ASSESSMENT OF THE AWARENESS OF THE IMPORTANCE OF MAMMOGRAPHY SCREENING AMONG FEMALE STAFF IN THE UNIVERSITY OF BENIN, EDO STATE NIGERIA

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CERTIFICATION/APPROVAL

This is to certify that this project with the topic**: ASSESSMENT OF THE AWARENESS OF THE IMPORTANCE OF MAMMOGRAPHY SCREENING AMONG FEMALES' STAFFS IN UNIVERSITY OF BENIN** was carried out by **EKHOMALOMEN KAREN EIYA** with matriculation number **BMS2001295** was carried out under my supervision

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(Head of Department) Signature and date

_____ _____

External examiner Signature and date

DEDICATION

To God Almighty, whose guidance and strength have been my source of inspiration throughout this academic journey, Finally, I dedicate this project to all women, especially those who have battled or are battling breast cancer.

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ABSTRACT

Breast cancer remains a major public health concern worldwide, with high mortality rates in low- and middle-income countries like Nigeria due to late-stage diagnosis and limited awareness. Mammography is a crucial screening tool for early detection, yet its utilization remains low among Nigerian women. This study assesses the level of awareness of the importance of mammography screening among female staff at the University of Benin, exploring the relationship between socio-demographic factors and screening uptake. A descriptive design was employed, utilizing the Health Belief Model as a theoretical framework. Data were collected from 306 female staff members through a structured questionnaire adapted from the Champion's Health Belief Model Scale. The findings reveal significant gaps in awareness and misconceptions about mammography, with over 50% of respondents unaware of its purpose. Socio-demographic factors, including age, education, and employment status, were found to influence awareness and utilization. Key barriers identified include fear of diagnosis, cost, cultural beliefs, and lack of time. The study highlights the urgent need for targeted educational campaigns and policy interventions to improve breast cancer screening uptake. These findings contribute valuable insights for public health strategies aimed at reducing breast cancer mortality among Nigerian women.

KEY WORDS: Mammography, Screening, Awareness, Utilization.

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Breast cancer (BC) is a pervasive disease that affects individuals of all ages and genders and is a leading cause of cancer-related deaths worldwide. According to recent global cancer statistics, breast cancer was the most prevalent form of cancer in 2020, with disproportionately higher mortality rates observed in low- to medium-income countries. Recently it has become the most frequently diagnosed cancer, with approximately 2.3 million new cases reported each year (Sung et al., 2021). Notably, breast cancer is relatively rare in women under the age of 40 accounting for only 4-6% of all cases worldwide (Johnson et al., 2018). Early detection of breast cancer is crucial for effective treatment and survival. To achieve this, women aged 40 and above should adopt a triple-pronged approach to breast health (American Cancer Society, 2015). This includes regular mammograms every one to two years, yearly clinical breast examinations by a healthcare professional, and self-examinations performed monthly. By doing so, women can identify potential breast abnormalities before symptoms arise, enabling prompt medical attention and improving prognosis. Therefore participating in breast cancer screening, such as mammography, significantly reduces the risk of breast cancer mortality for women between the ages of 40 and 74, compared to those who do not undergo screening. In many cases, the first indication of breast cancer is an abnormality visible on a mammogram, even before it can be detected through physical examination. While screening mammography has been instrumental in early detection and reducing breast cancer deaths, it has also led to a slight increase in the diagnosis of non-invasive cancers. (American Cancer Society, 2017).But it still remains the goal standard of breast cancer screening, despite being a long-established method. However, its availability remains limited, particularly in low-resource settings such as Nigeria

(Okobia et al., 2006). The level of awareness and utilization of these screening methods in Nigeria, as in most other developing countries is quite poor (Akhigbe et al., 2009).

In Nigeria, high mortality from breast cancer persists due to inadequate population awareness, poor health-seeking behaviour, low levels of female education and empowerment, and a poor health system leading to suboptimal treatment services (Copson et al., 2014). Research has shown that awareness of mammography varies globally. In Nigeria, only a small percentage of women (5%) who visit healthcare facilities know what mammography is (Elsie et al., 2010). Many factor affects people's knowledge and use of mammography screening in general. Research has shown that younger people and those with more education (Akhigbe et al., 2009; Ibrahim & Odusanya, 2009) are more likely to be aware of and use these services. Additionally, people with high socio-economic status tend to know more about and use screening services more often (Lee et al., 2010). Additionally, breast cancer cases in Nigeria have been rising steadily over the years, from 15.3 cases per 100,000 people in 1976 to 52.1 cases per 100,000 people in 2012 (Adebamowo et al., 1999; Jedy-Agba et al., 2012). Mammography is the only breast screening procedure for which empirical evidence exists to have significantly reduced breast carcinoma mortality by about 63% (Tabar et al., 2001). However, there are still challenges concerning its use such as costs, false positivity, and pain during the procedure, and risk of radiation exposure (Fletcher & Elmore, 2003). Breast cancer is not the only finding in mammography. There are numerous other pathologies ranging from benign to significant risk factors for the subsequent development of breast cancer such as Breast cysts and Fibro adenoma.

This study aims to assess the awareness of the importance of mammography screening among women above 40 at the University of Benin. Understanding these factors is crucial for developing effective strategies to improve breast cancer screening and early detection in Nigeria. By exploring the knowledge, attitudes, and practices of women in this age group,

this study seeks to identify areas for intervention and contribute to the reduction of breast cancer mortality in Nigeria.

1.2 Statement of the Problem

The breasts are considered accessory organs of the female reproductive system and several diseases can affect the breast including cancer, Breast cancer remains a significant public health challenge globally, with its prevalence on the rise, particularly in low- and middle-income countries such as Nigeria. It is the leading cancer affecting women, with 2.1 million new cases annually, and is responsible for 15% of all cancer-related deaths among women (WHO, 2019), and in Nigeria accounting for a staggering 22.7% of all new cancer cases, making it a significant public health concern that warrants attention, awareness, and action. (Globocan, 2018). Early detection through screening methods, notably mammography, is crucial in improving breast cancer outcomes and reducing mortality rates.

However, awareness and utilization of mammography among Nigerian women is alarmingly low. Numerous studies have indicated that a lack of knowledge, misconceptions about the procedure, cultural beliefs, and limited access to healthcare facilities contribute to this awareness gap. Despite the increasing burden of breast cancer in Nigeria, there is insufficient research focusing on the level of awareness and attitudes towards mammography among women in different regions of the country. This knowledge gap hinders the formulation of effective public health strategies and interventions aimed at promoting breast cancer screening. Therefore, this study seeks to investigate the level of awareness of mammography among women in Nigeria, identify factors influencing their knowledge and perceptions, and provide recommendations for enhancing breast cancer screening initiatives

1.3 Research Questions

1. What is the percentage of female staff in UNIBEN that have any knowledge of mammography?

2. What percentage of female staff in UNIBEN has done mammography screening tests since they clocked 40 years?

3. What is the perception of the female staff in UNIBEN towards mammography?

1.4 Hypothesis

· Null Hypothesis (H0): There is no significant association between awareness of mammography screening and participation in regular screening among female staff at the University of Benin.

· Alternative Hypothesis (H1): There is a significant association between awareness of mammography screening and participation in regular screening among female staff at the University of Benin.

