any breast changes promptly to their health care providers. There is also evidence that most of the early breast tumours are self-discovered and that the majority of early self-discoveries are by BSE performers (Smith, Caleff, Albert, Chen, Duffy, Franceschi and Nystrom, 2006).

1.2 Statement of the problem

According to the National Cancer Institute (NCI), the most common type of breast cancer is ductal carcinoma, which "begins in the lining of the milk ducts;" however, breast cancer refers quite broadly to any cancer that forms in the breast tissue. The cancer is far more common in women than in men. In 2013, there were an estimated 232,430 new female cases and 2,240 new male cases. In the same year, about 39,620 females died due to the disease, compared to 410 males (National Cancer Institute. 2014).

In the North-Western geopolitical zone of Nigeria, cancer of the breast was second to cancer of the cervix, while at University College Hospital (UCH), Ibadan (situated in the South-Western geopolitical zone of Nigeria) it was the leading malignancy among women (Ogunbiyi, Fabowale and Ladipo, 2010). At the North-central geopolitical zone, breast cancer constituted 22.41% of new cancer cases registered in 5 years and accounted for 35.41% of all cancers in women (Afolayan, Ibrahim and Ayilara, 2012). In developing or low income countries, breast cancer was characterized by late clinical presentation and in advance stage of the disease, when only chemotherapy and palliative care could be offered, and therefore associated with high mortality (Parkin, Sitas, Chinrenje, Stein, and Abrah, 2007).

Among Nigerian women, the peak age of breast cancer presentation is about 10-15 years later than what is observed in Caucasian women, where it occurs between the ages of 35-45 years. 70% of Nigerian women present with advanced staged disease while the 5-year survival rate is less than 10% compared with over 70% in Western Europe and North America (Okobia et al, 2006). The relative frequencies of breast cancer among other female cancers, from Cancer Registries in Nigeria were 35.3% in Ibadan, 28.2% in Ife-Ijesha, 44.5% in Enugu, 17% in Eruwa, 37.5% in Lagos, 20.5% in Zaria and 29.8% in Calabar (Banjo, 2004). In all the centres, except Calabar and Eruwa, breast cancer ruled first among other cancers. Further reports showed that majority of cases occurred in pre-menopausal women and the mean age of occurrence ranged between 43-50 years across the regions. The youngest age recorded was 16 years from Lagos (Banjo, 2004). Adebamowo and Ajayi 2000 also reported that peak age of incidence in Nigeria is 42.6 years, and that 12% of cases occurred before 30 years while post-menopausal women accounted for 20% of cases. These authors were of the opinion however that "...these

parameters may be more reflective of the demographic profile of Nigeria than an inherent difference in epidemiological characteristics of breast cancer in Nigeria" (Adebamowo and Ajayi, 2000).

Developing countries like Nigeria are experiencing demographic and epidemiologic transition and the prevalence of non-communicable disease especially breast cancer is on the increase (Lucas and Gilles, 2003). Breast cancer in female is the most frequently diagnosed cancers and the leading cause of cancer death sex in both economically developed and developing countries (Jemal, Bray, Center, Ferlay, Ward, and Forman, 2011). Worldwide, 1.3 million new breast cancer cases were reported every year accounting for 23% of the total new cases and 14% (458,000) of the total cancer deaths in 2008 (Jemal et al., 2011).

Several studies have shown that the knowledge of women on breast cancer directly influence their attendance and acceptance of screening and treatment (Sadler, Ko, Cohn, White, Weldon, and Wu, 2007). It is well-established that early detection and early treatment lead to improved survival (Althuis, Fergenbaum, Garcia-Closas, Brinton, Madigan and Sherm, 2004). From various studies about breast cancer in Nigeria, very low level of knowledge about symptoms of breast cancer and screening methods has been reported (Okobia et al., 2006). A comparison of the rate of breast cancer at risk population of a typical Africa country shows that whereas the size of at risk population remain largely stable in France it is increasingly steeply increasing in Nigeria (Akarolo-Anthony, Ogundiran and Adebamowo, 2010). Majority of patients in Nigeria present at advanced stage, the factors responsible for late presentation with advanced disease include low social economic level, fear of mastectomy (Elumelu, Adenipekun, Abdus-salam and Dojude, 2011). Pattern of breast cancer metastasis at the radiotherapy clinic, Ibadan-A ten year poverty (which does not only impede access to health care system, but is associated with other co-factors that can relatively affect outcomes such as co-morbidity and lack of breast health awareness) (Oluwole, Ali, Adu, Blanc, Barlow, Oropeza and Freeman, 2003).

The recent fall in deaths from breast cancer in Western Nations is partly explained by earlier diagnosis as a result of early presentation. According to Odusanya (2001), breast cancer is not well understood by women and there is a need for information and enlightenment if they are to present early in hospital. Lack of knowledge about breast

cancer has also been identified as an important factor preventing women from participating in breast cancer screening. It additionally adds to delay in presentation and treatment. Therefore it is important to understand the knowledge of breast cancer and factors that influence patients' screening practices. Breast cancer affects young, middle aged and elderly women who are caregivers of the family and who contribute to the development of society. Early detection of breast cancer can be accomplished through various screening methods and this is effective in reducing breast cancer mortality (Ohene-Yeboah, 2005).

Therefore, the purpose of this study was to assess the knowledge of female teachers in public Senior Secondary Schools in Ibadan North Local Government Area of Oyo State, Nigeria. As a result, this research becomes essential as it helps to increase early awareness among the female teachers, while also informing them that breast cancer is preventable, if detected early, using the various recommended screening methods viz: Breast Self-Examination (BSE), Clinical Breast Examination (CBE) and Mammography. By extension, these teachers will be encouraged to function as role models within their societies and also educate and counsel innocent female students under their charge about the dangers of breast cancer.

1.3 Justification of the study

In Nigeria, like in many developing countries, current reports have noted an increase in the incidence of breast cancer. Breast cancer belongs to the group of cancer that are potentially curable if diagnosed early, unfortunately in Nigeria, most cases presented during the late stage of the disease (Anyanwu, 2006). One of the major reasons observed for the late presentation was the lack the access by most women to vital information on the factors that decrease breast cancer risks (Lee, Ahn, You, Lee, Han, Choe and Noh 2004).

Several factors determine the stage at which patients with breast cancer present to the hospital. Some of such factors include educational status, financial capability, occupation, location, presence of health care facilities. However, a common denominator of these factors is the level of awareness and attitude toward breast cancer. For those patients that are aware of the disease, with the right attitude towards it, have an increased chance that they will present early for treatment, while the reverse is said to be true for those patients who are not aware of breast cancer and also have the wrong attitude towards the disease.

In Nigeria, previous studies on breast cancer knowledge assessment were conducted using different population (Okobia et al., 2006). Reports from these studies highlighted low level of awareness of breast cancer and poor practice of screening methods. In regard of the large proportion of patients with breast cancer in Nigeria who present with advanced stages of the disease, there is the need for more awareness and measures for early detection. Adequate knowledge and positive attitude towards breast cancer screening are essential for all female teachers if they are to successfully play their role in breast cancer awareness campaign in Nigeria. The female teachers are seen as role models in their different communities which they belong, and as a result, they provide credible and reliable information to the people of their communities. Studies in Nigeria which affect the knowledge and the screening practice of female teachers towards breast cancer are minimal. In one of such studies, most female Nigerian teachers were found to have inadequate knowledge of breast cancer, and certainly, they do not fully understand the risk factors (Odusanya, 2001).

Therefore, there is the need to assess the current level of knowledge of breast cancer and the practice of screening methods among the female teachers. This helps to determine the need for continuing medical and health education programmes that seek to improve the knowledge of the disease and adoption of early detection measures. This will not only enhance positive influence on women, but also improve their individual level of breast cancer awareness. The Public Secondary Schools in Ibadan consist of junior and senior schools and the teachers are allocated either to the junior or senior schools based on their specialized area. This study was carried out among the senior cadre of the public Senior Secondary School because it is the final stage of secondary schooling and most students under this category fall into ages 16-18 years more or less. The school teachers that attend to students in this category have an important role to play in health education, and this helps young people to develop healthy behaviour including BSE before they move on to tertiary institutions. Thus the main thrust of this study was to assess the knowledge of breast cancer including the practice of screening methods among female teachers.

1.4 Broad objective

The broad objective of this study was to assess breast cancer knowledge and screening practices among female teachers of public senior secondary schools in Ibadan North Local Government Area of Oyo State, Nigeria.

1.5 Specific objectives

1. Determine the awareness of breast cancer among female teachers.
2. Identify the sources of breast cancer and screening information.
3. Assess the level of breast cancer knowledge among female teachers.
4. Evaluate perceived susceptibility of breast cancer among female teachers.
5. Enumerate the method of screening practices mostly used among female teachers.
6. Examine factors that influence screening practices among female teachers.

1.6 Research questions

1. What is the awareness of breast cancer among female teachers?
2. What are the sources of breast cancer and breast screening information among female teachers?
3. What is the level of knowledge of breast cancer among female teachers?
4. What is the perceived susceptibility of breast cancer among teachers?
5. What are the methods of screening practices mostly used among female teachers?
6. What are the factors that influence screening practices among female teachers?

1.7 Research hypotheses

1. There is no significant relationship between breast cancer knowledge and age.
2. There is no significant relationship between breast cancer knowledge and years of service.
3. There is no significant relationship between breast cancer knowledge and level of education.
4. There is no significant relationship between practices of breast self examination and age.
5. There is no significant relationship between practices of breast self examination and years of service.
6. There is no significant relationship between practices breast self examination and level

of education.

7. There is no significant association between practicing breast self examination and those who had heard of harmful effect of breast cancer.
8. There is no significant association between practices of breast self examination and those that knew somebody who had carried out BSE before.

CHAPTER TWO

2.0 LITERATURE REVIEW

Cancer is a non-communicable disease, which is becoming increasingly important worldwide. It is a disease characterised by an abnormal growth of cells with the ability to invade adjacent tissues and even metastasize to distant organs, resulting in morbidity and eventually leading to the death of the individual if not detected and managed early. The aetiology is multifactorial and includes environmental factors such as tobacco smoking, tobacco chewing and alcohol consumption. Genetic factors are also implicated in the aetiology of cancer (Park K. 2007). Globally, about 10 million people are diagnosed with cancer and more than 6 million die of cancer every year (Park K. 2007). Cancer is a leading cause of disease worldwide. In 2012, there were an estimated 14.1 million new cases of cancer in the world: 7.4 million (53%) in males and 6.7 million (47%) in females, giving a male:female ratio of 10.9 (Ferlay, Soerjomataram, and Ervik., 2013). Lung, female breast, colorectal and stomach cancers accounted for more than 40% of all cases diagnosed worldwide. In men, lung cancer was the most common cancer (16.7% of all new cases in men). Breast cancer was by far the most common cancer diagnosed in women (25.2% of all new cases in women) (Ferlay et al., 2013) and it is the most frequently diagnosed cancer among women in 140 of 184 countries represented in this database (GLOBOCAN 2012).

2.1 Anatomy of female breast

The presence of breasts is one of the main aspects for distinguishing mammals from other living creatures, such as reptiles, birds and insects. With a support system of interlobular stroma and fibroadipose tissue, the female breast has 6-10 duct systems, which originate at the nipples. Similar to a tree branching into finer and finer branches, the ducts in the mature, lactating breast end in clusters of acini. The ductal lobular system is layered with an inner epithelium, with a main secretory function, and an outer myoepithelium, with a contractile function. Additionally, the breast is also lined with adipose tissue. The development of the female breast (thelarche) usually begins approximately 3 years before the onset of menstruation (menarche). Commonly, thelarche begins at approximately age 11 and menarche at age 13. The breasts are usually fully developed by age 18 (Carolina Ellberg, 2014).

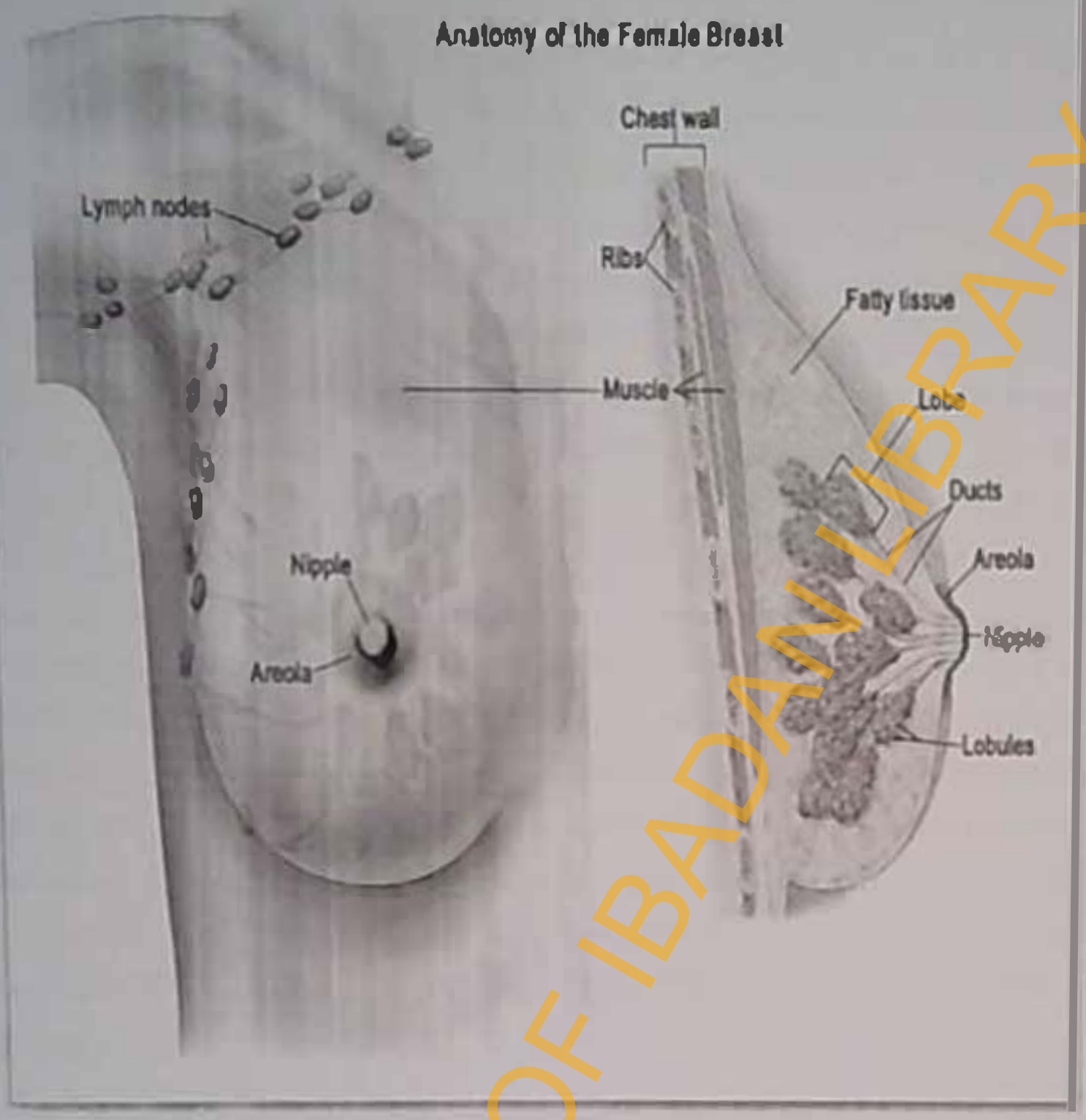

Figure 2.1 Anatomy of the female breast. The nipple and areola are shown on the outside of the breast. The lymph nodes, lobes, lobules, ducts, muscle, ribs, chest wall, and fatty tissue of the breast are also shown.

Source: National Cancer Institute © 2013 Terese Winslow LLC, U.S. Govt.

2.2 What is breast cancer?

Breast cancer (malignant breast neoplasm) is cancer originating from breast tissue, most commonly from the inner lining of milk ducts or the lobules that supply the ducts with milk (Sariego, 2010). Cancers originating from ducts are known as ductal carcinomas; those originating from lobules are known as lobular carcinomas. Breast cancer is a disease of humans and other mammals; while the overwhelming majority of cases in humans are women, men can also develop breast cancer. The size, stage, rate of growth, and other characteristics of the tumor determine the kinds of treatment. Treatment may include surgery, drugs (hormonal therapy and chemotherapy), radiation and/or immunotherapy (Florescu, Amir, Bouganim, and Clemons, 2011). Surgical removal of the tumor provides the single largest benefit, with surgery alone being capable of producing a cure in many cases. To somewhat increase the likelihood of long-term disease-free survival, several chemotherapy regimens are commonly given in addition to surgery. Most forms of chemotherapy kill cells that are dividing rapidly anywhere in the body, and as a result cause temporary hair loss and digestive disturbances. Radiation may be added to kill any cancer cells in the breast that were missed by the surgery, which usually extends survival somewhat, although radiation exposure to the heart may cause heart failure in the future (Buchholz , 2009). Some breast cancers are sensitive to hormones such as estrogen and/or progesterone, which make it possible to treat them by blocking the effects of these hormones.

Prognosis and survival rate varies greatly depending on cancer type and staging. With best treatment and dependent on staging, 5-year relative survival varies from 98% to 23%, with an overall survival rate of 85% (World Cancer Report, 2008). Worldwide, breast cancer comprises 22.9% of all cancers (excluding non-melanoma skin cancers) in women (World Cancer Report, 2008). In 2008, breast cancer caused 458,503 deaths worldwide (13.7% of cancer deaths in women) (World Cancer Report, 2008). Breast cancer is more than 100 times more common in women than breast cancer in men, although males tend to have poorer outcomes due to delays in diagnosis (National Cancer Institute, 2011).

2.3 History of Breast Cancer and Worldwide Breast Cancer Trends

Cancer is increasingly a global problem (Boyle, 2006) and breast cancer is not only the most common incident form of cancer in women worldwide, but is the first or second most

common in all regions of the world, and responsible for 1.4 million new cases annually (Boyle P, Levin B.2008). The incidence of breast cancer is increasing almost everywhere throughout the world, although the mortality rate from breast cancer is declining in many high-income countries (Autier, Boniol and La Vecchia, 2010). In 2012, 1.7 million women were diagnosed with breast cancer and there were 6.3 million women alive who had been diagnosed with breast cancer in the previous five years. Since the 2008 estimates, breast cancer incidence has increased by more than 20%, while mortality has increased by 14%. Breast cancer is also the most common cause of cancer death among women (522 000 deaths in 2012) and the most frequently diagnosed cancer among women in 140 of 184 countries worldwide. It now represents one in four of all cancers in women (IARC., 2012).

Worldwide as well as in Nigeria, breast cancer has been reported as the most common cancer in women and the second leading cause of death (Adebamowo and Ajayi, 2000). In general, breast and other cancers are not rare in Africa. The probability that the African woman will live to be 65 years of age compared to women in developed countries. Even if incidence is held constant, the change in this probability as a result of increased life expectancy at birth is an important cause of the increasing prevalence of breast cancer in Africa (Adebamowo and Adekunle, 2003). For women, breast cancer is the most commonly occurring cancer (Sen et al., 2002). It is also the most common cause of cancer deaths among women and thus needs to be dealt with comprehensively. Globally there are more than a million new cases of breast cancer resulting in about 375,000 deaths each year (Wilson, Tobin and Young, 2004).

Early detection of cancer greatly increase the chances of successful treatment and decreases the health burden of morbidity and mortality. Approximately 212,920 new cases of invasive breast cancer, 61,980 in situ cases, and 40,970 deaths were expected to occur among US women in 2006 (Smigal et al., 2006). It is estimated that 1 in 8 Caucasian women (1 in 14 African-American) in the US and 1 in 12 in Britain will develop cancer of the breast in their life time (Global Cancer Statistics 2008). Breast cancer mortality rates are higher in developing countries as a result of late detection and diagnosis. Several factors are attributable include genetics, cultural and social factors such as poverty, unequal access to prompt high quality treatment, lack of screening facilities, or lack of awareness and knowledge of the disease.

The American Cancer Society (ACS) projected more than 192,000 new cases of invasive breast cancer will be diagnosed among women in the United States in 2010 (ACS, 2009). Over 40,000 women in the United States are expected to die from breast cancer in 2009 (ACS., 2009). After skin cancer, breast cancer is the most frequently diagnosed cancer in women in the United States. Every three minutes a woman in the United States is diagnosed with breast cancer. The rising incidence of breast cancer in women may be due to increased detection (ACS., 2010). Breast cancer has been increasing steadily from an incidence of 1:20 in 1960 to 1:8 women today, which is second only to lung cancer as the leading cause of cancer mortality among U.S. women aged 35 to 54 (ACS., 2010). The chance of dying from breast cancer is about 1 in 35. However, breast cancer death rates have been declining since about 1990, with larger decreases in women younger than 50 years (ACS., 2010). Breast cancer is three times more common than all gynecologic malignancies put together and is usually a much more aggressive disease in younger women (National Breast Cancer Foundation, 2009). Overall, the incidence rate of breast cancer is higher for white women than for black women, yet the mortality rate for black women remains higher than white women (ACS., 2006). Several factors have been suggested to contribute to the higher breast cancer mortality in black women than in white women, including poorer socioeconomic status with reduced access to health care, lower frequency of mammography with delayed diagnosis, obesity, and high-grade breast cancer tumors (Hahn, Bondy, Selvan, Lund, Lift, Flagg, Brinton, Porter, Eley and Coates, 2007).

The incidence rates are 20% to 40% higher in white women aged 55 years and older compared to black women, but are higher in young (under age 40) black women than in young white women with a less favorable prognosis. Research suggests that breast cancer risk factors are different for young black women than white women. Early age at first birth and having four or more children before age 40 appears to increase the risk of breast cancer in young black women, while in white women early childbearing reduces breast cancer risk. The cause is unclear but has been linked to genetics (Breast Cancer Fund, 2008). Young black women have more aggressive tumors, typically estrogen-receptor negative, progesterone receptor tumors, HER2 negative and basal-type tumors, sometimes referred to as —negative tumors. Triple-negative tumors do not respond to hormonal therapies such as tamoxifen (antiestrogen medication used to treat breast cancer) (Breast Cancer Fund, 2008). In addition, young black women present with more advanced breast cancer at diagnosis, including larger tumors and more lymph node involvement (Breast Cancer Fund, 2008). Incidence rates rose

in the 1970s and the 1980s, increase slowed in the 1990s compared to the 1980's and in general are declining for young women (ACS., 2007). After increasing for more than two decades, female breast cancer incidence rates decreased by 2.2% per year from 1999 to 2005. This decrease may reflect the reduced use of hormone replacement therapy (HRT) after the results of the Women's Health Initiative were published in 2002. The study linked HRT use to an increased risk of breast cancer and heart diseases (ACS., 2007).

The most critical factor in determining survival of breast cancer patients is the histological stage of the disease at the time of diagnosis. Fifteen years ago, the five-year survival rate from breast cancer (all stages) was 82% for white women compared with 66% for black women. Currently, the 5-year relative survival rate for breast cancer among black women is 77% compared with 90% among white women (Susan G. Komen Breast Cancer Foundation, 2007). A recent study showed that about 75% of the racial differences in survival between these two populations might be explained by stage at diagnosis, specific characteristics of the tumor, the presence of additional illness, and socio-demographic factors (Susan G. Komen Breast Cancer Foundation, 2007).

Although rare, breast cancer can and does occur in young women and adolescents. Less than 5% of all breast cancers occur in women under age 40. Women who are diagnosed with breast cancer under age 40 are more likely to have a BRCA1 or BRCA2 gene (ACS., 2007). These genes are important with breast cancer and women who carry defects of either of these genes are at greater risk of developing breast cancer. If a woman carries a defective BRCA1 or BRCA2 gene, she may have a 50 to 85 % chance of developing breast cancer (Susan G. Komen Breast Cancer Foundation, 2008). During 2006 in the United States alone, over 11,000 young women under 40 years of age were told that they have breast cancer. Only 1 in 2500 women will develop breast cancer by age 30 (Susan G. Komen Breast Cancer Foundation, 2007). The ACS (2007) reported that the incidence of breast cancer among white and black women aged 15-19 years was 0 per 10,000. There was no other data found that reported the incidence, prevalence, and survival rate of breast cancer among adolescent females.

2.4 Breast cancer in Nigeria

Breast Cancer constitutes a major public health issue globally with over 1 million new cases diagnosed annually, resulting in over 400,000 annual deaths and about 4.4 million women living with the disease. It also affects one in eight women during their lives. It is the commonest site specific malignancy affecting women and the most common cause of cancer mortality in women worldwide. It is also found in men but not very common. Statistics available in Nigeria are largely unreliable because of many factors that have not allowed adequate data collection and documentation; but according to numbers provided by Globocan in 2002, and also a renowned radiologist at the University College Hospital (UCH), Ibadan, disclosed that about 25million people worldwide live with the disease and about 10,000 new breast cancer cases occur every year in Nigeria in 2011. Breast Cancer is responsible for about 16% of all cancer related deaths in Nigeria. Breast cancer is the commonest cancer among women in the world and in Nigeria (Adebamowo and Ajayi, 2000). In Nigeria the prevalence of breast cancer is 116 per 100,000 and 27,840 new cases were expected to develop in 1999 (Adebamowo and Ajayi, 2000). Recent observations show that the frequency of breast cancer has risen over that of non-Hodgkin's lymphomas and cervical cancer in Nigeria (Thomas, 2000). This trend was attributed to several factors; the acceptance of fine needle aspiration as an accurate diagnostic evaluation, increased awareness about breast cancer and usefulness of breast self-examination (Thomas, 2000).

The relative frequencies of breast cancer among other female cancers, from Cancer Registries in Nigeria were 35.3% in Ibadan, 28.2% in Ife-Ijesha, 44.5% in Enugu, 17% in Eniwa, 37.5% in Lagos, 20.5% in Zaria and 29.8% in Calabar (Banjo, 2001). In all the centers, except Calabar and Eniwa, breast cancer rated first among other cancers. Further reports showed that majority of cases occurred in pre menopausal women, and the mean age of occurrence ranged between 43–50 years across the regions. The youngest age recorded was 16 years, from Lagos (Banjo, 2004). Adebamowo and Ajayi, 2000) also reported that peak age of incidence in Nigeria is 42.6 years, and that 12% of cases occurred before 30 years while postmenopausal women accounted for 20% of cases. These authors were of the opinion however that "...these parameters may be more reflective of the demographic profile of Nigeria than an inherent difference in epidemiological characteristics of breast cancer in Nigeria..." (Adebamowo and Ajayi, 2000).

A ten year review of breast cancer in Eastern Nigeria revealed that patients with breast cancer constituted 30% of all patients with breast disease and that 69% of these patients were pre-menopausal (Salaudeen, Musa and Akande, 2009). A comparison of the rate of breast cancer at risk population of a typical Africa country shows that whereas the size of at risk population remain largely stable in France it is increasingly steeply increasing in Nigeria (Akarolo-Anthony, Ogundiran and Adebamowo 2010). Majority of patients in Nigeria present at advanced stage, the factors responsible for late presentation with advanced disease include low social economic level, fear of mastectomy (Elumelu, Adenipekun, Abdus-salam and Bojude, 2011) and poverty (which does not only impede access to health care system, but is associated with other co-factors that can relatively affect outcomes such as co-morbidity and lack of breast health awareness) (Oluwole et al., 2003).

2.5 Types of breast cancer

- Ductal carcinoma in situ (DCIS) is a noninvasive, precancerous condition in which abnormal cells are found in the lining of a breast duct. The incidence increased in all ages but more in women older than 50 years (Vimig, Wang, Shamilyan, Kane, Tuttle. 2010). The abnormal cells have not spread outside the duct t o other tissues in the breast. In some cases, DCIS ma y become invasive cancer and spread to other tissues, although it is not known a t this time how to predict which lesions will become invasive.

- Invasive (infiltrating) ductal carcinoma is t he most common cell type, comprising 70% to 80% of all cases. The tumors occur throughout the age range of breast carcinoma, being most common in women in their middle to late 50's. It is characterized by its solid core, which is usually hard and firm on pal pation. An associated ductal carcinoma in-situ is frequently present and comedo necrosis may occur in both invasive areas and areas of intraductal carcinoma. Invasive duct al carcinoma commonly spreads to the regional lymph nodes and carries the poorest prognosis among various ductal types. (Vimig, 2010)

- Lobular carcinoma in sit u (LCIS) is a condition in which abnormal cell s are found in the lobules of the breast. This condition seldom becomes invasive cancer.

however. having lobular carcinoma in situ in one breast increases the risk of developing breast cancer in either breast (Vimlg, 2010).

