A Study of Knowledge and Awareness about Breast Cancer among Female University Students of Dhaka

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A thesis report submitted to the Department of Pharmacy, East West University, in partial fulfillment of the requirements for the degree of Bachelor of Pharmacy.

Submitted By

Sabekun Nahar

ID: 2014-1-70-028

Department of Pharmacy,

East West University, Bangladesh

EAST WEST UNIVERSITY

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Declaration by the Candidate

I hereby declare that this dissertation entitled "A study of knowledge and awareness about Breast Cancer among female university students of Dhaka" submitted to the Department of Pharmacy, East West University, in the partial fulfillment of the requirement for the degree of Bachelor of Pharmacy (Honors) is a genuine & authentic research work carried out by me under the guidance of Nigar Sultana Tithi, Senior Lecturer, Department of Pharmacy. The contents of this dissertation, in full or in parts, have not been submitted to any other institute or University for the award of any degree or Diploma of Fellowship.

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Certificate by the Supervisor

This is to certify that the dissertation "A study of knowledge and awareness about Breast Cancer among female university students of Dhaka" submitted to the Department of pharmacy, East West University was carried out by Sabekun Nahar (ID: 2014-1-70-028) in partial fulfillment of the requirements of the degree of Bachelor of Pharmacy under my guidance & supervision and no part of this thesis has been submitted for any other degree.

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This is to certify that the thesis "A study of knowledge and awareness about Breast Cancer among female university students of Dhaka" submitted to the Department of pharmacy, East West University in partial fulfillment of the requirements of the degree of Bachelor of Pharmacy was carried out by Sabekun Nahar (ID: 2014-1-70-028).

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ACKNOWLEDGEMENT

First of all, thanks to Allah Almighty Who enabled me to research on such a hot issue of these days. I revere the patronage and moral support extended with love, by my parents whose financial support and passionate encouragement made it possible for me to complete this project.

I submit my heartiest gratitude to my respected supervisor **Nigar Sultana Tithi**, Senior Lecturer, Department of Pharmacy, for her sincere guidance and help for completing this project.

I feel my deepest admiration to the chairperson, **Dr. Chowdhury Faiz Hossain**, Department of Pharmacy, and the administration, East West University for giving me the honor to perform the research in partial fulfillment of the requirements for the award of the degree Bachelor of Pharmacy.

I would also like to put forward my most sincere regards and profound gratitude to **Dr. Shamsun Nahar Khan**, Associate Professor, Department of Pharmacy, East West University, for giving me the opportunity to conduct such an interesting project and for facilitating a smooth conduction of my study.

My joy knows no bounds in expressing my cordial gratitude to my sister **Farzana Islam Prity**. Her keen interest and encouragement were a great help throughout the course of this research work.

I humbly extend my thanks to all concerned persons who co-operated with me in this regard.

This Research Paper is Dedicated to

My Parents.

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Abstract

The increase in global incidence of breast cancer is occurring at a faster rate in developing countries. A cross-sectional study was aimed to assess the level of knowledge about breast cancer risk factors, early warning signs, screening approaches and practice of breast self-examination (BSE). In total, 221 female students aged between 20-28 years from four distinct universities of Dhaka participated in the study. Data was collected by a self-administered questionnaire. Majority of them were unmarried (90.5%) and about 76.02% were undergraduate students. Breast cancer was known to 100% respondents and 68.33% of them mentioned electronic media as the main source of information. It was found that majority respondents mentioned pain and discomfort in the breast or armpit (57.01%) and change in size and shape (58.37%) as signs and symptoms, and genetic (68.33%) and breast feeding (47.96%) as risk factors of breast cancer. About 59.28% were aware about the treatment options. But only 27.15% were aware about the screening methods among whom majority mentioned BSE (76.67%) and mammography (71.67%) as the early screening method. No one could specify the correct procedure of BSE although 23.08% respondents informed that they observed breasts for any changes. Majority of them (79.19%) mentioned about the importance of early screening. In conclusion, we observed an insufficient knowledge and awareness in the study population about breast cancer screening methods. So, raising students' awareness regarding BC and BSE is important for early detection of this increasingly alarming disease. Initiating BC educational programs among university students is highly recommended.

Key words: Breast Cancer, signs & symptoms, risk factors, early screening, BSE, University students, Dhaka

CHAPTER 1

INTRODUCTION

1.1 Breast Cancer

Cancer is a broad term for a class of diseases characterized by abnormal cells that grow and invade healthy cells in the body. Cancer begins in the cells which are the basic building blocks that make up tissue. Tissue is found in the breast and other parts of the body. Sometimes, the process of cell growth goes wrong and new cells form when the body doesn't need them and old or damaged cells do not die as they should. When this occurs, a buildup of cells often forms a mass of tissue called a lump, growth, or tumor.

Breast cancer starts in the cells of the breast as a group of cancer cells that can then invade surrounding tissues or spread (metastasize) to other areas of the body. Breast cancer occurs when malignant tumors develop in the breast. These cells can spread by breaking away from the original tumor and entering blood vessels or lymph vessels, which branch into tissues throughout the body. When cancer cells travel to other parts of the body and begin damaging other tissues and organs, the process is called metastasis (National Breast Cancer Foundation, 2016b).

1.2 Normal Structure of Breast

The breast is a modified skin appendage which is functional in the females during lactation but is rudimentary in the males. Microanatomy of the breast reveals 2 types of tissue components: epithelial and stromal. In a fully developed non-lactating female breast, the epithelial component comprises less than 10% of the total volume but is more significant pathologically since majority of lesions pertain to this portion of the breast (Mohan, 2010).

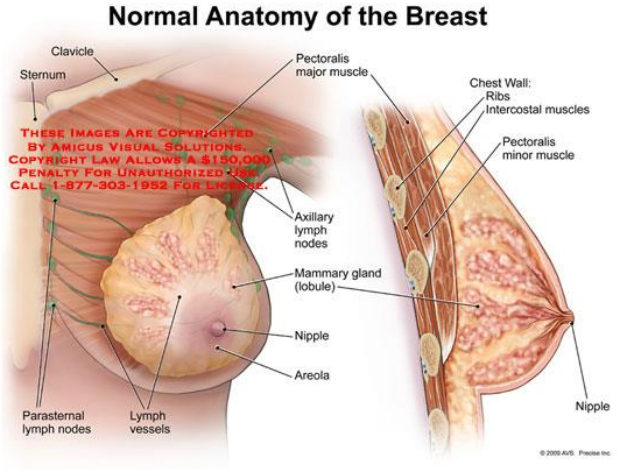

Figure 1.1: Normal Anatomy of the Breast (Anatomy Exhibits, 2017).

1.2.1 Epithelial Component

The epithelial component of the breast consists of 2 major parts: terminal duct-lobular unit (TDLU) which performs the main secretory function during lactation, and large duct system which performs the function of collection and drainage of secretions; both are interconnected to each other. The breast is divided into about 20 lobes. Each lobe consists of breast lobules which drain their secretions through its collecting duct system and opens into the nipple through its own main excretory duct, lactiferous duct. The segment of lactiferous duct subjacent to the nipple shows a small dilatation called lactiferous sinus. Each lactiferous duct has its own collecting duct system which has branches of smaller diameter, ultimately terminating peripherally as terminal ducts (or TDLU) in the breast lobules. The entire ductal-lobular epithelial system has bilayered lining: the inner epithelium with secretory and absorptive function, and an outer supporting myoepithelial lining, both having characteristic ultrastructure and immunoreactivity. The inner epithelium stains positive for epithelial membrane antigen (EMA) and lactalbumin while the myoepithelium is positive for smooth muscle actin (SMA) and S-100 (Mohan, 2010).

1.2.2 Stromal Component

The supportive stroma of the breast consists of variable amount of loose connective tissue and adipose tissue during different stages of reproductive life. The stromal tissue of the breast is present at 2 locations: intralobular and interlobular stroma. Intralobular stroma encloses each lobule, and its acini and ducts, and is chiefly made of loose connective tissue, myxomatous stroma and a few scattered lymphocytes. Interlobular stroma separates one lobule from the other and is composed mainly of adipose tissue and some loose connective tissue. The most important disease of the breast is cancer. However, there are a few inflammatory lesions, benign tumours and tumour-like lesions which may be confused clinically with breast cancer. These pathologic lesions are described first, followed by an account of breast cancer (Mohan, 2010).

1.3 Types of breast cancer

There are two main types of breast cancer–non-invasive or 'in situ' (cancers that are confined to the ducts or lobules and have not spread beyond the layer of tissue where they

developed) and invasive (cancers that have started to spread into surrounding tissue) (Ogden, 2004).

1.3.1 Non-invasive ('in situ') Breast Cancer

- **Ductal carcinoma (cancer) in situ (DCIS)** is non-invasive and is becoming more common because it is picked up at an early stage on mammograms. If there is DCIS it means there are cells in the milk ducts of the breast that have started to grow and divide abnormally and turn into cancer cells. But they have not yet broken out of the ducts and developed the ability to spread either to the rest of the breast or the rest of the body. There is a very high chance that the cancer will be cured and will not recur if it is removed at this stage.

Some doctors call this a very early form of breast cancer, but others describe it as a pre-cancerous condition because it might develop into a more serious invasive cancer if it isn't treated (Ogden, 2004).

- **Lobular carcinoma in situ (LCIS)** means there are abnormal cells in the lining of the milk lobule. This is not considered to be breast cancer at this stage, but it does mean there is more risk of getting invasive breast cancer in either breast in the future. It is more common in women who are pre-menopausal and should be closely monitored (Ogden, 2004).

1.3.2 Invasive Breast Cancer

- **Ductal carcinoma** is invasive and the most common type of breast cancer. It begins in the milk ducts of the breast but–unlike DCIS–it has developed the potential to spread to other parts of the body. The cancerous cells could do this by invading either the lymph or blood vessels in the breast and then being carried through them to other parts of the body, where they form other tumors. Because they have the potential to spread doesn't necessarily mean they have done, but doctors will want to assess the likely risk of it having happened, and if so how extensively, before deciding what treatment to recommend. This assessment is called 'staging' (Ogden, 2004).
- **Lobular carcinoma** is an invasive cancer that begins in the lobules where milk is produced. It does not always show up as a definite lump and so it can be difficult to diagnose, which means it might be larger than other types of breast cancer when it's

diagnosed. It is also more common for it to be diagnosed in both breasts at the same time (Ogden, 2004).

- **Inflammatory breast cancer** is a rare type of advanced breast cancer. It happens when the cancer cells block the lymph channels in the breast, and these then become inflamed. Inflammatory breast cancer can be confused with a breast infection or an allergic reaction because the symptoms can come on quite suddenly and are very similar, making diagnosis difficult. The first symptoms are usually a redness and warmth in the skin of the breast, often without a distinct lump. Other possible symptoms include sudden swelling–as much as a cup size in a couple of days–dark spots that look like bruises and a change in the color of the areola (the dark area around the nipple). It can also show itself through ridges, welts, pitting and a change in color–which can be difficult to see in women with darker skin tones. There might also be stabbing pains or persistent aches in the breast, discharge from the nipple and swollen lymph nodes under the arm or near the collarbone. If the breast is treated with antibiotics and fails to get better–or worse–it is important to have it investigated by a biopsy of the breast tissue and the skin itself. Inflammatory breast cancer grows and metastasises rapidly and must be taken very seriously (Ogden, 2004).
- **Paget's disease** is a rare invasive cancer which begins in the milk ducts of the nipple. One form of the disease is associated with an invasive cancer in the breast and another involves only the nipple. It often goes untreated until it is more advanced because its symptoms (including redness, oozing, crusting, itching of the nipple) are often thought to be due to an infection or inflammation. It is rarely found in both breasts, so if both nipples are itchy and scaling it is probably eczema, a far more common condition. If it doesn't clear up, however, it should be checked out. Paget's disease that involves the breast is treated as any other breast cancer, but when it involves only the nipple the cancer tends to grow slowly and can be treated by removing the nipple and areola (Ogden, 2004).

Cancer can reappear either locally (close to the primary cancer site) or somewhere else in the body. If it recurs locally–in the skin over where the lump used to be, the scar from a mastectomy or in the remaining breast tissue after a lumpectomy–it is often because a few cancer cells were left there and have grown into a new tumor, and not because they have spread through the blood or lymphatic system. Secondary breast cancer is more likely to occur in some parts of the body than others, commonly in: the lymph nodes near the breast

(especially in the armpit, or the lower neck or chest); one or more bones; the lungs; the liver; and, sometimes, the brain. It is possible for it to affect more than one area at a time, but often it only affects one part of the body. The earlier any recurrence is found and treated, the better is the outlook for the patient (Ogden, 2004).

1.4 Stages of Breast Cancer

- Number Staging
- TNM Staging

1.4.1 Number Staging

Number staging is usually expressed on a scale of 0 through IV — with stage 0 describing non-invasive cancers that remain within their original location and stage IV describing invasive cancers that have spread outside the breast to other parts of the body (Breastcancer, 2017a).