1.5 Aim and objectives of the study

This study aims to assess the level of awareness of the importance of mammography screening among female staff at the University of Benin.

The specific Objectives include:

1. To determine the percentage of female staff in UNIBEN that has any knowledge of mammography.

2. To determine the percentage of female staff in UNIBEN who have done mammography screening since they clocked 40 years.

3. To determine the perception of female staff in UNIBEN members towards mammography.

1.6 Significance of Study

This study is significant as it seeks to evaluate the level of awareness among female staff at the University of Benin regarding the importance of mammography in the early detection and prevention of breast cancer. Given that breast cancer remains a leading cause of mortality among women, early diagnosis through screening methods like mammography is crucial for reducing morbidity and improving survival rates.

The findings of this study will help identify existing knowledge gaps, misconceptions, or barriers that may hinder the uptake of mammography services among educated women. Additionally, it will provide useful data to inform future health education programs, policy development, and awareness campaigns targeted at encouraging routine breast cancer screening, not only within the university but also in the broader Nigerian population.

1.7 Scope of the Study

This study focuses on assessing the awareness, perception, and utilization of mammography screening among female staff at the University of Benin, Ugbowo Campus, Edo State, Nigeria. The target population consists of 1,299 female staff members, from which a sample size of 306 was selected using a stratified random sampling technique. The study examines the socio-demographic factors (such as age, education, and income) that influence their knowledge and uptake of mammography.

It includes women aged 35 and above, as mammography is recommended for women 40 years and older, with consideration for those 35-39 years with a family history of breast cancer. Data collection is conducted through a structured questionnaire, adapted from the Champion Health Belief Model Scale (CHBMS), ensuring a theoretical framework for evaluating health beliefs and screening behaviours..

1.8 operational definitions of terms:

- Mammography: A medical imaging procedure for early detection and diagnosis of breast cancer, used as both a diagnostic and screening tool.
- Awareness: Knowledge and understanding of mammography screening among female staff at the University of Benin.
- Utilization: Engaging in regular mammography screening (at least once every two years) among female staff at the University of Benin**.**
- Socio-demographic factors: Characteristics of female staff at the University of Benin, including age, education level, occupation, and marital status.
- Perception: Women's interpretation of their barriers, benefits, and access to mammography screening services at the University of Benin.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Framework

This conceptual review aims to provide a comprehensive overview of the interplay between mammography, breast cancer, breast anatomy, and awareness, highlighting the factors that influence the uptake of mammography screening.

2.1.1 What Is Mammography

This is a radiographic technique using low-energy X-rays to produce a detailed image of the breast tissue, used for the detection and diagnosis of breast diseases, particularly breast cancer (Hoogeboom, 2018).

It allows radiologists to examine breast tissue for abnormalities, such as calcifications, masses, and other irregularities that could indicate cancerous or benign changes. This early detection tool is crucial for improving treatment success, especially as it can identify cancer in its more treatable stages.

There are two primary types of mammography and they are screening and diagnostic. Screening mammography is employed as a preventive measure for asymptomatic women, aiming to identify breast cancer in its early stages. This procedure typically involves capturing two or more X-ray images of each breast, enabling the detection of tumors that may not be palpable. Additionally, screening mammograms can reveal microcalcifications, which can be indicative of breast cancer. (National Cancer Institute, 2022)

Conversely, diagnostic mammography is utilized when symptoms or signs of breast cancer are present, such as a lump, breast pain, nipple discharge, or changes in breast size or shape. This type of mammogram is also employed to investigate abnormalities detected during screening mammography. Diagnostic mammography requires a more extensive examination,

resulting in a higher radiation dose and longer procedure time. (National Cancer Institute, 2022)

For this research, the primary focus is on screening mammography, emphasizing its role in early breast cancer detection and prevention.

Mammographic imaging involves positioning the breast on a flat support plate and applying compression using a parallel plate, known as a paddle. X-rays are then generated by an X-ray machine, traversing the breast tissue to reach a detector on the opposite side. The detector records the X-ray transmission, creating an image that can be either analog (film-based) or digital (electronic signals transmitted to a computer). Standard mammographic protocols typically involve capturing both craniocaudal and mediolateral oblique views of each breast, with additional views obtained as necessary to investigate suspicious areas. (National Institute of Biomedical Imaging and Bioengineering, 2022)

Imaging relies on the different absorption rates of X-ray photons by various breast tissues. This process is optimized when using low-energy X-ray photons. The image produced shows adipose (fatty) tissue as dark areas and glandular tissue as bright areas due to their differing compositions and densities. However, glandular tissue and carcinomas (cancerous tumours) have similar densities, making it challenging to differentiate between them. To overcome this, low-energy X-ray photons (10-20 keV) are used to enhance contrast and enable differentiation. If X-ray energies exceed 28 keV, the absorption rates of glandular tissue and carcinomas become indistinguishable, leading to poor image contrast and making it difficult to differentiate between cancerous and normal tissue. (Bushberg et al., 2002; Andolina & Lyllé, 2011).

2.1.2 Breast Anatomy and Classification

The female breast is an organ located on the front of the chest, spanning from the third to seventh ribs and from the sternum to the armpit (Balboni et al., 2000). Its volume, shape, and development vary with age, gland development, fat content, and endocrine stimulation. The fully developed breast is 'tear-drop' shaped, comprising external and internal components.

Externally, the breast consists of the nipple, areola, skin, inframammary fold, and Montgomery's glands (Hogg et al., 2015). Internally, it comprises glandular tissue (15-20 lobes), lactiferous ducts, lactiferous sinuses, terminal ductal lobular units, adipose tissue, superficial and deep fascia, retro mammary space, Cooper's ligaments, and blood vessels (Hogg et al., 2015).

Understanding external anatomy is crucial for positioning the breast for mammography, while internal anatomy is essential for assessing mammographic images (Hogg et al., 2015). Breast tissue has three densities: fatty, fibrous, and glandular (Lampignano & Kendrick, 2018), which can change due to medications, weight loss or gain, pregnancy, lactation, breast pathology, or age (Radswiki & Murphy, 2021). Most women have breast asymmetry, with varying size, shape, and position on the chest wall (Hogg et al., 2015).

Mammography reveals changes in breast composition through variations in breast density. Typically, younger women have a higher proportion of dense glandular tissue, whereas in older women, the density decreases as glandular tissue is replaced by fatty tissue. (Grainger et al., 2020)

The American College of Radiology (ACR) has established the Breast Imaging Reporting and Data System (BI-RADS) to classify breast tissue density into four categories based on parenchymal patterns. The BI-RADS scale categorizes breast density into:

(a) The breasts are almost entirely fatty

(b) There are scattered areas of fibro glandular density

(c) The breasts are heterogeneously dense

(d) The breasts are extremely dense.

2.1.3 Breast Cancer

Breast cancer is a complex and multifaceted disease characterized by the uncontrolled growth and division of cells in the breast tissue, leading to the formation of a lump or mass. The majority of breast cancers originate in the lobules or ducts of the breast. Notably, breast cancer often presents asymptomatically in its early stages, underscoring the importance of screening for timely detection. A painless lump is the most common physical indicator, while less frequent signs and symptoms include breast pain or heaviness, skin changes, and nipple alterations. The likelihood of developing breast cancer is significant, with approximately one in eight women expected to receive a diagnosis during their lifetime, making it the most prevalent cancer among women. (American Cancer Society, 2022).