- Invasive lobular carcinoma is the 2nd most common type of invasive breast cancer accounting for 8-14% of all breast cancers (Singletary, Patel-Parekh, Bland, 2005). It is characterized by greater proportion of multicentricity in the same or the opposite breast. The lesions' end to have ill-defined margins, and occasionally the only evidence is subtle thickening or indurations. Patients with infiltrating lobular carcinoma are especially prone to have bilateral carcinoma. Stage by stage, invasive lobular carcinoma has a similar prognosis to infiltrating ductal carcinoma.

- In inflammatory breast cancer is a rare and aggressive form of breast cancer with unknown etiology and generally poor outcome (Anderson, Chu and Chang 2004). The breast looks red and swollen and feels warm. The redness and warmth occur because the cancer cells block the lymph vessels in the skin. The skin of the breast may also show the pitted appearance called peau d'orange (like the skin of an orange).

- Tubular carcinoma is al so known as a well-differentiated carcinoma. The frequency of axillary lymph node metastases is approximately 10%, lower than that of duct al carcinoma.

- Medullary carcinoma is characterized by a prominent lymphocyte infiltrate. Patients with medullary carcinoma tend to be younger than those with other types of breast cancer (Parkin, Ferlay and Hamdi-Chérif, 2003).

2.6 Breast cancer in men

The commonest cancers of Nigerian men are cancers of prostate, liver and lymphomas (Awodele, Adeyemoye, Awodele, Fayankinnu and Dolapo, 2011). Male breast cancer is rare in contrast to female breast cancer, which is the most common cancer in females and the second leading cause of cancer related deaths in women (Jemal, Siegel, Ward, 2008). A man's lifetime risk of the disease is 1 in 1,000, while a woman's is 1 in 8. According to a 2012 study that assessed more than 13,000 male breast cancers from the US National Cancer Data Base, men with breast cancer are less likely to survive the disease than women. The researchers found that at diagnosis, men were likely to have much larger

breast tumors, and the cancer was more likely to have already spread to other areas of the body (American Cancer Society 2012).

The most recent American Cancer Society estimates for breast cancer in men in the United States showed that about 2,190 new cases of invasive breast cancer will be diagnosed among men and about 410 men will die from breast cancer (American Cancer Society 2012). A recent study comparing the mortality outcomes between genders with breast cancer, depicted based on patient characteristics, that men exhibited detection of this cancer at later stages when evaluated next to their female counterparts (Deshpande, Gnerlich, Jeffe, Kimbuende, Margenthaler and Seelam, 2011). Similar to other studies, Deshpande et al. (2011) correlated the later stages to the insufficient consciousness of this disease. Early detection is crucial for effective treatment of any cancer, especially breast cancer. Through the use of the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), many low income women have received screenings and diagnostic services through Medicaid coverage. According to the Centers for Disease Control and Prevention (CDC 2011), the breast cancer mortality rate has lessened by a fair percentage in the last couple of years.

In Nigeria there is no available nationwide incidence rate, however, records from the University College Hospital (UCH) Ibadan cancer registry showed that from 1980 to 2007; 179 men and 5,006 women (ratio 1:28) constituting 2.6% were diagnosed to have breast cancer. The review of records also showed that the ages of those affected ranged from 2 to 99years (University College Hospital Cancer Registry 2008). A 12-year review in the Eastern part of Nigeria found a prevalence of 2% (Ezeome, Emegoakor, Chianakwana and Anyanwu, 2010). Similarly, the University of Maiduguri Teaching Hospital Cancer Registry record showed that between 2001 and 2005, a total of 1,216 cases of cancer were registered within the period under review.

Breast cancer accounted for 13.9% out of which eight occurred in men and 161 occurred in women (ratio1:20). The age range in this review was between 17 and 85 years with bimodal peak age group of 40-49 years and 60-69 years (Nggada, Yawe, Abdulazeez and Khalil. 2008) while Zaria has MBC incidence of 6.0% irrespective of these figures, breast cancer in men remain an under-researched area (Ezeome et al., 2010) in comparison to breast cancer in women resulting in a dearth of information about the awareness, knowledge and perception of men concerning male breast cancer in

Nigeria. This poor awareness militates against informed decision-making (McMenamin, Barry, Lennon, Purcell and Baum, 2005). The number of men being referred for breast assessment is increasing (Al-Allak, Govindarajulu, Shere, Ibrahim, Sabu and Cawthorn, 2011) prompting a need to streamline and optimise clinical pathways. With increasing numbers of men being seen, there is a call to recognise not only the more obvious biological aspects but also the subtler psychological and social aspects of male breast problems, and for research and awareness in this field (Al-Allak et al., 2011).

2.7 Risk factors of breast cancer

A variety of risk factors for breast cancer have been well-established by epidemiologic studies carried out to date, in addition to increasing age and female sex. These risk factors include non-modifiable factors such as race, ethnicity, and genetics, as well as modifiable exposures related to diet, physical inactivity, exogenous hormones, and certain female reproductive factors. Circulating levels of endogenous sex steroid hormones such as estradiol have been associated with increased risk of breast cancer among postmenopausal women (James, Lukanova and Dossus, 2011). Sex hormone levels are strongly associated with some risk factors for breast cancer (for example, obesity and higher alcohol consumption) and may mediate the effects of these factors on breast cancer risk (Endogenous Hormones and Breast Cancer Collaborative Group, 2011).

2.7.1 Race

Several factors may account for racial differences in breast cancer mortality including socioeconomic factors, access to screening mammography and timely treatment, and biological factors. In the United States, Hispanic ethnicity and black race have been associated with later stage at breast cancer diagnosis (Coughlin, Richardson, Orellen, Thompson, Richards, Sabatino, Wu and Conney, 2009). Compared with white women in the United States, black women tend to have more aggressive breast cancers that present more frequently as estrogen receptor negative tumors (Dunn, Agurs-Collins, Browne, Lubet and Johnson, 2010). Among premenopausal women, tumors that are estrogen receptor negative, progesterone receptor negative, and HER2 negative ("triple negative" tumors) are more common among black women than among white women.

2.7.2 Age at Menarche, Parity, and Age at First Live Birth

Younger age at menarche, parity, and older age at first full-term pregnancy are well-established risk factors for breast cancer. These risk factors may influence breast cancer risk through long-term effects on sex hormone levels in premenopausal women, through long-lasting changes in breast tissue, or by other biological mechanisms (Russo, Moral, Balogh, Mailo and Russo, 2005). Reproductive hormones may influence breast cancer risk by increasing cell proliferation and increasing the likelihood of damage to DNA or by promoting cancer growth (American Cancer Society, 2011). According to Endogenous Hormones and Breast Cancer Collaborative Group (2011) pooled analysis of control group data from 13 studies of postmenopausal women, circulating levels of estradiol were 6 % lower in women who had menarche at ages 14 years or older than in women who had menarche before 12 years.

Nulliparity increases breast cancer risk in older women (Jatoi and Anderson, 2010). Results from a cohort study of Norwegian women indicated that nulliparity and obesity may have a synergistic effect on breast cancer risk among older women (Opdahl, Alsaker, Jansky, Romundstad and Vatten, 2011). Higher parity was associated with a reduced risk of estrogen receptor positive/progesterone receptor positive breast cancer (hazard ratio=0.53, 95 % CI 0.39–0.73 for 37 versus 0 births, p (trend)=0.0002) (Palmer, Boggs, Wise, Ambrosone, Adams-Campbell and Rosenberg, 2011). Pregnancy may reduce breast cancer risk by bringing about persistent changes in the mammary gland that make the breast less susceptible to carcinogenic factors (Opdahl, 2011).

2.7.3 Breast Feeding

Breast feeding reduces a woman's risk of breast cancer and is an important modifiable preventive behavior. Longer duration of breast feeding has been associated with a greater reduction in breast cancer risk. The higher incidence of estrogen receptor negative/progesterone receptor negative breast cancer among black women in the United States may be partly explained by their lower prevalence of breastfeeding relative to white women (Palmer, 2011).

2.7.4 Menopausal Status and Age at Menopause

Older age at menopause is also a well-recognized risk factor for breast cancer. Both early menarche and older age at menopause increase lifetime exposure of breast tissue to hormones.

2.7.5 Oral Contraceptives

Epidemiologic studies of oral contraceptive use and breast cancer risk have generally shown little or no increased risk (Marchbanks, Curtis, Mandel, Wilson, Jeng, Folger, McDonald, Daling, Bernstein, Malone, Wingo, Simon, Norman, Strom, Ursin, Weiss, Burkman and Spirtas, 2012). Recent use of oral contraceptives may slightly increase the risk of breast cancer (American Cancer Society 2011). In an analysis of data from a multicenter, population-based case–control study, Marchbanks et al., 2012 found that breast cancer risk did not vary by oral contraceptive formation and that no formulation was significantly associated with an increased risk of breast cancer.

2.7.6 Hormone Therapy

Results from observational studies and the Women's Health Initiative Randomized Trial indicate that hormone replacement therapy after menopause increases breast cancer risk (Calle, Feigelson, Hildebrand, Teras, Thun and Rodriguez, 2009). Use of a regimen that includes both estrogen and progesterone has been associated with a higher risk of breast cancer than the use of estrogen alone (Calle, 2009). Studies of breast cancer incidence in the United States, Canada, and European countries showed a 5–10 % decline in breast cancer incidence following reductions in hormone therapy (HT) use after 2002 (Pelucchi Levi and La Vecchia, 2010). In several countries, however, temporal changes in screening mammography are also likely to have played a role in the decline in breast cancer incidence. Women who do not currently use HT may also undergo screening mammography less frequently (Breen, Cronin, Tiwo, Meissner, McNeel, Sabatino, Tangka and Taplin, 2011).

2.7.7 Diet

A wide variety of dietary factors have been examined as potential breast cancer risk factors in case–control and prospective studies, including increased consumption of alcohol (Chen, Rosner, Hankinson, Colditz and Willett, 2011), red meat, processed meat, and animal fat, and decreased consumption of fruits and vegetables, calcium, vitamin D, soy, and

antioxidants such as beta-carotene and other carotenoids, vitamin C, and vitamin E (Pan, Zhou, Gibbons, Morrison and Wen, 2011). The ratio of omega-3 to omega-6 fatty acids has also been examined in relation to breast cancer risk. Although initial studies suggest that a higher ratio of omega-3 to omega-6 fats may reduce breast cancer risk, more research is warranted (Donaldson, 2004). For most dietary factors, epidemiologic studies of breast cancer have provided inconsistent or inconclusive results. A notable exception is alcohol consumption, which is discussed separately below. Foods with a high glycemic index and glycemic load and dietary carbohydrates, which can influence blood glucose and insulin concentrations, have also been examined in relation to breast cancer risk (Shikany, Redden, Neuhouser, Chlebowski, Rohan, Simon, Liu, Lane and Tinker, 2011).

2.7.8 Alcohol

An increasing number of epidemiologic studies have implicated alcohol consumption as a risk factor for breast cancer (Chen, 2011). Studies have shown a linear dose-response relation between alcohol consumption and breast cancer risk. Chen et al., 2011 examined the association of breast cancer with alcohol consumption among 105,986 women enrolled in the Nurses' Health Study, of whom 7,690 developed 24 S. S. Alcohol consumption was significantly associated with increased breast cancer risk even at levels as low as 5.0–9.9 g per day, or about 3–6 drinks per week (RR = 1.15, 95 % CI 1.06–1.24). Cumulative average alcohol consumption over long periods of time was found to be the most relevant measure (Chen, 2011). The possible biological mechanisms include alcohol's effects on circulating estrogen levels.

2.7.9 Physical Activity

There is considerable evidence from epidemiologic studies that high level of physical activity reduces breast cancer risk in women. The possible biological mechanisms include the influences of physical activity on body composition, insulin resistance, and circulating levels of sex steroid hormones (Friedenreich, Neilson and Lynch, 2010). In the Women's Health Initiative Cohort Study, which involved 74,171 women aged 50–79 years recruited by 40 United States clinical centers, women who engaged in regular strenuous physical activity at age 35 had a 14 % decreased risk of breast cancer (RR=0.86, 95 % CI 0.78–0.95) compared to inactive women (McTiernan, Kooperberg, White, Wilcox, Coates, Adams-Campbell, Woods and Ockene, 2003). Similar but attenuated findings were observed for strenuous physical activity at ages 18 years and 50 years. The study results

also indicated that longer duration of physical activity provides the most benefit (McTiernan, 2003).

2.7.10 Anthropometric Factors

Anthropometric factors such as body height, weight, and adiposity have been extensively studied in epidemiologic studies of breast cancer (Green et al., 2011). In the Cancer Prevention Study II cohort (n =495,477 women), Calle et al. 2009 found that women with higher values of body mass index had an increased risk of dying from breast cancer and certain other cancers. Although overweight and obesity are important modifiable risk factors for breast cancer among postmenopausal women, epidemiologic studies have shown that high body mass index and other measures of adiposity are associated with a reduced risk of breast cancer among premenopausal women (Calle, Rodriguez, Walker-Thurmond and Thun, 2003). The age at which body mass or adiposity is assessed (childhood, adolescence, or adulthood) is important. In some studies, body mass index at age 18 years and body fatness during youth have been inversely associated with breast cancer risk in both pre- and postmenopausal women (Calle et al., 2003).

2.7.12 Environmental and Occupational Exposures

Chemical Exposure: Research has associated some chemicals found in cosmetics, agricultural pesticides, hormones, antibiotics, as well as plastics with cancer, at certain exposure levels. However, a definitive link between breast cancer risk and these substances has not been found (Daly Mary, Pilarski Robert, Axilbund Jennifer, Buys Saundra and Crawford Beth, 2014). Night work: Research has found an association between women who work shifts at night and increased breast cancer risk. More research is needed to better understand this association (Daly Mary et al., 2014).

2.7.13 Genetic Factors

Population-based epidemiologic studies and family-based studies have identified a number of low-penetrance genetic variants and rare, moderate-to-high penetrance genetic mutations including *BRCA1* and *BRCA2* gene mutations. As discussed in other chapters in this book, breast cancer is a heterogeneous disease and genetic factors likely account for pathological subtypes and much of the heterogeneity of the disease (Mavaddat, Antoniou, Easton and Garcia-Closas, 2010).

2.7.14 Family History of Cancer

Hereditary factors explain only around a quarter of breast cancer risk (Lichtenstein, Holm, and Verkasalo, 2000). Breast cancer risk is not associated with breast cancer in an adoptive parent. and does not vary with time since the family member was diagnosed, indicating genetic/biological factors rather than environmental factors or increased diagnostic activity underpin familial clustering of breast cancer cases (Zöller, Li, Sundquist and Sundquist, 2014).

Breast cancer risk is around twice higher in women with one first-degree relative with breast cancer, versus women with no first-degree relatives with the disease, meta- and pooled-analyses have shown (Collaborative Group on Hormonal Factors in Breast Cancer 2001). The risk is higher still with a larger number of affected first-degree relatives, or relatives affected aged under 50 (Collaborative Group on Hormonal Factors in Breast Cancer 2001). ER-positive and ER-negative breast cancer risks are associated to a similar extent with family history (Mavaddat et al., 2010). Over 85% of women with a first-degree relative with breast cancer will never develop breast cancer themselves (Collaborative Group on Hormonal Factors in Breast Cancer 2001). 87% of women with breast cancer have no first-degree relatives with the disease (Collaborative Group on Hormonal Factors in Breast Cancer 2001).

BRCA1 and BRCA2

BRCA1 and BRCA2 mutations confer a high risk of breast cancer in carriers (high-penetrance). Women with a BRCA1 or BRCA2 mutation have a 45-65% chance of developing breast cancer by age 70 (Antoniou A, Pharoah PDP, Narod S. 2003). BRCA1/2 mutation-carriers have higher breast cancer risk compared with the general population in all age groups (Antoniou, Pharoah and Narod, 2003). BRCA2-negative women with a BRCA2-carrying first-degree relative may also have increased breast cancer risk, a small UK cohort study showed (Evans DGR, Ingham SL, Duchan I, 2013). Higher sex hormone levels in BRCA mutation carriers may explain some of the increased risk (Widschwendter, Rosenthal and Philpott, 2013). Breast cancer risk in BRCA mutation carriers may be modified by other factors including family history (breast cancer risk among BRCA2 mutation carriers is 70% higher for each first-degree relative with breast cancer aged 50 or younger, versus BRCA2 mutation carriers with no such family history, breast cancer risk in

BRCA1 mutation carriers is not associated with family history) (Metcalfe, Lubinski, and Lynch, 2010), and lifestyle factors (indicated by higher risk in BRCA mutation carriers born post-1950 versus pre-1950) (Tea, Kroiss and Muhr, 2013). BRCA1 and BRCA2 mutations are uncommon, though this varies by ethnicity/country of origin (Turnbull and Rahman, 2008).

2.8 Warning symptoms of Breast cancer:

The first noticeable symptom of breast cancer is typically a lump that feels different from the rest of the breast tissue. More than 80% of breast cancer cases are discovered when the woman feels a lump. The earliest breast cancers are detected by a mammogram (American Cancer Society 2007). Lumps found in lymph nodes located in the armpits can also indicate breast cancer.

Indications of breast cancer other than a lump may include thickening different from the other breast tissue, one breast becoming larger or lower, a nipple changing position or shape or becoming inverted, skin puckering or dimpling, a rash on or around a nipple, discharge from nipple/s, constant pain in part of the breast or armpit, and swelling beneath the armpit or around the collarbone (Watson, 2008). Pain ("mastodynia") is an unreliable tool in determining the presence or absence of breast cancer, but may be indicative of other breast health issues (American Cancer Society, 2007).

Inflammatory breast cancer is a particular type of breast cancer which can pose a substantial diagnostic challenge. Symptoms may resemble a breast inflammation and may include itching, pain, swelling, nipple inversion, warmth and redness throughout the breast, as well as an orange-peel texture to the skin referred to as *peau d'orange*; as inflammatory breast cancer doesn't show as a lump there's sometimes a delay in diagnosis (Merck Manual of Diagnosis and Therapy, 2003).

Another reported symptom complex of breast cancer is Paget's disease of the breast. This syndrome presents as skin changes resembling eczema, such as redness, discoloration, or mild flaking of the nipple skin. As Paget's disease of the breast advances, symptoms may include tingling, itching, increased sensitivity, burning, and pain. There may also be discharge from the nipple. Approximately half of women diagnosed with Paget's disease of the breast also have a lump in the breast (National Cancer Institute, 2005).

Occasionally, breast cancer presents as metastatic disease—that is, cancer that has spread beyond the original organ. The symptoms caused by metastatic breast cancer will depend on the location of metastasis. Common sites of metastasis include bone, liver, lung and brain (Lacroix, 2006). Unexplained weight loss can occasionally signal breast cancer, as can symptoms of fevers or chills. Bone or joint pains can sometimes be manifestations of metastatic breast cancer, as can jaundice or neurological symptoms. These symptoms are called *non-specific*, meaning they could be manifestations of many other illnesses (National Cancer Institute, 2004).

Most symptoms of breast disorders, including most lumps, do not turn out to represent underlying breast cancer. Fewer than 20% of lumps, for example, are cancerous (McCann, 2008), and benign breast diseases such as mastitis and fibroadenoma of the breast are more common causes of breast disorder symptoms. Nevertheless, the appearance of a new symptom should be taken seriously by both patients and their doctors, because of the possibility of an underlying breast cancer at almost any age (Merck Manual of Diagnosis and Therapy, 2003).

2.9 The stages and the survival of breast cancer

A complete history and physical examination, complete blood count, chemistry profile and chest radiography/ mammography constitute an appropriate preoperative workup for symptomatic women with breast cancer. Bilateral mammograms are performed in al l women with biopsy proven breast cancer t o look for other lesions in the involved breast as well as t he opposite breast. Metastasis from the invasive breast cancer probably develop early during growth of the primary lesion, proliferate in distant metastatic site as occult "micro metastases" and becomes clinically detectable (~ 1 cm) after approximately 30 tumour cell doublings. The axillary lymph nodes are not barriers to metastasis, the number of axillary nodes involved by tumour is directly correlated with the risk of both regional and distant metastasis (Goldman and Ausiello, 2008).

Correct staging of breast cancer patients is of extraordinary importance. Not only does it permit an accurate prognosis but in many cases therapeutic decision making is based largely on TNM classification. It is based on the tumour size, the extent of breast involvement, axillary lymph node involvement and distant metastasis. Determination of tumour size is made by the pathologist on review of biopsy lumpectomy or mastectomy specimens. Currently approximately 50-60% Of women with newly diagnosed breast

cancer are node negative and 25-40 % is node positive; of those who are node positive, approximately 60% have involvement of only one to three nodes. Fewer than 10% of patients are seen with distant metastasis (Goldman and Ausiello, 2008).

Breast cancer has four stages that relate to the severity of the cancer. The following describes the types and stages of breast cancer:

Stage 0—noninvasive carcinomas (LCIS or DCIS).

Stage I—the tumor is no more than 2 cm in size.

Stage II—either the tumor has spread to the lymph nodes under the arms.

Stage III—the tumor is greater than 5 cm in size.

Stage IV—the cancer has spread to other parts of the body (metastatic cancer).

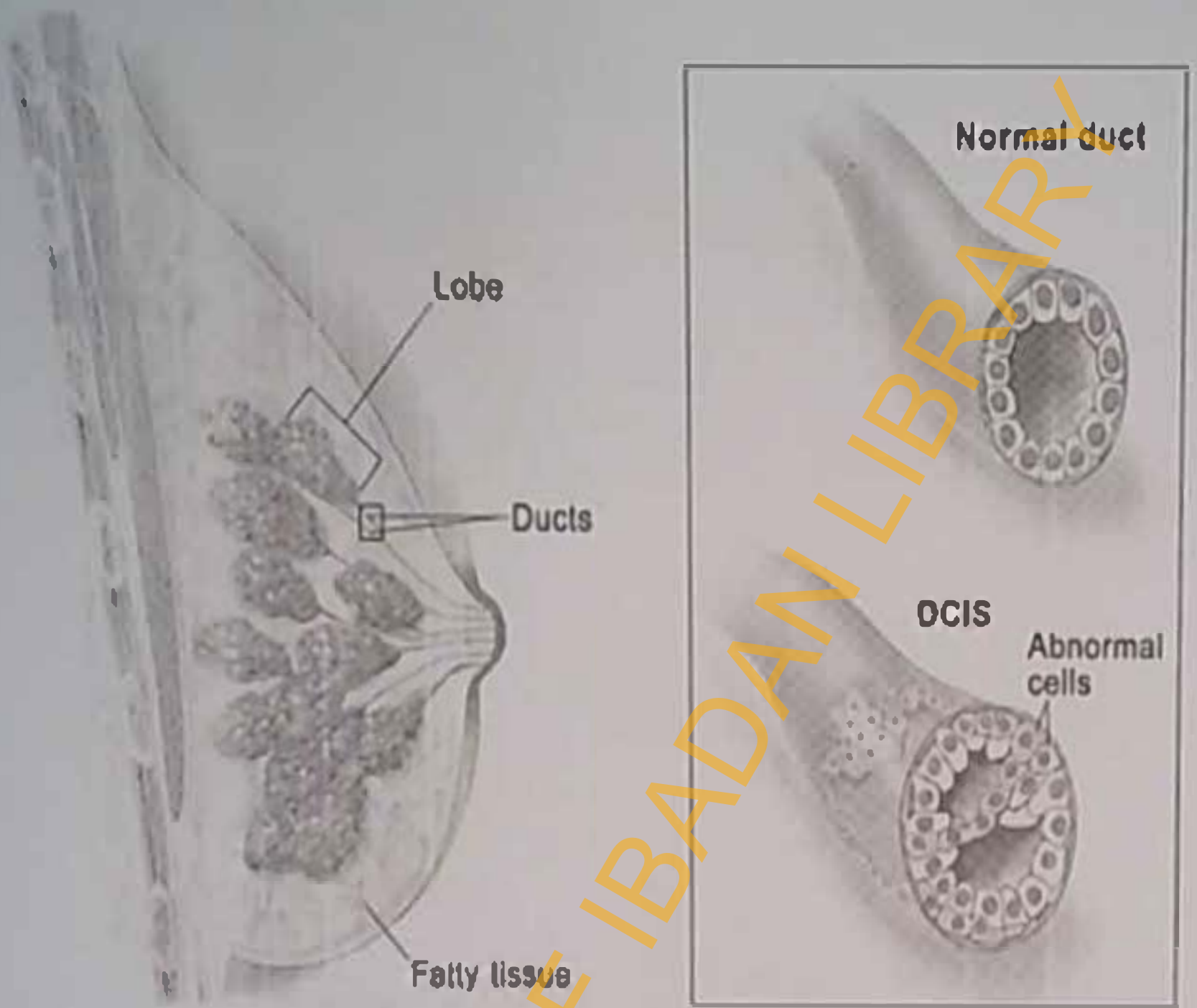

Figure 2.2: Stage 0--noninvasive carcinomas (LCIS or DCIS). Cancer cells have not invaded the surrounding breast tissue.

Source: http://ylbi.bol.ucla.edu/Pathophysiology.htm accessed. 2009

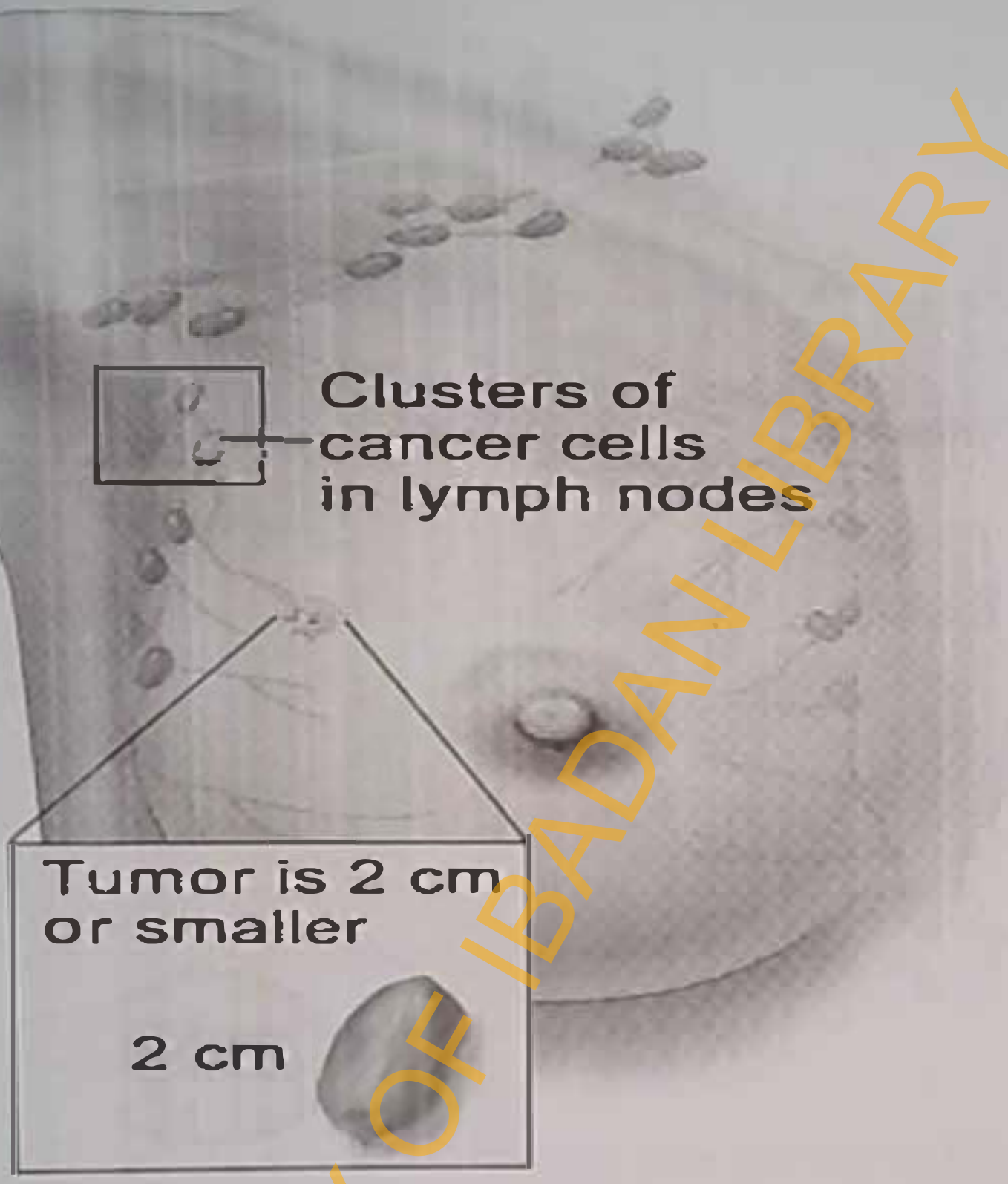

Figure 2.3: Stage I—the tumor is no more than 2 cm in size and cancer cells have not spread beyond the breast.