- Stage 0
- Stage I
- Stage II
- Stage III
- Stage IV

Table 1.1: Number Staging of Breast Cancer

Stage	Definition
Stage 0	Cancer cells remain inside the breast duct, without invasion into normal adjacent breast tissue.
Stage IA	The tumor measures up to 2 cm AND the cancer has not spread outside the breast; no lymph nodes are involved
Stage IB	There is no tumor in the breast; instead, small groups of cancer cells -- larger than 0.2 millimeter but not larger than 2 millimeters – are found in the lymph nodes OR there is a tumor in the breast that is no larger than 2 centimeters, and there are small groups of cancer cells – larger than 0.2 millimeter but not larger than 2 millimeters – in the lymph nodes.
Stage IIA	No tumor can be found in the breast, but cancer cells are found in the axillary lymph nodes (the lymph nodes under the arm) OR the tumor measures 2 centimeters or smaller and has spread to the axillary lymph nodes OR the tumor is larger than 2 but no larger than 5 centimeters and has not spread to the axillary lymph nodes.
Stage IIB	The tumor is larger than 2 but no larger than 5 centimeters and has spread to the axillary lymph nodes OR the tumor is larger than 5 centimeters but has not spread to the axillary lymph nodes.
Stage IIIA	No tumor is found in the breast. Cancer is found in axillary lymph nodes that are sticking together or to other structures, or cancer may be found in lymph nodes near the breastbone OR

	the tumor is any size. Cancer has spread to the axillary lymph nodes, which are sticking together or to other structures, or cancer may be found in lymph nodes near the breastbone
Stage IIIB	The tumor may be any size and has spread to the chest wall and/or skin of the breast AND may have spread to axillary lymph nodes that are clumped together or sticking to other structures, or cancer may have spread to lymph nodes near the breastbone. Inflammatory breast cancer is considered at least stage IIIB.
Stage IIIC	There may either be no sign of cancer in the breast or a tumor may be any size and may have spread to the chest wall and/or the skin of the breast AND the cancer has spread to lymph nodes either above or below the collarbone AND the cancer may have spread to axillary lymph nodes or to lymph nodes near the breastbone.
Stage IV	The cancer has spread — or metastasized — to other parts of the body

(Breastcancer, 2017a)

There may be some certain words used to describe the stage of the breast cancer:

- **Local:** The cancer is confined within the breast.
- **Regional:** The lymph nodes, primarily those in the armpit, are involved.
- **Distant:** The cancer is found in other parts of the body as well.

Sometimes doctors use the term “locally advanced” or “regionally advanced” to refer to large tumors that involve the breast skin, underlying chest structures, changes to the breast's shape, and lymph node enlargement that is visible or that your doctor can feel during an exam (Breastcancer, 2017).

The stage of the breast cancer can help the doctor understand the prognosis (the most likely outcome of the disease) and make decisions about treatment, along with all of the other results in pathology report. Cancer stage also gives everyone a common way to describe

the breast cancer, so that the results of patient's treatment can be compared and understood relative to that of other people (Breastcancer, 2017a).

1.4.2 TNM staging

TNM (Tumor, Node, Metastasis) is another staging system researchers use to provide more details about how the cancer looks and behaves. Your doctor might mention the TNM classification for your case, but he or she is much more likely to use the numerical staging system. Sometimes clinical trials require TNM information from participants, so talk to your doctor if you are considering participation in a clinical trial.

The TNM system is based on three characteristics:

- size (T stands for tumor)
- lymph node involvement (N stands for node)
- whether the cancer has metastasized (M stands for metastasis), or moved beyond the breast to other parts of the body.

The T (size) category describes the original (primary) tumor:

- TX means the tumor can't be measured or found.
- T0 means there isn't any evidence of the primary tumor.
- Tis means the cancer is "in situ" (the tumor has not started growing into healthy breast tissue).
- T1, T2, T3, T4: These numbers are based on the size of the tumor and the extent to which it has grown into neighboring breast tissue. The higher the T number, the larger the tumor and/or the more it may have grown into the breast tissue.

The N (lymph node involvement) category describes whether or not the cancer has reached nearby lymph nodes:

- NX means the nearby lymph nodes can't be measured or found.
- N0 means nearby lymph nodes do not contain cancer.
- N1, N2, N3: These numbers are based on the number of lymph nodes involved and how much cancer is found in them. The higher the N number, the greater the extent of the lymph node involvement.

The M (metastasis) category tells whether or not there is evidence that the cancer has traveled to other parts of the body:

- MX means metastasis can't be measured or found.
- M0 means there is no distant metastasis.
- M1 means that distant metastasis is present.

Once the pathologist knows your T, N, and M characteristics, he or she can use them to assign a stage to the cancer. For example, a T1 N0 M0 breast cancer would mean that the primary breast tumor is less than 2 centimeters across (T1), has not involved the lymph nodes (N0), and has not spread to distant parts of the body (M0). This cancer would be grouped as stage I (Breastcancer, 2017a).

1.5 Grading

Grade means what the cancer cells look like under the microscope.

Breast cancers can be:

- low grade – grade 1 (slow growing)
- intermediate grade – grade 2
- high grade – grade 3 (faster growing)

Low grade cancers tend to grow more slowly than high grade. High grade cancers are more likely to come back after they have first been treated. But the grade can only give a guide to how any individual cancer will behave and individual cancers may behave differently (Cancer Research UK, 2014).

1.6 Epidemiology and Risk Factors:

A large number of risk factors for breast cancer have been identified. Table 1.2 divides these into well established and less well-established groups and indicates, when possible, the relative risk posed by each. Some of the more important risk factors are summarized next.

1.6.1 Genetic Factors

- **Age–** Risk steadily increases throughout life, especially after menopause, peaking at roughly 80 years of age; 75% of women with breast cancer are older than 50 years of age, and only 5% are younger than 40 (Kumar, Abbas & Aster, 2013).
- **Geographic Variations**– Surprising differences in the incidence and mortality rates of breast cancer have been reported for various countries. The risk for development of this disease is significantly higher in North America and northern Europe than in Asia and Africa. For example, the incidence and mortality rates are five times higher in the United States than in Japan. These differences seem to be environmental rather than genetic in origin, because migrants from low-incidence to high-incidence areas tend to acquire the rates of their adoptive countries, and vice versa. Diet, reproductive patterns, and nursing habits are thought to be involved (Kumar, Abbas & Aster, 2013).
- **Race/Ethnicity**– The highest rate of breast cancer is in non-Hispanic white women. However, Hispanic and African American women tend to develop cancer at a younger age and are more likely to develop aggressive tumors that present at an advanced stage. Such disparities between ethnicities are an area of intense study and currently are thought to be due to a combination of genetic differences and social factors, such as lifestyle choices and access to health care (Kumar, Abbas & Aster, 2013).
- **Family History and Genetic Factors:** If someone's mother, sister, father or child has been diagnosed with breast or ovarian cancer, he/she has a higher risk of being diagnosed with breast cancer in the future. The risk increases if his/her relative was diagnosed before the age of 50 (National Breast Cancer Foundation, 2016a)
- **Personal Health History:** If breast cancer is diagnosed in one breast, there is an increased risk of being diagnosed with breast cancer in the other breast in the future. Also, the risk increases if abnormal breast cells have been detected before (such as atypical hyperplasia, lobular carcinoma in situ (LCIS) or ductal carcinoma in situ (DCIS)) (National Breast Cancer Foundation, 2016a).
- **Menstrual and Reproductive History:** Early menstruation (before age 12), late menopause (after 55), having your first child at an older age, or never having given birth can also increase your risk for breast cancer (National Breast Cancer Foundation, 2016a).
- **Certain Genome Changes:** Mutations in certain genes, such as BRCA1 and BRCA2, can increase the risk for breast cancer. This is determined through a genetic test, if

anyone has a family history of breast cancer. Individuals with these gene mutations can pass the gene mutation onto their children (National Breast Cancer Foundation, 2016a).

- **Dense Breast Tissue:** Having dense breast tissue can increase the risk for breast cancer and make lumps harder to detect. Several states have passed laws requiring physicians to disclose to women if their mammogram indicates that they have dense breasts so that they are aware of this risk (National Breast Cancer Foundation, 2016a).

1.6.2 Environmental and Lifestyle Risk Factors

- **Prolonged exposure to exogenous estrogens–** postmenopausally, as occurs with hormone replacement therapy, has been proved to be useful for the prevention of osteoporosis. However, according to recent studies, relatively short-term use of combined estrogen plus progestin hormone therapy is associated with an increased risk of breast cancer, diagnosis at a more advanced stage of breast cancer, and higher incidence of abnormal mammograms. Because the 2002 Women's Health Initiative report suggested greater harm than benefit of combined estrogen plus a progestin, a precipitous decline has occurred in estrogen and progestin use, along with a serious reevaluation of perimenopausal hormone therapy (Kumar, Abbas & Aster, 2013).
- **Oral contraceptives–** Certain forms of oral contraceptive pills have been found to raise breast cancer risk (Centers for Disease Control and Prevention, 2017)
- **Ionizing radiation–** to the chest increases the risk of breast cancer. The magnitude of the risk depends on the radiation dose, the time since exposure, and age. Only women in whom irradiation occurred before age 30, during breast development, seem to be affected. For example, breast cancer develops in 20% to 30% of women who underwent irradiation for Hodgkin lymphoma in their teens and 20s, but the risk for women treated later in life is not elevated. Of import, the low doses of radiation associated with mammographic screening have no significant effect on the incidence of breast cancer (Kumar, Abbas & Aster, 2013).
- **Lack of Physical Activity:** A sedentary lifestyle with little physical activity can increase the risk for breast cancer (National Breast Cancer Foundation, 2016a).
- **Poor Diet:** A diet high in saturated fat and lacking fruits and vegetables can increase the risk for breast cancer (National Breast Cancer Foundation, 2016a).
- **Being Overweight or Obese:** Being overweight or obese can increase the risk for breast cancer. The risk is increased if someone has already gone through menopause (National Breast Cancer Foundation, 2016a).

❖ **Drinking Alcohol:** Frequent consumption of alcohol can increase the risk for breast cancer. The more alcohol consumption, the greater the risk (National Breast Cancer Foundation, 2016a).

Table 1.2: Well established and less well-established groups and the relative risk

Factor	**Relative Risk**
Well-Established Factors	
Geography	Varies in different areas
Age	Increases after age 30
Family history	
First-degree relative with breast cancer	1.2–3.0
Premenopausal	3.1
Premenopausal and bilateral	8.5–9.0
Postmenopausal	1.5
Postmenopausal and bilateral	4.0–5.4
Menstrual history	
Age at menarche	<12 years 1.3
Age at menopause	>55 years 1.5–2.0
Pregnancy	
First live birth from ages 25 to 29 years	1.5
First live birth after age 30 years	1.9
First live birth after age 35 years	2.0–3.0
Nulliparous	3.0
Benign breast disease	
Proliferative disease without atypia	1.6
Proliferative disease with atypical hyperplasia	>2.0
Lobular carcinoma in situ	6.9-12.0
Other Possible Factors	
Exogenous estrogens	
Oral contraceptives	
Obesity	
High-fat diet	
Alcohol consumption & smoking	

(Kumar, Abbas &Aster, 2013)

1.7 Breast cancer symptoms

Perhaps the most recognized symptom of breast cancer is a lump or mass in the breast tissue. While many women go to their doctor after finding a lump, they should also be aware of any other changes to the breast or nipple.

With the different types of breast cancer come a variety of related symptoms. For example, invasive ductal carcinoma (IDC), which forms in the milk ducts, may cause a distinct breast lump that you can feel. Invasive lobular carcinoma (ILC), which forms in the milk-producing glands, may cause a thickening in the breast

- Symptoms of breast cancer vary from person to person. Some common breast cancer signs and symptoms include:
    - Skin changes, such as swelling, redness, or other visible differences in one or both breasts
    - An increase in size or change in shape of the breast(s)
    - Changes in the appearance of one or both nipples
    - Nipple discharge other than breast milk
    - General pain in/on any part of the breast
    - Lumps or nodes felt on or inside of the breast
- Symptoms more specific to invasive breast cancer are as follows:
    - Irritated or itchy breasts
    - Change in breast color
    - Increase in breast size or shape (over a short period of time)
    - Changes in touch (may feel hard, tender or warm)
    - Peeling or flaking of the nipple skin
    - A breast lump or thickening
    - Redness or pitting of the breast skin (like the skin of an orange) (Cancer Treatment Centers of America, 2017).

1.8 Importance of Early Detection and Screening

Women in the United States have a 1 in 8 chances of getting breast cancer. The good news is that when breast cancer is detected early, it can be cured. Studies show that the five-year survival rate for localized breast cancer is 97 percent, while the 12-year survival rate is 95 percent for cancers that are detected while still smaller than 1 centimeter in size. The size of the cancer and how much it has spread are two of the most important factors contributing to the success of treatment.

The key to successful treatment is early detection and screening. Screening exams are designed to find breast cancer while it is still small and localized – before it causes symptoms like an obvious lump. Breast cancers detected after symptoms arise are usually bigger and are more likely to have spread to areas beyond the breast. Early detection saves thousands of lives each year, so it's important for women of all ages to know what tests are available and when to get them (Godreau, 2017).

1.8.1 Women Ages 50+

Women in their 50s are at the greatest risk of contracting breast cancer. Women who gain weight (20 pounds or more) after menopause are significantly more likely to be diagnosed with breast cancer than women who maintain a healthy weight.

Maintain at least a yearly mammogram to monitor any possible breast cancer developments (Godreau, 2017).

1.8.2 Women Ages 40 – 49

Women 40 and older should have a mammogram each year, as long as they are healthy and free from serious health problems like congestive heart failure, end-stage renal disease, dementia, etc.

Various types of mammograms are available today, including 2D film or digital mammograms and 3D mammograms. Regardless of type, a mammogram is safe and is considered to be the best available test for detecting and diagnosing breast cancer.

Film, digital and 3D mammograms all use compression and a series of X-rays to generate pictures of internal breast tissue. During the exam, the technician compresses the breast with a paddle and takes images from various angles to obtain the necessary pictures.

If a patient receives abnormal mammogram results, doctors often order a breast ultrasound or an MRI breast scan as a follow-up test. These tests can zero in on a specific area identified by the mammogram, and they can help shed more light on whether the area in question might be a cyst or solid mass. A breast ultrasound or MRI breast scan can also sometimes distinguish between benign and cancerous tumors and can help doctors determine whether steps such as a stereotactic breast biopsy are necessary (Godreau, 2017).