The exact causes of breast cancer are still not fully understood, but research has identified various risk factors, including genetic mutations, hormonal imbalances, radiation exposure, and lifestyle choices (World Health Organization, 2022).

Global breast cancer incidence varies widely, and understanding these differences requires considering established risk factors, particularly age, which is the primary risk factor and peaks in the oldest age groups (Cancer Research UK, 2021)

Despite significant advances in breast cancer research and treatment, the disease remains a leading cause of cancer-related mortality among women. Early detection and diagnosis are critical for improving treatment outcomes and survival rates. Mammography screening,

clinical breast examination, and self-awareness are essential tools in the fight against breast cancer (American College of Radiology, 2022).

2.1.4 Mammography Screening

Breast cancer screening is a crucial component of early detection and diagnosis, enabling timely intervention and potential cure (Danford, 2013).

Breast self-examination (BSE), clinical breast examination (CBE), and mammography are the most commonly used breast cancer screening methods globally (Shah & Guraya, 2017; Coleman, 2017)

Mammography remains the gold standard for breast cancer screening (Breast Health Services, Johns Hopkins Medicine, 2020) and significantly decreases the risk of breast cancer mortality by 15%–56% (Mandrik et al., 2019). Screening aims to identify breast cancer before symptoms manifest, allowing for early treatment and improved prognosis.

However, in Nigeria and other African countries, most breast cancer cases are presented at an advanced stage, with over 70% of patients diagnosed with locally advanced or metastatic breast cancer (Adejumo et al., 2019; Awosefo et al., 2018). This late presentation is often attributed to inattention to breast cancer screening, among other factors.

Breast cancer can be detected during mammography screening, either asymptomatically or symptomatically. The American Cancer Society recommends annual mammograms for women aged 45-54 and biennial screening for those aged 55 and above (American Cancer Society, 2022).

Adherence to regular mammography examinations cannot be overemphasized, as it has been shown to cause a reduction in the risk of breast cancer mortality (Mittra et al., 2021).

The burden of breast cancer could be substantially reduced through the implementation of screening programs. However, Nigeria lacks a national breast cancer screening guideline, relying on international guidelines (Olesehinde et al., 2019).

While breast cancer screening improves disease prognosis, women may face barriers to accessing screening services due to lack of awareness, poverty, and limited access to healthcare.

2.1.5 Awareness and Utilization of Mammography Screening

Bridging the knowledge gap and promoting awareness are essential steps towards improving breast cancer screening and early detection, particularly in low- and middle-income countries where mammography utilization remains limited. As highlighted by Lawal et al. (2015), Olasehinde et al. (2019), and Okaliwe et al. (2020), mammography is a highly effective tool for early breast cancer detection, yet its use is hindered by several factors, including lack of knowledge, high costs, limited access to advanced technology, and a shortage of skilled professionals. This perpetuates a significant gap in breast cancer screening and early detection in these regions. As we strive to address these disparities, it is crucial to understand the role of awareness in promoting mammography uptake.

Awareness refers to having knowledge or understanding of a particular situation or fact or being informed and concerned about a specific issue (Lexico, 2019). Mammography is a highly effective tool for early breast cancer detection, yet its use remains limited in many low- and middle-income countries (Lawal et al., 2015; Olasehinde et al., 2019; Okaliwe et al., 2020). This highlights a significant gap in breast cancer screening and early detection in these regions. According to various authors, several factors contribute to the low utilization of mammography screening services, including a lack of knowledge about mammography, high costs, limited access to advanced technology, and a shortage of skilled professionals. Even

when mammography screening tools are available, women's participation in Nigeria remains low (Lawal et al., 2015). While there is limited research on the impact of socioeconomic factors on mammography uptake, socioeconomic status is known to significantly influence health services utilization and overall health outcomes (Akinyemiju et al., 2016; Ejemot-Nwadiaro et al., 2020). Knowledge and understanding of mammography are crucial for breast health. Research has shown that as women's educational levels increase, so does their utilization of mammography screening services (Alharbi et al., 2011; Erdem & Toktas, 2016). This highlights the importance of education in promoting awareness and use of breast imaging services. The high cost of mammography, combined with limited knowledge, may deter women from undergoing the test. In Nigeria, the cost of mammography varies significantly, ranging from 12,000 naira in public hospitals to 25,000 naira or more in private laboratories (Adejoro, 2020). This cost barrier may prevent many rural women, who often lack a steady income, from accessing this essential preventive health service. Enhancing awareness and understanding of mammography is crucial to improving utilization rates, particularly among underserved populations. Increasing knowledge and addressing barriers can promote breast cancer screening, early detection, and ultimately, better health outcomes.

2.1.6 Perception of Mammography Screening

Mammography screening, a crucial tool in the early detection and diagnosis of breast cancer, is often met with varying perceptions and attitudes among women. While some view it as a lifesaving technology, others may harbor concerns, fears, or misconceptions about the procedure.

Perception is the process by which we interpret and organize sensory information from our environment, enabling us to understand and interact with the world around us. (Goldstein, 2020), the perception of mammography screening is shaped by a complex array of factors,

including personal experiences, cultural beliefs, and societal influences. Some women may worry about the discomfort or pain associated with the procedure, while others may be anxious about the possibility of false positives or radiation exposure. Additionally, some may be unaware of the benefits and limitations of mammography screening or may have misconceptions about breast cancer risk factors. Understanding the perception of mammography screening is essential to address these concerns, promote informed decision-making, and encourage participation in regular screening. By exploring the attitudes and beliefs surrounding mammography screening, we can better understand the factors affecting the utilization of mammography screening and work towards improving health outcomes for women.

2.1.7 Importance and Benefits of Mammography Screening

Mammography screening is a vital tool in the early detection and diagnosis of breast cancer, playing a crucial role in saving lives and improving treatment outcomes. As a proven and effective screening modality, mammography has been widely recognized as a key strategy in the fight against breast cancer. The importance of mammography screening cannot be overstated, as it offers numerous benefits, including early detection of breast cancer, often before symptoms appear, improved treatment options and survival rates, reduced risk of advanced cancer and mortality, increased effectiveness of treatment, and enhanced peace of mind for women. Despite these benefits, many women fail to prioritize mammography screening, often due to a lack of awareness, misconceptions, or access barriers. As a result, breast cancer remains a leading cause of cancer deaths among women worldwide. This highlights the need for continued education, outreach, and access to mammography screening services, particularly in underserved populations. By emphasizing the importance and benefits of mammography screening, we can empower women to take control of their breast health and reduce the burden of breast cancer in our communities.

Research has shown that early detection of breast cancer through screening mammography can lead to earlier treatment and potentially reduced deaths from breast cancer among women aged 40-74, with the strongest evidence for women aged 50-69 (National Cancer Institute, 2022). This underscores the significance of promoting mammography screening among women in this age group, particularly those with significant family and career responsibilities. An estimated 30% of years of life lost due to breast cancer occurs in women diagnosed in their 40s (Oeffinger et al., 2015). While breast cancer incidence increases with age, the mortality benefits of screening are more pronounced in younger women. For example, annual screening in women in their 40s yields one year of life gained for every 20 women screened, compared to 45 women in their 70s who must be screened biennially to achieve the same benefit (Hendrick et al., 2014; Hendrick & Helvie, 2012).