Source: http://ylbl.bol.ucla.edu/Pathophysiology.htm accessed 2009

Figure 2.4: Stage II—either the tumor has spread to the lymph nodes under the arms but the tumor is less than 2 cm in size, or the tumor has not spread to the lymph nodes under the arms but is greater than 5 cm in size, or the tumor is between 2 and 5cm and may or may not have spread to the nodes.

Source: http://ibl.bol.ucla.edu/Pathophysiology.htm accessed, 2009

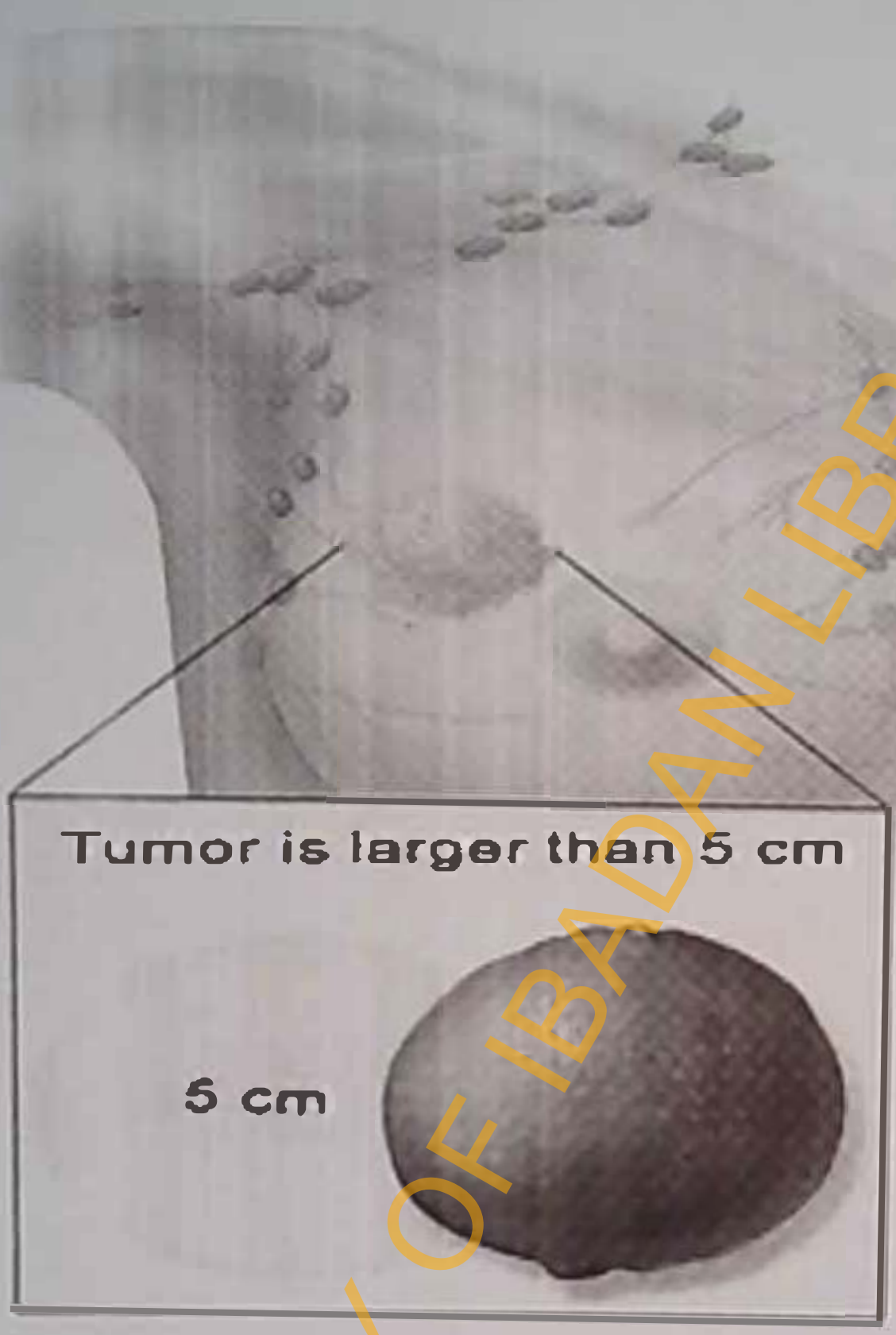

Figure 2.5: Stage III—the tumor is greater than 5 cm in size and has spread to the lymph nodes under the arms.

Source: http://ylb1.bol.ucla.edu/Pathophysiology hun accessed, 2009

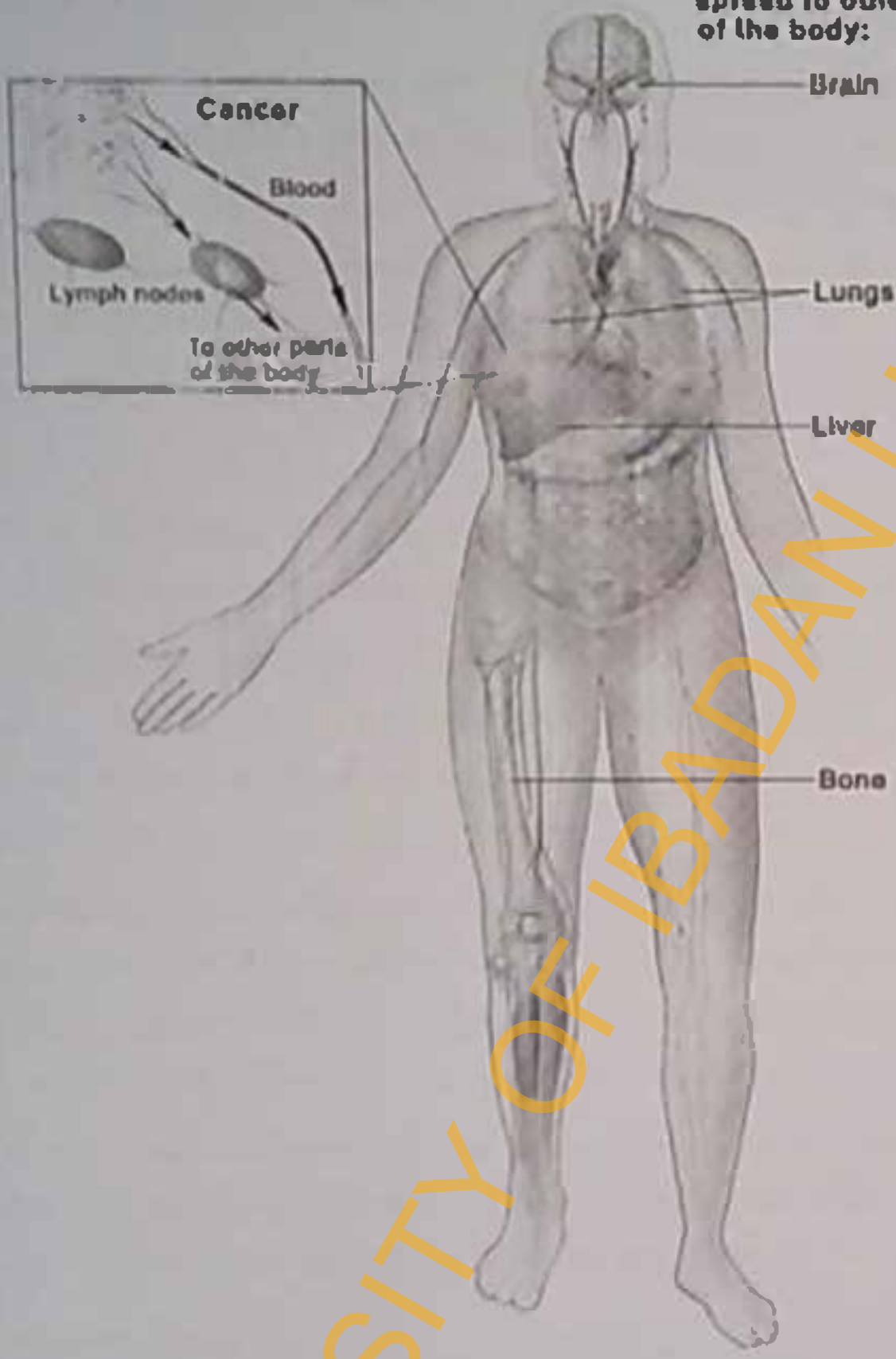

Figure 2.6: Stage IV—the cancer has spread to other parts of the body (metastatic cancer).

Source: http://ylb.bol.ucla.edu/Pathophysiology.htm accessed 2009

2.10 Treatment of breast cancer

Four types of standard treatment are used:

1. Surgery

Most patients with breast cancer have surgery to remove the cancer from the breast. The main goal of surgical therapy is to remove the cancer and accurately define t he stage of disease. Surgical options broadly consist of breast conservation therapy followed by radiation therapy. Breast conserving surgery, an operation to remove the cancer but not the breast itself, includes the following:

(a) Lumpectomy: Surgery to remove a tumour (lump) and a small amount of normal tissue around it.

(b) Partial mastectomy: Surgery to remove the part of the breast that has cancer and some normal tissue around it. This procedure is also called a segmental mastectomy.

(c) Total mastectomy: Surgery to remove t he whole breast that has cancer. This procedure is also called a simple mastectomy. Some of the lymph nodes under the arm may be removed for biopsy at the same time as the breast surgery or after. This is done through a separate incision.

(d) Modified radical mastectomy: Surgery to remove the whole breast t hat has cancer, many of the lymph nodes under the arm, the lining over the chest muscles, and sometimes, part of the chest wall muscles. Dotted line shows entire breast and some lymph nodes are removed. Part of the chest wall muscle may also be removed.

(e) Radical mastectomy: Surgery to remove the breast that has cancer, chest wall muscles under the breast, and all of the lymph nodes under the arm. This procedure is sometimes called a Halsted radical mastectomy (Hammer et al., 2008).

2. Radiation therapy

Radiation therapy is a cancer treatment t hat uses high-energy X-rays or other types of radiation to kill cancer cell s and suppress them from growing. There are two types of radiation therapy. External radiation therapy uses a machine outside t he body to send radiation toward the cancer. Internal radiation therapy uses a radioactive substance sealed in needles, seeds, wires, or catheters that are placed directly into or near the cancer. The way the radiation therapy is given depends on the type and stage of the cancer being treated (NCI, 2004).

3. Chemotherapy

Prior to the introduction of chemotherapy the mainstay of treatment was based on surgery and radiotherapy. Chemotherapy is a cancer treatment that uses drugs t o stop the growth of cancer cell s, either by killing the cells or by stopping them from dividing. When chemotherapy is taken by mouth or injected into a vein or muscle, the drugs enter the bloodstream and can reach cancer cells throughout the body (systemic chemotherapy). When chemotherapy is placed directly into the spinal column, an organ, or a body cavity such as the abdomen, the drugs mainly affect cancer cells in those areas (regional chemotherapy). The way the chemotherapy is given depends on the type and stage of the cancer being treated (McArdle and Katch, 2010).

4. Hormone therapy

Hormone therapy is a cancer treatment that removes hormones or blocks their action and stops cancer cells from growing. Some hormones can cause certain cancers to grow. If tests show that the cancer cells have pl aces where hormones can attach (receptors), drugs, surgery, or radiation therapy are used t o reduce the production of hormones or block them from working. Hormone therapy with tamoxifen is often given to patients with early stages of breast cancer and those with metastatic breast cancer (cancer t hat has spread t o other parts of the body). Hormone therapy with tamoxifen or estrogens can act on cells all over the body and may increase the chance of developing endometrial cancer. Women taking tamoxifen should have a pelvic examination every year to look for any signs of cancer. Any vaginal bleeding, other than menstrual bleeding, should be reported to a doctor as soon as possible. Hormone therapy with an aromatase inhibitor is given to some postmenopausal women who have hormone-dependent breast cancer. Hormone-dependent breast cancer needs the hormone estrogen to grow. Aromatase inhibitors decrease t he body's estrogen by blocking an enzyme called aromatase from turning androgen into estrogen. Aromatase inhibitors are also being tested inclinical trials to compare them to hormone therapy with tamoxifen for the treatment of metastatic breast cancer. This results in substantial improvements in disease free and overall survival for women with operable breast cancer (Mauri, Castrogiovanni, Simoncini and Iovieno, 2006).

2.11 Prevention:

2.11.1 Primary prevention:

The aim of primary prevention is to eliminate or modify established risk factors for developing breast cancer. Some of these risk factors are genetically, environmental and behavioural. It is really impossible or difficult to alter or modify genetically and environmental risk factors like age, positive family history, race or ethnicity. But there are some behavioural risk factors like using HRT and consumption of alcohol that can be altered. It is obvious that knowledge and awareness about the breast cancer can impact directly upon behaviour leading to modify breast cancer risk.

2.11.2 Secondary prevention:

Secondary prevention comprises the diagnosis and treatment of early cancer. It is proved that detection of breast cancer in an early stage has a potential value (Benjamin O. Anderson, Susan Braun, Susan Lim, Robert Smith and Stephen Taplin, 2003). Early detection could mean earlier diagnosis of symptomatic breast cancer, as well as the detection of occult breast cancer through the mammography screening in asymptomatic women. In 2002, the Global summit consensus Conferences, recommended a step wise process for building the foundation for achieving earlier detection. Their recommendations underlined the importance to promote the empowerment of women to seek and obtain health care; to create the infrastructure for diagnosis and treatment of breast cancer and to promote early detection through breast cancer education and awareness. Their report also recommended that if recourses become available, early detection effort should be expanded to include mammography screening. However, programmes for early detection have little value if the existing health care services cannot provide proper breast cancer treatment. Breast cancer treatment must be available, promptly accessible and affordable (Benjamin et al., 2003).

2.12 Breast cancer among Adolescent

This is not surprising as there are 1.7 billion young people in the world which make up over one-quarter of the world's population (Population Reference Bureau (PRB), 2006). Adolescence is a transition period between childhood and adulthood, during this time, significant changes occur in the body. These groups of females are just beginning to learn about their bodies. Nigerian population comprises people of this age

group (Bamgbose, 2002). Adolescence like youth is a unique period of joy, vigour, opportunities as well as challenges as the individual begins to appreciate more vividly phenomena in his or her environment in a more personal manner (Ikorok, 2004).

Young people all over the world are growing up in an increasingly complex environment that requires them to take tougher decisions, often without adequate preparation. Although it is generally known that the period of adolescence is a phase in life when young people are particularly vulnerable to many risks, especially in relation to their sexuality, they often lack access to adequate information, counseling and services on issues crucial to their development needs (Isiugo-Abanihe, 2011). This period is a time of rapid change that provides teaching opportunities for shaping health behaviors into adulthood. Breast cancer affects young, middle-aged, and elderly women who are caregivers of the family and who contribute to the development of society.

Since breast cancer is lower among young women, statistics are not readily available and are underrepresented for distinct age ranges under the age of 40 (Partridge, 2009). While breast cancer is less common among this age group, 15% of all breast cancers do occur in women under the age of 40 (American Cancer Society, 2009), which equates to nearly 70,000 young women in the United States (National Institutes of Health, 2006). Bottom et al. (2006) examined the National Cancer Institute's published Surveillance Epidemiology and End Results (SEER) incidence and survival rates and found that females aged 15-19 had a 1.3% incidence rate while 20 – 24 year olds had a greatly increased incidence rate of 12.1%. Breast cancer incidence for African American adolescents and young adults was more than two times that of Caucasian women.

Younger women also typically develop a more aggressive type of cancer and may be less responsive to treatment and survival (Partridge, 2009). Survival rates for 15-19 year olds is lower than that of older women regardless of histologic subtype and stage (Bottom, O'Leary, Sheaffer, Phillips, Shu and Arun, 2006). According to cancer statistics presented by the National Cancer Institute, the 5-year survival rate among women aged 20 – 29 is lowest among women diagnosed with cancer (Bleyer et al., 2006). Several factors can attribute to low survival for young females. As stated, breast cancer in young women is

typically more invasive. there is a decreased detection screening amongst the group, detection rates are lower due to lack of suspicion in the general population and medical community, and breast tissue in younger women is commonly more dense than in older women. resulting in mammography results that may be inconclusive (Bottoni et al., 2006). Early diagnosis of breast cancer is important for improving quality of life and survival. Women need to know risk factors and how breast cancer is diagnosed.

Health behaviors such as (Breast Self Examination) BSE can help female adolescents to take some control and responsibility over their health promotion (Karayurt, Ozmen and Cetinkaya, 2008). Teaching BSE and issues about breast cancer as early as possible will go a long way to encourage positive behavior towards BSE, create a breast-awareness and can lead to seeking regular professional breast examination/screenings later in life (Isara & Ojedokun, 2011) BSE is an easy-to-apply, economical, safe, non-invasive procedure; and it is one of the important and effective steps for identifying breast tumors at an early stage (Beydag and Yurugen, 2010).

A study was conducted on knowledge of secondary-school female students on breast cancer and breast self-examination in Jeddah, Saudi Arabia. A self-administered questionnaire was given to 6380 female secondary-school students (mean age = 18.1 years) in Jeddah to identify their knowledge of breast cancer and attitude towards breast self-examination (BSE). Knowledge of risk factors and presentation was very low. Over 80% of students failed to answer 50% of the questions correctly. A higher knowledge level was associated with older age, marriage and having children. Also students who had undergone mammography, had been exposed to breast surgery or had a positive family history of breast cancer showed significantly higher knowledge levels. Only 39.6% reported ever hearing of BSE and only 14.4% and 7.1% respectively knew the correct frequency and timing. However, 82.4% had a positive attitude towards learning (Milani, 2000).

The study conducted on adolescent girls' knowledge and attitudes towards breast self examination by using quasi experimental method. They selected sample from schools participating in an education program provided by a regional health education center. The sample consisted of 137 adolescent girls. Findings suggest that a one-hour lesson can improve knowledge and attitudes of adolescent girls with respect to breast self examination and early cancer detection (Clark, Sauter and Totechi, 2000).

The study conducted by Chong Chin Che, Jeya Devi Coomarasamy and Balakrishnan Suppayah, 2014 reported that (52.2%) of the respondents who were adolescents acquired information from school teacher, which is good in increasing awareness of screening practices among the adolescent because whatever they learn as a way of shaping their future. However the information provided by teachers is always viewed as being credible and as such it will be taken serious by the student under their care. Hence, it is recommended collaboration effort between school and health professionals must be initiated using smart partnership approaches.

The emergence of breast disease and the subsequent development of cancer tend to be more aggressive in young women compared with breast cancer progression in the older population (Anders, Hsu, Broadwater, Acharya, and Foekens, 2008). Young age at diagnosis correlates with worse prognosis and defines a subset of breast cancers with shared patterns of gene expression. The high mortality rate among young women is mainly due to lack of breast cancer awareness. Young women aged 20-29 years with breast cancer experienced mortality rate of 72.4% from the diseases (Soyer, Cicekliogiu and Ceber, 2007). Early cancer of the breast is curable, and if every adolescent girls would take time to carefully examine her breast at regular intervals, many benign and malignant tumour would be discovered easily and early.

2.13 Breast Cancer and Spirituality

When women are diagnosed with breast cancer this affects their entire well-being. A woman's spirituality often plays a significant role in her battle against breast cancer. A patient's spirituality is so important that the National Health Society in Scotland requires boards to have a spiritual care policy for patients. This is often overlooked by health care providers. In studies it shows there is a positive correlation with religion or spirituality and women with breast cancer (Swinton, Ingram, and Heys, 2011). African-American women have a positive correlation with religion and how it adds to their quality of life. They often have faith in their religious practices, belief in God, support system of family and friends to find meaning and purpose (Swinton et al., 2011). In Chili women's spirituality was important and showed it through prayer, perceived dependence on God to intercede and guide them through this time in their life. They also had social support from their faith communities (Swinton et al., 2011). Muslim women viewed their diagnoses as a will of

God. They were also active in getting the medical treatment they needed. These women's quality of life was linked with their spiritual meaning (Swinton et al., 2011).

Women often use their religion or spirituality to help them frame their diagnoses in a new way that provides meaning and purpose. Health care providers can benefit by knowing the role spirituality plays in these women's life, there will be a better awareness of the supporting networks these women need to help cope with their diagnoses. Providers will also be more sensitive to how they make meaning of their cancer, and this will help providers recognize and respond to their patient's spiritual experiences. This will open new doors for a greater empathic care (Swinton et al., 2011). Several investigators have explored the influence of spirituality and religiosity on BCS behaviors (Gullatte, 2006; Holt et al., 2008). Gullatte (2006) points out that neither of these models includes spirituality or religiosity.

2.14 Awareness of breast cancer

There is wide agreement that awareness leads to knowledge, and knowledge leads to behavior modification (Rimal, 2000). Breast cancer awareness in developing countries is not well documented, and what is known is far from encouraging (Reisi, Javadzade and Sharifirad, 2013) as comparatively few women in these areas have adequate knowledge of the risk factors and preventive measures or screening techniques for early detection. The lack of knowledge and incorrectly held beliefs about breast cancer prevention among females are responsible for the negative perception of the curability of cancer detected early and of the efficacy of the screening tests (Obeidat and Lally, 2013).

Awareness and understanding of breast cancer in Africa is generally low. In recent years, the World Health Organization and several international organizations such as The Breast Health Global Initiative (BHGI) have sought to increase breast cancer awareness among African women (Yip, Cazap, Anderson and Bright, 2011). Studies in other parts of the world have shown that general breast cancer awareness increases with level of education (Mutalqah, Radaideh, Yusoff and Awalsu, 2011). Little is known about the knowledge level and awareness of breast cancer among university students in Angola. The main purpose of this study was, therefore, to assess breast cancer knowledge and awareness among university students in Angola. Because breast cancer affects African women early as previously mentioned, most university students are at a stage where it is critical that they

at least perform BSE regularly and potentially detect any changes early. Previously, most studies aimed at investigating the level of understanding of breast cancer among college students focused on female students (Al-Naggar, Al-Naggar, Bobryshev, Chen and Assabri, 2010). We chose to include male students in our study because previous studies have shown widespread lack of knowledge of the disease among men (Thomas, 2010). It is our argument that even though breast cancer is not common in men, well-informed men can play a significant role in increasing awareness among the general public.

Several studies have shown inadequate levels of knowledge towards risk factors awareness and screening methods including mammiography, even among educated women and health care providers (Amin, Al Mulhim and Al Meqihwi, 2009). However, lack of awareness about early detection of breast cancer and the benefits of screening tests is a real problem among women in developing countries. It has been reported that the public awareness Knowledge is a necessary predisposing factor for behavioral change. Knowledge also plays an important role in improvement of health seeking behavior. Knowledge may not only dramatically improve the attitude, disbelieve and misconception, but also consequently enhance screening practice. That's why; to reduce the number of deaths from breast cancer, there must be a shift in emphasis from breast self-examination to breast awareness.

According to Odusanya 2001, breast cancer is not well understood by women and there is a need for information and enlightenment if they are to present early in hospital. Among Nigerian women, some of the factors preventing early hospital presentation and thus increasing mortalities are thought to include inadequacy of systems protecting and promoting women's health and cultural taboos regarding the female body. Education and awareness alone may contribute in a favorable shift in the stage of breast cancer at presentation. Education can be achieved with very low costs, simple, and popular means, such as radio and television advertisement and programs. Education need to be culturally appropriate and targeted toward the individual population so that highest benefit can be gained. It is also important to educate men as well as women because men can facilitate early detection in their partner and help to reduce the barrier to seek care (Robert smith et al 2006). In the United Kingdom, Stockton et al. found that in the 1980s before the national breast cancer screening program began, the rate of advance stage cancer was

reduced dramatically. The important aspect of awareness is the dissemination of knowledge about that breast cancer is curable and if diagnosed early survival rate is good. With earlier stage at presentation and with good treatment facilities it is not a big problem (Benjamin et al, 2003).

It is also important to educate health care providers, especially those who come in regular contact with women. These providers may be physicians, nurses, midwives, medical students. Evidence suggest, for example that nurses can play an important role providing the information regarding breast cancer in countries with limited resources (Yarbro, 2003). In recent years, the World Health Organization and several international organizations such as The Breast Health Global Initiative (BHGI) have sought to increase breast cancer awareness among African women (Yip, Cazap, Anderson and Bright, 2011). Studies in other parts of the world have shown that general breast cancer awareness increases with level of education (Matalqah, Radaideh, Yusolf and Awaisu, 2011).

Despite the growing campaign on breast cancer awareness in Nigeria, the practice of breast self examination (BSE) continues to vary widely among women. Female women teachers form a group that are often neglected in breast cancer research. Available literature reveal that teachers have a poor practice of BSE, both in technique and timing, often in the light of a fair knowledge of breast cancer (Nur, 2010). Thus, Increasing comprehensive knowledge and awareness of breast cancer could facilitate breast self-examination (BSE) and mammography screening. However, poor awareness and knowledge about breast cancer symptoms and screening methods has been previously reported by several different studies (Akhigbe and Omuemu VO. 2009).

2.15 Knowledge of breast cancer

Women's knowledge and views about BC and its treatment may contribute considerably to medical help-seeking behaviors (Odusanya, 2001). Knowledge deficiency may lead to delayed presentation with advanced stages when little or no benefit is derived from any form of therapy (Ferlay et al, 2007). For presentation at an early stage, women must be "breast aware"; they must be capable of identifying symptoms of BC through routine

practice of screening. The importance of knowledge of these risk factors and the need for every woman to be aware of the need for surveillance on her breasts and the various ways to do this cannot be over emphasized. The poor knowledge and wrong beliefs about cancer breast prevention among women are responsible for a negative perception of the curability of a cancer detected early and of the efficacy of the screening tests (Sait, Al-Amoudi, Tawfat and Abduljabbar, 2010). Studies that detect the awareness ofbreast cancer and the practice of BSE among Arab women were few and pointed to a lack in breast cancer knowledge of females (Al Diab, Qureshi, Al Saleh, Al Qahtani, Alcem, Alghamdi, Alsaif, Bokhari, Qureshi and Qureshi, 2013).

Knowledge also plays an important role in improvement of health seeking behavior. Knowledge may not only dramatically improve the attitude, disbelieve and misconception, but also consequently enhance screening practice. Knowledge is an important issue for early detection and improvement of health seeking behavior. Breast cancer knowledge refers to a woman's knowledge of breast cancer risk, breast cancer screening as described by the American Cancer Society, and breast cancer treatment. It is a predisposing variable that determines women's breast cancer screening compliance. Breast cancer knowledge is important because women who have an appropriate amount of breast cancer knowledge are more aware of their risk for breast cancer and are more likely to comply with breast cancer screening. Various epidemiologic studies have shown that the increased women's knowledge about early diagnosis and screening of breast cancer can change people's screening seeking behavior (Parkin, Bray, Ferlay, and Pisani, 2005). Early diagnosis of cancer can effectively improve the chance of early detection of breast cancer in early stages and successful treatment resulting in improvement survival rate and quality of life. In this regard, early detection of disease through clinical breast exams such as mammography and breast self-examination as simple and inexpensive approaches provides the best approaches for reducing the risk of dying from breast cancer. Accordingly, correct knowledge about early warning signs and screening methods of disease plays an effective role towards developing and employing early detection programs in a community (Elmore and Carney, 2004). The poor knowledge and wrong beliefs about cancer breast prevention among women are responsible for a negative perception of the curability of a cancer detected early and of the efficacy of the screening tests.

Preventive behavior is essential for reducing cancer mortality. Knowledge is a necessary predisposing factor for behavioral change. Knowledge also plays an important role in improvement of health seeking behavior. Knowledge may not only dramatically improve the attitude, disbelieve and misconception, but also consequently enhance screening practice. That's why, to reduce the number of deaths from breast cancer, there was a shift in emphasis from breast self-examination to breast awareness after 1991(English, 2003). Besides, several studies also show that knowledgeable women and beliefs about breast cancer and its management may contribute significantly to medical help-seeking behaviors and increase their adherence to recommended breast cancer screening (Sadler, Ko, Cohn, White, Weldon and Wu, 2007). Furthermore, understanding the factors that influence patients' delay in seeking breast cancer treatment is therefore necessary to improve its treatment outcomes (Luquis and Villanueva Cruz, 2006). Several studies have shown inadequate levels of knowledge towards risk factors awareness and screening methods including mammography, even among educated women and health care providers (Madanat & Merill, 2002; Ahmed et al., 2006; Parsa et al., 2008 Amin et al., 2009).