1.8.3 Women in 20s and 30s

Younger women – those in their 20s and 30s – should have clinical breast exams every three years. A CBE is usually done in conjunction with a mammogram and is an opportunity for women to discuss any changes in breast tissue, options for medical imaging scans, and any hereditary factors that could increase breast cancer risk.

A breast self-exam is another option for women starting in their 20s, and is something that can be done on a monthly basis throughout life. While self-exams play a smaller part in detecting breast cancer compared to other methods, they nonetheless help women become familiar with how their breasts normally look and feel. This makes it more likely that a woman will notice if a change occurs – perhaps a lump, swelling, pain, discharge, etc. Many time these symptoms are not cancerous, but they should always be reported to a doctor so the appropriate follow up tests can be done.

For a woman in her 20s, the odds of contracting breast cancer are quite low; however, the risk does increase with age. CBEs and self-exams enable women to know what is normal for them so they can immediately report any changes to their doctors (Godreau, 2017).

The Five Steps of a Breast Self-Exam

Step 1: The breast self-exam is begun by looking at the breasts in the mirror with the shoulders straight and arms on the hips.

The following should be observed:

- Breasts that are their usual size, shape, and color
- Breasts that are evenly shaped without visible distortion or swelling

If any of the following changes have been found, doctor's attention need to be drawn:

- Dimpling, puckering, or bulging of the skin
- A nipple that has changed position or an inverted nipple (pushed inward instead of sticking out)
- Redness, soreness, rash, or swelling

Figure 1.2: Breast Self-Exam — Step 1

Step 2: The above-mentioned changes should be checked again by raising the arms.

Step 3: While looking at the mirror, the girls should look for any signs of fluid coming out of one or both nipples (this could be a watery, milky, or yellow fluid or blood).

Figure 1.3: Breast Self-Exam — Steps 2 and 3

Step 4: Next, while lying down, the breasts should be felt by using the right hand to feel the left breast and then the left hand to feel the right breast. Woman should use a firm, smooth touch with the first few finger pads of the hand, keeping the fingers flat and together. She should use a circular motion, about the size of a quarter.

The woman should cover the entire breast from top to bottom, side to side — from the collarbone to the top of the abdomen, and from the armpit to the cleavage.

A pattern should be followed to cover the whole breast. This can be begun at the nipple, moving in larger and larger circles until reaching the outer edge of the breast. The female can also move the fingers up and down vertically, in rows, as if she was mowing a lawn. This up-and-down approach seems to work best for most women. The female should sure to feel all the tissue from the front to the back of the breasts: for the skin and tissue she should just beneath, use light pressure; use medium pressure for tissue in the middle of the breasts; she should use firm pressure for the deep tissue in the back. When she has reached the deep tissue, you should be able to feel down to your ribcage.

Figure 1.4: Breast Self-Exam — Step 4

Step 5: Finally, the breasts should be felt while standing or sitting. Many women find that the easiest way to feel their breasts is when their skin is wet and slippery, so they like to do this step in the shower by following the step 4.

Figure 1.5: Breast Self-Exam — Step 5 (Breastcancer, 2017b)

1.8.4 High-Risk Women

Today, doctors use various risk assessment tools – such as the Gail model, the Claus model, and the Tyrer-Cuzick model – to help determine a woman's risk for breast cancer. These

tools give approximations of risk based on various factors and data. Genetic testing is also available and can identify whether a woman carries the BRCA1 or BRCA2 gene mutation.

For women who are identified as high-risk patients, experts recommend a yearly mammogram and MRI breast scan. An MRI breast scan is used in addition to a mammogram, rather than in place of it. While an MRI is more sensitive than a mammogram, it does miss some cancers that a mammogram can otherwise detect.

In most of these high-risk cases, the combination of mammograms and MRI breast scans should start at age 30 and continue as long as a woman is healthy enough to receive the tests. However, the age to start the exams should take personal situations and needs into account and can be modified accordingly by the doctor and patient.

Women having any of the medical imaging scans mentioned above should do so at a certified diagnostic imaging center to ensure they receive the most accurate tests possible. The Center for Diagnostic Imaging is proud to offer Comprehensive Breast Care Centers in the Miami area that offer all women access to life-saving mammograms, breast ultrasounds and MRI breast scans (Godreau, 2017).

1.9 Diagnosis of Breast Cancer

The following tests may be used to diagnose breast cancer or for follow-up testing after a breast cancer has been diagnosed.

1.9.1 Imaging tests

Imaging tests show pictures of the inside of the body. The following imaging tests of the breast may be done to learn more about a suspicious area found in the breast during screening (Cancer, 2017).

- **Diagnostic mammography**

  Diagnostic mammography is similar to screening mammography except that more pictures of the breast are taken. It is often used when a woman is experiencing signs, such as a new lump or nipple discharge. Diagnostic mammography may also be used if something suspicious is found on a screening mammogram (Cancer, 2017).

- **Ultrasound**

  An ultrasound uses sound waves to create a picture of the breast tissue. An ultrasound can distinguish between a solid mass, which may be cancer, and a fluid-filled cyst, which is usually not cancer (Cancer, 2017).

- **MRI**

  An MRI uses magnetic fields, not x-rays, to produce detailed images of the body. A special dye called a contrast medium is given before the scan to help create a clear picture of the possible cancer. This dye can be injected into a patient's vein or given as a pill to swallow. A breast MRI may be used after a woman has been diagnosed with cancer to check the other breast for cancer or to find out how much the disease has grown throughout the breast. It may also be used before surgery to find out if chemotherapy is working to shrink the tumor. Breast MRI is also a screening option, along with mammography, for some women with a very high risk of developing breast cancer (Cancer, 2017).

1.9.2 Biopsy

A biopsy is the removal of a small amount of tissue for examination under a microscope. Other tests can suggest that cancer is present, but only a biopsy can make a definite diagnosis. There are different types of biopsies, classified by the technique and/or size of needle used to collect the tissue sample (Cancer, 2017).

- **Fine needle aspiration biopsy.** Uses a thin needle to remove a small sample of cells (Cancer, 2017).

- **Core needle biopsy.** Uses a wider needle to remove a larger sample of tissue. This is usually the preferred biopsy technique for finding out whether an abnormality on a physical examination or an imaging test is cancer. Local anesthesia, which is medication to block pain, is used to lessen a patient's discomfort during the procedure (Cancer, 2017).

- **Surgical biopsy.** Removes the largest amount of tissue. Because surgery is best done after a cancer diagnosis has been made, a surgical biopsy is usually not the recommended way to diagnose breast cancer. Most often, non-surgical core needle biopsies are recommended to diagnose breast cancer. This means that only 1 surgical

procedure is needed to remove the tumor and to take samples of the lymph nodes (Cancer, 2017).

- **Image-guided biopsy.** During this procedure, a needle is guided to the location with the help of an imaging technique, such as mammography, ultrasound, or MRI. A stereotactic biopsy is done using mammography to help guide the needle. A small metal clip may be put into the breast to mark where the biopsy sample was taken, in case the tissue is cancerous and more surgery is needed. This clip is usually titanium so it will not cause problems with future imaging tests, but check with your doctor before you have any imaging tests. An image-guided biopsy can be done using a fine needle, core, or vacuum-assisted biopsy, depending on the amount of tissue being removed. Imaging tests may also be used to help do a biopsy on a lump that can be felt, to help find the best location (Cancer, 2017).
- **Sentinel lymph node biopsy.** A way to find out if there is cancer in the lymph nodes near the breast (Cancer, 2017).

1.9.3 Analyzing the biopsy sample

Analyzing the sample(s) removed during the biopsy can help your doctor learn about specific features of a cancer that help determine treatment options.

- **Tumor features.** Examination of the tumor under the microscope is used to determine if it is invasive or in situ, ductal or lobular, and whether the cancer has spread to the lymph nodes (Cancer, 2017).
- **ER and PR.** Testing for ER and PR helps determine both the patient's risk of recurrence and the type of treatment that is most likely to lower the risk of recurrence. ER and PR are often measured for DCIS as well. Generally, hormonal therapy works well for ER-positive and/or PR-positive cancers (Cancer, 2017).
- **HER2.** The HER2 status helps determine whether drugs that target the HER2 receptor, for example the antibody treatment trastuzumab (Herceptin), might help treat the cancer. In addition, about 50% of HER2-positive tumors also have hormone receptors and can benefit from both hormone- and HER2-directed therapy (Cancer, 2017).

- **Grade.** The tumor grade is also determined from a biopsy. Grade refers to how different the cancer cells look from healthy cells, and whether they appear slower growing or faster growing (Cancer, 2017).

1.9.4 Genomic tests to predict recurrence risk

Tests that take an even closer look at the biology of the tumor may be used to understand more about a woman's breast cancer. These tests can help estimate the risk of cancer recurrence in the years after diagnosis. They can also predict whether a treatment can reduce the risk of cancer recurrence. This helps some patients avoid the possible side effects of a treatment that is not likely to work well.

The tests described below are typically done on tissue removed during surgery. Most patients will not need an extra biopsy or more surgery. For more information about genomic tests, what they mean, and how the results might affect your treatment plan, talk with your doctor (Cancer, 2017).

- **Oncotype Dx™.** This test evaluates 16 cancer-related genes and 5 reference genes to estimate the risk of the cancer coming back within 10 years after diagnosis. The test is typically used for women with stage I or stage II ER-positive breast cancer who will receive hormonal therapy. Results are mainly used to help make decisions about whether chemotherapy should be added to a person's treatment with hormonal therapy. This test is typically used for patients with breast cancer that has not spread to the lymph nodes. But recent research suggests that this test may be useful for some patients with cancer that has spread to the lymph nodes (Cancer, 2017).
- **Breast Cancer Index™:** This test may help make decisions about how long a woman should receive endocrine therapy (Cancer, 2017).

1.10 Treatment

Treatment will depend on:

- the type of breast cancer
- the stage of the cancer
- sensitivity to hormones

- the patient's age, overall health, and preferences

The main options include:

- radiation therapy
- surgery
- biological therapy, or targeted drug therapy
- hormone therapy
- chemotherapy

Factors affecting the choice will include the stage of the cancer, other medical conditions, and individual preference (Nordqvist, 2017).

1.10.1 Surgery

If surgery is needed, the choice will depend on the diagnosis and the individual.

- **Lumpectomy**: Removing the tumor and a small margin of healthy tissue around it can help prevent the spread of the cancer. This may be an option if the tumor is small and likely to be easy to separate from the surrounding tissue.
- **Mastectomy**: Simple mastectomy involves removing the lobules, ducts, fatty tissue, nipple, areola, and some skin. Radical mastectomy removes muscle from the chest wall and the lymph nodes in the armpit as well.
- **Sentinel node biopsy**: Removing one lymph node can stop the cancer spreading, because if breast cancer reaches a lymph node, it can spread further through the lymphatic system into other parts of the body.
- **Axillary lymph node dissection**: If there are cancer cells on a node called the sentinel node, the surgeon may recommend removing several nymph nodes in the armpit to prevent the spread of disease.
- **Reconstruction**: Following breast surgery, reconstruction can recreate the breast so that it looks similar to the other breast. This can be done at the same time as a mastectomy, or at a later date. The surgeon may use a breast implant, or tissue from another part of the patient's body (Nordqvist, 2017).

1.10.2 Radiation therapy

Controlled doses of radiation are targeted at the tumor to destroy the cancer cells. Used from around a month after surgery, along with chemotherapy, it can kill any remaining cancer cells.

Each session lasts a few minutes, and the patient may need three to five sessions per week for 3 to 6 weeks, depending on the aim and the extent of the cancer.

The type of breast cancer will dictate what type of radiation therapy, if any, is most suitable.

Adverse effects include fatigue, lymphedema, darkening of the breast skin, and irritation of the breast skin (Nordqvist, 2017).

1.10.3 Chemotherapy

Medications known as cytotoxic drugs may be used to kill cancer cells, if there is a high risk of recurrence or spread. This is called adjuvant chemotherapy.

If the tumor is large, chemotherapy may be administered before surgery to shrink the tumor and make its removal easier. This is called neo-adjuvant chemotherapy.

Chemotherapy can also treat cancer that has metastasized, or spread to other parts of the body, and it can reduce some symptoms, especially in the later stages.

It may be used to reduce estrogen production, as estrogen can encourage the growth of some breast cancers.

Adverse effects include nausea, vomiting, loss of appetite, fatigue, sore mouth, hair loss, and a slightly higher susceptibility to infections. Medications can help control many of these (Nordqvist, 2017).

1.10.4 Hormone blocking therapy

Hormone blocking therapy is used to prevent recurrence in hormone-sensitive breast cancers. These are often referred to as estrogen receptive (ER) positive and progesterone receptor (PR) positive cancers.

Hormone blocking therapy is normally used after surgery, but it may sometimes be used beforehand to shrink the tumor.

It may be the only option for patients who cannot undergo surgery, chemotherapy, or radiotherapy.

The effects normally last for up to 5 years after surgery. The treatment will have no effect on cancers that are not sensitive to hormones.

Examples include:

— tamoxifen

— aromatase inhibitors

— ovarian ablation or suppression

— a luteinising hormone-releasing hormone agonist (LHRHa) drug called Goserelin, to suppress the ovaries

Hormone treatment may affect a woman's future fertility (Nordqvist, 2017).

1.10.5 Biological treatment

Targeted drugs destroy specific types of breast cancer. Examples include trastuzumab (Herceptin), lapatinib (Tykerb), and bevacizumab (Avastin). These drugs are all used for different purposes.

Treatments for breast and other cancers can have severe adverse effects.

The patient should discuss with a doctor the risks involved and ways to minimize the negative effects, when deciding on treatment (Nordqvist, 2017).

1.11 Prevention

There is no sure way to prevent breast cancer, but some lifestyle decisions can significantly reduce the risk of breast and other types of cancer.