Probably one of the most significant benefits of breast cancer screening is the reduction in treatment morbidity. The prognosis for breast cancer patients is significantly influenced by the stage of disease at diagnosis, with 5-year survival rates ranging from 99% for localized disease to 27% for distant metastatic disease (American Cancer Society, n.d.). As a result, the stage of disease also impacts treatment options, with more extensive disease requiring more aggressive surgery and radiation therapy (Saadatmand et al., 2015). Notably, women who do not undergo screening are more likely to undergo mastectomy, axillary node dissection, and chemotherapy compared to screened women (Ahn et al., 2018). By detecting cancer at an earlier stage, screening can substantially reduce the morbidity associated with breast cancer treatment, highlighting the importance of screening in reducing treatment-related complications.

2.1.8 Potential Harms of Mammography Screening

While mammography screening is a crucial tool in the early detection and diagnosis of breast cancer, it is not without its limitations and potential harms. As the National Cancer Institute (2022) highlights, the benefits of mammography screening must be weighed against the risks of overdiagnosis, overtreatment, false-positive and false-negative results, and radiation exposure. These concerns are particularly relevant for certain populations, such as older women, younger women with dense breasts, and those with a family history of breast cancer. As we strive to promote breast cancer screening and education, it is essential to acknowledge and address these potential harms, ensuring that women are fully informed and empowered to make decisions about their breast health.

One of the significant concerns surrounding mammography screening is the risk of overdiagnosis and overtreatment, which can have profound consequences for women's health and well-being. As noted by the National Cancer Institute (2022), screening mammograms may detect cancers that would not have caused symptoms or threatened a woman's life, leading to unnecessary treatment. Overdiagnosis is a significant concern in breast cancer screening, particularly among older women. Other potential harms include false-positive results, which can lead to additional testing, anxiety, and psychological distress, particularly among younger women, women with dense breasts, and those with a family history of breast cancer (National Cancer Institute, 2022). False-negative results can also occur, leading to missed breast cancers, delayed treatment, and a false sense of security, with a higher likelihood among younger women with dense breasts (National Cancer Institute, 2022). Furthermore, radiation exposure from repeated X-rays carries a low risk of causing cancer, and women should discuss the need for each X-ray with their healthcare provider (National Cancer Institute, 2022).

2.2 Empirical Review

Previous studies have explored various aspects of mammography awareness and participation, identifying a range of factors that influence screening rates. Research indicates that knowledge about breast cancer risks and the benefits of early detection strongly correlate with higher screening rates. However, socio-economic barriers, cultural beliefs, misconceptions about mammography, and logistical issues such as cost and accessibility often inhibit participation. In Nigeria, studies have shown that while awareness of breast cancer is relatively high, actual utilization of screening services remains low due to these barriers. By reviewing similar research within academic and urban environments, this study seeks to contextualize the specific awareness levels and challenges faced by female staff at the University of Benin, contributing valuable insights that can inform targeted interventions.

Mammography is a widely used screening tool for breast cancer, and its benefits and risks have been extensively debated. While mammography has been shown to reduce breast cancer mortality rates and improve early detection, it also carries potential risks such as false positives, false negatives, overdiagnosis, and radiation exposure. Understanding the benefits and risks of mammography is crucial for informed decision-making among women, healthcare providers, and policymakers.

According to a study published in Tunis Med (2020) by Khrouf et al., mammography screening has both benefits and harms. Using a review of 36 articles published between 2001 and 2018, the authors found that screening is associated with a reduced risk of breast cancer mortality, with an estimated reduction of 15-30%. However, they also found that the estimated rate of over diagnosis ranged from 0-50%, meaning that some women may be diagnosed with breast cancer who would not have gone on to develop symptoms or die from the disease. The authors highlight the complexity of the issue, emphasizing that the benefits

and harms of mammography screening are still being debated. They also note that individualized approaches to screening may be necessary to maximize benefits and minimize harms.

A randomized controlled trial conducted by Duffy et al. (2020) demonstrated the benefits of mammography screening in reducing breast cancer mortality in women aged 40-48 years. The study found a statistically significant 25% reduction in mortality from breast cancers diagnosed during the intervention phase at 10 years follow-up, with an absolute benefit of one death prevented per 1000 women screened. While the reduction in mortality was not sustained beyond the intervention phase, the study suggests that annual mammographic screening can lead to earlier detection and treatment of breast cancer, thereby reducing mortality.

A retrospective cohort study of 54,635 women aged 70 and older found that the cumulative incidence of breast cancer was higher among screened women compared to unscreened women, with an estimated 31% of cases potentially overdiagnosed among women aged 70-74. The overdiagnosis rate increased with age, with 47% of cases potentially overdiagnosed among women aged 75-84 and up to 54% among women aged 85 and older (30). Additionally, the study found no statistically significant reduction in breast cancer-specific death associated with screening. These findings suggest that mammography screening may lead to overdiagnosis and overtreatment in older women, highlighting the need for careful consideration of the benefits and harms of screening in this population. (Richman et al., 2023).

Mammography screening is an essential preventive measure for early detection of breast cancer. However, despite its proven efficacy, participation rates in screening programs vary widely across regions and populations, often influenced by multiple social, psychological,

and economic factors. Understanding these factors can aid in designing targeted interventions to increase screening uptake and reduce breast cancer mortality. Several studies across different countries provide insights into the complex interplay of beliefs, socio-demographics, and healthcare access in shaping women's awareness and participation in mammography screening.

Awareness of mammography among women in Nigeria is critically low, with only 5% of respondents having heard of the procedure, according to a study by Obajimi et al. (2017). The study, which surveyed 818 women attending outpatient clinics in Ibadan, South-West Nigeria, found that women with primary or secondary levels of education were less likely to be aware of mammography compared to those with tertiary education. Additionally, participation in community breast cancer prevention activities and previous clinical breast examinations were significant predictors of mammography awareness. The study highlights the need for targeted interventions to increase awareness of mammography among Nigerian women, particularly among the illiterate and older women. Clinicians performing breast examinations should utilize the opportunity to inform women about the mammography procedure, and promotional efforts should focus on educational articles via media to reach the literate population.

Okpaleke et al. (2022) investigated the perception of mammography examination among middle-aged women in public schools in Nnewi North Local Government Area, Nigeria. The study revealed that 84.8% of the respondents knew mammography, with social media being the primary source of information (84%). However, only 6.4% of the respondents had undergone mammography examinations, with tertiary education being a significant predictor of mammography uptake. The study highlights the need to address the barriers to mammography examination, including fear of breast cancer diagnosis, to increase uptake among middle-aged women in Nigeria.

A study conducted in Iran investigated the beliefs, fears, and awareness of women about breast cancer and their mammography screening practices (Emami et al., 2020). The study found that only 38.2% of women had undergone a mammogram within the last 24 months. The results showed that self-efficacy, susceptibility, motivation, and lower perceived barriers were associated with being screened. However, fatalistic beliefs and awareness towards breast cancer were not significant factors. This suggests that awareness alone may not be enough to drive mammography screening practices and that other factor such as self-efficacy and motivation may play a more important role.