2.16 Breast Cancer Screening Practices

Globally, breast self-examination (BSE), clinical breast examination (CBE) and mammography are the recommended screening test for early detection of breast cancer. Two of them—clinical breast examinations (CBE) and breast self-examination—rely on manual palpation of the breast. The third screening method, mammography, uses x-rays to detect tumors and anomalies in the breast. Despite the fact that the benefits of screening for breast cancer are well documented, many women, particularly poor, medically underserved, and ethnic minority, do not participate in the screening programmes. Past literatures have linked poor participation in screening to barriers such as high cost, lack of awareness of the need for screening and fear of breast cancer (Adam, 2000). Poor participation in breast self examination has also been linked to lack of confidence in performing the procedure (Javandi et al, 2002; Ahuja and Chakrabarti, 2010).

In some studies there is a suggestion that women in certain occupations, such as teaching, have a higher risk of breast cancer although the evidence so far is equivocal (Hiom-Ross et al., 2002). In a prospective study, California female teachers were noted to have a 51% higher age standardized invasive breast cancer incidence rate and a 67% higher in-situ

breast cancer incidence rate than would be expected based on race specific statewide rates after three years follow up (Bernstein et al., 2002). A number of positive studies were based on registry data where it was impossible to control for confounders such as lifestyle and reproductive factors. Over the years education and communication have been emphasized to encourage health seeking behavior change, with several studies addressing how to improve breast cancer knowledge and screening practices among women teachers (Madanat and Merrill, 2002; Jarvandi et al., 2006). However, these assume teachers are aware of breast cancer risk factors and recommended screening guidelines. Several studies have shown inadequate levels of knowledge of breast cancer screening methods as well as screening behaviors among female teachers (Madanat and Merrill, 2002). Results of an Egyptian study of women academics showed that only 10.6% and 11.5% had satisfactory knowledge about breast cancer and breast self examination, respectively (Seif and Aziz, 2000). Considering the important role teachers have in education, they are in a position to educate young people about breast cancer risk factors, types of screening practices, and influence behaviors that will reduce the risk of future breast cancer morbidity and mortality.

Rising incidence of breast cancer as well as earlier age of presentation has been reported in developing countries. Since no cure has been found for breast cancer, early diagnosis and early treatment have been found to yield a better survival rate. There is now strong evidence that an individual's risk of developing cancer can be substantially reduced by healthy behavior such as participating in cancer screening according to recommended guidelines. The American Cancer Society posits that if we can effectively promote healthy behaviors, much of the suffering and death from cancer can be prevented or reduced (American Cancer Society, 2002). However, poor practice of breast cancer screening methods has been reported in many studies in Nigeria (Akhigbe & Omuemu, 2009; Okobia *et al*, 2006). Beyond poor knowledge, or ignorance, several other factors have been found to influence the practice of breast cancer screening in different countries, including Nigeria.

In Nigeria, late presentation has been described as the hallmark of breast cancer and reasons given include poverty, under-education, lack of knowledge and poor access to care (Akhigbe & Omuemu, 2009). Adebamowo (2000) says creating awareness about cancer and improving access to testing and health care facilities will help decrease the steadily

rising numbers. But Nigeria is ill equipped to deal with the complexities of cancer care. A wobbly health care infrastructure makes clinical services hard to come by and inadequately distributed. Only a few health centers have functioning radiotherapy equipment and the cost of care remains out of reach for most Nigerians who have received a cancer diagnosis. Nigeria is also home to only a few medical professionals with expertise in cancer treatments. According to a consultative committee on national cancer control, most surgeries here are performed by surgeons whose primary clinical practice is not oncology (Global Press Institute, 2010).

The predominant feature of late presentation of breast cancer had been reported over three decades in Nigeria. This is probably due to the fact that there is no established national screening program for breast cancer. Awareness of early detection measures of breast cancer such as clinical breast examination (CBE) and breast self examination (BSE) is also low (Adebamowo and Ajayi 2000). In an environment where late presentation is predominant and where most breast cancers were detected accidentally by women themselves (Adebamowo and Ajayi 2000) there is an urgent need for awareness of breast cancer and its early detection measures. Similarly, baseline reports on current level of knowledge would be vital to an effective awareness program, hence the need for studies assessing level of knowledge of breast cancer in the population (Adebamowo and Ajayi 2000). The diagnosis of breast cancer is a topic that is not freely discussed, hence lack of knowledge prevails. It has also been documented that rural population is usually neglected in health education issues (Pillay, 2000) hence the selected population. A recent study reported that 73 out of 326 breast cancer patients recruited for study initially were women who lived predominantly in the rural area (Adebamowo et al, 2003).

2.16.1 Breast self Examination

Breast self examination (BSE) is a simple and cost effective method of breast cancer screening in limited resources countries. American Cancer Society (2012) also recommends that women, starting from age 20 should be educated on the benefits and limitations of performing a monthly Breast Self- Examination (BSE). During the breast self examination (BSE), a women systematically inspect, and palpate her each breast using her controlateral hand with her ipsilateral arm raised above her head. She performs her examination both in lying and standing position. Usually it is better to examine the breast

in front of mirror so that she can inspect any sort of asymmetry or dimpling (Benjamin Oct al. 2003). The BSE is done in an attempt to find out breast cancer earlier and reduce mortality. Breast self examination makes women more "breast aware", which in turn may lead to an earlier diagnosis of breast cancer (Özgul, 2008).

Several studies based on breast cancer patient's retrospective self reporting on their BSE have shown a positive relation with early detection of breast cancer and BSE (Robert A smith et al). Despite the varying controversies about the use of BSE, including its sensitivity, specificity in detecting breast cancer as highlighted by Allen et al. (2010). BSE still remains the most readily available methods of screening to rural women especially in most part of the low resource countries where sophisticated diagnostic screening methods are not easily accessible in term of affordability and availability. For younger women, BSE education and adherence are a gateway to health promotion behaviors which set the stage for adherence to clinical breast examination and mammography screening later in life (Rosenberg and Levy- Schwartz, 2003). Although the value of BSE is controversial (Thomas. Gao, Ray, Wang, Allison. Chen, Porter, Hu, Zhao, Pan, Li, Wu, Coriaty, Evans, Lin, Stolsberg and Self, 2002). American Cancer Society recommends BSE as an option for breast cancer awareness and it's early detection. It benefits women as women become familiar with both the appearance and the feeling of their breasts and detect any changes in their breasts as early as possible (American Cancer Society, 2008). The rationale behind extending BSE practice as a screening test is the fact that breast cancer is frequently detected by women themselves without any other symptoms (Sialipiish & Sigh, 2002).

Available literature reveal that teachers have a poor practice of BSE. both in technique and timing, often in the light of a fair knowledge of breast cancer (Jarvandi et al; 2002. Nur, 2010. Odunsanya, 2001). In a cross sectional study to determine the knowledge, attitudes and behaviours of female teachers related to breast cancer and breast examination in Southern Turkey, more than half of them did not practise BSE and only 12.5% of them practised BSE regularly (Nur, 2010). Another study carried out among female secondary school teachers in Ilorin West Local Government Area of Kwara State, Nigeria revealed that 187 (54.8%) of the respondents had done BSE before,

49.0% were still practising it as at the time of the study, about 70% practised BSE once monthly, 12.5% thrice monthly, 3.1% twice yearly and 12.5%once a year. About 40% of the teachers knew the correct BSE procedure, while 36.5% did not know about the procedure at all (Kayode et al., 2005). Poor participation in breast self examination has also been linked to lack of confidence in performing the procedure (Ahuja Chakrabarti, 2010). Among 231 female traders recruited during a crosssectional study in Ibadan, Oyo State, Nigeria, only 89 (37.1%) of the traders were aware of BSE and 51 (18.1%) of the respondents had ever practised BSE (Balogun and Owoaje, 2005). Just 11 of the respondents (5.5%) had practised BSE in the report carried out amongst women seeking care in primary health-care centres in the Jos North Local Government area of Plateau state, Nigeria (Chirdan and Akosu, 2006).

Okolie U.V 2012, in a cross-sectional descriptive survey that assessed the knowledge, attitude and practice of BSE amongst 200 university female nursing undergraduates, between June and September 2011, found that the majority (92.35%) of the respondents had examined their breasts. Sixtytwo (62%) of the respondents examined their breasts some days after menstruation, 32.14% did not have any particular time for examining their breasts, 4.08% examined their breasts during menstruation and 3.57% before menstruation. The majority (51.60%) examined their breasts anytime they felt like it; 33.67% did it once a month and 11.73% twice a month (Okolie, 2012).

In a cross-sectional study carried out amongst 406 female teachers in the Ilorin West Local Government area of Kwara State, Nigeria, in 2005 by Kayode et al., it was found that most (95.6%) respondents were aware of BSE. Despite the positive attitude of teachers to BSE, the practice of BSE was low (34.8%). One hundred and fifteen (71.8%) of the respondents who performed BSE, did it once a month; 12.5% indicated three times a month; 3.1% did it twice-yearly and 12.5% once a year. Of the 160 (49.0%) of the respondents who knew about BSE, 25 (15.6%) examined their breasts during the 1st week, 15 (9.3%) during the 2nd week, 18 (11.2%) in the middle of the cycle, and 102 (63.7%) at any period of the cycle, that is, irregularly. Fifty-five (34.3%) of the study population put a mark on a calendar as a reminder for the next BSE, whereas 105 (34.3%) did not.

A cross-sectional survey was conducted at the University of Ilorin and Kwara State Polytechnic, Ilorin in Kwara State Nigeria by Salaudeen, Akande and Musa, among female

students of the two institutions living in the hostels. Of the 704 students recruited, 700 responded. Even though more respondents (573 or 81.9%) had heard of breast self-examination, only 209(29.8%) respondents claimed that they knew how to perform it. In Lagos University Teaching Hospital, Nigeria, in another cross-sectional study amongst female nursing students, only 135 of the 150 questionnaires handed out were collected and analysed. The respondents' practice of BSE was good with 80.2% of the respondents claiming that they regularly performed BSE.

Another descriptive hospital-based study was carried out amongst employees of two main health institutions in Bayelsa, Nigeria by Adika, Jolfa and Apiyanteide (2011) which was based on power calculations, 98 nurses were the legitimate sample size needed to participate in the study. Only 92, however, responded to the self-report questionnaire. Twenty-two (23.9%) practised BSE once a month and only 3 (3%) practised BSE more than once a month. Despite the varying controversies about the use of BSE, including its sensitivity, specificity in detecting breast cancer as highlighted by Allen et al. (2010), BSE still remains the most readily available methods of screening to rural women especially in most part of the low resource countries where sophisticated diagnostic screening methods are not easily accessible in term of affordability and availability.

Figure 2.7: Steps of self breast examination
(Source: Gaffan J, Dacre J, Jones A. 2006)

Step 1 - Note: Standing in front of mirror to see if there is any change in the shape or contour of the breasts (Figure 2.6).

Step 2 - Note: Visual Exam - Arms over the head- watching closely in the mirror, clasp the hands behind the head and press the hands forward (Figure 2.6).

Step 3 - Note: Visual Exam - Hands on Hips- press the hands firmly on the hips and bow slightly toward the mirror and pull the shoulders and elbows forward (Figure 2.6).

Step 4 - Note: Manual Exam - Stand and Stroke-Raise the left arm. Use three or four fingers of the right hand to explore the left breast firmly, carefully, and thoroughly. Beginning at the outer edge, press the flat part of the fingers in small circles, moving the circles slowly around the breast. Gradually work toward the nipple. Be sure to cover the entire breast. Pay special attention to the area between the breast and the underarm, including the underarm itself. Feel for any unusual lump or mass under the skin (Figure 2.6).

Step 5 - Note: Manual Exam - check the nipples- gently squeezes the nipple and look for a discharge. (If there is any discharge during the month - whether or not it is during BSE - see a doctor.) Repeat steps 4 and 5 on the right breast (Figure 2.6).

Step 6 - Note: Manual Exam - Recline and Stroke- Steps 5 and 6 should be repeated lying down. Lie flat on the back with the left arm over the head and a pillow or folded towel under the left shoulder. This position flattens the breast and makes it easier to examine. Use the same circular motion described earlier. Repeat the exam on the right breast (Figure 2.6).

Tips for doing BSE

1. Mark calendar as a reminder for BSE regularly. This is a good way to prevent worry if find a normal cyclic change.
2. Stay relaxed and breathe normally during BSE. Becoming tense will produce some knots that may be mistaken for something worrisome.
3. Report any changes or unusual pain to a doctor or nurse practitioner. Keep a log of changes, if that helps to remember.
4. Remember to have an annual clinical exam and a mammogram

2.16.2 Clinical Breast Examination:

Clinical Breast Examination (CBE) is a standardized procedure whereby a health care provider examines a women's breast, chest wall, and axillae. Unless one has a family history of cancer or other factors that place one at high risk, the American Cancer Society 2012 recommends having clinical breast exams once every three years until age 40. After that, recommends having a yearly clinical exam.

The examination consist of 1) Visual inspection of the breast while the women in upright position and her arms relaxes and then raised above her head. 2) Palpation of the axillae and supraclavicular fossae when the women in the upright position and 3) palpation of the breasts while the women both in upright and supine positions. The examiner inspects the breast visually for symmetry, skin of the breast, areola, and nipple for oedema, erythema, puckering, dimpling, or ulceration, all of which can be evidence of underlying masses. The provider palpates the regional axillary nodes. Enlarged hard, matted or fixed nodes can indicate cancer. CBE training is necessary as a key contributor to prompt diagnosis of symptomatic disease. In addition, it is likely to be use in area where mammography examination is unavailable (Benjamin, 2003). The Canadian national breast cancer screening study found no significant difference in breast cancer mortality between the group offered mammography and the group offered CBE (Robert smith et al., 2006).

Clinical breast examination is also relatively simple and inexpensive, but its effectiveness in reducing mortality from breast cancer has not been directly tested in a randomized trial However, early diagnosis has been found to improve survival chances irrespective of the method that is used. Early diagnosis is only possible by educating women on the importance of examining their breast regularly to identify any abnormality, which could later lead to significant health problems. Past literatures have linked poor participation in screening to barriers such as high cost, lack of awareness of the need for screening and fear of breast cancer (Adam, 2000). Clinical breast exams and mammography have been shown to reduce the risk of dying from breast cancer by as much as 25% in women between ages 50 and 69 (CDC, 2010).

The Breast Health Global Initiative (BHGI) Early Detection Panel 2008 Guidelines recommended CBE as the first tool for assessing breast cancer for basic and limited level resources in low- and middle-income countries (Yip et al., 2008). A number of studies done in Nigeria also recommended the use of CBE as a tool for assessing breast diseases (Omolara, 2011). Neither CBE nor mammography alone is capable of accurately distinguishing benign from malignant lesions. Hence, several studies have advocated the use of 'Triple Test' which consists of clinical breast examination, radiologic examination and cytopathology (Bishop, Coleman, Cooke, Davies, Frost and Grace, 2004). No trials comparing screening by CBE alone to not screening have been reported (Humphrey, Helfand, Chan and Woolf, 2002) No study has directly tested the efficacy of CBE in decreasing breast cancer mortality (Green and Taplin, 2003). In a study, of 63 out of 82 family physicians from 4 out of the 6 health zones in Nigeria and the Federal Capital territory Abuja, Nigeria, it was found that CBE was carried out monthly by 48.9% of physicians on their regular patients. In another study by Okobia et al., 2006 in Nigeria, only 91 study participants (9.1%) had CBE in the past year. The main reasons given for not undergoing CBE included not having a breast problem (62.5%) and being unaware of the need for CBE (32.2%). None of the participants had ever had mammography screening performed. A cross-sectional survey conducted among nurses working in a general hospital in Lagos revealed that 204 nurses out of 280 participated in the study (73% response rate). Only 30%, however, had a clinical breast examination (Odusanya et al., 2001). Two hundred and twenty-eight students were selected by stratified random sampling from their different faculties in the University of Ibadan, Nigeria. Only 64 (28%) knew the interval for BSE, whereas 11 (25%) practiced BSE regularly (Chioma, 2007).

Proper position for palpation of the breast with the patient comfortably supine.

Outline of the breast and surrounding area to be palpated systematically.

Pads of the second, third, and fourth fingers are the most sensitive for breast palpation.

Pads of the fingers are rotated in concentric *dime-size* circles for effective palpation of the breast.

Varying degrees of pressure are used so that a small mobile mass is not pushed away from the palpating fingers.

A vertical strip pattern is most effective for systematic palpation of the breast.

Precise location and measured size of a mass can be effectively described using the clock position. The mass in this illustration should be recorded as: left breast, dominant 3-cm mass at 1 o'clock position, 2 cm from the areolar border.

Note: The examiner (a doctor or a nurse) inspects the breast visually for symmetry, skin of the breast, areola, and nipple for redness, erythema, puckering, dimpling, or ulceration, all of which can be evidence of underlying masses.

Figure 2.9: Clinical Breast Examination
Source: National Cancer Institute 2001

2.16.3 Mammography:

Mammography is a low-dose x-ray procedure that allows visualization of the internal structure of the breast. Mammography is highly accurate, but like most medical tests, it is not perfect. On average, mammography will detect about 80%-90% of breast cancers in women without symptoms. Testing is somewhat more accurate in Postmenopausal than in premenopausal women. Mammography is complex and expensive, but may pick up tumors long before they can be detected in any other way, thus enhancing better prognosis than those whose cancer is detected in some other ways (Aldridge, 2005). As a result mammography is not easily accessible for countries with limited resources. One big criticism against Mamntography is false positive results which might lead to range of adverse consequences among women without breast cancer. That's why the implementation of mammographic screening also demands strong quality assurance. Mamntography can reduce mortality rates for women aged 40 to 74 by 25% (Mat et al., 2009). World Health Organisation (WHO)(2011) reported that mammography is the most successful way of detecting breast cancer among women older than 50 years.

Recommended screening intervals are based on the duration of time a breast cancer is detectable by mammography before symptoms develop. Studies have 33 shown that many breast cancers are diagnosed as larger, more advanced cancers simply because too much time has elapsed from the date of the last normal mammogram (Taplin, Ichikawa and Yood, 2004). For this reason, women should talk with their doctors about a plan for receiving regular mammograms according to recommended guidelines. Numerous randomized trials and population-based evaluations of screening mammography have clearly shown that early detection of breast cancer through mammography greatly improves treatment options, the chances for successful treatment, and survival (Tabar, Yen, Vitak, Tony Chen, Smith and Duffy, 2003). Mammography is the single most effective method of early detection. Since it can identify cancer several years before physical symptoms develop. Treatment is more successful when cancer is discovered early. Mammography has limited application in Nigeria, where facilities and expertise are largely unavailable, therefore, breast self examination if properly carried out remains the most cost effective method for the early detection of breast cancer (Chioma and Asuzu, 2007). Mammography is complex and expensive, but may pick up tumors long before

they can be detected in any other way, thus enhancing better prognosis than those whose cancer is detected in some other ways (Aldridge, 2005).

Several studies have concluded that mammograms reduce mortality from breast cancer by a relative amount of 15%. It has a false negative rate of 10%. For the average woman, it is recommended by the US Preventive Services Task Force that mammography should be every two years in women between the ages of 50 and 74 (Rachael Akinola, Kikelomo Wright, Oludamilola Osunfidiya, Olubunmi Orogbemi and Oluwarotimi Akinola, 2011). The largest study of the radiation risk from mammography concluded that the risk was insignificant in women above 40years but greater in younger women. Although mammography remains the best diagnostic tool in the detection of breast cancer it is not routinely performed in Nigeria and other developing countries in Africa because of cost, high technology equipment and expertise required (Porter, 2009). Carrying out annual mammography is considered the most valuable tool for detecting breast cancer in the earliest possible stages, before the cancer has metastasized and when interventions are most effective and least invasive and debilitating (Dündar, Ozmen, Oztürk, Haspolat, Akyildiz, Coban and Cakiroglu, 2006.)

Mammography. The breast is pressed between two plates. X-rays are used to take pictures of breast tissue.

Figure 2.9 Mammography

Sources: National Cancer Institute © 2013 Terese Winslow LLC, U.S. Govt.

2.17 Factors influencing screening practices

Early diagnosis has been found to improve survival chances irrespective of the method that is used but in developing countries breast cancer mortality and morbidity is still on the high side due to late presentation and this same trend has been reported among Nigerian women, as late presentation has been reported as the hallmark of breast cancer in this population (Agboola, Deji-Agboola, Oritogun, Musa, Oyebadejo, Ayoade, 2007). If discovered early breast cancer can usually be cured; however, early detection through screening is the only way to reduce mortality (Akhigbe and Omuemu, 2009). Breast self examination helps women to find their breast cancer early despite an increase in women literacy rate and knowledge about breast cancer, there are certain barriers to practice breast self examination, like worry about breast cancer, embarrassment, lack of time, unpleasant of procedure, lack of privacy, fear of discovering a lump and unfavourable attitude towards breast self examination. As students are source of information to the society they need to be provided with necessary information on breast self examination (Hemlatha, 2008).

Past literatures have linked poor participation in screening to barriers such as high cost, lack of awareness of the need for screening and fear of breast cancer (Adam, 2000). Poor participation in breast self examination has also been linked to lack of confidence in performing the procedure (Javandi et al., 2002; Ahuja and Chakrabarti, 2010). Majority of patients in Nigeria present at advanced stage, the factors responsible for late presentation with advanced disease include low social economic level, fear of mastectomy (Elumelu, Adenipekun, Abdus-salam and Bojude, 2011) and poverty (which does not only impede access to health care system, but is associated with other co-factors that can relatively affect outcomes such as co-morbidity and lack of breast health awareness) (Oluwole et al., 2003).

Barriers to obtain screening mammograms have been identified through numerous sources. The barriers include: high cost, physicians' failure to discuss mammography with women, misconceptions that screening is unnecessary, lack of health insurance, and cancer fear and fatalism (American Cancer Society, 2010; Champion et al., 2000; Guidry et al., 2003; Mayo et al., 2001; Powe et al., 2006; Spurlock & Cutlins, 2006; Underwood et al., 2005; Young & Severson, 2005). The public health discipline has conducted several studies

examining the relationship between spiritual health locus of control, breast cancer beliefs, and mammography utilization. Overall, the results of these studies show that these variables have both a positive and negative impact on the BCS behaviors (Holt et al., 2008; Gullatte, 2006). Kinney et al. (2002) concluded that a decreased inclination to participate in breast cancer screening because of their belief in God. These findings were similar to those found by Mitchell et al. (2002) and Underwood and Powell (2006).

Several factors are implicated in late presentations and include religious belief, prolonged denial, lack of awareness, ill-informed perceptions about breast cancer, reduced breast health awareness, lack of breast cancer knowledge in women and health care professionals, negative perceptions of breast cancer (American Cancer Society, 2012) but also socio-economic problems, reliance on herbal treatment and an intimidating hospital environment (Malik IA and Gopalan S.2003). As a result of late presentation, breast cancer mortality is steadily increasing according to national cancer registries (Adebamowo, 2000). The five-year breast cancer survival rate in Nigeria is less than 10% compared to 70% in Western Europe and North America (Okobia, et al., 2006). Misconceptions about breast cancer and the fear of stigmatisation by the community are also reasons why women may conceal breast cancer symptoms at early stages and lead to late presentation and high mortality rates (Coughlin and Ekwieme, 2003). Important knowledge deficits can have a detrimental impact on the education of women on screening practices and attitudes of women in the adoption of early detection practices (Coleman, 2003).

2.18 Past researches on knowledge of breast cancer and screening practices

European studies revealed a relatively different picture. Stephanie Kung et al (2003) conducted a research on Screening for Breast Cancer and Cervical Cancer in a large city in northwestern Germany and published their results in the European Journal of Public Health. They noted that knowledge about available procedures for early detection of breast cancer was good. Kung et al also determined that almost all women in their study group had had their breasts examined at least once by a medical doctor and age at first breast examination was associated with higher social class. Kung and coworkers also identify women who had been affected by breast cancer and also those with a family history of breast cancer. These women were also asked for their source of information. Most women received their information from office-based gynecologists (84.2%). Only 9.4% of women

had information from their general practitioners of which most were over 55 years of age and belonged to the lower social class. Much information was obtained from the media (64%) including newspapers, journals and leaflets (39.1%), radio and television (24.9%). Less important sources were relatives and friends (16.9%). These authors also identified women who had had a mamntography and concluded that most of whom did belonged to upper class (75.4%) and middle class (56.3%).

A research article by Erbay et al (2006) titled "The knowledge and attitudes of breast self examination and mammography in a group of women in a rural region of western Turkey" was published in February 2002 in the BMC Cancer Journal. The investigators recruited 244 women by means of cluster sampling and subjected them to a questionnaire which consisted of socio demographic variables, risk factors and signs of breast cancer and the adapted version of the Champions Health Belief Model Scale (CHBMS). 76.7% of the women reported that they had heard or read about breast cancer, the authors concluded that only 56.1% of the women had significant knowledge about breast cancer. Similarly although 72.1% of their participants reported having knowledge about screening practice only 40.9% of the women of their study group ever indicated practicing BSE in the previous 12 months. Very few women in the Turkish study (10.2%) stated that they performed BSE on a regular monthly basis. Women were also enquired about their source of information on breast cancer. Television and Radio ranked as the number one source of information (39.3%).

Available literature reveal that teachers have a poor practice of BSE, both in technique and timing, often in the light of a fair knowledge of breast cancer (Jarvandi et al, 2002; Nur, 2010; Odunsanya, 2001). In a cross sectional study to determine the knowledge, attitudes and behaviours of female teachers related to breast cancer and breast examination in Southern Turkey, more than half of them did not practise BSE and only 12.5% of them practised BSE regularly (Nur, 2010).

Another study carried out among female secondary school teachers in Ilorin West Local Government Area of Kwara State, Nigeria revealed that 187(54.8%) of the respondents had done BSE before, 49.0% were still practicing it as at the time of the study, about 70% practiced BSE once monthly, 12.5% thrice monthly, 3.1% twice yearly and 12.5%

once a year About 40% of the teachers knew the correct BSE procedure, while 36.5% did not know about the procedure at all (Kayode et al., 2005).

Avci (2008) conducted a descriptive correlational study to identify knowledge levels and performance frequency of BSE and to examine variables related to breast cancer screening behaviours in a sample of 103 Muslim female workers at a hazelnut factory in Ordu city, Turkey. He published his results in the European Journal of Oncology in April of 2008 which showed that only 26.2% of the women reported knowledge about BSE and BSE performance was as low as 4.3%.

With education programs being developed to promote adherence to recommended breast cancer screening guidelines in the United States, Sadler et al (2001) of the UCSD Cancer Centre, California published an article in the 2001 September issue of the Public Health Nursing Forum about breast cancer knowledge, attitudes and screening behaviour of 194 American Asian Indian women and concluded that a majority of these women reported their breast cancer knowledge as being inadequate and the overall awareness level being inadequate (52%).

Another Turkish study led by Yaren, Ozkilinc et al (2008) regarding awareness of breast and cervical cancer risk factors and screening behaviours among nurses in a rural region of Turkey. Researchers utilized a self administered questionnaire for investigative purposes and came to the conclusion that the risk factors and symptoms of breast cancer were generally well known except for early menstruation and late menopause. The result showed that overall awareness was slightly lower and none of the women identified early menarche and late menopause as risk factors. Additionally, women identified BSE as a beneficial method of breast cancer screening. Most women included in our study group too (73 out of 80) showed a positive attitude towards breast self examination.

Mine Bekar, Handan Guler, Funda Evcili, Gulbahtiyar Demirel, Ozlem Duran 2013 carried out a research on knowledge and screening practices among teachers. The objective of their study was to determine the level of knowledge about risk factors for breast cancer and screening behaviors among 468 female teachers who work in Sivas, Turkey. In this cross-sectional survey, a self-administered, structured questionnaire was used for data collection. This study revealed a relatively low awareness about the knowledge and practice of

screening methods among teachers. The relatively low rates of breast self-examination, clinical breast-examination, and mammography practiced by this group of teachers are of concern and suggest that increased awareness of these methods, their value, and how they should be conducted is needed.

Soyer et al (2007) of the Ege University, Turkey aimed to identify the level of breast cancer knowledge and BSE practice knowledge among primary health care nurses. In addition they aimed to investigate the frequency of BSE practice and evaluated the effects of an in-service training program about breast cancer and BSE practice. Concluded that the in-service education improved the knowledge of breast cancer and BSE among the nurses.