These include:

- avoiding excess alcohol consumption
- following a healthy diet with plenty of fresh fruit and vegetables
- getting enough exercise

- maintaining a healthy body mass index (BMI)

Women should think carefully about their options for breast-feeding and the use of HRT following menopause, as these can affect the risk.

Preventive surgery is an option for women at high risk (Nordqvist, 2017).

1.12 Prevalence of breast cancer

The majority of new breast cancer diagnoses and deaths occur in developing countries as opposed to Western countries. The higher number of cases in developing countries is partly due to their larger portion of the world's population.

However, rates have been steadily increasing in these non-developed nations as well, in recent decades. Breast cancer is now the leading cause of cancer-related deaths in women in the world's developing regions.

The breast cancer incidence, or the number of cases per 100,000 women, is still lower in developing countries overall than in the West, but death rates from the disease are higher. This may be attributed to later diagnosis and poor access to treatment. By contrast, the rate of breast cancer per 100,000 women is higher in the U.S., Canada, and Europe than it is in developing countries. Conversely, death rates are markedly lower. In westernized countries, more breast cancer cases are detected early when a cure is more likely and more women are able to get treatment. Furthermore, in developed countries breast cancer is second to lung cancer for cancer-related deaths in women (Berry, 2017).

Asia

- Percentage of world population: 59
- Percentage of new breast cancer cases: 39
- Percentage of breast cancer deaths: 44

Africa

- Percentage of world population: 15
- Percentage of new breast cancer cases: 8
- Percentage of breast cancer deaths: 12

- **U.S. and Canada**
  - Percentage of world population: 5
  - Percentage of new breast cancer cases: 15
  - Percentage of breast cancer deaths: 9

Incidence rates per 100,000 women

- **Countries with highest incidence:**
  - The Netherlands: 95.3
  - France: 94.6
  - U.S: (white people only - other races have lower incidence): 90.6
- **Countries with lowest incidence:**
  - Thailand: 25.6
  - Algeria: 29.8
  - India: 30.9 (Berry, 2017).

1.13 Breast Cancer Survival Rates

Chances for survival vary by stage of breast cancer. Non-invasive (stage 0) and early stage invasive breast cancers (stages I and II) have a better prognosis than later stage cancers (stages III and IV).

Cancer that has not spread beyond the breast has a better prognosis than cancer that has spread to the lymph nodes. The poorest prognosis is for metastatic breast cancer (stage IV), where the cancer has spread beyond the lymph nodes to other parts of the body (Susan G Komen, 2017).

1.13.1 Overall survival rates

An overall survival rate shows the percentage of people who are alive after a certain period of time after diagnosis of a disease (such as breast cancer). For example, say the 5-year overall survival for women with stage I breast cancer was 90 percent. This would mean 90 percent of women diagnosed with stage I breast cancer survive at least 5 years

beyond diagnosis. And, most of these women would live much longer than 5 years past their diagnoses.

Overall survival varies by breast cancer stage. People diagnosed with stage 0, I or II breast cancers tend to have higher overall survival rates than people diagnosed with stage III or IV breast cancers. However, overall survival rates are averages and vary depending on a person's diagnosis and treatment (Susan G Komen, 2017).

1.13.2 Relative survival rates

Relative survival compares survival rates for women with breast cancer to survival rates for women in the general population. For example, say the 5-year relative survival for stage II breast cancer was 85 percent. This would mean women with stage II breast cancer were, on average, 85 percent as likely as women in the general population to live 5 years beyond their diagnosis. Say, the 5-year relative survival for women with stage I breast cancer was 100 percent. This would mean women with stage I breast cancer were, on average, just as likely as women in the general population to live 5 more years. As with overall survival, relative survival rates are averages and vary depending on a person's diagnosis and treatment (Susan G Komen, 2017).

1.13.3 Population survival rates

Summary cancer staging is the most basic way to stage any type of cancer, including breast cancer. It's used to assess survival at the population level.

Summary cancer staging is also called SEER staging because it's used by the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program. SEER collects cancer data in the U.S. and compiles national cancer statistics. Table 1.4 below shows 5-year relative breast cancer survival rates based on SEER staging. For example, the 5-year relative survival for localized breast cancer is 99 percent. This means women with localized breast cancer are, on average, 99 percent as likely as women in the general population to live 5 years beyond their diagnoses. These rates are averages and vary depending on a person's diagnosis and treatment.

SEER breast cancer survival rates are vital to researchers, advocates and policymakers. However, they are less helpful in estimating survival for individuals because the stages are defined so broadly (Susan G Komen, 2017).

Table 1.3: 5-year relative breast cancer survival rates based on SEER staging

Summary/SEER Staging Category	Definition (for all types of cancer)	5-Year Relative Breast Cancer Survival*
Localized	The cancer cells have not spread beyond the organ where they began to grow.	99%
Regionalized	The cancer cells have spread beyond the organ where they began (for example to nearby lymph nodes), but this spread is limited.	85%
Distant	The cancer cells have spread to other parts of the body (metastasis).	26%

(Susan G Komen, 2017).

1.14 Mortality from breast cancer

Breast cancer is the leading cause of cancer death in under developed regions representing 14.3% of all cancer deaths. In more developed regions breast cancer deaths represent 15.4% of all cancer deaths (even though the incidence rate is higher) and is the second cause of female cancer death after lung cancer.

Breast cancer mortality rates also vary amongst world regions. In more developed areas of the world, despite high-incidence rates, survival remains better than in less developed areas with lower incidence rates. For example, 6 per 100,000 breast cancer patients died in Eastern Asia compared to 20 per 100,000 in Western Africa.

A study using data from the World Health Organization (WHO) between 1987 – 2013 was presented by Pizot at the 2016 San Antonio Breast Cancer Symposium. This large research study found that the mortality rate from breast cancer have decreased in 39 out of 47 countries. The US and most European countries saw a marked decrease in breast cancer mortality over the last 25 years.

However worldwide there were a few disparities. South Korea and some Latin American nations saw an increase in breast cancer deaths. South Korea had an 83% overall increase in mortality rates across all age groups.

For the Latin American countries, Brazil and Colombia also saw an increase in mortality rates whilst Argentina and Chile saw a decline in breast cancer mortality rates (Halls, 2017).

1.15 Breast Cancer in Bangladesh

The annual mortality rate per 100,000 people from breast cancer in Bangladesh has increased by 74.3% since 1990, an average of 3.2% a year.

Though this has been the trend overall, adjust the filters at the top of the visualization to see how the mortality rate for breast cancer has changed over time for men and women of specific age groups in Bangladesh.

For men, the deadliness of breast cancer in Bangladesh peaks at age 80+. It kills men at the lowest rate at age 40-44.

Women are killed at the highest rate from breast cancer in Bangladesh at age 80+. It was least deadly to women at age 20-24. At 46.7 deaths per 100,000 women in 2013, the peak mortality rate for women was higher than that of men, which was 2.8 per 100,000 men (Health Grove, 2017).

CHAPTER 2

LITERATURE REVIEW

2.1 Breast cancer knowledge and awareness among university students in Angola

A cross-sectional survey on 595 university students in medical and non-medical programs was conducted using a self-administered questionnaire to investigate participants' awareness and knowledge of breast cancer in Angola. The results showed insufficient knowledge of breast cancer among university students irrespective of whether they were in medical or non-medical programs. The majority of the participants were not aware of some of the early signs of breast cancer such as change in color or shape of the nipple, even though they appreciated the need for monthly breast self-examination. Overall most of the participants indicated the need for increased breast cancer awareness among university students (Sambanje and Mafuvadze, 2012)

2.2 Knowledge and Awareness of Breast Cancer among University Students In South-South Nigeria

Another similar study was conducted among a convenience sample of 774 male and female university students in south-south Nigeria. Data analysis was done using Statistical Package for the Social Sciences (SPSS) version 20. 800 questionnaires were administered and 774 were completed and returned giving a response rate of 97%. There were a higher percentage of females (62.3%) than males (37.7%). All respondents (100%) had heard of breast cancer with radio (52.9%) and television (47.3%) respectively as the major sources of information. Level of knowledge and awareness of risk factors for respondents from Delta State University and University of Port Harcourt was poor (51.2%, 49.8%) respectively. For both universities, respondents had excellent knowledge and awareness of breast cancer symptoms (75.5%, 72.7% respectively); breast cancer prevention and treatment (89.2%, 87.8%) respectively; and breast cancer detection methods (94.0%, 93.5%) respectively. The study revealed excellent knowledge and awareness of breast cancer symptoms, breast cancer prevention and treatment and breast cancer detection methods, but poor knowledge and awareness of breast cancer risk factors among students of the two universities (Onwusah *et al.*, 2017).

2.3 Awareness and Practice of Breast Cancer and Breast-self Examination among University Students in Yemen

Ahmed (2010) carried out a cross sectional descriptive study among 425 female university students in Al-Mukalla city in 2009 by using self administered questionnaire. The study indicated that majority of participants had low level of knowledge of BC 58.6%. Only 1.4%

had gained high level of knowledge. 95.3%of participants believed BC is a serious disease. It was found that despite 76.9% of participants heard about BSE, only 17.4% of them were performing it. 55.9% mentioned lack of knowledge about technique of BSE as a barrier for not practicing BSE. Mass media 81.6% and 67.3% was the first source of information about BC and BSE mentioned by the participants respectively (Ahmed, 2010).

2.4 Knowledge and Awareness of breast cancer among university female students in Muscat, Sultanate of Oman-A pilot study

A pilot study was carried out to assess the awareness and knowledge about the screening method (Breast self examination), risk factors and symptoms of breast cancer among 157 university female students in Muscat region. The study results indicated that female students were well informed and aware about breast cancer in general but their knowledge of breast cancer symptoms was better than the risk factors of breast cancer. The study also revealed that majority of the students knew that Breast self examination (BSE) is the most common and easy method of breast cancer detection but their knowledge regarding frequency and the appropriate time to practice BSE was not very good (Junaibi and Khan, 2011).

2.5 Breast cancer awareness among female University students in Ajman, UAE

Another cross-sectional study was conducted among female university students in three large Universities in Ajman, namely Gulf Medical University (referred to as U1), offering health related programs; Ajman University of Science and Technology (referred to as U2) offering mostly science and technology programs; and Preston University Ajman (referred to as U3) offering science programs. A validated, pilot-tested self-administered questionnaire was used as a tool for data collection. A score less than 60% was considered as inadequate knowledge. Data were entered in to Excel sheets and analyzed using PASW 19. Family history of Breast cancer was reported by 9.2% (36) of the participants, which had affected mostly second degree relatives (63.9%). None of the students had a personal history of breast cancer. The most widely known risk factors for breast cancer were previous cancerous growth in the breast (72.4%), family history of breast cancer (70.2%), radiation to chest (67.9%), and smoking cigarettes (65.3%). The most frequent correct response about the warning signs of breast cancer (61%), was “Painless breast lump”, next was “change in the size or shape of the breast” (60.2%). Among the participants, 53.8% had heard about Breast Self-Examination and 44.1% Clinical Breast Examination.

Significantly higher knowledge scores regarding risk factors for breast cancer are noticed among participants from countries in the Americas, from universities offering only medical/ health related programs, and those having family history of cancers compared to their respective counterparts in the nationality, university and family history subgroups respectively. The most frequent misconceptions are "Treatment for breast cancer affects woman's feminity", "Herbal remedies and dietary supplements can treat breast cancer" and "There is little that I can do to prevent cancer" reported by 62.5%, 56.4% and 49.7% respectively (Sharbatti *et al.*, 2012).

2.6 Awareness of Breast Cancer among Female Students at Ain Shams University, Egypt

Another descriptive cross sectional study was done by Boulos and Ghali, (2014) among Ain Shams University female students. Most study participants had low level of knowledge of breast cancer risk factors. The most widely known risk factors by the students were smoking 66.9%, followed by radiation to the chest 63.7% and genetic factors 63.7%. Most of the students (81.6%) identified breast lump as a symptom for breast cancer. However, non lump symptoms were less known and less than half were aware of other warning signs. Mass media such as TV and/or radio were identified as the main source of information on breast cancer by 89.1% of students followed by relatives 39.2%. Only 8.8% of students identified correctly the appropriate time to perform breast self examination and 1.3% reported performing it regularly every month. The most common reasons for not practicing BSE were" did not know how to perform it" (47.7%) and lack of interest (35%). The findings of this study showed that there is low level of knowledge on breast cancer risk factors, early warning signs and BSE among female university students and that only few students practice BSE monthly (Boulos and Ghali, 2014).

2.7 Knowledge and attitude of Saudi female students towards breast cancer: A cross-sectional study

Latif (2014) conducted a cross-sectional study among one hundred and fifty females from a university in Saudi Arabia. Data analysis was carried out using Statistical Package for the Social Sciences (SPSS) Version 19. Mean knowledge score was 16.6 out of 29. One hundred and six participants (70.7%) scored 50.0% and more. On the other hand, number of participants whose scores were below 50% was rather less (44; 29.3%). Variables like single, knowing of a friend/family member suffering from breast cancer or practice of

breast self-examination were significantly related to participants' knowledge scores.50.7% participants admitted to carry out the breast self-examination procedure. Only 13 study participants (8.7%) had clinical breast examination. None of the participants had undergone mammography (Latif, 2014).

2.8 Practice of breast self-examination and knowledge of breast cancer among female university students in Korea

Another cross-sectional descriptive study was conducted by Shin, Park and Kim (2012) among 2186 female university students in Korea. The collected data were analyzed through descriptive statistics, χ2-test, t-test, ANOVA, and logistic regression. Twenty-seven percent of students reported engaging in breast self-examination. The participants displayed a medium-level score (total score: 5.33 ± 2.70, range: 0–11) on knowledge about breast cancer. Predictors for breast self-examination were age (odds ratio = 1.15, $P < 0.001$), major (odds ratio = 1.80, $P < 0.001$), and knowledge of breast cancer (odds ratio = 1.16, $P < 0.001$). This study was the sole nationwide-scale research that examined the practice of breast self-examination, related factors, and knowledge of breast cancer among female university students, as a representative sample of young Korean women (Shin, Park and Kim, 2012).