A retrospective cross-sectional study conducted at Asokoro District Hospital in Abuja, Nigeria, examined the pattern of mammography utilization among women of childbearing age (Bassey et al., 2020). The study found that most women (94.9%) were referred for mammography by health workers, while only 5.1% self-referred. Additionally, 71% of women paid for mammography out-of-pocket, while 28.1% used the National Health Insurance Scheme (NHIS). Notably, all women who self-referred for mammography paid out-of-pocket. The study highlights the importance of healthcare provider referrals and funding options in accessing mammographic services.

A cross-sectional study conducted in Calabar, Nigeria, examined the association between socio-demographic characteristics and mammography uptake among women aged 40 years and above (EgomNja et al., 2022). The study found that only 9.9% of participants had undergone mammography, with the majority (90.1%) having never had one. Mammography uptake was highest among respondents with tertiary education, married women, civil/public servants, and those in the high-income level category. However, educational status, marital status, occupation, and age were not statistically significantly associated with mammography uptake ($p>0.05$). In contrast, religious denominational affiliation ($p=0.02$) and income level ($p=0.002$) were statistically significantly associated with uptake.

A study in Saudi Arabia investigated women's knowledge and attitudes towards mammography screening, revealing significant gaps in understanding. Many women lacked knowledge about breast cancer risk factors, such as early menarche, first pregnancy after 30, and late menopause. Furthermore, only 50.8% of women correctly identified mammography as the ideal method for detecting breast cancer. Personal barriers to screening included lack of information (69.5%), fear of radiation exposure (67.4%), and fear of discovery of breast cancer (62.9%). Economic barriers also played a role, with difficulty taking sick leave from work (40%) and the perceived cost of mammograms (37.8%) being significant concerns. Additionally, health system barriers such as fear of error in diagnosis (62.6%), long wait times for medical appointments (57%), and preference for doctor recommendations (52.7%) also hindered screening uptake. The study highlights the importance of addressing these barriers and improving women's education and income to increase the uptake of mammography screening (Aljouf et al.,2022).

A study conducted in Nigeria investigated the barriers to mammography screening in two communities with different access to screening facilities (Olasehinde et al., 2019). The study found that despite the availability of mammography services in one of the communities, uptake was extremely low, with only 2.8% of women in Ife Central Local Government and 1.8% in Iwo Local Government having undergone mammography. The most common reasons cited for not having mammography were lack of awareness, lack of perceived need, and cost. The study highlights the need for awareness creation and innovative measures to address the barrier of cost to improve breast cancer screening uptake in Nigeria.

A study conducted among 1353 Jordanian women assessed their knowledge, attitude, and practice regarding breast cancer and mammography screening (Al-Mousa et al., 2020). The results showed that while most participants were aware that breast cancer is the most common cancer among women in Jordan, their knowledge of risk factors, signs and

symptoms, and early detection methods was limited. Specifically, 53.7% of participants had an intermediate level of knowledge regarding risk factors, and 44% had a good to excellent level of knowledge about breast cancer signs and symptoms. The participants' level of education was the main factor influencing their knowledge, and their participation in mammography screening was low, despite having an intermediate level of knowledge regarding this screening method. Overall, the study highlights the need for targeted education and awareness programs to improve breast cancer knowledge and screening practices among Jordanian women.

The uptake of mammogram screening in Malaysia is a topic of interest, and a systematic review aimed to summarize the trend of mammogram screening uptake among Malaysian women aged 40 years and above, between 2006 and 2015 (Aidalina & Syed Mohamed, 2018). The review found that the rate of mammography uptake ranged from 3.6% to 30.9% among the general population, and 80.3% among personnel of a tertiary hospital. Factors associated with mammogram screening included clinical breast examination, age, income, knowledge of breast cancer and mammograms, perceived susceptibility to breast cancer, ethnicity, and education level. However, barriers to mammogram screening included lack of knowledge, embarrassment, fear of cancer diagnosis, the perception that breast screening was unnecessary, lack of coping skills, and pain during the procedure. The review highlighted the limitations of the studies, including limited generalizability and self-reported data, and identified research gaps.

Breast cancer screening practices among female health workers in Nigeria are critically low, with mammography utilization rates lagging behind global standards. A recent study by Omisore et al. (2022) sheds light on the current state of mammography screening practices and perceptions among Nigerian female healthcare practitioners. Using a cross-sectional online survey of 562 respondents, the authors found that only 15.4% of respondents had

undergone mammography screening, with the majority having their first mammography long after attaining the age of eligibility. Notably, only 24.8% of tertiary health workers had access to functional mammography machines at their place of work, and the majority of female doctors (78%) never referred eligible patients for mammography, despite being willing to do so. These findings highlight the need for targeted interventions to increase mammography uptake and reduce breast cancer mortality in Nigeria.

A cross-sectional study conducted among female employees of King Saud University in 2015 aimed to assess mammography uptake, identify obstacles and barriers, and determine effective sources of breast-cancer-related information (Al-Shammari et al., 2017). The study found that among 229 participants, 51.5% had undergone mammography, with age, education, and marital status being significant predictors. However, multivariate analysis revealed that earlier age was associated with a lower rate of mammography uptake. The main obstacle was ineligibility criteria (21.8%), while awareness campaigns, television, and radio were the primary sources of information (45.4% and 43.7%, respectively). The study concluded that mammography uptake and awareness were low, emphasizing the need for earlier detection and increased awareness to improve breast cancer mortality rates in Saudi Arabia.

According to Duong et al. (2020), mammography screening behavior among rural Vietnamese women is influenced by various factors. In their predictive correlational study of 120 women aged 40 and above, conducted in the suburbs of Hanoi, Vietnam, they found that only 16.7% of participants had undergone mammography screening. The authors identified high education levels, high monthly family income, having family members or friends with breast cancer, and receiving physicians' recommendations as significant predictors of mammography screening behavior.

Using the Breast Cancer Awareness Measurement and the Champion Health Beliefs Model Scale, the researchers discovered that perceived susceptibility and perceived barriers significantly differed between participants who had and those who had not undergone screening. Specifically, perceived barriers were the most significant predictors of screening behavior, The study's findings highlight the importance of addressing perceived barriers to increase mammography screening rates among rural Vietnamese women. As Duong et al. (2020) suggest, efforts are necessary to promote mammography awareness in the community and increase screening rates in Vietnam.

2.3 Theoretical Framework

Mammography screening is a crucial tool in the early detection and prevention of breast cancer. Despite its importance, many women do not undergo regular mammography screening. This theoretical framework aims to understand the health beliefs and behaviors associated with mammography screening among women.

The theoretical framework for this study is the Health Belief Model (HBM), which explains health behaviors. The Champion's Health Belief Model Scale (CHBMS) was adapted from the original HBM to specifically investigate breast cancer screening behaviors and beliefs (Champion, 1999). This scale has been used in various studies, including Lawal et al. (2017), to explore breast cancer screening behaviors and beliefs. For this study, the CHBMS was adapted in the questionnaire to assess the awareness of the importance of mammography among female staff at the University of Benin.