Bener, Alyash, Miller and Denic (2001) conducted a cross sectional questionnaire based survey to evaluate knowledge, attitudes and practices related to breast cancer screening among 1750 Arabic women aged 40 to 65 years who attended primary health care centers and reported that knowledge about breast cancer screening was low and only 12.7% of the study population practices BSE. Arabic study concluded that 12 % were regular and 23% were irregular performers.

Cross-sectional survey study was also carried out by Parsa, Kandiah, Mohd Zulkefli and Rahman, 2008 to determine the knowledge and practices of 425 female secondary school teachers from 20 selected secondary schools in Selangor, Malaysia on breast cancer screening (BCS). A self-administered, structured questionnaire was used for data collection. That study showed moderate to low knowledge on breast cancer (BC) and BCS among teachers. Only 19%, 25% and 13.6% eligible women performed breast self-examination (BSE), clinical breast examination (CBE) and mammography respectively, on a regular basis. It was suggested that efforts are needed to increase knowledge and remove misconceptions about breast cancer and screening practices among Malaysian women.

Alam (2006) published a study to assess the knowledge of breast cancer and its risk factors among women in Riyadh and reported that knowledge about breast cancer and BSE was as high as 82% however, only 41.2% of the women performed BSE with a lesser percentage performing it regularly, on a monthly basis. The study revealed a lesser overall awareness

(52%) and an even lower monthly performance of BSE (12%). Knowledge about risk factors and protective factors was found to be moderate and it was also concluded that knowledge varies according to marital status and the level of education in these women. Alam also revealed that 18.2% of the 864 participants had had a mammography done.

Osime, Okojie, Aigbekaen and Aigbekaen (2008) carried out a research to assess the knowledge attitude and practice about breast cancer among civil servants in Benin city, Nigeria, published in Annals of African Medicine. The study was carried out using a structured questionnaire. A total of 400 female civil servants were enlisted in the study, but only 385 respondents completed and returned the forms. Two hundred and seventy seven (72.0%) respondents had tertiary level of education. Sixty six (17.1%) respondents were in the 30-34-year age group. Three hundred and twelve (81.0%) respondents knew correctly that breast lump is usually the first symptom of presentation of breast cancer. One hundred and forty four (37.5%) respondents knew that a positive family history of breast cancer is a risk factor, while two hundred and seventy four (71.2%) respondents answered that cancer of one breast in a woman increases her chances of having cancer of the other breast. Three hundred and twenty one (83.4%) respondents knew that breast cancer could spread from one breast to the other and two hundred and thirty (59.7%) knew that breast cancer could spread to other parts of the body. One hundred and eighty three (47.5%) respondents would visit the hospital as the first reaction if they were to detect a breast lump, while twenty three (6.0%) respondents would ignore the lump. While three hundred and twenty seven (85.0%) respondents have heard of breast self- examination, only one hundred (26.0%) could correctly describe the procedure of breast self -examination. While one hundred and thirty five (35.0%) respondents have heard of mammography, only twenty seven (7%) respondents go for yearly mammography screening. Three hundred and seventy two (96.6%) respondents know that mastectomy is done as part of the management of breast cancer, but only forty nine (12.7%) respondents have heard about conservative surgery. In conclusion the level of awareness about breast cancer among civil servants in Benin City is low.

Jahan, Saigul and Abolgadir, (2006) carried out a cross sectional survey amongst 300 female patients between 20 and 70 years of age attending Primary Health Care Centers in the Quassim region of Saudi Arabia in order to explore their level of knowledge regarding

breast cancer and attitudes towards BSE. The level of knowledge about breast cancer and the practice of BSE was low with as many as 69.7% of the women never having heard of BSE and 18.7% reporting to have ever practiced BSE. However the participants' had a positive attitude towards learning BSE.

Jarvandi et al (2002) conducted a descriptive study at the Iranian Centre for Breast cancer in Tehran Iran to explore the beliefs and behaviour of 800 Iranian teachers towards breast cancer and BSE. In the Iranian study the mean age of participants was 37.3 years and 83% were married only 6% of women in this study reported BSE performance on a monthly basis. The most common reasons for not performing BSE was lack of knowledge and the belief that it was not necessary (36% and 34%).The Iranian study also noted that BSE was more frequent among married and older women.

Yavari et al (2007) of the Shaheed Behesti Medical University. Tehran. Iran intended to identify the relationship between Iranian women's socioeconomic status and their knowledge and practice of BSE. They obtained data from a hospital based case control study among women diagnosed with breast cancer. They included 303 cases and 303 controls whose mean ages were 48.2 and 50.2 respectively. The study revealed that there were significant relationships between education level and knowledge and practice of BSE in both cases and controls.

Madanat and Merrill (2002) reported a study on breast cancer risk factors and screening awareness among women nurses and teachers in Jordan. Data was used to determine two dimensions of breast cancer awareness; the knowledge of risk factors associated with disease and the knowledge of BSE and mammography. Their survey tool was the Breast Cancer Knowledge Test and Comprehensive Breast Cancer Questionnaire. They found that profession, age and a family history of the disease significantly influenced breast cancer screening awareness. The Jordanian study involved a comparative analysis of two groups of women namely teachers and nurses. Overall the awareness levels for nurses were 88.3% and teachers 73.1% in the Jordanian study.

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Shepherd and McInerney (2006) organized a Breast Week in Freetown, Sierra Leone during which 1200 women were educated on Breast cancer and the importance of breast health. Of these a sample size of 120 women (10%) was obtained and it was concluded that the majority of women had some knowledge about breast cancer and its risk factors. The women were able to link breast cancer with its signs and symptoms associated with it as did women in our study group.

Oluwatosin and Oladepo (2006) carried out a research to assess the knowledge of breast cancer and its early detection measures among 420 randomly selected rural women in two health districts in Akinyele Local Government Area, Ibadan, Nigeria. The study revealed that respondents overall lacked knowledge of the vital issues of breast cancer and its early detection methods with only 13.3% of the women claiming to have ever heard of BSE. None of the women in this study group had ever practiced BSE.

A study by Ibrahim and Odusanya (2009) on knowledge of risk factors, beliefs and practices of female healthcare professionals towards breast cancer in a tertiary institution in Lagos, Nigeria. A cross-sectional study was conducted using a self-administered questionnaire to assess the knowledge of breast cancer risk factors, beliefs about treatment and practice of screening methods among 207 female doctors, nurses and other healthcare professionals working in a university teaching hospital in Lagos, Nigeria. Stratified random sampling method was employed. The result indicated that female doctors obtained a mean knowledge score of 74% and were the only professional group that had satisfactory knowledge of risk factors. Majority (86%) believed that early breast cancer is curable while half of participants believed that prayer can make breast cancer disappear from the affected breast. Eighty three percent practice breast self-examination (BSE) once a month and only 8% have ever had a mammogram. Age, knowledge of risk factors, profession and beliefs were not significantly associated with rate of BSE in this study. Conclusion of the results from this study suggested the need for continuing medical education programmes aimed at improving knowledge of breast cancer among female healthcare providers other than doctors.

Knowledge, attitude and practice of Nigerian women towards breast cancer a cross-sectional study carried out by Okobia, Bunker, Okonofua and Osime (2006). The results of this study suggest that community-dwelling women in Nigeria have poor knowledge of breast cancer and minority practice BSE and CBE. In addition, education appears to be the major determinant of level of knowledge and health behaviour among the study participants. They recommend the establishment and sustenance of institutional framework and policy guidelines that will enhance adequate and urgent dissemination of information about breast cancer to all women in Nigeria.

Breast Cancer Knowledge and Screening Behaviors of the Female Teachers by Naimi Nur (2010) made it known that the sources of that information were television (59.0%), newspapers (48.9%), and health professionals (24.1%); 58.5% of the teachers had a sufficient knowledge level about breast cancer risk factors. The most frequently reported risk factor was family history of breast cancer (94.9%), followed by getting older, high fat diet and having a first child at a late age (68.6%, 51.7%, and 45.1%, respectively). No significant differences were found in knowledge by age groups, having breast-related complaints, teaching experience, or marital status. Among the teachers, 43.9% had performed breast self-examination; yet only 10.5% of them performed it monthly. Only 22.3% of the teachers reported having at least one clinical breast-examination. Among the 136 women over the age of forty years, only 37.5% had had at least one mammogram. A significant association was noted between level of knowledge about breast cancer risk factors and use of breast self-examination. Also, being married and having breast-related complaints were significantly related to practicing clinical breast-examination and mammography. This study revealed a relatively low awareness about the knowledge and practice of screening methods among teachers. The relatively low rates of breast self-examination, clinical breast-examination, and mammography practiced by those groups of teachers are of concern and suggested that increased awareness of these methods, their value, and how they should be conducted is needed.

The study carried out by Odusanya (2001) examines the knowledge, attitudes, and practices of female school teachers concerning breast cancer. A cross-sectional survey was conducted among 200 school teachers randomly selected from 12 schools in Lagos, Nigeria. A self-administered questionnaire was used to investigate their knowledge about

the symptoms of breast cancer, methods of diagnosis, risk factors, and breast self-examination. A response rate of 94% (188 respondents) was achieved. Eighty-five percent knew breast cancer was a serious disease, but only 53.2% knew that a breast lump was the most commonly recognized sign. Other symptoms were even less well known. Only 13.8% knew the methods of diagnosis, and knowledge of risk factors was also poor. Breast self-examination was practiced by 62% of respondents, 11% practiced it on a monthly basis, but only 25% were deemed to possess sufficient knowledge about the procedure. One-quarter of participants were categorized as possessing a satisfactory knowledge of breast cancer. The level of awareness on breast cancer is very low among this group of female schoolteachers.

Another study was conducted by Alam (2006) to assess knowledge of breast cancer and sources of information. He found that knowledge on breast self examination was high. 82% knew about BSE and 61% knew about mammography but only 41.2% performed BSE and 18.2% had mammography screening. Knowledge on breast cancer risk factors was moderate.

Milani (2000) conducted a cross sectional study on 6380 female secondary school student in Jeddah to identify their knowledge of breast cancer and attitude towards breast self-examination (BSE). Knowledge of risk factors was very low. Over 80% of students failed to answer 50% of the questions correctly. Only 47.1% of students reported that they had heard of or read some scientific information about breast cancer in various media and 39.1% reported that lump in the breast is the warning sign of breast cancer. Only15.2% agreed that use of contraceptive pill is a potential risk factor. Few (16.2%) knew that breast cancer could appear as a change of or bleeding from the nipple.

2.19 Summary of Literature Reviewed

Cancer is a major public health problem, with significant associated death and disability. It is the second leading cause of death in developed countries and is one of the three leading causes of death for adults in developing countries and there are over 200 different types of cancer. For women, breast cancer is the most commonly occurring cancer. It is also the

most common cause of cancer deaths among women and thus needs to be dealt with comprehensively.

Early detection of cancer greatly increases the chances of successful treatment and decreases the health burden of morbidity and mortality. Therefore WHO recommends regular breast screening for women using mammography? Breast cancer mortality may be reduced by up to one third with the help of mammography through early detection and treatment. Breast self examination (BSE) and clinical breast examination (CBE) are other screening methods often advocated. It is therefore important to assess the awareness and knowledge of the screening target group before devising strategies to make the screening programme more effective.

A large number of studies investigating these beliefs have been conducted worldwide examine the utilization of these screening tools and to understand the obstacles to their underutilization if at all. Such factors range from poor awareness about cancers and their screening methods, poverty, cultural issues, old age, lack of facilities, perceptions of fear towards screening, perceived insusceptibility to developing cancer and concerns about privacy.

However, few studies have been conducted in Nigeria which assesses the knowledge of teachers on breast cancer. This study will be carried out with the aim of generating data that can help teachers to promote breast cancer screening practices.

2.20 Observed gaps in the reviewed studies

Most of the breast cancer studies reviewed in this chapter was conducted in developed and developing countries including Sub-Saharan Africa and Nigeria. The review was quantitative in nature. In addition, most of the reviewed studies either worked on self breast examination practices or knowledge and practice of breast self examination. This is just a single method of breast screening.

Hence, the current study therefore intends to bridge this gap. Firstly, the study was conducted in Ibadan where few studies on breast cancer had hitherto been carried out among teachers. Also, the study researched the knowledge of breast cancer and screening

practices. All the three recommended methods of breast cancer screening are included in the research work.

2.21 Conceptual Framework

Researchers create and implement interventions as a major means by which to disseminate knowledge and increase awareness about a given health problem, such as breast cancer. Interventions that yield desirable changes are ideally based on at least one theoretical framework (Glanz, Rimer, and Lewis, 2002). Health-behaviour theories assist researchers by organizing their inquiry into why people do or do not engage in specific health behaviors (NCI, 2005). They are valuable during different stages of planning, implementing, and evaluating an intervention. Theories also help explain behaviour and suggest ways to achieve behavior change (Glanz et al., 2002).

The Health Belief Model (HBM) (Table 2.1, Figure 2.9) is an example of a health behavior theory that considers one's overall perceived risk of an illness as a precursor to positive, preventive behaviour (Wendt, 2005). It was originally postulated in the 1950's by social psychologists in the U.S. Public Health Service (Glanz et al., 2002). Perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action comprised the initial core components of the model; in 1977, Bandura added the self-efficacy component to the HBM (Janz, Champion, and Strecher, 2002). The fundamental premise of the HBM is that an individual's desire to evade illness, coupled with a belief that a particular health action would avert onset of the illness, can be interpreted and explained in relation to a number of diseases. More detailed analysis can estimate an individual's perceived susceptibility, severity, and cues to action to attempt to reduce overall risk for a particular illness or disease (Glanz et al., 2002). Only three of the concepts of the HBM are addressed during this study, including perceived susceptibility, perceived severity and perceived benefits.

Table 2.1: THE HEALTH BELIEF MODEL illustrating a health behaviour that considers teacher's overall perceived risk of breast cancers as a precursor to positive, preventive behaviour.

LEVELS	EXAMPLES
Perceived Susceptibility	Beliefs of female teachers about the chances of getting a condition (breast cancer).
Perceived Severity	Beliefs of female teachers about the seriousness of breast cancer and its consequences
Perceived Benefits	Beliefs of female teachers about the effectiveness of taking action to reduce risk or seriousness of breast cancer and its consequences
Perceived Barriers	Beliefs about the material and psychological costs of going for screening.
Cues to Action	Factors that activate "readiness" to go for breast cancer screening" e.g. information from peers, doctors, media, conferences.
Self-efficacy	Female teacher's confidence to perform screenings.

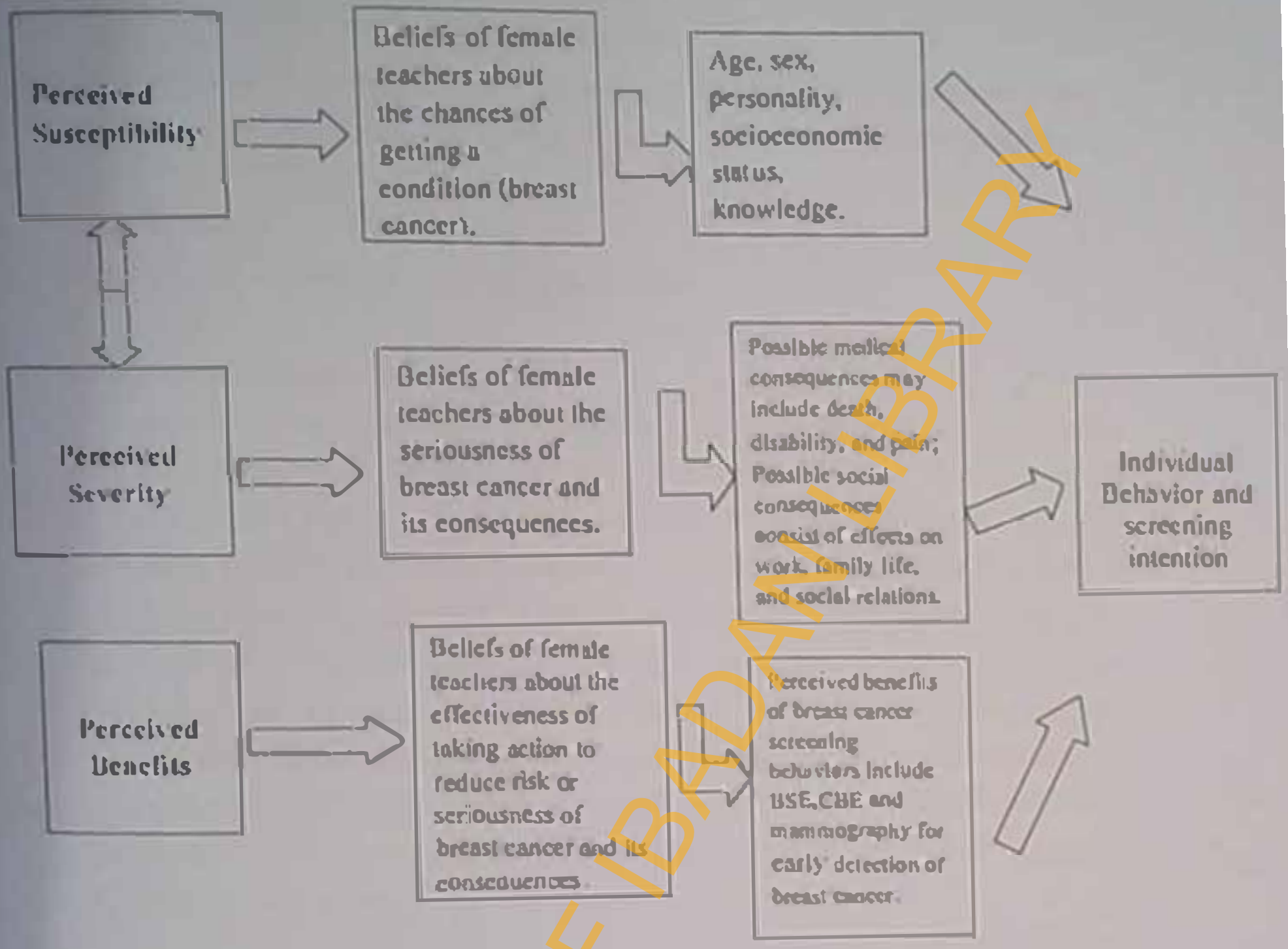

Figure 2.10: A modified health belief model conceptual framework for understanding the health behaviour of teachers in relation to their perception regarding breast cancer as it influenced the use of BSE or CBE or mammography screening.

CHAPTER 3

METHODOLOGY

This chapter is about methods applied in the study on the knowledge of breast cancer and the screening practices among secondary school teachers in Ibadan, Oyo State, Nigeria.

3.1 Study design

This study was a descriptive cross- sectional in design.

3.2 Description of study area

The study was carried out within Ibadan metropolis and Ibadan remains not only the capital city of Oyo State, but the biggest city in South-Western Nigeria. Oyo State as one of the 36 States in Nigeria covers a total land mass of 27,249 square kilometers. The state is bounded by Ogun State in the south and by Kwara State in the North. The State is bounded by part of Ogun State and Republic of Benin in the West and by Osun State in the East. Oyo State otherwise known as '*The Pace Setter State*' consists of 33 Local Governments and the state remains the home of mainly Yoruba people – one of the three major ethnic groups in Nigeria. Specifically, Ibadan North Local Government was founded by the Federal Military Government of Nigeria on the 27th September, 1991 with its headquarters remains Agodi. It has an area of 27 km^2 and a population of 306,795 going by the CENSUS 2006 report.

The males made up about 150,837 of the total population, while the female population was 149,100 people. Ibadan North Local Government comprises of 12 wards. Most of the populations of Ibadan North Local Government residents are in the private sector. They are mainly traders and artisans. A good number of their workers are civil servants. Notably, there are numerous educational institutions in Ibadan North Local Government area and they include University of Ibadan, 27 public senior secondary schools, and 60 public junior secondary schools and 48 public primary schools; there are 1735 teachers, 461 non-teaching staff and 205 youth corps members in the Local Government (Oyo State Post-Primary Schools Teaching Service Commission 2010).

3.3 Study population

The study population comprised of teachers of public Senior Secondary Schools in Ibadan North Local Government at the time of the study.

3.4 Target population

The study population consists of all female teachers of Senior Secondary Schools in Ibadan North Local Government Area.

3.5 Sample size and sampling

Sample size was determined using the formula for sample size determination for a cross-sectional descriptive study (Araoye M.O, 2003) with a 95% confidence interval, a precision of 5%, and a prevalence of knowledge of breast cancer risk factors among teachers 59% (0.59) (Nur, 2010).

Formula: $n = \frac{z^2 p(1-p)}{d^2}$

Where:

n = estimated sample size

Z = confidence limit (1.96)

P = prevalence of breast cancer knowledge (59%)

d = marginal error (5%)

$n = \frac{(1.96)^2 \times 0.59(1-0.59)}{(0.05)^2}$

$n = \frac{3.84 \times 0.24}{0.0025}$

$n = \frac{0.92}{0.0025}$

$n = 372$

Adding 10% non-response rate: n = 409

The calculated sample size was 372 and by adding 10% non response rate and incomplete questionnaire, the total sample size was found to be 391 teachers. All the female teachers in the public senior secondary schools (SSS 1-3) at the time of the study were eligible to participate in the study. This was because of the total numbers of teachers were four hundred and eleven (411) at the time of this study. A total sampling technique was used,

however, only 307 (74.7%) consented to participate in the study and all were used for the study.

Table 3.1: List of Senior Secondary School female teachers in Ibadan North. LGA.

LIST OF SENIOR SECONDARY SCHOOLS	NO. OF FEMALE TEACHERS	NO. OF MALE TEACHERS
1. Islamic Senior High School, Basorun	22	13
2. Saint Lious Senior Grammar School, Mokola.	15	10
3. Saint Patrick's Senior Grammar School, Basorun	10	4
4. Saint Gabriel's Senior Secondary School, Mokola.	11	5
5. Mount Olivet Senior Grammar School.	15	3
6. Anglican Senior Commercial Grammar School 1 & 2	29	10
7. Abadina Senior College, UI, Ibadan	21	12
8. Methodist Senior Grammar School, Bodija	21	9
9. Oba Akinbiyi 1 Senior High School	7	8
10. Oba Akinbiyi 2 Senior High School	13	6
11. Poly Senior High School	13	7
11. Immanuel Senior College 1 & 2	19	8
12. United Senior Secondary School	15	9
13. Basorun/Ojoo Senior High School	27	15
14. Humani Alaga Senior High School	10	3
15. Ikolaba Senior Grammar School	26	7
16. Ikolaba Senior High School 1&2	27	9
17. Chesire Senior Secondary School	16	5
18. Bishop Onabanjo School High School	16	6
19. Oba Akinyele Senior Memorial High School	18	7
20. Navlori Un – Deen High School	10	4
21. Community High Agbowo Bodija Senior	10	6
22. Ibadan North Government Secondary School, Inalende	9	5
23. Ebenezer African Church Grammar School	13	4
Total	411	175

3.6 Inclusion criteria

All the female teachers of public Senior Secondary Schools during the period of this study were included.

3.7 Exclusion criteria

Non-teaching staff, male teachers, Junior Secondary Schools teachers and Senior Secondary School teacher who were not in school at the time of this study were not excluded from the study.

3.8 Study instrument

A pre-tested, self-administered questionnaire was used. Questions were drawn using information on breast cancer from the various literature reviewed. The self-administered semi-structured questionnaire used was divided into 6 sections. Section A: The socio-demographic variables. Section B. Awareness of breast cancer, screening practices and sources of information, Section C. Knowledge of Breast Cancer was assessed by asking questions on breast Cancer Symptoms and Risk Factors. Section D. Previous breast cancer screening practices. Section E. Perceived susceptibility of breast cancer, perceived severity of breast cancer and perceived benefits of early detection and Section F. Factors influencing the practice of BSE, CBE and mammography was assessed. Except for the basic demographic information, all questions had multiple-choice responses (e.g. yes/no/don't know), and the answer choices were categorized and quantified when possible.

3.9 Method of data collection

Data collection was done by the researcher alone and a semi-structured questionnaire was used to elicit information from the respondents. Permission was first taken from all the principals of each schools enlisted for this research, who later introduce the investigator to the teachers to inform them about the research that was been conducted. The consent of each teacher was also taken before questionnaires were distributed One school was interviewed daily for a period of one month. Consenting respondents were given printed copies of the questionnaire and allowed time to fill their response at their will and convenience, and in a private, confidential setting. Respondent then returned these

questionnaires anonymously. The questionnaire was self-administered so as to limit bias and allow for forthright responses from respondents. Each respondent spent 10 to 15 minute and the questionnaires were completed during their free period and break time. Completed questionnaires were scrutinized on the spot and at the end of the daily field sessions for immediate correction of erroneous entry.

3.10 Validity and reliability

Validity: Validity and reliability of the instrument was ensured through a comprehensive review of related literature. The salient variables of interest were teased out from the literature relating to knowledge and screening practices for measurement. The result of the literature review was used to develop the questionnaire for the study. The instrument was subjected to peer and expert review by authorities in the field.

Reliability: The instrument was pre-tested in Ibadan North East among Senior Secondary School teachers and 10% of the calculated sample size which is 42 respondents was used. The exercise was carried out by the principal investigator only. Modification of the instrument was done after pretest through which multiple response questions were included in the question in order to capture some of the responses. The pre-tested questionnaire was coded, entered into a computer and analyzed. Reliability coefficient was used to test for the statistical reliability of the instrument. A Cronbach's Alpha score for the pretest was 0.893.

3.11 Data analysis

Knowledge of breast cancer was measured by posing questions on prevention, risk factors and symptoms of breast cancer. A total of thirty (30) questions were asked and one (1) point was be allocated to every correct answers thus bringing the total points to thirty (30). Afterwards the points were categorized between 0-14 as Code 1, 15-20 as Code 2 and 21-30 as Code 3. Participants that score between 0-14=Code 1 was poor knowledge of breast cancer, 15-20=Code 2 was fair knowledge of breast cancer and 20-30=Code 3 was good knowledge of breast cancer. The screening practice was measured by asking the respondents to indicate which of the breast screening have they ever practice. The following was put in place to ensure proper and effective management of data. The questionnaires were serially numbered for control and recall purposes and data collected were checked for completeness and accuracy after which data was sorted, edited and coded manually. The data analysis was being carried out using the SPSS statistical software. A

summary measure such as means and standard deviations were used for quantitative variables, while chi square test was used to test for association

3:12 Ethical considerations

Ethical approval was obtained from the Ministry of Health in Oyo State Secretariat in the Department of Health Planning, Research and Statistics. Further permission and approval was obtained from principal of each school before the commencement of the study and also, informed consent was obtained from each respondent. The respondents were assured of the confidentiality of their answers and that total participation in the study was voluntary. No names of respondents or their identifiers were written on questionnaires to ensure that responses cannot be linked to any of the respondents. In addition, respondents were given the right to feel free to participate or withdraw from participating at any stage without any penalty whatsoever. The purpose of this was to ensure that the research conform to accepted scientific principles and international ethical guidelines required in human subjects research. Permission was obtained from the various heads of all the twenty four schools enrolled in the study.

3.13 Limitations of the study

The sample included only the teachers that were present at the time of data collection. The study population is a specific group and profession of the country and this may affect the generalization of the findings. The total number of the senior secondary school teachers were 411 as at the time of this study but 101 did not participate in the study teachers because of non-payment of their salary as at the time this study and some were not present in the school during the time of this study and this affected the sample size.

CHARPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of the respondents

Respondents' age ranged from 22-59 years with a mean age 39.8±8.5 years. Two hundred and fifty two (82.1%) were Christian and 17.3% were Muslim. Almost all the respondents were Yoruba 288 (93.8%). The majority of the respondents 79.8% (n=245) were married, 15.3% (n=47) were single. 2.6% were divorced and 2.3% were widow.

Also, the years of service ranged from 2-34 years and the mean years of service was 12.0±8.5 years, 130 (42.3%) had serviced for 1 to 9 years, (115) 37.5% had serviced between 10 to 19 years. 42 (13.7%) had serviced for 20 to 29 years and 20 (6.5%) had serviced for 30 years or more. Furthermore, forty one (13.4%) had NCE, more than half 215 (70.0%) had first degree, 46 (15.0%) had masters and 1.7% had M.Phil and PhD. Eleven (3.6%) of the respondents were principals, twenty four (7.8%) were vice principals, eight (2.6%) were counselor, twenty two (7.2%) were heads of departments and majority. Most 224 (74.6%) of the respondents were in a monogamous marriage while 28 (9.1%) in a polygamous marriage and 50 (16.3%) (Table 4.1).