2.9 Knowledge and Practice of Breast Self Examination among female undergraduate students in Universiti Malaysia Sarawak (UNIMAS)

Suut (2010) adopted a descriptive study and simple random sampling technique to assess the level of knowledge and practice of breast self examination among One hundred and thirty three female undergraduate students using self administered questionnaire in Universiti Malaysia Sarawak (UNIMAS). Data were analyzed using Statistical Package for Social Sciences (SPSS) version 15.0. Eighty-eight respondents (66.2%) answered correctly that breast self examination is a method to examine one's own breasts to detect abnormalities of the breasts. Only 22 of the respondents (16.5%) knew that breast self examination is not the only method for early detection of breast cancer. Less than half of respondents (38.3%) knew that breast self examination should be performed regularly that is every month. Out of' 133 respondents. only 45.9°o have good knowledge about breast self examination. Only 68 respondents (51.1°°) ever performed breast self examination and out of 68, 48 respondents (36.1 0 °) reported that they practice breast self examination for the past 12 months. Only three of the respondents (2.3%) practice breast self examination

regularly that is 10 to 12 times in the past 12 months. The study found out that the level of knowledge and practice of breast self examination among female undergraduate students in Universiti Malaysia Sarawak (UNIMAS) is poor (Suut, 2010).

2.10 Awareness and attitudes regarding breast cancer and breast self-examination among female Jordanian students

Using a cross-sectional research design, a self-administered survey was used, via a pre-validated pre-piloted questionnaire was distributed to 900 female students aged between 18 and 37 years recruited from the University of Jordan in Amman. Statistical analysis was performed using Epi-Info version 6.4 statistical Software. The overall response rate was 93.3%. Approximately half of the respondents 435 (51.8%) were aware of breast cancer. Of these, 99 (22.7%) believed that it was caused by a medical condition, followed by old age (71; 16.4%), lack of breastfeeding (58; 13.3%), heredity (56; 12.8%), late marriage (44; 10.3%), pregnancies in older women (33; 7.5%), the use of brassieres (18; 4.1%), excessive breastfeeding (17; 3.9%), being unmarried (14; 3.2%), and spirituality (11; 2.6%). Overall, 152 participants (34.9%) were aware of BSE, but only 93 (11%) had performed it. The awareness of breast cancer in Jordanian students and their use of BSE were insufficient (Suleiman, 2014).

2.11 Knowledge and Awareness about Breast Cancer and its Early Symptoms among Medical and Non-Medical Students of Southern Punjab, Pakistan

A cross-sectional descriptive analysis was done using a self-administered questionnaire in Southern Punjab, Pakistan among 566 university students out of which 326 were non-medical and 240 were from a medical discipline. Statistical analysis was carried out using Graph Pad Prism Version 5 with a significance level set at $p<0.05$. The mean age of the non-medical and medical participants was 23 (SD 2.1) and 22 (SD 1.3) years, respectively. Less than 35% students were aware of the early warning signs of the breast cancer development. Knowledge medical students about risk factors was significantly better than the non-medical ones, but on the whole was insufficient. The study indicated that knowledge regarding breast cancer was generally insufficient amongst the majority of the university students (75% non-medical and 55% medical) of Southern Punjab, Pakistan (Noreen *et al.*, 2015).

2.12 Breast Self-examination: Knowledge, Attitude, and Practice among Female Dental Students in Hyderabad City, India

Doshi *et al*. (2012) conducted a similar cross-sectional descriptive questionnaire study on 203 female dental students at Panineeya Institute of Dental Sciences, Hyderabad, India. Data were analyzed using SPSS software (version 12). Overall, the total mean knowledge score was 14.22 ± 8.04 with the fourth year students having the maximum mean score (19.98 ± 3.68). The mean attitude score was 26.45 ± 5.97. For the practice score, the overall mean score was 12.64 ± 5.92 with the highest mean score noted for third year 13.94 ± 5.31 students. KAP scores upon correlation revealed a significant correlation between knowledge and attitude scores only (P<0.05) (Doshi *et al*., 2012).

2.13 Knowledge and practice of breast-self examination among female undergraduate students of Ahmadu Bello University Zaria, Northwestern Nigeria

Another similar study was carried out among female undergraduate students of Ahmadu Bello University Zaria, Nigeria. In the study, knowledge and practice of BSE were examined among 221 female students aged 16 - 28 years old using self administered questionnaires. It was found that despite nearly three quarter of the respondents (87.7%) had heard of BSE, only 19.0% of them were performing this examination monthly. Regarding the sources of information about BSE among respondents, media was found to be most common followed by health workers accounting for 45.5% and 32.2% respectively. Regular performance of BSE was significantly correlated with duration of stay in the University (X^2 = 81.9, df = 3, P < .05) and family history of breast cancer (X^2 = 17.4, df = 2, P < .05). A disparity between high levels of knowledge of BSE compared to a low level of practice was observed (Gwarzo, Sabitu and idris, 2009).

2.14 Practices of Breast Self-Examination and Associated Factors among Female Debre Berhan University Students

Another cross-sectional study was conducted in 2015 among 420 using self-administrated questionnaire among female Debre Berhan University students in Ethiopia. Majority of the study participants, 338 (84.5%), were between 20 and 24 years old with the mean age of 21.1 ± 1.65. Only 14 (3.5%) had family history of breast cancer. Two hundred fifty-six (64%) of the participants had heard about BSE and 30.25% had good knowledge about BSE. Mass media were the most common source of information about breast cancer. Few of the participants (28.3%) had performed BSE. Lack of knowledge on how to perform

BSE was cited as the main reason for not practicing BSE. Knowing how to perform, when to perform, and position to perform BSE and having a perception that BSE is important and useful to detect breast cancer were significant predictors of practices of BSE. The study revealed that most of the participants had low knowledge and practice of BSE (Birhane *et al.*, 2017).

2.15 Awareness about Early Detection Methods, Symptoms and Risk Factors towards Breast and Cervical Cancer among the Female Students of Mawlana Bhashani Science and Technology University (MBSTU), Santosh, Tangail, Bangladesh

Zohora *et al.* (2017) carried out a study from July to September, 2015 among the participants of university female halls, different female hostels and different faculty of the university by using a validated questionnaire which was developed for this study. A total 250 female students, at the age of (18 - 26) years were participated. Collected information was analyzed using SPSS, Graph-pad Prism and MS Excel. The results showed that about 87.6% participants were undergraduate. Most of them came from village (45.6%) and city (36.0%). About 90% were Muslims and the socioeconomic level of most of the participants was middle (90.4%). In case of food intake patterns, it was observed that 35.6% participants eat chips, soft drinks, popcorn everyday; 40.4% eat meat regularly; 24% eat sugar everyday; 27.6% eat fruits and vegetables every day. Among them, 55.6% girls maintained daily 1 hour physical activity; 37.2% did exercise rarely; 34.8% participants rarely do strenuous exercise. About 84.4% respondents had not any family history of cancer; 6% participants had sister or mother having breast tumor and 7.2% had at least more than one close relative who have cancer. Among the participants, only 0.8% drank alcohol; 1.2% had addiction of smoking cigarette; 15.6% girls wear tight bra; 3.6% had benign breast disease and 2.8% participants had attended in breast or cervical cancer screening programs. The moderate numbers of girls had breast cancer screening practice. Among them, only 28.8% participants had ever heard about BSE (Breast self-examination) and 40.4% had not any knowledge about breast cancer treatment. About 50.8% respondents didn’t have any knowledge about cervical cancer treatment. The village people were the most risky group. About 17.02% girls recognized weakened immune system as a risk factor of cervical cancer (Zohora *et al.*, 2017)

2.16 Knowledge, Attitude and Practice Regarding Breast Cancer Among Medical Students of Bangladesh. - A protocol study.

A proposed protocol study was designed to assess the knowledge attitude and practice regarding breast cancer in medical student in Bangladesh. The study population was not only the health professionals but also represent the higher educated population of Bangladesh. Their level of knowledge gave an idea about the mass general lower educated population in Bangladesh. The proposed study was conducted during February 2008 to May 2008 on 3rd year to 5th year medical students of different medical colleges of Bangladesh through a cross-sectional study. Data was collected by a self administered questionnaire (Mia, 2007).

2.17 A Study Survey on Risk Factors Associated with Breast Cancer in Bangladeshi Population

A hospital based case control study was conducted. A nationwide representative sample of 100 out of 115 cancer patients aged 20 or older was interviewed at NICRH to provide information on awareness of the risk factors of breast cancer causes in Bangladeshi population. Highest number of patients was from 40-49 (39%) and 30-39 (27%) year-age group. About 15% patients had direct family history, 21% had early periods. About 14% have got late menopause. If women begin menopause after age 55, the risk increases. 15% women have had not had children, and 10% had their first child after age 30. Study found women using birth control pills (47%), have slightly greater risk. 9% women's breast feeding lasts below 1 year. And about 7% patient never breast fed their child. About 40% female patients do not walk as exercise. Results suggested a mixture of different factors with Aging and direct family history poses higher risk for breast cancer (Afroz, Rahman & Hossain, 2017).

2.18 Awareness of breast cancer and barriers to breast screening uptake in Bangladesh: A population based survey

A nationally representative cross-sectional survey of women aged 30–59 years was conducted in 7 districts of the 7 divisions in Bangladesh, using a multistage cluster sampling technique. The factors associated with the awareness of BCa and breast assessment of asymptomatic women were investigated separately, using multivariable logistic regression. Of the 1590 participants, mean age 42.3 (±8.0) years, 81.9% had ever heard of BCa and 64.2% of any methods of BCa screening, respectively. Awareness of BCa

was associated with being aged 40–49 years (adjusted OR 2.04, 95% CI 1.46–2.84), aged 49–59 years (1.96, 1.32–2.91), being overweight (1.46, 1.07–2.01) and obesity (1.62, 1.01–2.62), while inversely associated with rural dwelling (0.37, 0.22–0.61), primary education (0.44, 0.27–0.70), having no education (0.23, 0.14–0.36) and parity (0.62, 0.44–0.87). Of the 750 women who were aware of clinical breast examination (CBE) or mammography, reasons provided for not undergoing screening included that they had no symptoms (92%) and that they did not know screening was needed (40%). 8% of women reported CBE. Women with no education were less likely to have undergone CBE (0.38, 0.14 1.04; p = 0.059). Lack of understanding of the assessment of asymptomatic women is the key obstacle to BCa screening uptake in Bangladesh (Islam *et al.*, 2016)

2.19 Knowledge on Breast Cancer among Female College Students, Dhaka, Bangladesh

Another cross sectional descriptive study was conducted among 182 female College students selected. Semi-structured pre Bengali questionnaire was used as a tool of data collection. The mean age of the respondents was 16.99 ±0.69 years. It was found that knowledge about breast cancer on risk factors was 6.6%, sign and symptoms 4.4% and way of early detection 15.4% among the students. The mean knowledge score of breast cancer among the respondents was 1.79±1.31. Of the respondents 164 (90.2%) had poor knowledge, 17(9.3%) had fair knowledge and only 1(.5%) had good knowledge. It was concluded that knowledge on breast cancer was very poor of the female college students although the availability of mass media and health institutes is continuously influences them to have better knowledge towards breast cancer; hence enable them to informed decision about pro-creation later life (Shaham *et al.*, 2016)

2.20 Breast cancer in South Asia: A Bangladesh perspective

A significant proportion of breast cancer cases occur in premenopausal women. The various aspects of breast cancer in different geographical regions are limited in South Asia. This article reviewed the Bangladesh perspective of breast cancer epidemiology, risk factors, pathology, diagnosis and treatment. As in other developing countries, due to lack of breast cancer awareness in Bangladeshi population and inadequate access to health care, the majority of the patients is diagnosed at the advanced stage of the disease. Early detection has a crucial impact on the overall treatment outcomes. To battle against breast cancer in resource-limited countries like Bangladesh, it is not feasible to set up a parallel health

service system solely dedicated for cancer. Therefore, a cost-effective public health strategy is needed, which reaches a large number of women in the country. Considering all these issues, we propose an innovative female-based primary healthcare approach focusing on awareness, screening and early detection of breast cancer in Bangladesh. This preventive strategy could be a model for other resource-limited developing countries (Hossain, Ferdous & Karim-Kos, 2014)

Significance of the Study

Breast cancer is the most frequent cancer among women, impacting over 1.5 million women each year, and also causes the greatest number of cancer-related deaths among women. In 2015, 570,000 women died from breast cancer – that is approximately 15% of all cancer deaths among women. While breast cancer rates are higher among women in more developed regions, rates are increasing in nearly every region globally (WHO, 2017a). Bangladesh is facing a high burden of breast cancer disease. It is the 2nd leading cause of cancer death after cervical cancer (Parveen *et al*., 2015). It is easily understandable that breast cancer incidence is increasing at a faster rate. In Bangladesh, there is no national cancer registry. However, age-standardized incidence rates from Karachi, Pakistan (53.8/100,000), and Kolkata, India (25.1/100,000)3 (both with whom Bangladesh shares many cultural and historical similarities), suggest an annual incidence rate of 35–40/100,000. Therefore, in Bangladesh, an annual new breast cancer case burden of 30,000 women was estimated (Story *et al*., 2012).