2.3.1 Health Belief Model (HBM)

The Health Belief Model (HBM) is a framework developed in the 1950s by social psychologists within the U.S. Public Health Service to understand and predict individuals' health-related behaviors, especially regarding disease prevention.

The Health Belief Model (HBM) provides a framework for understanding how individuals' beliefs influence their health behaviors (Champion & Skinner, 2008). The Champion's Health Belief Model Scale (CHBMS) was originally developed to explain breast self-examination behavior in the US, with subscales including perceived susceptibility, seriousness, benefits, barriers, and health motivation (Champion, 1984). The scale evolved, with the addition of a confidence subscale for women's BSE in 1993 (Champion, 1993) and a revision in 1999 to account for the growing use of mammogram screening (Champion, 1999). The revised CHBMS-BC consists of three subscales: perceived susceptibility, perceived benefits, and perceived barriers, which help explain mammogram screening utilization (Champion, 1999). Logically, women who perceive themselves as more susceptible to breast cancer and recognize the benefits of screening are more likely to participate in screening programs, whereas those who perceive more barriers are less likely to do so (Champion, 1999). The HBM remains a prominent model in behavioral health research, widely used to predict health-promoting behaviors (Bay et al., 2017; Farajzadegan et al., 2016; Sari, 2018). The model proposes six key constructs that influence behavior: perceived severity, perceived susceptibility, perceived benefits, perceived barriers, cues to action, and self-efficacy (Dadipoor et al., 2017; Morowatisharifabad et al., 2018; Tafti et al., 2018).

These components influence an individual's likelihood of engaging in health behaviors, including mammography screening.

Research has also applied the Health Belief Model to understand breast cancer screening behaviors among Saudi women (AlJunidel et al., 2020). This study found that younger age, marital status, and family history of breast cancer were associated with mammography screening and that knowledge and motivation factors played a role in predicting screening behaviors.

2.3.2 Constructs of the Health Belief Model

Perceived Susceptibility

Perceived susceptibility is an individual's assessment of their risk of developing a disease. When a person feels they are at high risk for a particular health issue, they are more inclined to take action to prevent it (Marmarà et al., 2017; Wang et al., 2014), For breast cancer, risk factors include gender, family history, alcohol consumption, obesity, and age (Manika & Gregory-Smith, 2017; Agbonifoh, 2016; Johns & Moyer, 2018). Thus, women who believe they are susceptible to breast cancer are more likely to participate in screening. Women's perceptions of their susceptibility to breast cancer play a significant role in their likelihood of undergoing mammography screening.

Perceived Severity

Women's perceptions of the severity of breast cancer also impact their likelihood of undergoing mammography screening. Knowledge of breast cancer outcomes and personal experience with breast cancer may influence perceived severity.

Perceived severity refers to an individual's assessment of the seriousness of a disease and its potential consequences. These consequences might include disability, chronic treatment, mental health impacts, financial burdens, or mortality (Cal & Bahar, 2018; Chin & Mansori, 2018a; Dadipoor et al., 2017). If a person perceives a health threat as severe, they are more likely to engage in preventive behaviors to reduce that threat. In the context of breast cancer, women who believe the consequences of the disease are severe may be more inclined to undergo screening.

Perceived Benefits

In HBM, perceived benefits refer to the positive outcomes that individuals expect from engaging in a health-promoting behavior (Akhondali et al., 2015; Soriano et al., 2018). If a person anticipates beneficial results from their actions, they are more likely to pursue those actions (Darvishpour et al., 2018; Figueiredo et al., 2017). Women's perceptions of the benefits of mammography screening, such as early detection and treatment, influence their likelihood of undergoing screening. Knowledge of mammography effectiveness and recommendations from healthcare providers may influence perceived benefits.

Perceived Barriers

Perceived barriers encompass the obstacles that discourage individuals from engaging in preventive behaviors. These can include inconvenience, cost, limited access to information, and fear of the unknown (Dadipoor et al., 2017; Ganga et al., 2018; Tafti et al., 2018; Viviana et al., 2018). In the context of breast cancer, cultural beliefs and social stigma may create additional barriers, as some women resist discussing breast cancer or mistakenly attribute its causes to external factors such as their living environment (Chin & Mansori, 2018b; Tweneboah-Koduah, 2018), Other barriers to breast screening may include fear of diagnosis, misconceptions about screening procedures, and low perceived susceptibility (Magnan et al., 2017; Stacey et al., 2016; Van Der Heijden et al., 2017), Addressing these barriers is crucial to increasing mammography screening rates.

Cues to Action

In HBM, cues to action are the triggers that prompt individuals to adopt health-promoting behaviors (Francis et al., 2018; Hisam et al., 2018; Tamayo et al., 2018). These cues can be internal, such as physical symptoms, or external, such as information from media or health campaigns. For example, a woman noticing changes in her breast (like a lump or skin

changes) might be spurred to seek screening. Similarly, reminders from media or family members can serve as cues, increasing the likelihood of preventive action.

The effectiveness of cues to action depends on factors such as source credibility and message framing.

Self-Efficacy

Women's confidence in their ability to undergo mammography screening or self-efficacy, also plays a role in their likelihood of doing so. Past experiences with mammography and social support may influence self-efficacy.

This sense of efficacy, supported by HBM, further empowers women to take action (Gall & Bilodeau, 2018; Lee et al., 2018; Morowatisharifabad et al., 2018)

For breast cancer, if a woman knows that early detection significantly increases survival rates, this understanding aligns her beliefs and attitudes with preventive behavior. With the right knowledge, her self-efficacy the belief in her capability to undertake breast screening increases (Mama et al., 2015; Pope et al., 2018; Stacey et al., 2016).

In conclusion, the HBM provides a valuable framework for understanding the theoretical factors that influence mammography screening behaviors among women. By addressing these factors, healthcare providers and public health campaigns can increase mammography screening rates and ultimately reduce breast cancer mortality.

2.4 Summary

The literature review highlights the critical role of mammography in the early detection and management of breast cancer, underscoring the potential to significantly reduce mortality rates through timely intervention. While mammography screening is recognized as the gold standard for breast cancer detection, numerous studies indicate that awareness and utilization

remain low, especially in low- and middle-income countries like Nigeria. Factors such as cost, limited access to healthcare, cultural beliefs, and lack of education about breast cancer screening contribute to the low uptake of mammography services.

The Health Belief Model (HBM) serves as a valuable framework for understanding the underlying factors that influence mammography behavior. Constructs such as perceived susceptibility, perceived severity, perceived benefits, and perceived barriers offer insights into how women view their risk of breast cancer and the potential impact of early screening. Additionally, cues to action and self-efficacy highlight the importance of external support systems and individual confidence in influencing screening behavior. Together, these constructs illustrate the complex interplay of psychological and social factors that affect mammography awareness and utilization among women.

Empirical studies reviewed indicate that awareness alone may not be sufficient to drive participation in mammography screening programs. Education, social support, and targeted health campaigns are necessary to address both informational gaps and misconceptions about breast cancer and screening practices. Moreover, economic and healthcare barriers, particularly in underserved communities, need to be addressed to ensure equitable access to mammography.