Table 4.1: Socio-demographic characteristics of the respondents

Variable		Frequency	Percent (%)
Age (years)	20-29	38	12.4
	30-39	112	36.5
	40-49	114	37.1
	50 above	43	14.0
Religion	Christianity	252	82.1
	Muslim	53	17.3
	Traditional	1	0.3
	Others	1	0.3
Ethnicity	Yoruba	288	93.8
	Igbo	1	0.3
	Hausa	11	3.6
	Other	7	2.3
Marital Status	Single	47	15.3
	Married	245	79.8
	Divorce	8	2.6
	Widow	7	2.3
Years of service	1-9	130	42.3
	10-19	115	37.5
	20-29	42	13.7
	30 above	20	6.5
Educational Status	NCE	41	13.4
	Degree	215	70.0
	Master	46	15.0
	M.Phil	3	1.0
	PhD	2	0.7
Present position	Principal	11	3.6
	Vice principal	24	7.8
	Counselor	8	2.6
	Head of department	22	7.2
	Class Teacher	242	78.8
Types of marriage	Monogamy	229	74.6
	Polygamy	28	9.1
	Others	50	16.3

4.2 Awareness of breast cancer, screening methods and sources of information

Most of the respondents 286 (93.2%) had heard of breast cancer while 219(71.3%) claimed that someone has ever discussed the harmful effect of breast cancer with them (Figure 4.1)

4.2.1 Awareness of breast self examination

Two hundred and thirty four respondents (76.2%) were aware of breast self examination while 42.7% knew someone who practices BSE (Figure 4.2). Of those who knew someone who practices BSE, 17.6% were friends, 5.9% were their sisters, and 2.9% were mothers and 1.0% aunties. To the question on what is the recommended age of breast self examination to start only 33(10.7%) knew the appropriate age of commencing breast self examination to be 20 years, 55(17.9%) indicated that should be started at all age, 121 (39.4%) once breast formation starts, and 10(3.3%) at the age of 30 and 88(28.7%) did not know when to start (Table 4.2).

4.2.2 Awareness of clinical breast examination

One hundred and sixty three (53.1%) were aware of clinical breast examination while 74 (24.1%) knew some who had gone for clinical breast examination before (Figure 4.2) and thirty eight respondents 12.4% of these were friends, 1.0% were mothers 0.7%, 1.3% and 0.7% were their sisters and aunts to the respondents respectively. The response for the question what is the recommended age of CBE examination to start: 39 (12.7%) reported it should be started at all age, 67(21.8%) once breast formation starts, 45(14.7%) at the age of 30, 15 (3.3%) at the age of 40, 3(1.0%) indicated at the age of 50 and 201 (65.5%) did not know when to start (Table 4.2).

4.2.3 Awareness of mammography

Seventy three respondents (23.8%) of the respondents had heard of mammography while the same percentage of respondents (23.8%) knew someone who had gone for the mammogram (Figure 4.2) and out of which 10.4% of them were friends, 2.0% were mothers and 1.6% each was their sisters and aunts respectively. The respondents response for the question what is the recommended age of mammography examination to start: 23 (7.5%) reported it should be started at all age, 33 (10.7%) once breast formation starts, and 31(10.7%) at the age of 30, 16 (5.2%) at the age of 40 and 3(1.0%) at age of 50, 201(65.5%) did not know when to start (Table 4.2).

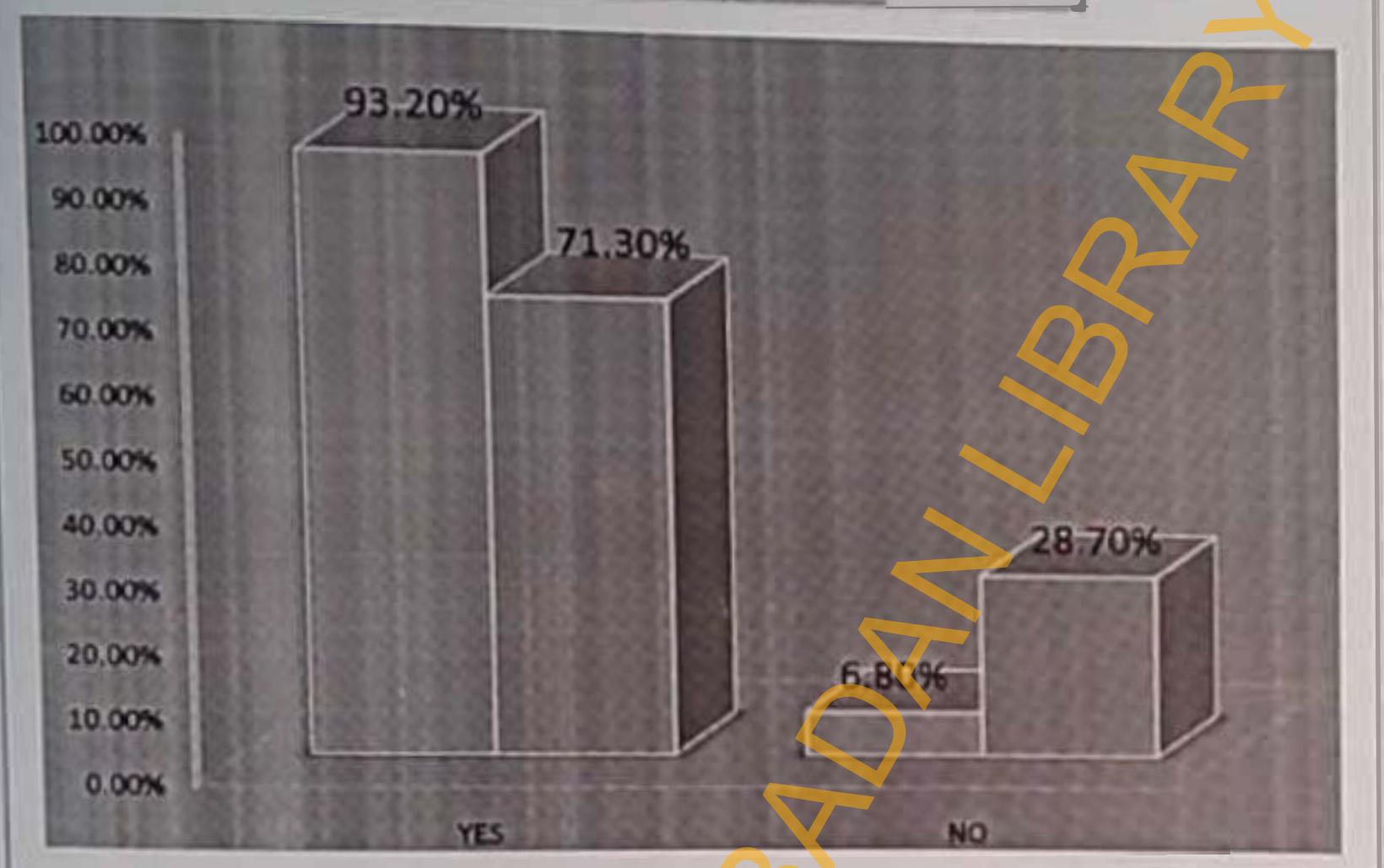

Figure 4.1: Awareness of breast cancer

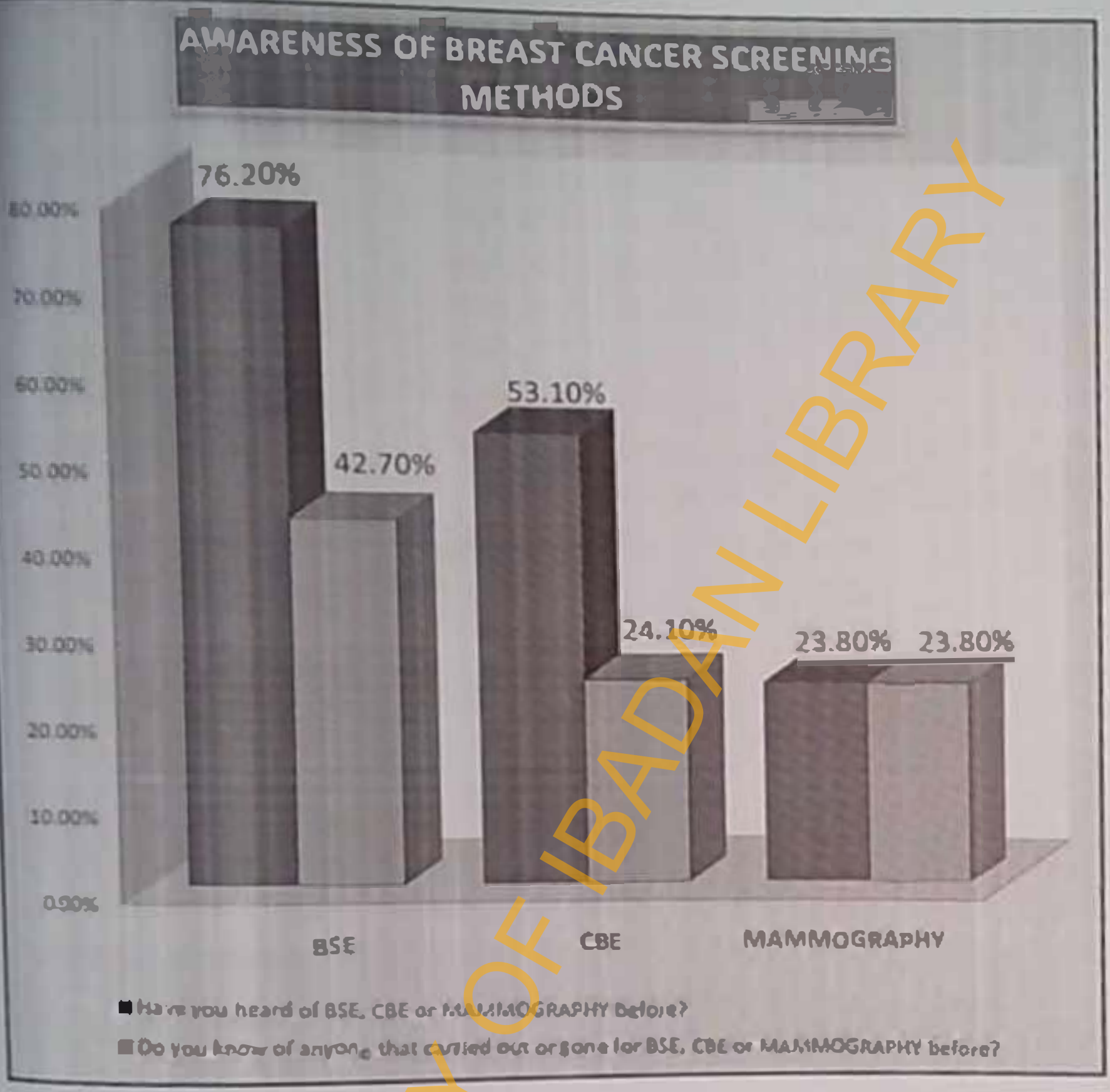

Figure 4.2: Awareness of breast cancer screening methods

Table 4.2: Recommended age of breast cancer screening methods

Variables	BSE	CBE	Mammography
At all age	55(17.9%)	39(12.7%)	23(7.5%)
Once breast formation starts	121(39.4%)	67(21.8%)	33(10.7%)
At age 20 years	33(10.7%)	0(0%)	0(0%)
At age 30 years	10(3.3%)	45(14.7%)	31(10.1%)
At age 40 years	0(0%)	15(4.9%)	16(5.2%)
At age 50 years	0(0%)	0(0%)	3(1.0%)
At old age	0(0%)	1(0.3%)	0(0%)
Don't know	88(28.7%)	140(45.6%)	201(65.5%)
Total	307	307	307

4.2.4 Sources of information

The leading sources of information were television 212(69.1%), radio 134 (43.6%) while internet 38(12.4%) was the source of internet. Other sources of information were lecture 100(32.6%), doctors/health provider 103(33.6%), book 87(28.3%), friends 78(25.4%) and church/mosque 55(17.9%) (Table 4.3).

Table 4.3: Respondents' sources of breast cancer information

Sources of Information on BC	Frequency (n)	Percent %
Television	212	69.1
Radio	134	43.6
Internet	38	12.4
Lecture	100	32.6
Doctors/Health Provider	103	33.6
Book	87	28.3
Friends	78	25.4
Church/Mosque	55	17.9

*Multiple responses

4.3 Knowledge of breast cancer

Less than half (42.3%) believed that breast cancer can cured and eighty six percent (86.6%) believed that breast cancer can be cured if discovered early. Sixty nine (22.5%) held the belief that surgery is the only method of treatment for breast cancer, 52.4% for breast cancer is caused by excessive sucking and massage, 43.6% for breast cancer is difficult to discover until the symptoms manifest, 66.1% for breast cancer can be detected by oneself, 88.9% for breast cancer is harmful to health, 16.0% for breast cancer is the disease of young girls, 67.4% for breast cancer is the disease of the white and 2.0% for breast cancer is the disease of old women (Table 4.4).

Table 4.4: Knowledge of breast cancer

Variables	Frequency (%)		
	Yes	No	Don't know
Breast cancer cannot be cured	82(26.7%)	130(42.3%)*	95(30.9%)
Breast cancer can be cured if discovered early	266(86.6)*	14(4.6%)	27(8.8%)
Breast cancer can be cured by surgery only	69(22.5%)*	123(40.1%)	115(37.5%)
Breast cancer is caused by excessive sucking and massage	12 (3.9%)	161(52.4)*	134(43.6%)
BC is difficult to discover until the symptoms manifest	134(43.6%)	95(30.9%)*	78(25.4)
Breast cancer can be detected by oneself	203(66.1%)*	42(13.7%)	62(20.2%)
Breast cancer is harmful to health	273(88.9%)*	11(3.6%)	23(7.5%)
Breast cancer is the disease of yuung girls only	198(64.5%)	49(16.0%)*	23(7.5%)
Breast cancer is disease of the white	8(2.6%)*	270(67.4%)	92(30%)
Breast cancer is the disease of old women only	6(2.0%)	231(67.4%)*	60 (19.5%)

*Correct responses

4.3.1 Knowledge of breast cancer symptoms

Sixty five (21.2%) identified bloody nipple as a symptom of breast cancer while 70 (22.8%) recognised inversion, pulling in of the breast as a symptom, 71.0% answered correctly the question lump in the breast, 40.1% for lump in the amipit, 56.7% for pain in the breast region, 30.0% scaling/dry skin in the nipple region, 17.3% for breast enlargement, 22.8% for inversion/pulling in of the breast, 16.3% for ulceration, 20.8% for headache, 13.4% for abdominal and 21.2% for bloody nipple. Other levels of knowledge of symptoms are shown on (Table 4.5).

Table 4.5: Knowledge of Breast Cancer Symptoms

Knowledge of breast cancersymptoms	Frequency (%)		
	Yes	No	Don't know
Bloody nipple	65(21.2%)*	55(17.9%)	187(60.9%)
Inversion, pulling in of the breast	70(22.8%)*	55(17.9%)	182(59.3%)
Breast ulceration	50(16.3%)*	47(15.3%)	210(68.4%)
Headache	64(20.8%)	55(17.9%)*	188(61.2%)
Abdominal pain	41(13.4%)	72(23.5%)*	194(63.1%)
Lump in the breast	218(71.0%) *	15(4.9%)	74(24.1)
Lump under the arm bit	123(40.1%)*	52(6.9%)	132(43.0%)
Pain in the breast region	174(56.7%)	26(8.5%)*	107(34.9%)
Scaling, dry skin in the nipple region	92(30.0%)*	35(11.4%)	180(58.6%)
Breast enlargement	116(37.8%)*	53(17.3%)	138(45.0%)

*Correct responses

4.3.2 Knowledge of breast cancer risk factors.

When asked about breast cancer risk factors 18.2% answered correctly the question breast cancer can be caused by putting money between the breast and brassier, 9.1% for obesity, 6.2% breast feeding, 27.0% bruising the breast, 47.9% for family history of breast cancer, 20.8% for as age increases, 27.0% for it is caused by the devil, 26.7% for history of benign breast and the least recognized risk factors were 7.5% for early age of menstruation, 6.5% for late age at menopause (Table 4.6).

Table 4.6: Knowledge of Breast Cancer Risk Factors

Knowledge of breast cancer risk factors	Frequency (%)		
	Yes	No	Don't know
Putting money between the breast and brassier	147(47.9%)	56(18.2%)*	104(33.9%)
Family history of breast cancer	151(49.2%)*	55(17.9%)	101(32.9%)
Older age	64(20.8%)*	104(33.9%)	139(45.3%)
Obesity	28(9.1%)*	111(36.2%)	168(54.7%)
Breast feeding	19(6.2%)	190(61.9%)*	98(31.9%)
Bruising the breast	47(15.3%)	83(27.0%)*	177(57.7%)
It is caused by the devil	92(30.0%)	94(30.6%)*	121(39.4%)
Previous history of benign breast problems	82(26.7%)*	59(19.2%)	166(54.1%)
Early age of menstruation (age 12 or before)	23(7.5%)*	135(44.0%)	149(48.5%)
Late age at menopause (age 55 or after)	20(6.5%)*	114(37.1%)	173(56.4%)

*Correct responses

4.3.3 Respondents' total knowledge score of breast cancer

The mean knowledge score of BC was 8.8 ± 4.5 with score range of 1-23. About 86.3% had poor knowledge, 13.0% had fair knowledge and 0.7% had good knowledge of BC (Figure 4.3).

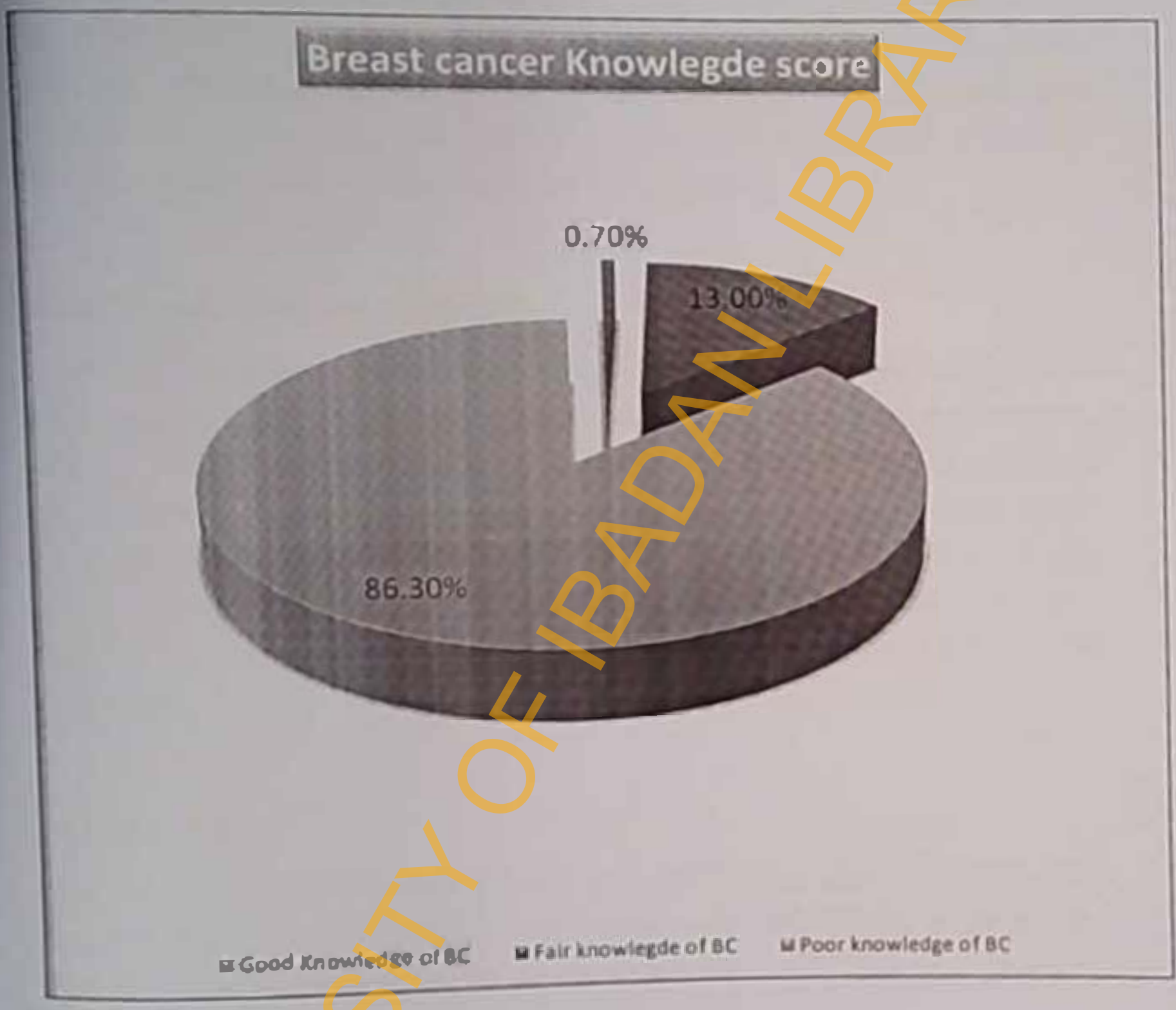

Figure 4.3 Respondents' knowledge of breast cancer

4.4 Breast Cancer Screening Practices among the Teachers

4.4.1 Breast-Self-Examination (BSE)

Of all the teachers (307), only 111 (36.2%) had ever practiced BSE (Figure 4.4). Of these 27.6% were doing it monthly, 32.7% once in a while, 24.5% everyday, 2.0% once in a year, 1.0% at every childbirth and 6.1% once in a week and once in two weeks respectively. When asked the last time BSE was done, 40.2% indicated month preceding the study, 9.9% indicated year preceding year of study, 13.7% week preceding the study, 26.4% before the study and 9.8% indicated day of the survey.

4.4.2 Clinical Breast Examination (CBE)

Fourteen (4.6%) teachers reported ever having clinical breast-examination (Figure 4.4). When asked the last time it was done 5(1.6%) indicated last year, 4(1.3%) reported to have gone for clinical breast examination 4 months ago, 2(0.7%) indicated last month and 1(0.3%) indicated last week, just recent and 4 years ago respectively. In respect of the question on how regularly they practice CBE and out fourteen respondents who indicated to have ever gone for CBE only 4(1.3%) reported to be doing it every year, 3(1.0%) once while 1(0.3%) indicated to be practicing CBE often, monthly and once in a while respectively.

4.4.3 Mammogram

Only 5(1.6%) of the respondents had ever gone for mammography (Figure 4.4) while 3(60.0%) reported to have gone for mammography last year, 1(20.0%) 6 months ago, 1(20.0%) 3 years ago while 1(20.0%) indicated 2 years ago.

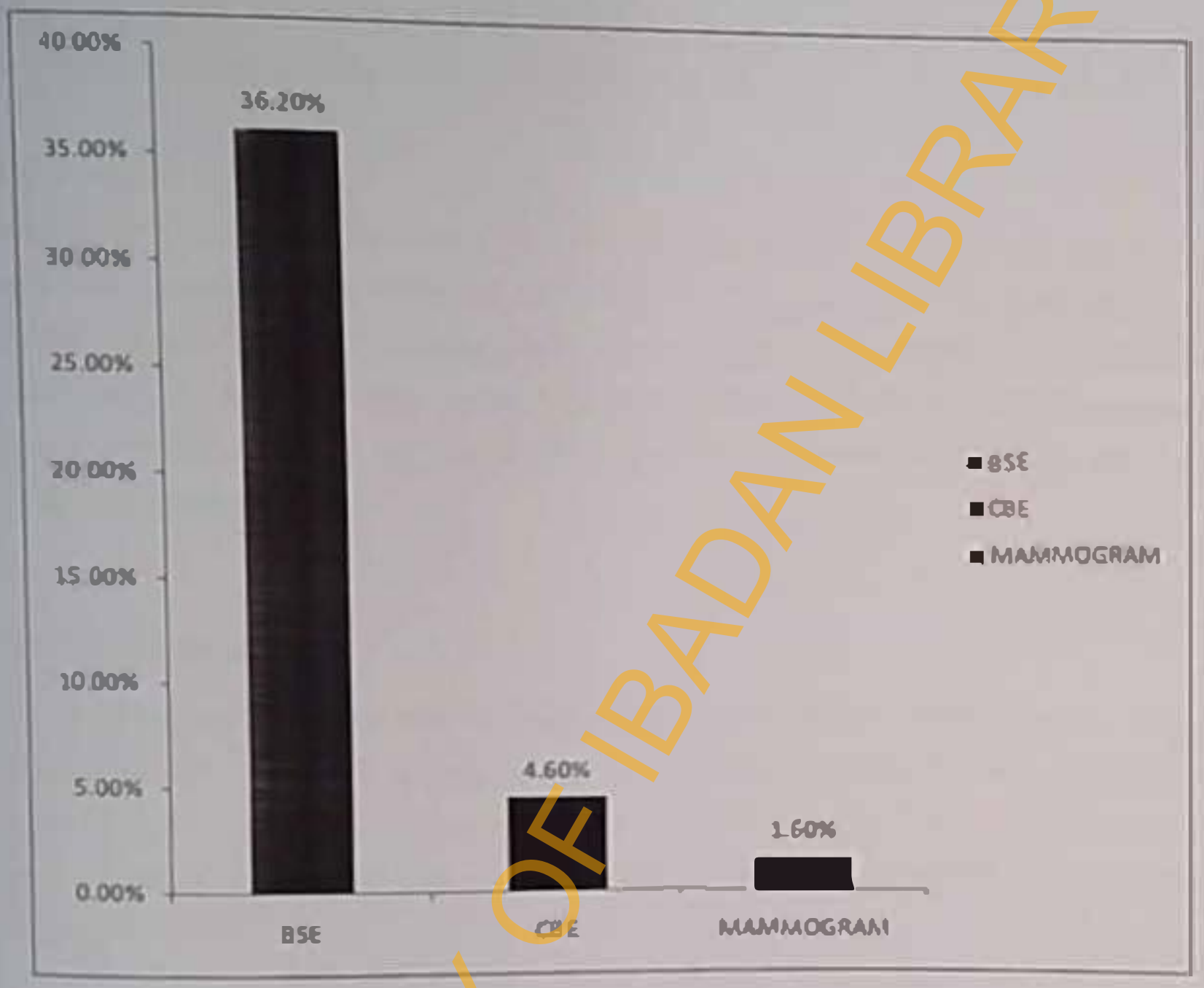

Figure 4.4: Breast cancer screening practices among female teachers

4.5 Perception of Breast Cancer

4.5.1 Perceived Susceptibility

Out of the respondents. 31 (10.1%) indicated that breast cancer is an unavoidable disease. Similarly. 70 (22.8%) were worried about getting breast cancer. In addition. 4 (1.3%) are those who believe that they are likely to get breast cancer as others and 5 (1.6%) see themselves developing breast cancer in the future (Table 4.7).

4.52 Perceived Severity

Substantial number of respondents 267 (87.0%) agreed with the statement that breast cancer can cause death if untreated, 149 (48.5%) also agreed with the same statement "breast has to be removed", 105 (34.2%) of women indicated that breast cancer can cause problems in sexual rela ationshipgreed with this statement. 207 (67.4%) breast cancer is a burden to family members and 225 (73.3%) agreed that breast cancer will affect work and social life (Table 4.7).

4.5.1 Perceived Benefits

One hundred and forty three (46.6%) respondents agreed with the statement that one of the benefits of early detection of breast cancer is that it helps in early detection of abnormal mass, 195 (63.5%) period of treatment can be reduced, 163 (53.1%) can prevent anxiety and 164 (53.4%) indicated that early detection is effective in detecting abnormality in breast (Table 4.7).

Table 4.7: Perception of Breast Cancer

Variables	Yes	No	Don't Know	Total
Perceived Susceptibility				
Breast cancer is unavoidable	31(10.1%)	168(54.7%)	108(35.2%)	307
I worry about getting breast cancer	70(22.8%)	167(54.4%)	70(28.8%)	307
I am likely to get breast cancer as other	4(1.3%)	247(80.5%)	56(18.25%)	307
Do you see yourself developing the breast cancer	5(1.6%)	259(84.4%)	43(14.0%)	307
Perceived Severity				
Can cause death if untreated	267(87.0%)	8(2.6%)	32(10.4%)	307
Breast has to be removed	149(48.5%)	64(20.8%)	94(30.6%)	307
Can cause problems in sexual relations	105(34.2%)	76(24.8%)	126(41.0%)	307
Being a burden to family member	207(67.4%)	37(12.1%)	63(20.5%)	307
Would affect work/social life	225(73.3%)	32(10.4%)	50(16.3)	307
Perceived Benefits				
Help early detection of abnormal mass	143(46.6%)	25(8.1%)	139(45.3%)	307
If detected early, period of treatment can be reduced	195(63.5%)	30(9.8%)	82(26.7%)	307
Prevent anxiety	163(53.1%)	44(14.3%)	100(32.6%)	307
Effective in detecting abnormality in breast	164(53.4%)	22(7.2%)	121(39.4%)	307

*Multiple responses

4.6 Factors influencing screening practices

The most frequently endorsed reason for non performance of breast cancer screening was did not like people touching their breast 111(36.2%) followed by, did not know how the test is done 107(34.9%), complexity of the hospital registration 94(30.6%), misinformation about breast cancer 81(26.4%), cost 78(25.4%), there is no free time 71(23.1%), fear of finding cancer 69(22.5%), lack of trust in hospital registration 67(21.8%), family responsibilities 58(18.9%) and the least was pain associated with screening practices 45(14.7%) (Table 4.8).