Awareness for breast cancer can lead to reduction in incidence and mortality of major causes of death among women and can address the profound inequities seen in the incidence and mortality from breast cancer. Incidence rates vary greatly worldwide from 19.3 per 100,000 women in Eastern Africa to 89.7 per 100,000 women in Western Europe. In most of the developing regions the incidence rates are below 40 per 100,000. Breast cancer survival rates also vary greatly worldwide, ranging from 80% or over in North America, Sweden and Japan to around 60% in middle-income countries and below 40% in low-income countries (WHO, 2017b). The recent fall of death from breast cancer in western nations is particularly explained by earlier diagnosis as a result of early presentation. In most of the developing countries including Bangladesh patient comes for treatment in an advance stage when little or no benefit can be derived from any sorts of therapy. A study conducted in the northern part of Bangladesh named Khulna Division in 2007 – 2008 showed that 87% of new cases of breast cancer were diagnosed as stage III+, where cancer has spread to other parts of the body. The treatment options were limited and very expensive, especially in a low-resource country such as Bangladesh. The main possible reason is lack of public awareness for early detection of breast cancer (Story *et al.*, 2012). Early diagnosis can be successfully achieved by mass screening either by Mammography, Clinical Breast Examination (CBE) and Self breast examination (SBE) or by the combination of three. Though it is well documented that mammography is the best choice

for screening, breast self examination is also equally important and beneficial for mass awareness especially in country with limited recourses. In a developing country like Bangladesh and it is not a realistic approach to pursue a population based mass screening program. According to stepwise approach of Global Summit Panel 2002 Breast Self Examination would be the approach for early detection in limited resources countries (Mia, 2007).

There are many studies like on general population (Islam *et al.*, 2015), medical students- a protocol study (Mia, 2007) and college students (Shaham *et al.*, 2016) conducted in Bangladesh regarding knowledge and awareness of Breast Cancer. The Studies showed poor level of knowledge and awareness of breast cancer except medical students. Very few studies have been found conducted on university students in Bangladesh (Zohora *et al.*, 2017). As the knowledge and awareness increase with the increased educational level, a cross sectional survey is designed on "A study of knowledge and awareness about Breast Cancer among female university students of Dhaka" to make an analysis of the current statistics of the knowledge & awareness of the Breast Cancer regarding risk factors, early detection, diagnosis and the knowledge and practice of BSE among female university students aged 20 years or above.

Objective of study

The main objectives of this study were

- To find out the level of knowledge of Breast Cancer regarding risk factors, signs and symptoms, diagnosis and treatment among Female University Student respondents.
- To find out the knowledge and awareness of early detection and the practice of BSE among them
- To find out their habits or activities that may influence the formation and prevalence of Breast Cancer

CHAPTER 3

METHODOLOGY

3.1 Type of Study

Cross-sectional survey based study

3.2 Study Area

The study was conducted in four different universities of Dhaka.

3.3 Total Number of Respondent

Data was collected from 221 female students of respected universities.

3.4 Inclusion Criteria of Respondent

- ✓ University Students
- ✓ Only Female Respondents
- ✓ Age of the Respondents are 20 years old or above.

3.5 Exclusion Criteria

- ✓ Unwilling to participate or unable to comply with protocol requirements

3.6 Procedure

- ✓ For collecting data, a self-administered questionnaire was prepared according to required information. The collected data were analyzed with the help of Microsoft Office Excel and filtered out accordingly for analysis. Some graphical representations were made from those analysis statuses.

CHAPTER 4

RESULTS

4.1 Respondents Location

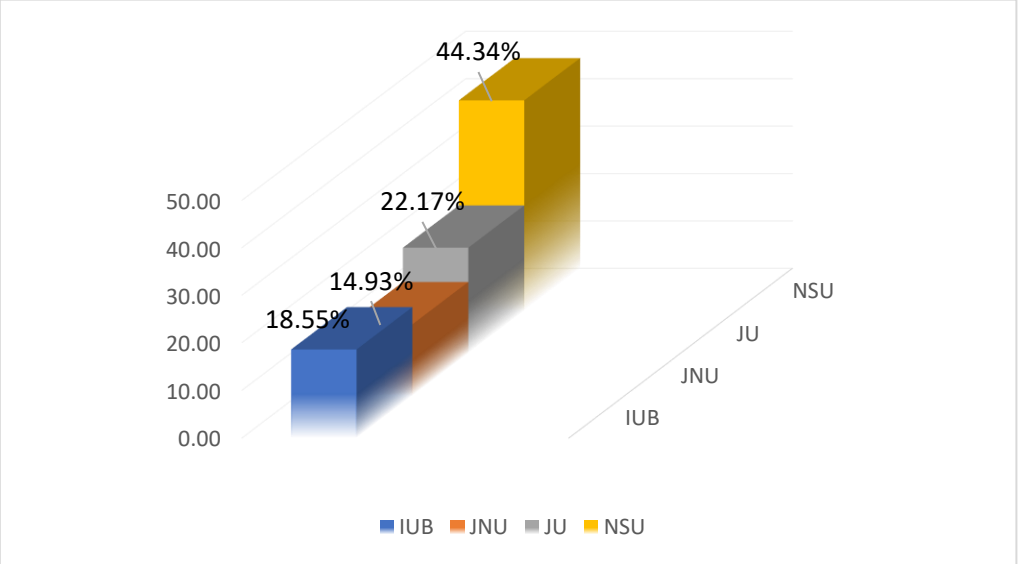

Figure 4.1: Location of the Respondents

Total 221 female university students were from four different universities of Dhaka participated in this study. Among them 44.34% of respondents from North South University (NSU), 22.17% of respondents from Jahangirnagar University (JU), 18.55% of respondents from Independent University (IUB) and 14.93% from Jagannath University (JNU).

4.2 Marital Status

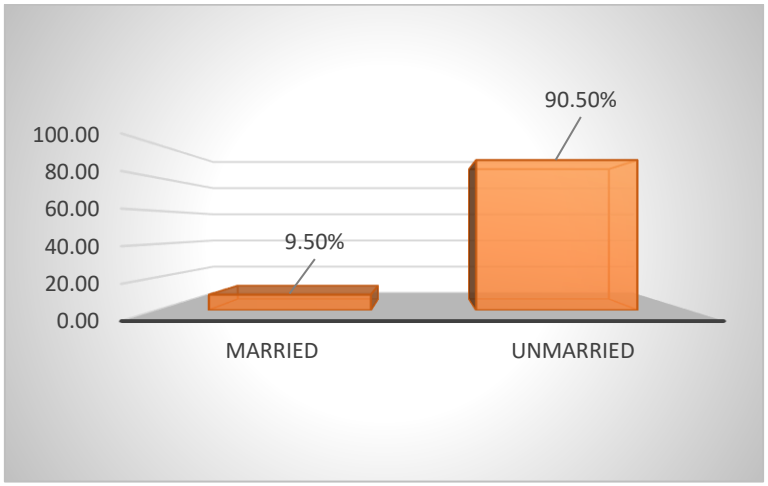

Figure 4.2: Marital Status

Among the respondents, majority (90.5%) of them are unmarried. Only 9.5% are married and among them only two respondents have babies. The respondents were aged between 20-28 years.

4.3 BMI Status of the Respondents

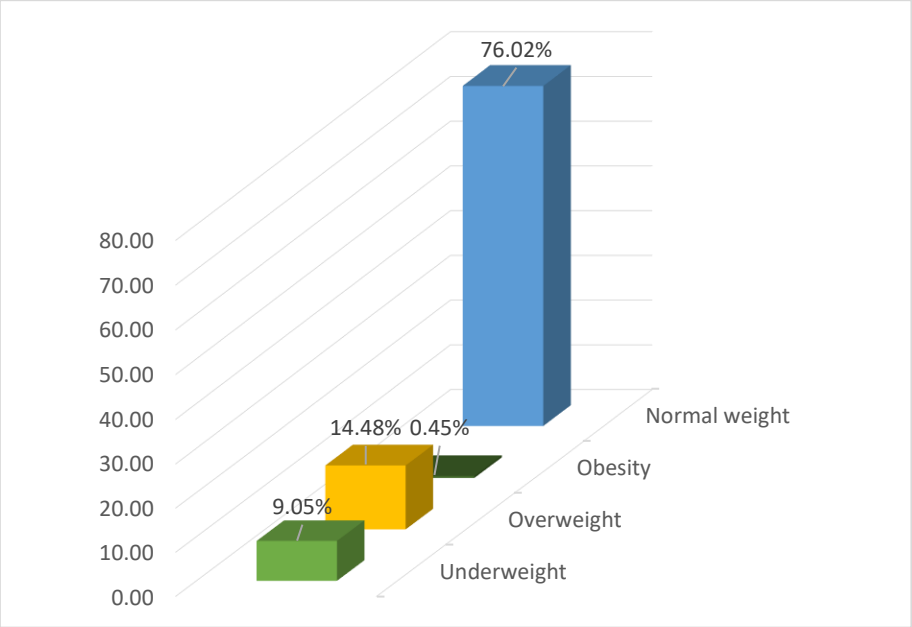

Figure 4.3: BMI Status

The body mass index (BMI) is a measure of relative weight based on an individual's mass and height. It is defined as the individual's body mass divided by the square of their height – with the value universally being given in units of kg/m2

$$BMI = \frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

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BMI Categories:

Underweight = <18.5

Normal weight = 18.5–24.9

Overweight = 25–29.9

Obesity = BMI of 30 or greater (WebMD, 2017).

There is a BMI graph from which we can see that highest number of respondents had normal BMI status (76.02%). The underweight respondents were (9.05%). The overweight respondents were 14.48% and obese (0.45%) which is the lowest one.

4.4 Source of Information about Breast Cancer

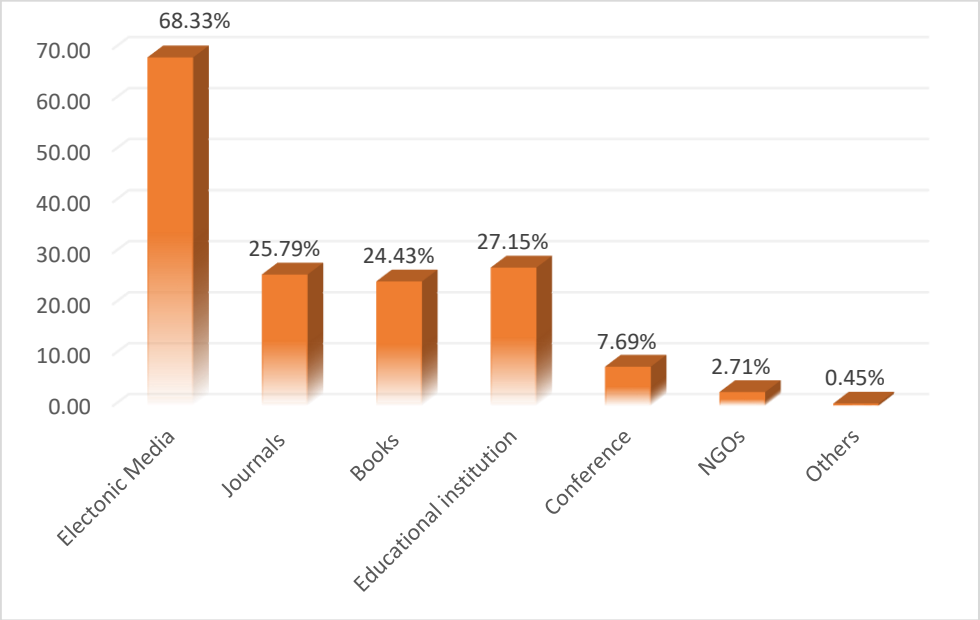

Figure 4.4: Source of Information about Breast Cancer

Among 221 respondents, most of them are undergraduate students (92.76%). There were only 5.88% of graduate and only 1.36% of post-graduate students. All of them were aware about the Breast Cancer term. Majority got the information of Breast cancer from electronic media (68.33%). The next possible sources of information for Breast Cancer are the educational institution (27.15%) and journals (25.79%). The respondents also got the information from books (24.43%), conferences (7.69%), NGOs (2.71%) and other source such as from doctors (0.45%).

4.5 History of Breast Cancer in their Family

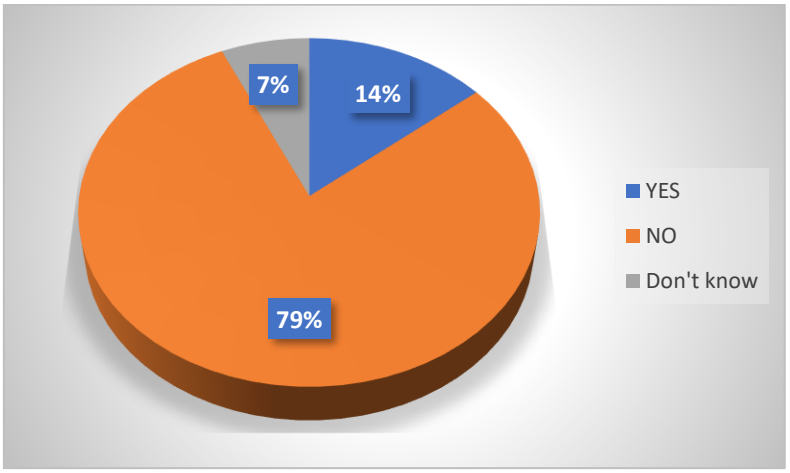

Figure 4.5: History of Breast Cancer in their family

Most of the respondents (79%) had no history of breast cancer in their family. Only 14% had family history of breast cancer. Among the respondents who had family history of breast cancer, their relatives having breast cancer were their aunty (54.84%), cousin (22.58%), grandmother (19.35%) and sister (6.45%). 7% of the respondents do not know about whether they have family history of Breast Cancer or not.