This chapter establishes a foundational understanding of the factors affecting mammography awareness and utilization, providing a basis for further exploration of these issues among female staff at the University of Benin. By identifying and addressing the specific barriers and facilitators within this population, targeted interventions can be developed to improve mammography uptake and, ultimately, support early breast cancer detection and better health outcomes.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Setting

The research setting is the University Of Benin (UNIBEN) Ugbowo campus which is a public university located in Benin City, Edo State, Nigeria

3.2 Research Study Design

This study employed a Descriptive Research Design, using a quantitative approach. The study utilized a survey questionnaire as the data collection tool to examine the relationships between variables, specifically the awareness of mammography screening, perception, socio-demographics, and mammography utilization among female staff.

3.3 The Population of the Study

The research population includes female staff employed at the University of Benin.

3.4 Inclusion Criteria and Exclusion Criteria

The research study included females 35 years of age and above, that are employed in the University of Benin.

The research study excluded the following categories of staff:

1. All females younger than 35 years of age. This is because mammography is recommended for females above the age of 40 and all females between the age of 35 - 39 years with a positive maternal history of breast cancer.
2. All males employed by the University as the researcher are interested in the female population due to the research problem. Further, due to rare incidences of male breast cancer, studies have focused on females.

3.5 Sample and Sampling Techniques

A stratified random sampling technique was used to select a representative sample from a finite population of 1299. The total sample size was calculated using the TARO YAMANE'S population formula(Yamane, 1967):

$n = N / (1 + (N \times e^2))$

$n = 1299 / (1 + (1299 \times 0.05^2))$

$n = 1299 / (1 + (1299 \times 0.0025))$

$n = 1299 / (1 + 3.2475)$

$n = 1299 / 4.2475$

$n \approx 306$

This resulted in a total sample size of 306. The stratum sample sizes were then calculated using the formula:

$n_i = (N_i / N) \times n$,

- n_i = sample size for stratum i
- N_i = population size for stratum i
- N = total population size
- n = total sample size

This resulted in stratum sample sizes ranging from 8 to 44. Both formulas ensured a representative sample was selected from each stratum, allowing for accurate population inferences.

Table 3.1: Sample Distribution Across Faculties

S/N	SCHOOLS AND FACULTIES	POPULATION OF FEMALE STAFFS	SUB GROUP SAMPLE SIZE
1	AGRICULTURE	86	20
2	ARTS	68	16
3	DENTISTRY	36	8
4	EDUCATION	151	36
5	ENGINEERING	98	23
6	ENVIRONMENTAL SCIENCES	50	12
7	LAW	62	15
8	LIFE SCIENCES	185	44
9	MANAGEMENT SCIENCES	97	23
10	PHARMACY	53	12
11	PHYSICAL SCIENCES	69	16
12	SCHOOL OF BASIC MEDICAL SCIENCES	107	25
13	SCHOOL OF MEDICINE	112	26
14	SOCIAL SCIENCES	93	22
15	VETERINARY MEDICINE	32	8
	TOTAL	**1299**	**306**

3.6 Instrument for Data Collection

The instrument used for data collection in this study was a structured survey questionnaire,(see APPENDIX I) adapted from the Champion's Health Belief Model Scale (CHBMS) (Pillay, 2021). The CHBMS is a validated and reliable instrument developed by Dr. Victoria Champion to assess beliefs about breast cancer and breast self-examination. This questionnaire was modified to suit the study's objectives, focusing on mammography awareness, perception, and utilization among female staff at the University of Benin.

A paper-based (hard copy) questionnaire was administered. One of the primary advantages of using paper surveys is their higher response rates compared to online surveys (Nulty, 2008).

The questionnaire consisted of three sections:

- Section A: Demographic characteristics, including age, educational background, and marital status.
- Section B: Knowledge of mammography and breast cancer, assessing participants' understanding of screening practices.
- Section C: Awareness and utilization of mammography, including screening practices and perceived barriers to mammography screening.

3.7 Validity of The Instrument

To ensure the accuracy, validity was assessed. Due to the large population sample size, a questionnaire was the most feasible method for data collection. Although self-reported responses may vary depending on participants' states of mind, the inclusion of an information sheet explaining the study's purpose aims to encourage honest and truthful answers. The Champions Health Belief Model Scale, revised in 1998 with an internal validity range of 0.75 to 0.88, will be adapted for this study. Additionally, the questionnaire was reviewed and approved by my supervisor, the HOD of the Radiography Department, to further ensure its validity and relevance.

3.8 Method of Data Collection

A sample size of 306 female staff was drawn from a defined population using a stratified random sampling technique, The population was divided into subgroups (strata) based on faculties, A random sample was selected from each stratum to ensure fair representation ,The data collection process lasted approximately one month, Completed surveys were personally retrieved and submitted to the statistician for data analysis.

The data collection process involved the personal administration of paper-based questionnaires to selected participants at the University of Benin. Before distribution, the purpose of the study and questionnaire was clearly explained to each respondent to ensure

they understood its significance. Additionally, I was available to assist participants with any areas of confusion.

This stratified sampling method, combined with direct administration and guidance, ensured a high response rate, improved accuracy in responses, and enhanced the reliability and generalizability of the findings.

3.9 Method of Data Analysis

Data analysis was performed using SPSS version 21. Descriptive statistics (frequencies, percentages) and graphical representations (pie charts, bar charts) were used to summarize the data. Likert scales measured attitudes and opinions, while chi-square tests examined relationships between categorical variables.

3.10 Ethical Consideration

In conducting this research, we are committed to upholding high ethical standards. To ensure the well-being and privacy of our participants, i Obtained informed consent from all participants before distributing the questionnaire, ensuring they understand the purpose of the study, Guaranteed confidentiality and anonymity in handling data, ensure that participants' identities are protected and data is stored securely, Pursued ethical approval from the University of Benin's Review Board, ensuring that our research protocol meets the highest ethical standard.(APPENDIX II)

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Presentation of Results

This section presents the findings of the study based on data collected from 306 female staff members of the University of Benin. The results are organized and analysed to provide insights into the awareness, perception, and utilization of mammography screening. Tables and figures are used to illustrate key patterns, and discussions follow each result to highlight relevant implications.

4.1.1demographic Characteristics of Respondents

Understanding the demographic distribution of respondents is essential in assessing factors that influence mammography awareness and utilization. The tables and figures below provide insights into the respondents' age, ethnicity, marital status, employment type, income level, educational qualification, and job category.

Table 4.1 Showing Age Distribution, Ethnicity and Marital Status of Respondents.