Table 4.8: Factors Influencing Screening Practices

Factors Influencing Screening Practices	Frequency	Percent %
SBE		
Do not know how the test is done	107	34.9
Misinformation about breast cancer	81	26.4
Fear of finding cancer	69	22.5
CBE		
Do not like people touching my breast, I feel embarrassed	111	36.2
There is no free time	71	23.1
Complexity of the hospital registration	94	30.6
MAMMOGRAPHY		
Cost	78	25.4
Lack of trust in hospital registration	67	21.8
Family responsibilities	58	18.9
Pain associated with screening practices	45	14.7

*Multiple responses

4.7 TEST OF HYPOTHESES

4.7.1 HYPOTHESIS ONE

There is no significant association between breast cancer knowledge and age.

According to Table 4.7 out of those that were age 20-29, 33(86.8%) had poor knowledge of BC and 5(13.2%) had fair knowledge of BC. Respondents' between age 30-39 ninety six (85.7%) had fair knowledge of BC, 14 (12.5%) had fair knowledge of BC while 2 (1.8%) had good knowledge of BC. Out of 114 who were between the age of 40-49 almost half 97(85.1%) had poor knowledge of BC, 17(14.9%) had fair knowledge of BC while 39(90.7%) of those who were between the age of 50 and above had poor knowledge of BC and 4(9.3%) had fair knowledge of BC. Statistically, there was no association between respondents' age and knowledge of breast cancer.

Table 4.9: Association between breast cancer knowledge and age

Age of Teachers	Poor knowledge	Fair knowledge	Good knowledge	Chi-Square Test
20-29	33 (86.8%)	5 (13.2%)	-	
30-39	96 (85.7%)	16 (14.3%)	-	P=0.623
40-49	97 (85.1%)	17 (14.9%)	-	
50 above	39 (90.7%)	4 (9.3%)	-	

*P < 0.05; $X^2 = 4.40$, df = 6, p < 0.623 (not significant)

4.7.2 HYPOTHESIS TWO

There is no significant association between breast cancer knowledge and years of service.

According to Table 4.8 out of 130 that had put in between 1-9 years of service, 115(88.5%) had poor knowledge of BC, 14(10.8%) had fair knowledge of BC and 1(0.8%) while 95 (35.8%) respondents that had serviced between 10-19 had poor knowledge of BC, 19(16.5%) had fair knowledge of BC and 1(0.9%). Those who had served between 20-29 years 35(83.3%) had poor knowledge of BC, 7(16.7%) had fair knowledge of BC and those who had served for more than 29 years all had poor knowledge of BC. Statistically, there was no association between respondents' years of service and knowledge of breast cancer. Breast cancer self examination and those who had heard of harmful effect of breast cancer are dependent.

Table 4.10: Association between breast cancer knowledge and years of service

Years of Service	Poor knowledge	Fair knowledge	Good knowledge	Chi-Square Tests
1-9	115 (88.5%)	15 (11.60%)	-	
10-19	95 (82.6%)	18 (17.4%)	-	P=0.439
20-29	35 (83.3%)	7 (16.7%)	-	
30 above	20 (100%)	-	-	

*P < 0.05; X^2 = 5.86, df = 6, p < 0 .439 (not significant)

4.1.3 HYPOTHESIS THREE

There is no significant nssociation between breast cancer knowledge and level of education.

According to Table 4.9 out of the 215 that had first degree, 191 (88.8%) had poor knowledge of BC. 23 (10.7%) had fair knowledge of BC. Also, out of 46 who had master 35 (76.1%) had poor knowledge. 10 (21.7%) had fair knowledge and 1 (2.2%) had good knowledge of BC. Those who were NCE holder 34 (82.9%) had poor knowledge of BC and 7 (17.1%) had fair knowledge of BC. There was no statistical relationship between respondent's level of education and breast cancer knowledge. Breast cancer knowledge and level of education are independent.

Table 4.11: Association between breast cancer knowledge and level of education

Level of education	Poor knowledge	Fair knowledge	Good knowledge	Chi-Square Tests
NCE	34 (82.9%)	7 (17.1%)	-	
Degree	191 (88.8%)	24 (11.2%)	-	
Master	35 (76.1%)	11 (23.9%)	-	P=0.446
M.Phil	3(100.0%)	-	-	
PhD	2(100.0%)	-	-	

*P < 0.05; X^2 = 7.67, df = 8, P < 0.446 (not significant)

4.7.4 HYPOTHESIS FOUR

There is no significant nssociation between practicing breast self examination and age.

According to Table 4.10 out of those that were age 20-29 only 11 (28.9%) reported ever practiced BSE, those who were between the age of 30-39 only 33 (29.5%) had ever practiced BSE, out of 114 who were between the age of 40–49 almost half 55 (48.2%) practiced BSE while 12 (27.9%) of those who were between the age of 50 and above reported to had ever practiced self breast examination. Statistically, there was an association between respondents' age and practice of BSE. Those in age 40-49 practiced SBE more (48.2%) followed by those who were mid-adult 30-39. Breast self examination and age are dependent.

Table 4.12: Association between breast self examination and age

Age of teachers	Breast Self Examination		Chi-Square Tests
	Yes	No	
20-29	11(28.9%)	27 (71.1%)	
30-39	33 (29.5%)	79 (70.5%)	P=0.018
40–49	55 (48.2%)	59 (51.8%)	
50 above	12 (27.9%)	31 (72.1%)	

*P < 0.05; $X^2 = 11.5$, df = 3, p < 0.018 (not significant)

4.7.4 HYPOTHESIS FOUR

There is no significant association between practicing breast self examination and age.

According to Table 4.10 out of those that were age 20-29 only 11 (28.9%) reported ever practiced BSE, those who were between the age of 30-39 only 33 (29.5%) had ever practiced BSE, out of 114 who were between the age of 40-49 almost half 55 (48.2%) practiced BSE while 12 (27.9%) of those who were between the age of 50 and above reported to had ever practiced self breast examination. Statistically, there was an association between respondents' age and practice of BSE. Those in age 40-49 practiced SBE more (48.2%) followed by those who were mid-adult 30-39. Breast self examination and age are dependent.

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40-49	55 (48.2%)	59 (51.8%)	
50 above	12 (27.9%)	31 (72.1%)	

*P < 0.05; $X^2 = 11.5$, df = 3, p < 0.018 (not significant)

4.7.5 HYPOTHESIS FIVE

There is no significant association between practicing breast self examination and years of service.

According to Table 4.11 out of 130 that had served between 1-9 years only 36 (27.7%) reported ever practiced SBE, 115 respondents that had served between 10-19 only 52(45.2%) had ever practiced self breast examination. 42 that had served above 20-29 years only 18(42.9%) reported to had ever practiced BSE. There is a statistical significant association between respondents' years of service and BSE. The practice of BSE was reportedly higher among those who had served between 10-19 years. Breast self examination and years of service are dependent.

Table 4.13: Association between breast self examination and years of service

Years of service	Breast Self Examination		Chi-Square Tests
	Yes	No	
1-9	36 (27.7%)	94 (72.3%)	
10-19	52 (45.2%)	63 (54.8%)	P=0.018
20-29	18 (42.9%)	24(57.1%)	
30 above	5 (25.0%)	15(75.0%)	

*P < 0.05; X^2 = 11.7, df = 3, p < 0.018 (not significant)

4.7.6 HYPOTHESIS SIX

There is no significant association between practicing breast self examination and level of education.

According to Table 4.12 out of the 215 (70.0%) that had first degree, 82 (38.1%) reported ever practiced breast self examination while 133 (61.9%) had never practiced self breast examination. out of 46 (15.0%) who had master, only 18 (39.1%) reported practiced self breast examination and 28 (60.9%) had never practiced self breast examination and out of 41 (13.4%) who had National Certificate of Education, only 10 (24.4%) reported practiced self breast examination and 31 (75.6%) had never practiced self breast examination. The practice of self breast examination was reportedly higher among teachers that had first degree, followed by masters' holder but the difference was not statistically significant. Level of education and breast self examination practice are independent.

Table 4.14: Association between breast self examination and level of education

Level of education	Breast Self Examination		Chi-Square Tests
	Yes	No	
NCE	10 (24.4%)	31(75.6%)	
Degree	82 (38.1%)	133(61.9%)	P=0.301
Master/ M.Phil/ PhD	18 (37.7%)	33(62.3%)	

*P < 0.05; X^2 = 0.487, df=4, P < 0.301 (not significant)

4.7.7 HYPOTHESIS SEVEN

There is no significant association between practicing breast self examination and those who had heard of harmful effect of breast cancer.

According to Table 4.13 out of the 220 (71.7%) that had heard of harmful effect of breast cancer, 91(41.4%) reported ever practiced breast self examination while 129 (58.6%) had never practiced self breast examination and out of 87 (15.0%) who did not heard of the harmful effect of breast cancer only 20 (23.0%) reported practiced self breast examination and 67 (77.0%) had never practiced self breast examination. There is a statistical significant association between respondents having knowledge of harmful effect of breast cancer and breast self examination (p = 0.002). Breast self examination and those who had heard of harmful effect of breast cancer are dependent.

Table 4.15: Association between breast self examination and those who had heard of harmful effect of breast cancer.

Heard of harmful effect of BC	Breast Self Examination		Chi-Square Tests
	Yes	No	
Yes	91 (41.4%)	129 (58.6%)	P=0.002
No	20 (23.0%)	67 (77.0%)	

*P < 0.05; X^2 = 0.912, df=1, p < 0 .002 (significant)

4.7.8 HYPOTHESIS EIGHT

There is no significant association between practices of breast self examination and those that knew somebody who had carried out BSE before.

According to Table 4.14 out of the 131 (42.7%) of those that knew somebody who had heard carried out BSE before the survey, 57 (43.5%) reported ever practiced breast self examination while 74 (56.5%) had never practiced self breast examination and also out of those who did not know anyone who had carried out BSE before the survey 54 (30.7%) reported practiced self breast examination and 122 (69.3%) had never practiced self breast examination. There is a statistical significant association between practice of breast self examination and respondents that knew somebody who had heard carried out BSE ($p = 0.014$). Breast self examination and those that knew somebody who had carried out BSE before are dependent.

Table 4.16: Association between breast self examination and those that knew somebody who had carried out BSE before

Heard of harmful effect of BC Tests	Breast Self Examination		Chi-Square
	Yes	No	
Yes	57 (43.5%)	74 (56.5%)	P=0.014
No	54 (30.7%)	122 (69.3%)	

*P < 0.05; $X^2 = 5.36$, df=1. p < 0.014 (significant)

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Socio-demographic characteristics of the respondents

The age range of the respondents falls within (22-59) which is what is expected of civil service that they belong to and the respondents also were the reproductive age which means they are expected to have some level of knowledge regarding breast cancer and this is similar to a study by Kayode et al., (2005) which was carried out in Ilorin and a study by Tobin Ekaete Alice and Okeowo Philomena (2014) among female secondary school teachers. Breast cancer tend to occur in women after the age of 20 years, leveling up to a plateau at the age of 45–55 years, and thereafter increasing to a peak at 50–60 years (Bassey, Inuhe, Olowoyeye and Adeyomoye, 2011). One is not surprised that an overwhelming majority of the respondents were Yoruba (93.8%); this is in keeping with the fact that the study community is a Yoruba community. Most respondents were Christians (82.1%) and this is also in tandem with a study by Inuhe, Raji, Olowoyeye, Adeyomoye, Arogundade, Soyebi, Ibitoye, Abonyi and Eniyandunn (2012) in which most of the respondents (72.5%) were Christian.

5.2 Awareness of breast cancer, screening methods and sources of information

Most of the respondents (93.2%) in this survey were aware of breast cancer and 71.3% has someone who had discussed the harmful effects of breast cancer with them. This result is contrary to the study conducted in other region of Nigeria where 58.2% of the respondents were aware of breast cancer as a disease entity (Omotara, Yahya, Amodu, Bimba, 2012). This rate of awareness was also higher in comparison to that found in the in Iran (61.0%) (Montazeri et al., 2008) and similar to that found in Ireland (McMenamin et al., 2005). The awareness of breast cancer among the respondents could be attributed to the level of education of the respondents and their opportunity to obtain information from various sources, the awareness consistent with a previous studies (Inuhe et al. 2012; Okobia et al., 2006).

The major sources of information about breast cancer were television (69.1%) and closely followed by radio (43.6%) in this study. Similar observation was supported by some other researchers (Inuhe et al., 2011; Bassey et al., 2010). Also Nur (2010) who studied breast cancer knowledge and screening behaviors of the female teachers found that, leading

sources of information was television (59.0%). This finding was in contrast to the study of Afaf Abd El-Mohsen and Mona M. Abd El-Maksoud (2015) who found that the commonest source of information about BSE was health professionals and teachers (62.8%). While only 15.9% was source of their knowledge from (newspaper, books, magazine, and relatives), and 9.7 % did not gain any information about BSE. The least reported primary source of information on breast cancer in the study was church/mosque and internet. This is one of the gaps existing in church/mosque education as leaders have no time to discuss pertinent health issues with their followers. It might also be due to the fact that some of the spiritual leaders have no information or knowledge on some of these topics and as such have little or nothing to discuss. Also, the use of internet among teachers is very low, the reasons for which are unclear from our data. It may be that do not see the internet as a useful tool for health information or they may lack computer literacy skills. This should be addressed in any future programs targeted towards health education of educators.

Breast self examination, clinical breast examination and mammography are considered as screening methods for early detection breast cancer (Lam, Chan and Chan2008). Breast self-examination is one of the essential screening methods for early detection of breast cancer and the procedures are easy, non-invasive and involve little time. In this study more than two-third of the respondents (76.2%) claimed to have heard of BSE, while 42.7% knew someone who practices BSE and only 10.7% knew the appropriate age for performing BSE. Our findings are in concordance to those of other studies (Matalqah et al., 2011; Isara and Ojedokun, 2011; Iyuke et al., 2011; Obaikol , Galukande and Fualal, 2010; Gwarzo, Sabitu and Idris, 2009). This is less than the study by Kayode and Akande (2005) who reported that 95.6% were aware of breast self examination as a screening method and also the findings reported from Enugu and Lagos both in Nigeria where 92% of the respondents were aware of the procedure (Odeyemi and Oyediran, 2002). Our study is also low to a similar study by Parsa et al 2011, reported that 90% of the Malaysian women teachers heard about BSE, and also among adolescent girls in Colombo, Sri Lanka (Ranasinghe, Ranasinghe, Rodrigo, Senevirathne and Rajapakse, 2013). Awareness of breast self examination as a method of breast screening among teachers may be as a result of information received from friends and close relations because almost half (42.7%) knew someone who had carried out breast self examination before and majority of these people were friends.

Clinical breast examination is non-invasive and is still an important tool for making diagnosis of breast lesions because of professionals that handle it. Physical examination of the breasts performed by skilled practitioners and it requires only the physician's fingers. More than half of the respondents (53.1%) have heard of clinical breast examination as one of the screening methods and 14.7% knew the appropriate of commencing clinical breast examination. This percentage was small compare to awareness of breast self examination and this also reflected in those who knew someone who had gone clinical breast examination before which was twenty four percent (24.1%) and these were friends (12.4%), 1.0% were mothers and 1.3% were their sisters and aunts to the respondents. The low level of awareness of CBE as a method of breast screening will affect its uptake. In a study by Parisa Parsa et al., 2008, 25% of women have had a CBE. Similarly, Dundar's (2006) study found that 18.4% of women in rural areas in Turkey had a CBE (2006). In the study by Ho et al (2005), the annual CBE percentage was 45% in educated women. Wu et al (2006) study showed 59% of educated Asian immigrants, living in the US performed CBE annually. In another study by Okobia et al (2001) in Nigeria, only 91 study participants (9.1%) had CBE in the past year. The main reasons given for not undergoing CBE included not having a breast problem (62.5%) and being unaware of the need for CBE (32.2%).

Almost twenty four percent (23.8%) of the respondents had heard of mammography and knew someone who had gone for mammogram before respectively and 5.2% knew the appropriate age of commencing mammogram. This study is in tandem with a study by Millicent bajimi and Ikeoluwapo Ajayi (2013) found a low level of awareness of mammography. This figure contrasts with much higher proportions reported from other authors in Nigeria likely due to variability in the characteristics of the study population. Osime et al (2008) found a prevalence of mammography awareness of about 35% among civil servants while Akinola et al (2008) reported an awareness level of 40.5% among a hospital sample. Furthermore, the findings from the study that majority of women have not heard about mammography as a screening modality for breast cancer was in line with study by Adebamowo and Ajayi (2000) that mammography is not known to many women in Nigeria and Oluwatosin and Oladepo (2006) where none of the respondents studied acknowledged mammography as an early detection measure. This figure is also a little below that reported in Saudi Arabia (30.0%) (Sait et al., 2010) and high in comparison with that reported in Iran (9.0%) (Montazeri et al., 2008) but is still far

lower than that in Turkey (72.1%) (Dundar et al.2006). Lack of awareness of any particular breast screening methods will affect its uptake and levels of education or professional status do not predetermine awareness of screening methods (Odusanya and Tayo, 2001 ; Akhigbe and Omuemu, 2009).

5.3 Knowledge of breast cancer

The knowledge of respondents about the cause of breast cancer was low. The mean knowledge score of BC was 8.8 ± 4.5. The high awareness of breast cancer did not translate to in depth knowledge of breast cancer as majority of the teachers had little knowledge of breast cancer. Thus, without full knowledge, affected women will still take so long to consult medical experts even if they notice some changes in their breasts. These misconceptions about breast cancer need to be corrected in order to confer some protection from breast cancer.

Less than half (42.3%) believed that breast cancer can cured and eighty six percent (86.6%) believed that breast cancer can be cured if discovered early. Sixty nine (22.5%) held the belief that surgery is the only method of treatment for breast cancer. 52.1% believed that breast cancer is caused by excessive sucking and massage. 43.6% believed that breast cancer is difficult to discover until the symptoms manifest, 66.1% believed that breast cancer can be detected by oneself. 88.9% believed that breast cancer is harmful to health. 16.0% believed that breast cancer is the disease of young girls, 67.4% believed that breast cancer is the disease of the white and 2.0% believed that breast cancer is the disease of old women. There was a lot of misconception about breast cancer being a disease of particular group of people but many authors have suggested that breast cancer in young women is biologically different from that of older women, specifically, the tumours progresses faster, present with higher grade and are more often estrogen receptor negative than tumours in older patients (Althuis et al., 2003; Colleoni et al., 2002; Maggard et al., 2003). Delayed diagnosis is probably partly due to the fact that the breast tissue of younger women is denser and therefore difficult to examine clinically and by mammography (Rapiti, Fioretta, Verkooijen, Vlastos, Peter Schaferb, Sappino, Kurtz, NeyroudCaspar and Bouchardya, 2005) and also that breast cancer patients in Nigeria are younger; presenting a decade earlier than their Caucasian counterparts (Adebamowo et al, 2000). In addition,

studies on biological characteristics of breast cancer showed that it tends to be more aggressive in black women (Ikpat , et al 2002).

The majority of teachers in this study showed a general lack of understanding of some of the common risk factors associated with breast cancer. One of the strongest risk factors of breast cancer is family history of the disease (Tsuchiya, Iwasaki, Otani, Nitadori, Goto, Nishiwaki. Uchitomi and Tsugane, 2007) and in this study more than half of the respondents (50.8%) were not aware that family history of breast cancer is a major risk associated with breast cancer and 79.2% did not know that as age increase tendencies of having breast cancer increases and this may be the reasons why some of them thought that breast cancer is the disease of young girls and some believe that breast cancer is the disease of old women. Age as another major risk factor was poorly understood since all women surveyed were unsure of age as a factor. This misconception may lead to under-estimation of the importance of regular screening by older women if they mistakenly believe the younger age groups as the groups most at risk.

Although women with a strong family history of breast cancer have a higher risk, a larger percentage of cases occur in women without a positive family history (McPherson et al, 2000). This emphasis on family history as a risk factor for breast cancer could potentially lead to a state of complacency among women for whom there is no known family history. Previous research has demonstrated that women with a family history may overestimate their risk of developing disease (Neise et al. 2001). Furthermore, increased personal risk perception may have a negative effect on participation in breast screening (Neise et al. 2001), suggesting that consideration should be given to the way that information is presented even to women at increased risk.

Less than 10% of teachers knew that obesity, early age of menstruation and late age at menopause are breast cancer risk factors. Thirty percent believed that breast cancer is caused by the devil. More than half (56.7%) of respondents in this study shared the view that lumps in the breast that are cancerous would be painful. This, as reported by Powe, Underwood, Canales and Finnie (2005), is a widespread misconception as most people associate pain with the occurrence of cancer. Ukwenya et al (2008) reported in a study in Nigeria that a majority of breast cancer patients cited ignorance of the seriousness of a painless lump as a reason for prolonged delay before seeking medical advice. Inadequate knowledge about risk factors of breast cancer were also reported by previous researches

(Alam, 2006; Amin et al., 2009). female teachers and health providers such as nurses were found to have inadequate knowledge on breast cancer (Parsa et al., 2008; Ahmed et al., 2006). These two previous studies have found that only 55.0% of Malaysian teachers (Parsa et al., 2008) and 35.0% of Pakistani nurses had good knowledge on risk factors of breast cancer (Ahmed et al., 2006).

In this study 92(30.0%) belief that breast cancer is caused by the devil and in a study by Mitchell and Lannin (2002) strong religious beliefs were found to be common among women in Eastern North Carolina in United States of America. The report showed that a majority believed that God works through doctors to cure breast cancer. In addition, minority, who were mainly African-Americans, believed that medical treatment was unnecessary because only God could cure breast cancer. A significant proportion of female healthcare professionals in this study believed in efficacy of prayer and traditional or herbal therapy. This calls for concern because such beliefs could have negative effect on their role in creating appropriate awareness about breast cancer in Nigeria, a country where majority of those with the disease present with advanced stages (Anyanwu, 2000).

In this study, a misconception that breast feeding was a risk factor for breast cancer was observed and it has to be corrected. Yan (2009) also found that breastfeeding, age of menopause and menarche were not recognised as risk factors; these findings may will limit the regular screening. The results of the survey suggest the need for educational programmes to improve current knowledge of cancer. Knowing the risk factors for breast cancer might help the respondents to adopt a healthy lifestyle in order to reduce the incidence of breast cancer morbidity and mortality (Hadi, Hassali, Shafie and Awaisu, 2010). Poor knowledge of risk factors and knowledge of their relative risk of developing breast cancer also explains why they do not engage in health promoting behaviour or breast-screening practices.

Also, less than twenty five percent indicated that bloody nipple, inversion or pulling in of the breast and ulceration of the breast as symptoms of breast cancer. The most widely known symptom by the teachers was lump in the breast (71.0%). Some respondents believed that BC can be cured though require treatment to be cured (42.3%) and 64.5% believed that BC is a disease of young girls. One hundred and seventy four respondents (56.7%) indicated that pain in the breast region is a symptom of breast, 30.0% indicated scaling/dry skin in the nipple region, 17.3% for breast enlargement. The high awareness of

breast cancer as a disease is in contrast to the lack of knowledge regarding breast cancer symptoms, early detection and risk factors. Our findings of low level of knowledge regarding breast cancer are supported by several studies in Nigeria, Saudi Arabia, Turkey and Egypt (Okobia et al 2006; Odusanya. 2001; Dundar et al., 2006; Seif et al 2000; Karayurt et al 2008; Milaat 2000).

There were some facts which most subjects could correctly identify, the majority (88.9%) of the respondents indicated that breast cancer is harmful to health, 66.1% believed that breast cancer can be discover by oneself, 71.0% lump in the breast and 86.6% said breast cancer can be cured if discovered early. A previous study in Malaysia also showed that respondents heard high knowledge about blood nipple as a symptom of breast cancer and low knowledge about nipple retraction (Parsa et al., 2008). Also, a study in Singapore found that the most frequent symptoms recognized by respondents were breast lump and bloody nipple (Sim et al., 2009). Another study in Iran showed that nipple retraction and bloody discharge have been recognized as symptoms of breast cancer by only 5.0% and 6.0% of respondents respectively (Montazeri, Vahdaninia and Harirchi, 2008). The case was not different in Egypt in which only 10.6% of academic women had satisfactory knowledge about breast cancer (Seif and Aziz, 2000). In a similar study carried out among female school teachers in Lagos, only 53.3% knew correctly that a mass was the commonest recognized symptom of breast cancer (Odusanya 2000). In a study by Naif Alharbi and Malik Alshammari et al 2011 only 68.9% of the participants answered correctly when they asked about bloody discharge from nipple, 83.6% about enlargement of neighboring lymph nodes 73.9% abnormal enlargement of breast, 66.3% about breast pain, 64.6% about asymmetric sagging in breast, only 47.0% answered correctly the questions about nipple retraction, and 42.8% about breast skin retraction. However, some studies have shown that the incidence of breast cancer is said to be slightly higher in persons that have first degree relatives with a history of breast cancer, persons that have early menarche and late menopause and those that use oral contraceptives, persons do not breast feed and those women having their first birth after age 35 or nulliparous women. The incidence is also increased with increasing age of the patient, smoking, obesity, physical inactivity, radiation exposure, intake of alcohol and high fat diet (Adebamowo. 2000).

Such a low knowledge about breast cancer could be considered a barrier to seek early health care. Knowledge on breast cancer among women is important so that they can seek early care. Lack of knowledge may increase the risk of under recognition of the disease in its early stage (Hom-Ross, Hoggatt and West, 2002). As teachers constitute one group of professionals who have regular contact not only with their students in schools but with the community members who look at them as change agents and role models. There exists a gap in the knowledge needs to be filled and this could be achieved through designing and implementing on intensive health education programme for female teachers which will major to increase knowledge of breast cancer risk factors and symptoms.

5.4 Practice of breast cancer screening among the teachers

5.4.1 Breast self examination

Of all the teachers (307), only 111 (362%) had ever practiced BSE but only 27.6% were doing it monthly and this is less than the figure reported from a study in by Mbanaso et al. 2005 found that 84.0% of their study population practiced BSE, however only 47.9% of them performed it monthly. In a descriptive cross sectional study among secondary school female teachers in Ilorin, Nigeria it was observed that 54.8% of the respondents had done BSE (Kayode et al., 2005). A study done in Cameroon (Suh, Atashili, Fuh and Eta, 2012) with fairly educated subjects indicated that nearly three quarters (71.17%) of participants had previously heard about BSE and almost 60% practiced it. Also, Sadler et al. 2007 reported in a study carried out in America that 31% of their study population practiced BSE monthly. However, those who practice self breast examination was greater than the Nigerian study with 221 female students aged 16-18 years at Ahmadu Bello University Zaria, indicated that though 87.7% of the participants had heard of BSE, however, only 19% of them practiced it monthly (Gwarzo, Sabitu and Idris, 2009). The prevalence of BSE practice in this study was higher than that of an Iranian and Egyptian study in which only 6% and 2.65% of the study population respectively practiced BSE monthly (Haji-Mahmoodi, 2002).

Poor practice of BSE has been documented across all age group in various studies in Nigeria and other parts of the world (Okobia et al., 2006; Oluwatosin, et al 2006; Karayurt, et al 2008). Variables such as higher level of education and years of service were not significant determinants of BSE practice in this study; age was significantly related to BSE

practice and practice of BSE increased significantly with age from among those who were 20–29 years to those who were 40 years and above. The implication of this is that there is the need for proper orientation about BSE among the younger ones especially those below the age of forty; they have to be properly taught the routine of BSE as this will greatly influence their practice as they grow older.