4.6 Knowledge about Breast Cancer and signs and symptoms of Breast Cancer

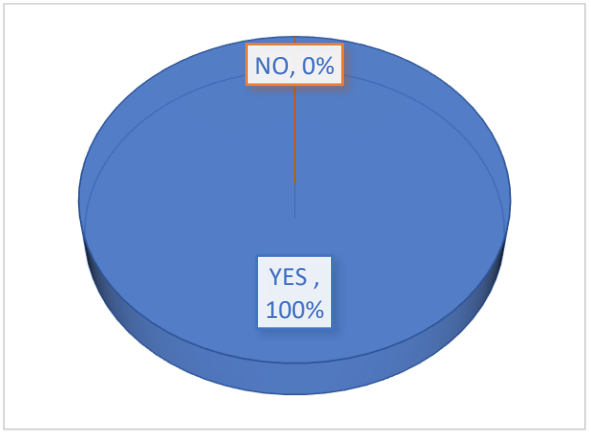

Figure 4.6: Knowledge about Breast Cancer

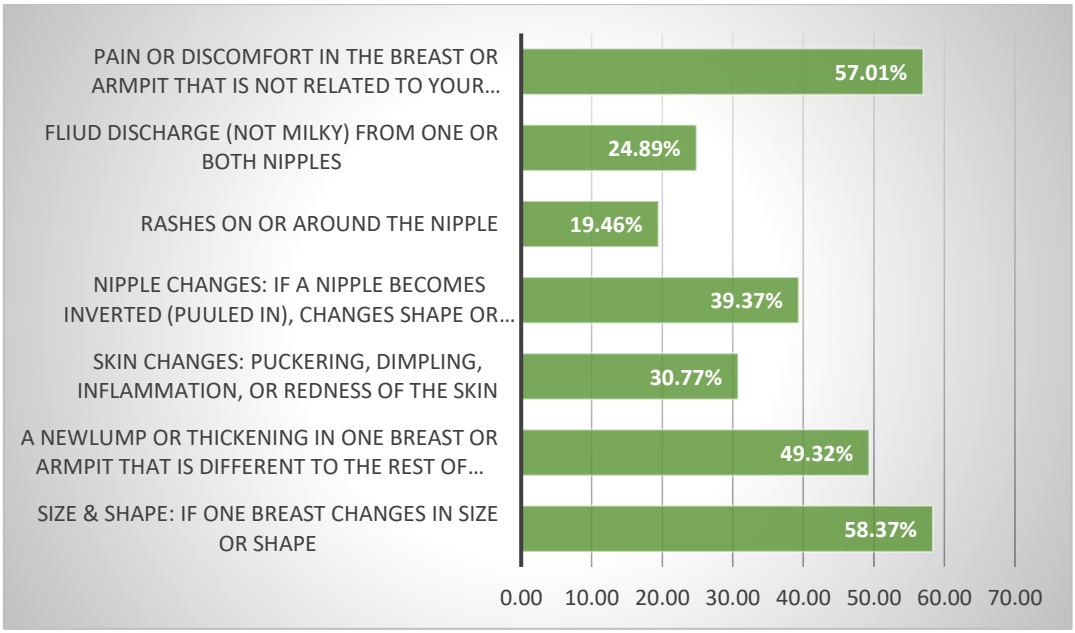

Figure 4.7: Respondents knowledge about signs and symptoms of Breast Cancer

All the respondents said that they had heard about the Breast Cancer term. But there had been found a great variation of awareness about Breast Cancer among the respondents. They were asked about the signs and symptoms of Breast Cancer and they were able to give multiple options of signs and symptoms. Among them 58.37% identified size and shape: if one breast changes in size or shape and 57.01% identified pain or discomfort in the breast or armpit that is not related to periods as the sign and symptom of breast cancer. About 49.32% mentioned a new lump or thickening in one breast or armpit that different to the rest of the breast, 39.37% mentioned nipple changes, 30.77% mentioned skin changes, 24.89% mentioned fluid discharge (not milky) from breast and 19.46% mentioned rashes around the nipple as the sign and symptom

4.7 Knowledge about reason of Breast Cancer

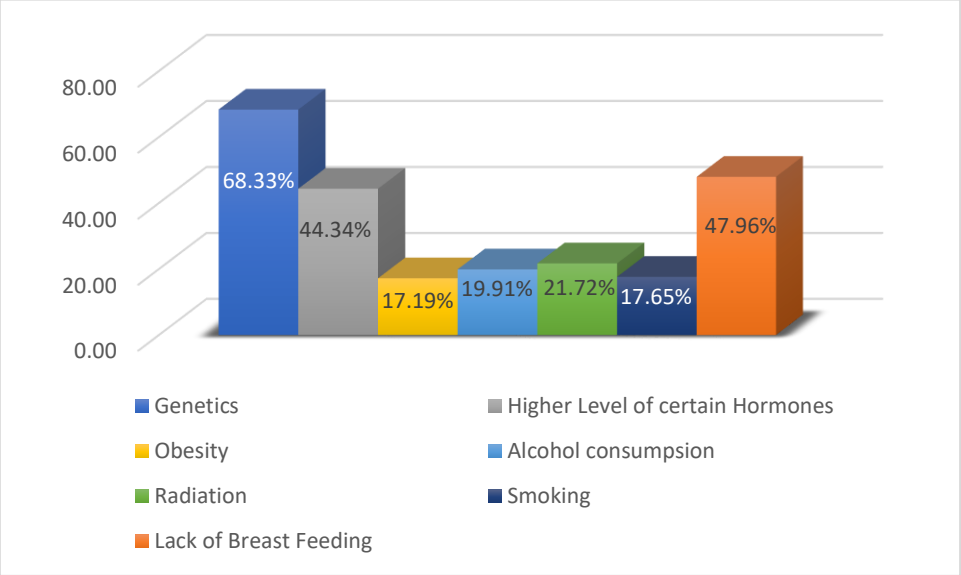

Figure 4.8: Knowledge about reason of Breast Cancer

Most of the respondents (68.33%) knew that genetics is the main risk factor and lack of breast feeding was mentioned by 47.96% of the respondents as one of the main causes of breast cancer. 44.34% said that higher level of certain hormone can also lower the risk. It had been found that least respondents knew that obesity (17.19%), alcohol consumption (19.91%), smoking (17.65%) and radiation (21.72%) can also cause breast cancer.

4.8 Menstruation Status

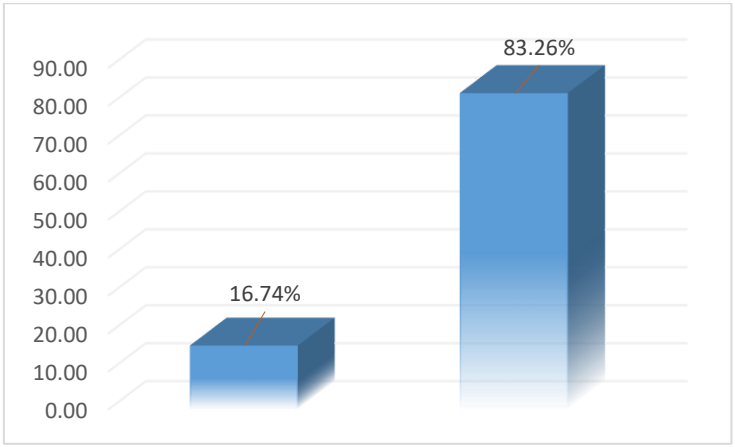

Figure 4.9: Menstruation Status of the Respondents

Among all the respondents, 83.26% had started menstruation at 12 years or above. Only 16.74% had started menstruation below 12 years. Starting menstruation younger than age twelve has a higher risk of breast cancer. It had been found that most of the respondents (74.21%) had no idea about this.

4.9 Radiation to chest or face

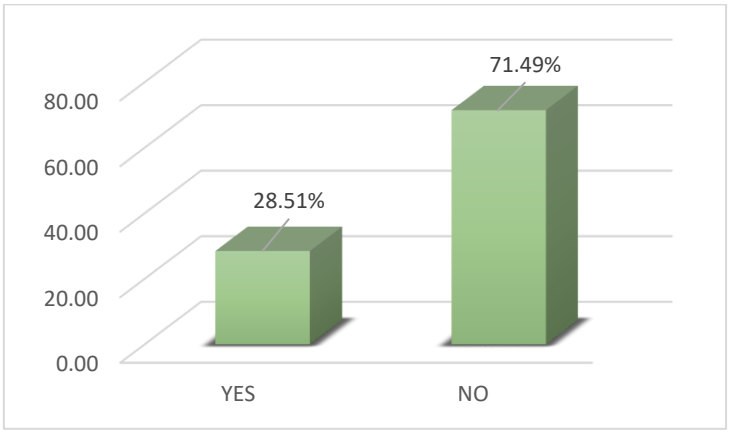

Figure 4.10: Radiation to chest or face

Among all the respondents, 71.49% had not ever come in contact with radiation to chest or face. Only 28.51% had come in contact with radiation.

4.10 Knowledge of activities that can less the risk of Breast Cancer

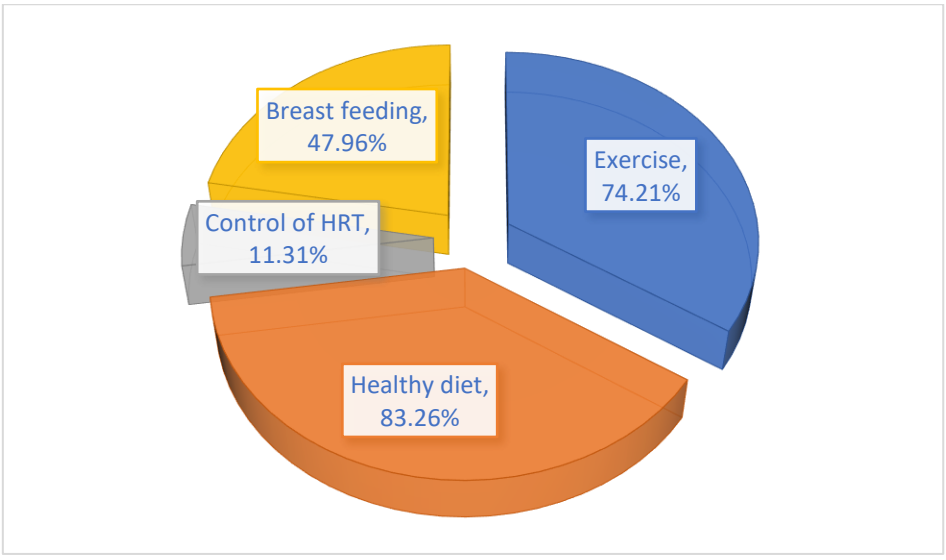

Figure 4.11: Knowledge of activities that can less the risk of Breast Cancer

According to respondent's knowledge, majority of the respondents (83.26%) thought that healthy diet can lower the risk of breast cancer. Rest of them thinks that exercise (74.21%), breast feeding (47.96%) and control of HRT (11.31%) can reduce the risk of breast cancer.

4.11 Knowledge of treatment of Breast Cancer

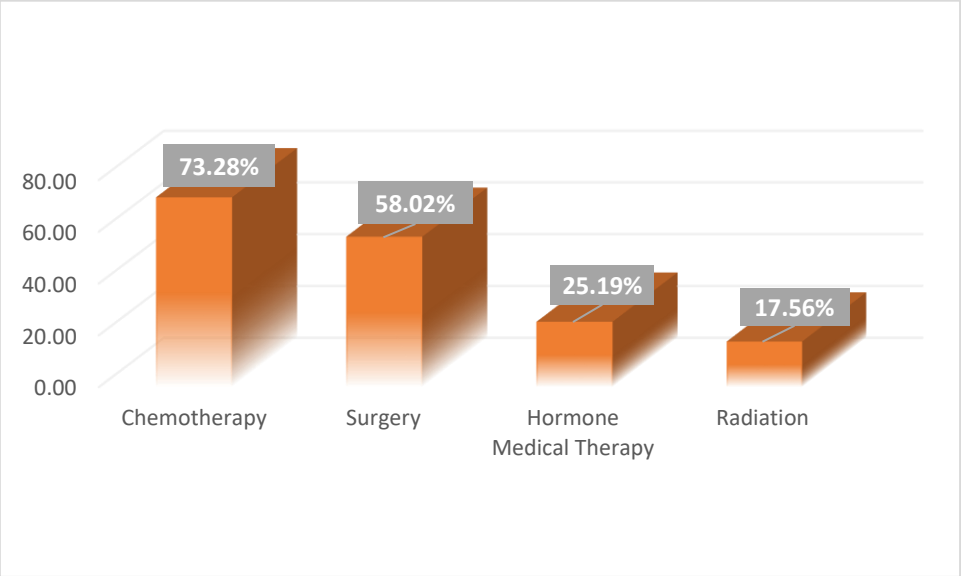

Figure 4.12: Knowledge of treatment of Breast Cancer

Among all the respondents, 59.28% had knowledge about the treatment of breast cancer. 40.72% had no knowledge about the treatment. Concerning treatment options for the disease most of the respondents (73.28%) identified chemotherapy; 58.02% identified surgery, 25.19% mentioned hormone medical therapy and 17.56% mentioned radiation among the 59.28% respondents.