The literature on the effectiveness of BSE as a means for detecting breast cancer has been somewhat controversial (Smith et al., 2003; Franco et al., 2006), however the American Cancer Society (Smith et al., 2003) encourages women to be aware of how their breasts look and feel so that they will be able to recognize any changes and promptly report them to their clinicians. In order to achieve this goal, women need to be taught to practice BSE competently with the recommended frequency. This fact manifests that women should know about breast cancer symptoms and breast self-examination techniques for early detection of breast cancer. It is understandable why breast cancer screening practices were low among female teachers; this also suggested that inadequate knowledge might be one of the main reasons and this always lead to delay in presentation of breast cancer. Because of the important role that teachers play in educating young women, they should be encouraged and motivated to increase their own knowledge on breast cancer screening most especially BSE.

5.1.2. Clinical breast examination

Patient education during the CBE had been shown to improve adherence to the BSE (Freund, 2000). Our results show that teachers have low rates of CBE as only 14 (4.6%) had ever gone for clinical breast examination before while only 4(1.6%) did it once in a year, which is lower than the report among Nurses in Lagos (7.8%) and an abysmally low rate compared with similar studies in Saudi Arabia (42.7%) and Singapore (35%) (Scar et al. 2007). However, this study is at a very low CBE rate compared to the US (78%) and the neighboring country Qatar (23.3%). In another study by Okobia et al. 2006, in Nigeria, only 91 study participants (9.1%) had CBE in the past year. The main reasons given for not undergoing CBE included not having a breast problem (62.5%) and being unaware of the need for CBE (32.2%) (Okobia et al., 2006). A cross-sectional survey conducted amongst nurses working in a general hospital in Lagos revealed that 204 nurses out of 280 participated in the study (73% response rate). Only 30%, however, had a clinical breast examination (Odusanya et al., 2001). In a study, of 63 out of 82 family physicians from 4 out of the 6 health zones in Nigeria and the Federal Capital territory Abuja, Nigeria, it

was found that CBE was carried out monthly by 48.9% of physicians on their regular patients (Ajayi and Adewole, 2002). This study is similar to a study by (Heidari, Mahmoudzadeh-Sagheb and Sakhavar, 2008) 4.1% reported ever had a CBE. The critical importance and reliability of CBE was confirmed by the Canadian National Breast Cancer Screening Study (Epstein, Berell and Seaman, 2001). The study was a randomised controlled trial carried out on 40 000 women, aged 40–59 years on entry; these women were followed up by record linkage for 9–13 years, with active follow-up of cancer patients for an additional 3 years. Half the women performed monthly BSE, following instruction by trained nurses, had annual CBEs (duration 5 min–10 min) by trained nurses, and annual mammograms. The other half practised BSE and had annual CBEs but no mammograms (Epstein et al., 2001).

5.1.3. Mammography

Among the screening methods mammography is the appropriate tool for screening, diagnosis and examining breast lumps (Mahbubi, Alvandi and Alizade Navaei 2004). It is the most sensitive screening method for identifying patients and early detection of breast cancer in many countries (Hatefnia, Niknami, Mahmudi, Ghofranipour and Lamyian, 2009). Screening with the aid of mammography causes a 22 percent decrease in mortality rate of women aged over 50 and a 15 percent decrease in women aged 40-49 (GHarahkhanlu, Torabeian and Kamrani, 2009). Out of seventy three (23.8%) who claimed to had heard of mammography as breast screening method but only 5(1.6%) had ever gone for mammography. Olobia et al. (2006) also reported that none of the participants in a study among semi-urban community-dwelling women in Nigeria ever had mammography screening. With regard to mammography in Dundar's (2006) study showed that only 5.5% of women above 40 years had undergone it. In contrast, significantly higher rate of mammography screening is often reported among women in advanced countries like 64% among educated Asian women (Wu et al., 2006), 61.3% among Asian Indian women in the US (Sadler et al., 2002) and 25% among Turkish women in Istanbul, Turkey (Secginli and Nahcivan, 2006). Another study by Nachivan and Secginli (2005) indicates that among women aged 40 and above, 56% of them have read or heard nothing about mammography, and only 25 percent of them had done mammography (Secginli and Nahcivan, 2005)

widely used in the context of research studies concerned with predicting health-related behaviors. Health belief model has five key concepts which has to do with behavior like perceived severity, perceived susceptibility, perceived benefits and barriers, and self efficacy (Navvabi Rigi, Kerman Saravi, Navidian, Khazaiyan, Sharaki and Sharaki Sanavi, 2012). The health belief model has to do behaviour which is a function of one's knowledge and attitude (Davari, Dolatian, Maracy, Sharifirad and Safavi 2010). Health belief model made known that those women who believe that they are prone to breast cancer (perceived susceptibility) and that breast cancer is a serious disease (perceived severity), and those women who have received more benefits and less barriers are more likely to perform mammography (Mokhtari, Bamdaran Rezaee, Mohammadpour Asl and Mousavi, 2011). These commonly expressed beliefs had a negative or positive influence on screening intentions. Ogedegbe, Cassells and Robinson (2005) found that women who believed that screening could hasten their chances of developing and dying from breast cancer were less likely to be screened than those without such beliefs.

The result of perceived susceptibility showed that respondents in this study did not perceived of being exposed to breast cancer because only 31 (10.1%) indicated that breast cancer is an unavoidable disease, 70 (22.8%) were worried about getting breast cancer, 4 (1.3%) are those who believe that they are likely to get breast cancer as others and only 5 (1.6%) see themselves developing breast cancer in the future. Low level of involvement in screening practices could be attributed to the knowledge level of the respondents, since knowledge and attitudes are stage-setting factors in a health behavior (Ghorchaei, Charkazi and RazzaqNejad, 2013). The results of present study showed that teacher's breast screening practices was at a low level. Also, perceived susceptibility of the researched units in this study is at a medium level, and this could be related to the poor performance of them, because when one considered herself as being exposed to an illness, she would do an preventive action to avoid it. Mishra et al (2007) also concluded in their study that making people aware may increase their perceived susceptibility and ultimately the screening behavior (Mokhtari, 2011).

Perceived severity is one's belief about the seriousness of a medical condition and the sequence of events after diagnosis and personal feelings related to the consequences of a specific medical condition (Janz et al., 2002). Possible medical consequences may include death, disability, and pain; possible social consequences consist of effects on work, family life, and social relations (Janz et al., 2002). Breast cancer perceived severity has to do with a

belief and perception that this ailment is serious and the consequences can be serious or can lead to death (Mishra, Bastani, Crepsi, Luce and Baqute, 2007). Concerning perceived serious of breast cancer by the female teachers, 267 (87.0%) agreed with the statement that breast cancer can cause death if untreated, 149 (48.5%) also agreed with the same statement "breast has to be removed", 105 (34.2%) of women indicated that breast cancer can cause problems in sexual relationship agreed with this statement. 207 (67.4%) breast cancer is a burden to family members and 225 (73.3%) agreed that breast cancer will affect work and social life. With perceived severity of this study being high among female teachers but this did not translate to the use of screening methods among these professionals. It is essential to address screening tests among these professional, especially use of BSE, CBE and mammography.

Perceived benefits are one's belief in the efficacy of the advised action to reduce health risk (Janz et al., 2002). Also termed as perceived benefits of taking health action, the attitudes of health behavior changes are reliant on one's view of the health benefits for performing a health action (Janz et al., 2002). Perceived benefits of breast cancer screening behaviors include BSE and CBE for early detection of breast diseases. The findings of a study by Marshal and et al. (2002) on diabetic patients also show an increase in perceived benefits level after intervention based on health belief model (Motamedi, Helazi, Hazavei, Zamani, Saberi and Rohimi, 2010). The result of this study more than half of the respondents belief had a good perception of the benefits embedded in practicing breast cancer screening methods. One hundred and forty three (46.6%) respondents agreed with the statement that one of the benefits of early detection of breast cancer is that it helps in early detection of abnormal mass, 195 (63.5%) period of treatment can be reduced, 163 (53.1%) belief it can prevent anxiety and 164 (53.4%) indicated that early detection is effective in detecting abnormality in breast. In some studies, susceptibility, seriousness and benefits were variables that found no relationship with screening practices performance (Grahant et. al., 2002; Mikhail and Petro-Nustus, 2001; Lee, 2003; Sergili and Nahcivan, 2006) while in some studies it was reported that these variables were significant predictors of the breast cancer screening performance (Petro-Nustus and Mikhail, 2002, Gözüm and Aydin, 2004, Canbulat and Uzun, 2008). The results in this study clearly demonstrate that improved knowledge would produce a corresponding improvement in screening because, according to the conceptual modeling that guided the study there was high level of perceived benefit which indicate that improved knowledge will affect increase in recommended breast cancer

screening practices. There is a need for a targeted health promotion intervention, emphasizing knowledge, perception of susceptibility, severity and benefits in order to influence the desired health-seeking behaviour.

5.6 Factors Influencing Screening Practices

However, poor practice of breast cancer screening methods has been reported in many studies in Nigeria (Akhigbe & Omuemu, 2009; Okobia *et al.* 2006). Beyond poor knowledge, or ignorance, several other factors have been found to influence the practice of breast cancer screening in different countries, including Nigeria. Some of the factors influencing low frequency of BC screening performance among teachers may be related to a lack of information about the importance of these tests (mammography), family responsibilities, complexity of the hospital registration, no symptoms of breast cancer, some believed it is not necessary while some believed they cannot have it. Previous studies examining the factor influencing screening behaviour determined the most common barriers included lack of information, fear and worries (Bener, Ayoubi and Moore, 2009); inadequate knowledge of breast cancer screening, too busy, forgetfulness, embarrassment, fear of cancer diagnosis and cost (Parsa et al., 2008); fear of having breast cancer, absence of prominent breast problems, lack of knowledge on how to perform self-examination and forgetting (Demirkiran et al., 2007). The belief in the benefit of early detection among Asian such as Korean (Han et al., 2000) and Turkish women (Secginli et al., 2006) are positively associated with screening behaviors. Poss (2001) also stated that significant beliefs allow a better understanding of the cultural perspective affecting the people's behaviour.

This study showed that most frequently endorsed reason for non performance of breast cancer screening was that respondents did not like people touching their breast 111(36.2%) and this is related to Asian traditional culture, women embarrassment prevents them to show their breasts to others, including health care providers (Smith et al., 2006). Also, Asian women are unwilling to show their breasts to others, including to health care providers (Smith R et al 2006). Other results of this study showed that 107(34.9%) did not know how the test is done, 94(30.6%) complexity of the hospital registration, misinformation about breast cancer, cost 78(25.4%), there is no free time 71 (23.1%), 81(26.4%) fear of finding cancer 69(22.5%), 67(21.8%) lack of trust in hospital registration, 58(18.9%) family responsibilities and the least was pain associated with

screening practices 45(14.7%). Likewise, findings of many studies showed that women were fearful about cancer and death which make them reluctant to participate in breast cancer screening (Benner et al., 2002; Juon et al., 2004;Nissan et al., 2004). Previous studies highlighted barriers to screening behavior including fear of results, fear of treatment and fear of the test itself. These studies include countries such as, Iran (Jafandi et al., 2002), Malaysia (Hisham and Yip, 2003), United Arab Emirates (Benner et al., 2002) and Jordan (Petro-Nustas and Mikhail, 2002). Smith et al., (2006) also investigated that fatalism, fear, language barriers, and preference for traditional healers are barriers. Lack of time and costs also were the most frequently reported reasons for Chinese women from Hong Kong reluctance to participate in clinical breast examinations or mammography screenings (Chua, Franzer and Mok, 2005).

Socio-demographic characteristics of age, educational level and years of service were not significantly associated with knowledge breast cancer and practice of breast cancer screening among teachers. Similarly a study among rural women (Dundar, Ozmen, Ozturk, Haspolat, Akyildiz, Coban and Cakirgil, 2006) reported that in a group of rural women in Turkey there was no significant association between age groups and BSE practice. Furthermore, the authors reported that other studies have not found significant association between socio-demographic characteristics and BSE practice. However in a Singapore study (Seah and Tan, 2007) socio-demographic variables were not also significantly associated with BSE practice, but clinical experience with caring for a client with breast cancer was significantly associated with knowledge and practice. A significant association was found between practicing breast self examination and those who had heard of the harmful effect of breast cancer. This shows that discussion of breast cancer and its harmful effect of breast cancer may encourage female teachers to take screening practices more serious. Educational campaigns can improve patient motivation and positively influence breast screening practices. It was said that having awareness and knowledge of breast cancer and its screening may not be enough (Sadler et al., 2001; Yavari et al., 2006; El-Saghir, 2007; Hartman et al., 2009; Nasseri, 2009) but perceived risk of cancer and effectiveness of screening practices have been found to influence screening behavior (Baron-Epel, 2010; Tavalian et al 2009).

5.7: Implications for Health Promotion and Education

Teachers constitute one group of professionals who have regular contact not only with their students in schools but with the community members who look at them as change agents and role models. This study has demonstrated that there exists a gap in the knowledge of breast cancer and breast screening practices. If teachers are to fulfill their role as educators in their various communities, public health professionals therefore have a mandate ensuring that teachers are educated on health promotion activities such as SBE, CBE and mammography. Though the mass media which is the major source of information has done notable well in creating a high level of awareness, other forms of information dissemination strategies such seminars, symposia and public lectures where details of breast cancer and different screening methods can be spelt out. Also, this could be achieved through designing and implementing an intensive health education programme for female teachers on the importance of breast examination. Educational materials such as handbills, posters and leaflets should be freely made available during such teachings so as to facilitate better learning. Also, advocacy visit to media houses to disseminate appropriate information on breast cancers' risk factors, symptoms' and the different screening practices through radio and television programs. This will raise people's awareness and knowledge of breast cancer, its implications and the important of breast cancer screening.

The low percentage of respondents who examined their breast regularly is an indication that there is lack of motivation among them to perform the screening. The teachers therefore need a constant source of motivation to encourage them to consistently practice breast screening. To encourage a positive attitude towards breast screening and most especially self breast examination among teachers, there is need to highlight the benefits of the engaging in breast screening by explaining the severity of the cancer problem and the susceptibility of individuals to the disease. Despite these limitations, the benefits of this study's findings are potentially far-reaching and include: raising awareness levels of breast cancer and its screening activities; developing a culturally appropriate, socially-acceptable, and effective intervention program; and ultimately, decreasing both morbidity and mortality from breast cancer among teachers.

5.8 Conclusion

This study explored the knowledge of breast cancer and screening practices of female secondary school teachers uncovering their understanding of breast cancer. The importance of secondary education in educational system cannot be overemphasized. Apart from serving as the link between primary and tertiary education, it provides opportunity for a child to acquire additional knowledge, skills, and traits beyond the primary level. A major factor that necessitates the acquisition of secondary education in Nigeria is that the education being provided at the primary level is proving to be insufficient for a child to acquire permanent literacy, communicative, and numeracy skills expected from him/her at the end of the training (Chinelo, 2011; Ige, 2011; Yusuf, 2009). Teachers are the fulcrum on which the lever of educational system rests (Achimugu, 2005). Apart from students, they are the largest and most crucial inputs of educational system who influence to a great extent the quality of educational output (Fadipe, 2003). In the National Policy on Education (2004), it is stated that no educational system can rise above the quality of the teachers.

This study points to the insufficient knowledge of female teachers about breast cancer and also identified the negative influence of low knowledge on the practice of BSE, CBE and Mammography. Due to the low level of breast cancer knowledge and breast screening practices such a group of teachers cannot impact on their students a comprehensive knowledge of breast cancer the importance of breast self-examination and other screening practices. Accordingly, relevant educational programs to improve the knowledge level of teachers regarding breast cancer and screening methods are needed. Freeman, Scott, Waxman and Arcona (2002) also emphasized the need for adolescents to be properly taught the routine of breast self-examination as this will greatly influence their practice as they grow older and this can only be achieved if their teachers who are being seen as a role model and credible source of information are well informed in the use of screening methods and are have a good knowledge of breast cancer. Periodic intervention programmes targeting teachers in public schools should be undertaken. This could comprise of talks and demonstrations carried out by interest groups. Relevant nongovernmental organizations (NGOs) can make significant contribution to breast cancer and screening methods education by sponsoring health talks and workshops for teachers to reposition them better to reach out to their students and the community at large.

Information, Education and Communication materials (IEC) can be made use of in the school environment and in various educational professional bodies.

5.9 Recommendations

In the light of the findings of this study, the following recommendations are made.

1. Teachers contribute to the economic, social, and cultural development of society as they play a unique and essential role in advancing human society. Intervention should be designed to stimulate breast cancer knowledge and breast screening behaviour among women, through innovative health education strategies, emphasizing intensive cognitive and health promotion activities, to improve their knowledge of the disease and the benefits of breast screening practices. The program also includes support workshops designed to fast track teacher's knowledge of breast cancer and screening practices so that they can eventually train other teachers and student – creating a truly sustainable program.

2. Increase awareness of breast cancer, risk factors, symptoms and the harmful effect of breast cancer is a sure way of reducing the incidence of breast cancer. Health education programs should be initiated to improve teacher's practice of BSE. Health education programs are essential to motivate teachers to improve on breast screening practices. This could be achieved through the use of peer education which provides flexibility in meeting the diverse needs. Peer education is an effective health promotion strategy. Peer educators receive special training on breast cancer through qualified professionals, learn important skills regarding technique of self breast examination. Peer education will provide sustainable motivation, empowerment and inspiration for regular breast screening practices. Also, teachers have day-to-day contact with many young people especially the students under their tutelage; teachers can also play an active role in providing useful information regarding breast cancer and self breast examination to the students.

3. Teacher associations like National Union of Teachers, Social Studies Educationists Association of Nigeria (SOSAN) and Science Teachers Association of Nigeria (STAN), Parent-Teacher Association, All Nigeria Confederation of Principals of Secondary schools and other educational bodies can be used to promote and facilitate

breast cancer awareness and screening practices. To this end teacher associations can serve as a platform where health professionals can meet regularly with teachers to provide regular information on knowledge of breast cancer and screening methods through educational programmes which will provide teachers with practical knowledge.

4. Health education programmes should be targeted at women through various media including leaflets, television, and radio. In addition, health education should be channeled through women friendly agencies/organizations such as hospital antenatal and postnatal clinics, religious organizations. Information should include when breast cancer screening should be started and which of the available screening methods will be the most effective methods for achieving increased rates of early breast cancer detection.

5. Non-governmental and other charitable organizations can also make significant contribution to "breast cancer awareness" through sponsoring health talks, symposia and workshops targeted at relevant segments of the population.

6. Awareness campaigns and subsidizing the costs for mammography by Ministry of Health would improve survival from breast cancer also; Involving men as well in this awareness will also greatly improve the current situation. All this should be coupled with acquisition of mammography machines by regional referral hospitals to ease access to the service.

7. Intensive educational campaigns to tackle the observed knowledge deficits should be planned in order to raise awareness towards breast cancer with emphasis on role of prevention and guidelines for screening through clinical breast examination and mammography.

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QUESTIONNAIRE

BREAST CANCER KNOWLEDGE AND SCREENING PRACTICES AMONG FEMALE TEACHERS IN IBADAN NORTH LOCAL GOVERNMENT AREA, IBADAN OYO STATE, NIGERIA

Dear Respondent,

I am a student of the Department of Health Promotion and Education, Faculty of Public Health, University of Ibadan. I am carrying out a study relating to Breast Cancer knowledge and Screening Practices among Female Teachers in Ibadan North Local Government, Ibadan, Oyo State. The information obtained will be used in future to design programmes for teachers in order to increase breast cancer awareness and screening practices. Your honest response can help prevent millions of people from being a victim of breast cancer. I assure you that whatever you tell me will be kept secret. Please note that your names are not needed on this questionnaire. Thank you for your cooperation

Section A: Socio – Demographic Characteristics

Instruction: In this section tick (√) the boxes that correspond to your answers or complete the spaces provided

1. Age, at last birthday .....

2. Religion (1) Christianity [ ] (2) Islam [ ]
   (3) Traditional [ ] (4) None [ ] (5) Others (please specify) [ ]

3. Ethnicity (1) Yoruba [ ] (2) Hausa [ ]
   (3) Igbo [ ] (4) Other [ ]

4. Marital status (1) Single [ ] (2) Married [ ]
   (3) Divorced [ ] (4) Widow [ ]

5. Years of service .....

6. Level of education: (1) NCE [ ] (2) Degree [ ]
   (3) Master [ ] (4) M.Phil [ ]
   (5) PhD [ ]

7. Present position
   (1) Principal [ ] (2) Vice-Principal [ ]
   (3) Counselor [ ] (4) Head of Department [ ]
   (5) Class teacher [ ]

8. Which type of marriage are you in? (If you are not married leave blank)
   (1) Monogamy [ ] (2) Polygamy [ ]

Section B: Awareness and sources of Information

Instruction: In this section tick (√) the boxes that correspond to your answers or complete the spaces provided.

9. Have you heard of breast cancer before?
(1) YES ☐ (2) NO ☐

10. Has anyone ever discussed the harmful effects of breast cancer with you?
(1) Yes ☐ (2) No ☐

11. What are your source(s) of information about 'breast cancer'? Tick one or more of the options that apply to you.

(1) Television ☐ (2) Radio ☐ (3) Internet ☐
(4) Lecture ☐ (5) Doctors/Health Provider ☐ (6) Book ☐
(7) Friends ☐ (8) Church/Mosque ☐
(9) Other sources not listed above _____

12. Which of the following screening test below have you heard of?
(1) Self Breast Examination: YES ☐ NO ☐
(2) Clinical breast examination (CBE): YES ☐ NO ☐
(3) Mammography: YES ☐ NO ☐

13. Do you know of anyone that has gone for mammography (x-ray of the breast) before?
(1) YES ☐ (2) NO ☐

If yes, who is this person to you? Please tick (√) appropriately
(1) Mother ☐ (2) Sister ☐
(3) Aunt ☐ (4) Friends ☐
(5) Other relations ☐

If yes, how regularly does she do it? Please tick (√) appropriately
(1) Monthly ☐ (2) Every 3 months ☐
(3) Once in a year ☐ (4) Every 3 years ☐
(5) Every 5 years ☐

14. Do you know of anyone that has gone for clinical breast examination (CBE) lately?
(1) Yes ☐ (2) No ☐

If yes, who is this person to you? Please tick (√) appropriately
(1) Mother ☐ (2) Sister ☐
(3) Aunt ☐ (4) Friends ☐
(5) Other relations ☐

If yes, how regularly does she do it? Please tick (√) appropriately

(1) Monthly [ ] (2) Every 6 months [ ]

(3) Yearly [ ] (4) Every 2 years [ ]

(5) Once in a year [ ]

15. Do you know of anyone that carried out self breast examination recently?

(1) Yes [ ] (2) No [ ]

If yes, who is this person to you? Please tick (√) appropriately

(1) Mother [ ] (2) Sister [ ]

(3) Aunt [ ] (4) Friends [ ] (5) Other [ ]

If yes, how regularly does she do it? Please tick (√) appropriately

(1) Daily [ ] (2) Weekly [ ]

(3) Monthly [ ] (4) Every 3 months [ ]

(5) Once in a year [ ]

16. At what age is self breast examination appropriate?

1. At all age [ ] 2. Once breast formation starts [ ]
3. At age 20 years [ ] 4. At age 30 years [ ]
5. At old age [ ] 6. Don't know [ ]

17. At what age is clinical breast examination appropriate?

1. At all age [ ] 2. Once breast formation starts [ ]
3. At age 30 years [ ] 4. At age 40 years [ ]
5. At old age [ ]

18. At what age is mammography (x-ray of the breast) appropriate?

1. At all age [ ] 2. Once breast formation starts [ ]
3. At age 30 years [ ] 4. At age 40 years [ ]
5. At age 50 [ ] 6. Don't know [ ]

Section C: Knowledge of Breast Cancer Prevention

19. Instruction: In this section tick (√) the boxes that correspond to your answers

S/N	Knowledge of Breast Cancer	YES	NO	DON'T KNOW
19.1	Breast cancer cannot be cured			
19.2	Breast cancer can be cured if discovered early			
19.3	Breast cancer can be cured by surgery only			
19.4	Breast cancer can be discovered by self			
19.5	Breast cancer is difficult to discover until the symptoms manifest			
19.6	Breast cancer can be detected by oneself			
19.7	Breast cancer is harmful to health			
19.8	Breast cancer is disease of young girls			
19.9	Breast cancer is disease of the white			
19.10	Breast cancer is the disease of old women			

17. Tick (√) the boxes that correspond to your answers

S/N	Knowledge of Breast Cancer Symptoms	YES	NO	DON'T KNOW
20.1	Bloody Nipple			
20.2	Inversion, pulling in of the nipple			
20.3	Ulceration			
20.4	Headache			
20.5	Abdominal Pain			
20.6	Lump in the breast			
20.7	Lump under the arm pit			
20.8	Pain in the breast region			
20.9	Scaling, dry skin in the nipple region			
20.10	Breast enlargement			

18. Tick (√) the boxes that correspond to your answer

S/N	Knowledge of Risk Factors	YES	NO	DON'T KNOW
21.1	Caused by putting money between the breast and brassier			
21.2	Family history of breast cancer			
21.3	As age increases, tendencies of having breast cancer increases			
21.4	Obesity can cause breast cancer			
21.5	Breast feeding can cause breast cancer			
21.6	Bruising the breast			
21.7	It is caused by the devil			
21.8	Previous history of benign breast problems			
21.9	Early age of menstruation (age 12 or before)			
21.10	Late age at menopause (age 55 or after)			

Section I): Screening Practices

Instruction: In this section tick (√) the boxes that correspond to your answers or complete the spaces provided

19. Have you ever being screened for breast cancer (1) YES ☐ (2) NO ☐

If yes to the question above, which of the screening method have you carried out in recent times?

1. Self Breast Examination ☐
2. Clinical breast examination (CBE) ☐
3. Mammography ☐
4. None of the above ☐

(b) When last did you carried out the screening?

_____

(c) How often do you practice this screening method?

_____

20 If no to Q25, why have you not been screened for breast cancer?

_____

21. If you were offered an opportunity to be screened, would you take it?
(1) Yes [ ] (2) No [ ]
(3) Can't make up my mind [ ]

Section E: Perception about breast cancer

22. Perceived susceptibility of breast cancer

S/N	Perceived susceptibility of breast cancer	YES	NO	DON'T KNOW
22.1	Breast cancer is unavoidable			
22.2	I worry about getting breast cancer			
22.3	I am likely to get breast cancer as others			
22.4	Do you see yourself developing the breast cancer?			

23. Perceived severity of breast cancer

S/N	Perceived severity of breast cancer	YES	NO	DON'T KNOW
23.1	Can cause of death if untreated			
23.2	Breast has to be removed			
23.3	Can cause problems in sexual relationship			
23.4	Being a burden to family members			
23.5	Would affect work/social life			

24. Perceived benefits of early detection

S/N	Perceived benefits of early detection	YES	NO	DON'T KNOW
24.1	1. Help early detection of abnormal mass			
24.2	2. If detected early, period of treatment can be reduced			
24.3	3. Prevent anxiety			
24.4	4. Effective in detecting abnormality in breast			

Section F:

25: Factors influencing screening practices

Instruction: In this section tick (√) the boxes that correspond to your answer(s)

S/N	Factors influencing screening practices	DISAGREE	UNCERTAIN	AGREE
25.1	Do not know how the test is done			
25.2	There is no free time			
25.3	Do not like people touching my breast, I feel embarrassed			
25.4	Cost			
25.5	Pain associated with screening practices			
25.6	Family responsibilities			
25.7	Lack of trust in hospitals and doctors			
25.8	Complexity of the hospital registration process			
25.9	Fear of finding cancer			
25.10	Misinformation about breast cancer			

TELEGRAMS...... TELEPHONE.......

MINISTRY OF HEALTH

DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION

PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Our Ref. No: AD 13/479/134

Date: 23rd August, 2011

The Principal Investigator,
Department of Health Promotion & Ed Education,
Faculty of Public Health,
College of Medicine,
University of Ibadan,
Ibadan

Attention: Ojewusi, Ayoola A.

Ethical Approval for the Implementation of Your Research Proposal in Oyo State

This acknowledges the receipt of the corrected version of your Research Proposal titled "*Breast Cancer Knowledge and Screening Practices among Female Teachers in Ibadan North Local Government, Oyo State*".

The Committee has noted your compliance with all the ethical concerns raised in the initial review of the proposal. In the light of this, I am pleased to convey to you, the approval of the committee for the implementation of the Research Proposal in Oyo State, Nigeria.

Please note that the committee will monitor, closely, and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of the findings as this will help in policy making in the health sector.

Wishing you all the best.

Mrs. V.A. Adepoju
Director, Planning, Research & Statistics
Secretary, Oyo State, Research Ethical Review Committee