4.12 Knowledge of early detection method of Breast Cancer

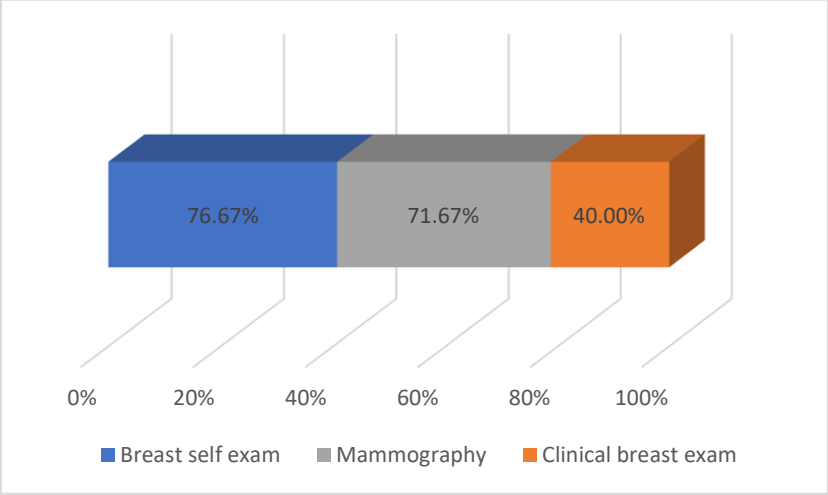

Figure 4.13: Knowledge of early detection method of Breast Cancer

Majority respondents (72.85%) had no idea about diagnosis of breast cancer. Only 27.15% respondents had idea about this. Among the respondents (27.15%) who had knowledge about diagnosis of breast cancer, 76.67% mentioned breast self-exam and 71.67% mentioned mammography for diagnosis. About 40% knew clinical breast exam for the diagnosis of breast cancer. Among the respondents who mentioned breast self-exam for the diagnosis of breast cancer, 51.67% said that they had the knowledge of performing breast self-exam. But no one had the proper knowledge at which age breast self-exam is started and how many times it is recommended. Among the respondents who mentioned mammography, no one had the knowledge at which age it is started and among them only 2 respondents confirmed the correct knowledge of recommendation time of mammography.

4.13 Frequency of taking nutritious food

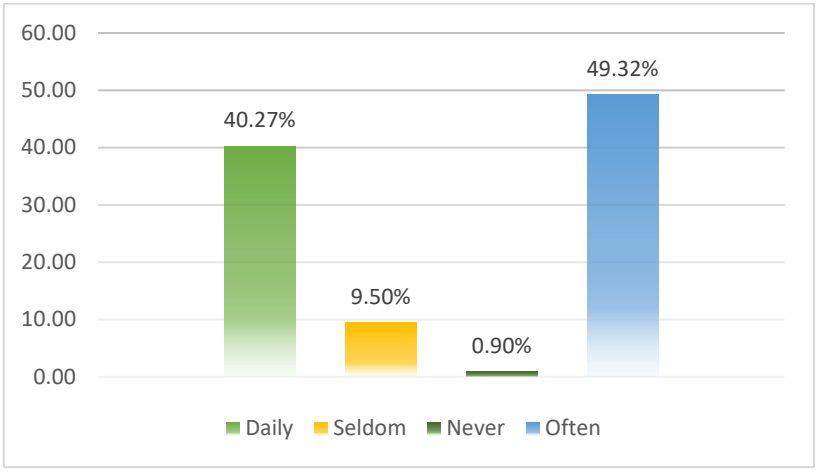

Figure 4.14: Frequency of taking nutritious food

Majority (49.32%) of the respondents took nutritional food often while 40.27% took daily, 9.50% took seldom and 0.90% never took nutritious food.

4.14 Frequency of doing physical exercise

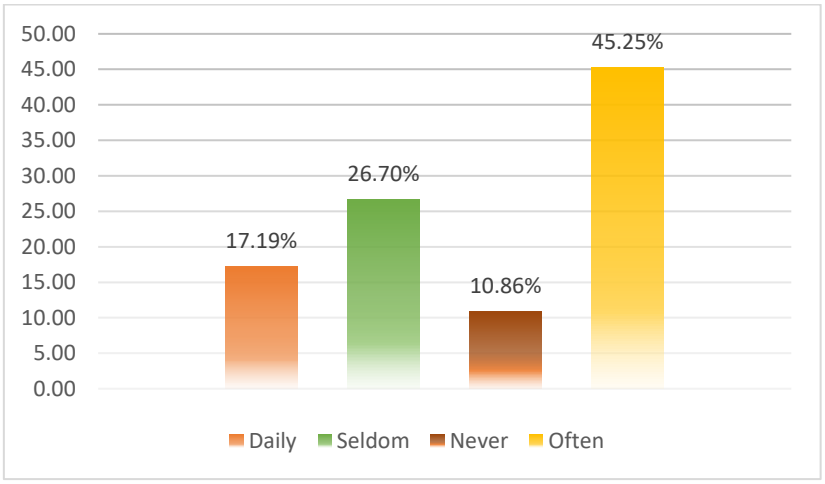

Figure 4.15: Frequency of doing physical exercise

Among the respondents only 17.19% did physical exercise on daily basis. The rest of 45.25% often, 17.19% seldom and 10.86% never did physical exercise.

4.15 Regular observation of breasts

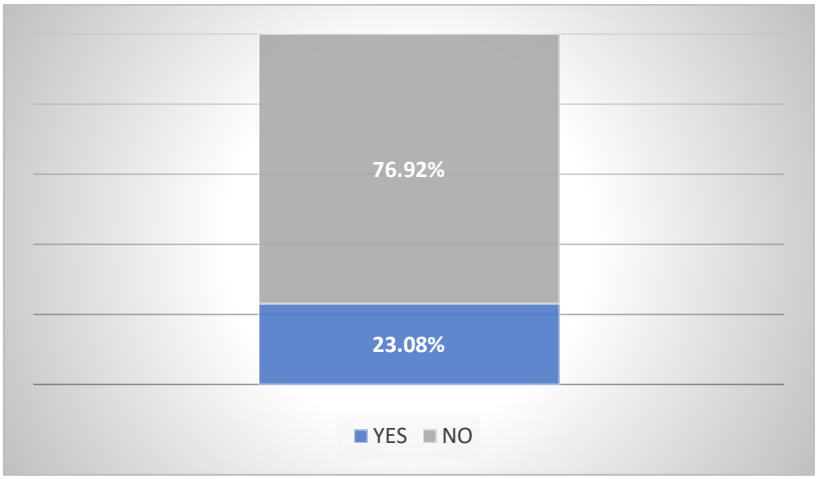

Figure 4.16: Regular observation of breasts

Breast cancer screening is a very important measure to minimize the risk of breast cancer. Most of the respondents (79.19%) had agreed with this phenomenon. A significant number of respondents (20.81%) did not know whether it was necessary or not. Among all respondents only 23.08% participants observed their breast change regularly. They knew about breast cancer but they were not aware about this matter. 89% had not ever attained an appointment for breast cancer screening. About 11% of the respondents do not know about this matter.

4.16 Measures after finding lump and emotional barriers

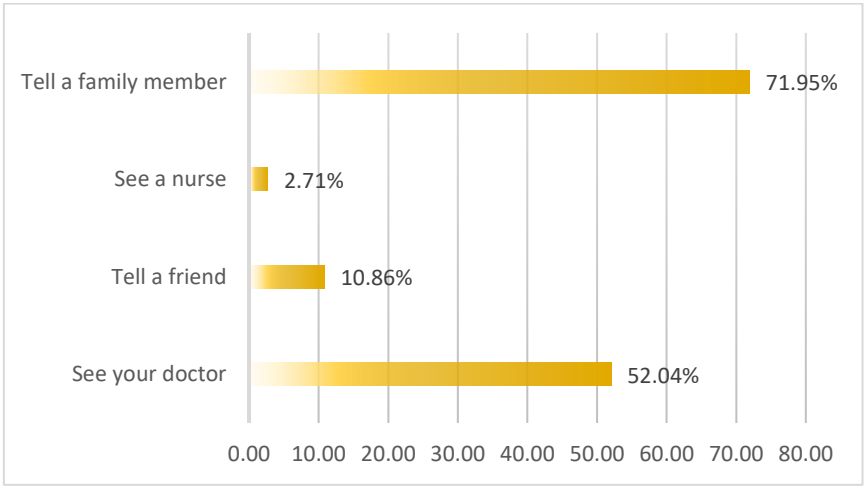

Figure 4.17: Measures after finding lump

Among all respondents, 52.04% participants will see a doctor after finding a lump or something, 71.95% participants will tell a family member, 2.71% will see a nurse and 10.86% will tell a friend. 48.87% of the respondents mentioned that they are too scared and worried about what the doctor might find and 43.44% of them are too embarrassed to go and see the doctor or not feeling confident talking about their symptom with the doctor.

CHAPTER 5

DISCUSSION

The majority of new breast cancer diagnoses and deaths occur in developing countries as opposed to Western countries. Breast cancer is now the leading cause of cancer-related deaths in women in the world's developing regions (Berry, 2017). The higher mortality rate has been attributed to a general lack of public awareness of the disease, coupled with limited screening programs which often results in late diagnosis of the disease even after it has already metastasized to other organs. For this, using a structured questionnaire, this study was conducted on 221 female university students from four different universities of Dhaka to assess their knowledge about breast cancer and BSE. Maximum respondents were undergraduate students (92.76%) and graduate and post-graduated represented only 7.24%. Most of them (90.50%) were single and they were aged between 20-28 years. A similar study conducted by Junaibi and Khan (2011) where 51% of the total students were post-graduate students and about 43% of the respondents were aged between 18-24 years.

All the respondents had knowledge about breast cancer and majority (68.33%) of the respondents had come to know about breast cancer from electronic media which is consistent with the study of Boulos and Ghali (2014) where majority (89.1%) of the students had acquired information about the disease from electronic media like television and/or radio. There are several signs and symptoms of breast cancer. Among the respondents, majority (57.01%) identified pain or discomfort in the breast or armpit that is not related to periods as the sign and symptom of breast and about 49.32% mentioned a new lump or thickening in one breast or armpit that is different to the rest of the breast which is lower than the results of similar study done in Oman (88.5%) (Junaibi & Khan, 2011). Only few people knew about changes in nipples and discharge or fluid from nipple, rashes as indicator of breast cancer.

The majority of students in this study showed a general lack of understanding of some of the common risk factors associated with breast cancer. Although some of these risk factors are not easily modifiable, others, such as the use of hormone replacement therapy (HRT), obesity, alcohol consumption, diet and physical inactivity can be altered in order to reduce risk. According to our study most of our respondents (68.33%) knew that family history or genetics is the main cause of breast cancer. Only 14% respondents had family history of breast cancer among whom most their aunty (54.84%) or cousin (22.58%). A similar result was found in the study conducted by Sharbatti *et al*. (2012) in which many participants correctly identified that a personal and family history of breast cancer was a risk factor and 9.2% had a family history of breast cancer. Our second majority respondents (47.96%)

indicated lack of breast feeding as one of the main risk factors of breast cancer. Another study conducted in Oman (Junaibi & Khan, 2011), reported no breast feeding (61%) as the most commonly known risk factor among respondents, which is higher than our finding. Although a significant number of respondents (74.21%) had no idea that start of menstruation at less than 12 years age is another risk factor of breast cancer, majority of them are in lower risk condition as 83.26% had their first menstruation at 12 years or older age. In the study of Junaibi & Khan (2011), about 50 % of the respondents were unable to recognize early onset of menses as the complex risk factor of breast cancer which is lower than our finding. Among the respondents, about 28.51% respondents came in contact of radiation to chest or face.

According to the respondents, control use of hormone replacement therapy (11.31%) is the best option to lower the risk of breast cancer. Only 83.26% knew the role of nutritious food in lowering the risk but majority of them (49.32%) takes those often which is a promising sign. Although only 74.21% identified that physical exercise can lower the risk of breast cancer but most of them (45.25%) often perform exercise.

It was found that most of the respondents (59.28%) had knowledge about the treatment options of breast cancer and surgery (58.02%), chemotherapy (73.28%), hormone medical therapy (25.19%) and radiation (17.56%) were identified by them. This is in contrast to the study conducted in South-South Nigeria (Onwusah *et al.*, 2017) where the respondents of the two universities respectively had excellent knowledge of surgery being a treatment option for breast cancer (92.8%, 92.8%) followed by radiation therapy (85.4%, 83.7%) and chemotherapy (85.2%, 78.7%).

In our study only 27.15% respondents knew about the early detection of breast cancer which is lower than the study results conducted in South-South Nigeria (Onwusah *et al.*, 2017). After 20 years of age breast self-examination is recommended to perform once in every month (Biomerica, 2016). Though all the respondents were aged 20 years or above, only 76.67% among those who were aware of early detection mentioned about breast self-examination. Moreover, none had the proper knowledge about how to perform BSE and at what age it should be started. On the other hand, from the age of 45 years mammography is recommended to perform once in every year and after 55 it is recommended for every 2 years (American cancer society, 2017). Only 2 respondents correctly mentioned the recommended time of mammography while they could identify as an early detection

method. None of the respondents had any detailed knowledge about clinical breast exam but 40% had heard of it. Knowledge about importance of breast cancer screening was high (79.19%) in the study population. But only 23.08% respondents reported to feel their breasts for changes and most of them (48.87%) were scared and worried about what the doctor might find; 43.44% felt embarrassed to go and see the doctor or not feeling confident talking about their symptoms with the doctor.

CHAPTER 6

CONCLUSION

Throughout the world as well as our country, number of breast cancer patient is increasing day by day. Breast cancer in women is a major health burden in Bangladesh. Results of this study showed that all of the women from four distinct universities of Dhaka heard about breast cancer but they did not have proper knowledge. Respondents were found having a moderate level of knowledge on the signs and symptoms, risk factors and treatment of breast cancer. But the knowledge about diagnosis of breast cancer was very poor. They agreed that breast cancer screening is important and many of them observed their breasts but they did not have the proper knowledge of performing breast self-exam. But they are in less risky position because without knowing they practice some factors such as physical exercise, intake of nutritious food etc. which lower the risk of breast cancer. Nevertheless, policy makers and health professionals are not that much concern about this alarming condition. This study recommends a greater focus on breast cancer education program to improve the knowledge and change misconceptions, as these are the basis for sound attitudes and behaviors of participants towards breast cancer awareness.

CHAPTER 7

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