AGE	**FREQUENCY**	**PERCENTAGE**
<35YRS	54	17.6
35-39YRS	57	18.6
40-49YRS	56	18.3
50-59YRS	41	13.4
60-65YRS	50	16.3
66YRS AND ABOVE	48	15.7
TOTAL	306	100.0
ETHNICITY	FREQUENCY	PERCENTAGE
EDO ETHNIC GROUPS	112	36.6
IGBO	68	22.2
YORUBA	59	19.3
HAUSA	46	15.0
TIV	21	6.9
Total	306	100.0
MARITAL STATUS	FREQUENCY	PERCENTAGE
SINGLE	73	23.9
MARRIED	233	76.1
Total	306	100.0

The table shows that respondents are fairly distributed across different age groups. The majority fall within the 35-39 years (18.6%) and 40-49 years (18.3%) age categories. Additionally, 32% of respondents are aged 50 and above, which is a significant age group for mammography screening. The least represented age group is those below 35 years (17.6%). The table presents the ethnic composition of the respondents, revealing that the Edo ethnic group constitutes the majority (36.6%), followed by the Igbo (22.2%) and Yoruba (19.3%) ethnic groups. The Hausa (15%) and Tiv (6.9%) are less represented. This distribution

suggests that the study predominantly reflects the views of the Edo ethnic group. A large majority of respondents (76.1%) are married, while 23.9% are single. This marital distribution could influence health-seeking behaviors, as married women may have more motivation or encouragement to undergo preventive health screenings like mammography.

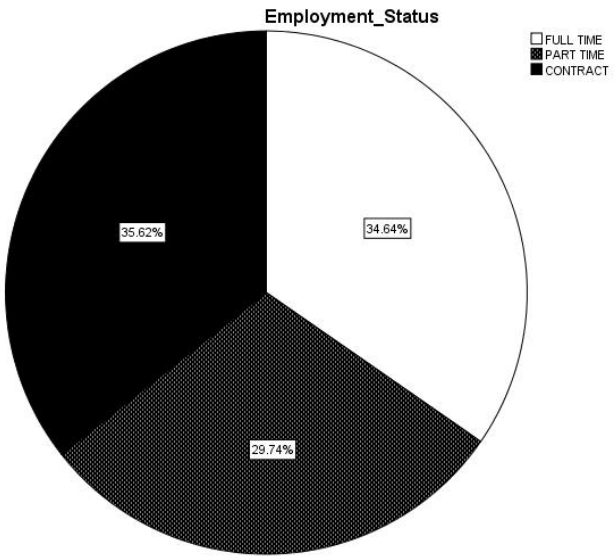

Fig 4.1: Pie Chart Showing Percentage of Employment Status.

The chart indicates that 35.64% of respondents are full-time employees, while 29.74% are part-time staff, and 34.62% are on contract employment. The dominance of full-time employment suggests stable job security, which may influence access to healthcare services, including mammography.

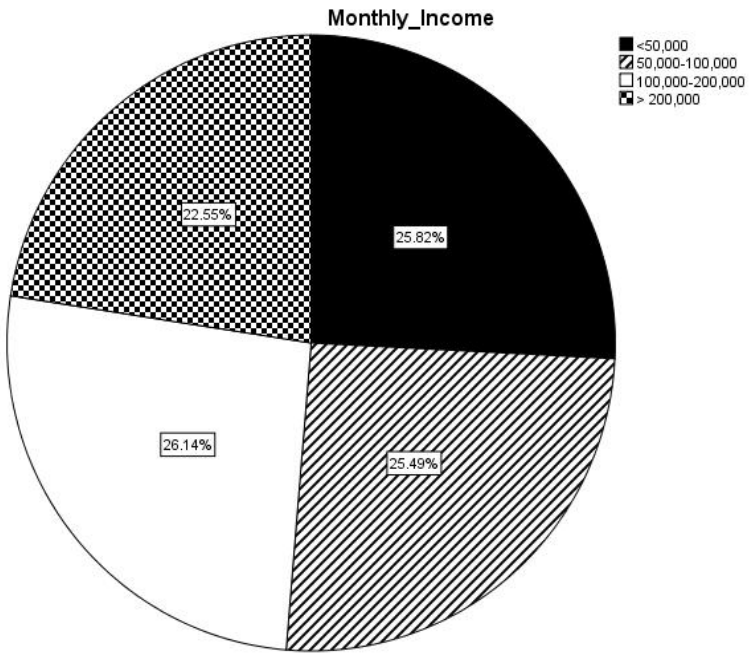

Fig 4.2: Pie Chart Showing Percentage of Monthly Income of Respondents.

This figure reveals the income distribution of respondents. 25.82% earn between ₦50,000 - ₦100,000, while 25.49% fall within the ₦100,000 - ₦150,000 range. A smaller proportion, 22.55%, earn below ₦50,000, and 26.14% earn above ₦150,000. This distribution suggests that while some respondents may afford mammography, financial constraints could be a barrier for lower-income earners.

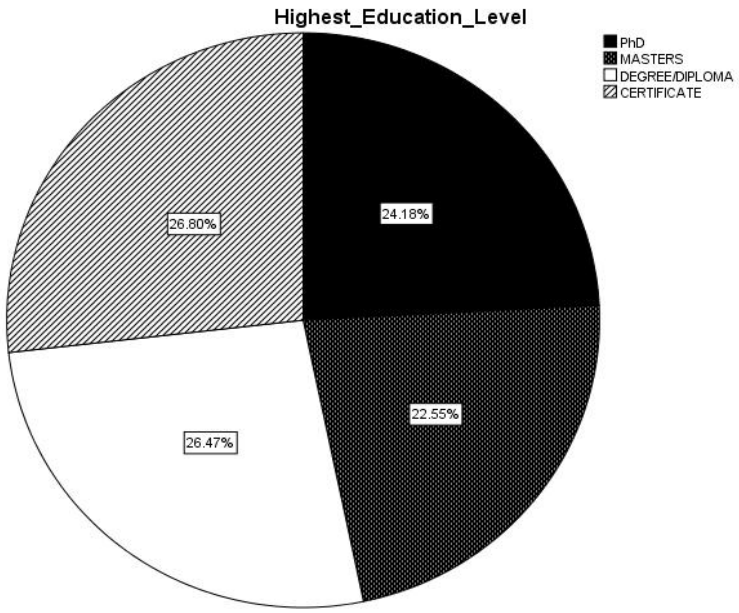

Fig 4.3: Pie Chart Showing Percentage of the Educational Qualification of Respondents.

The figure illustrates respondents' educational backgrounds. 26.47% hold a degree or diploma, while 26.80% possess a certificate qualification. Additionally, 24.18% have a master's degree, and 22.55% hold a PhD. Education level is a critical factor influencing knowledge, perception, and willingness to engage in preventive healthcare like mammography. .

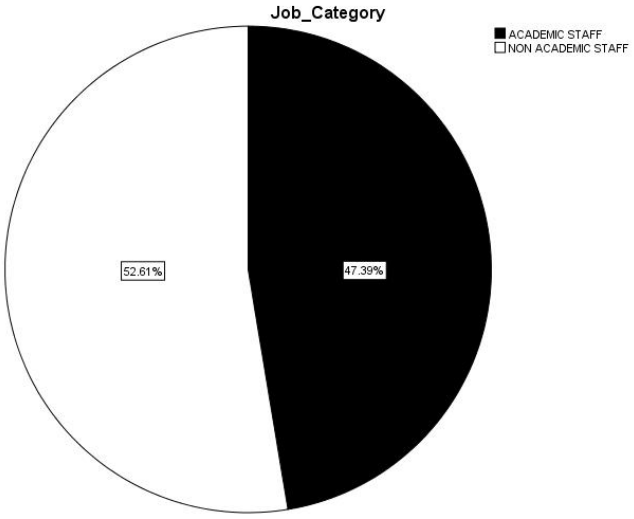

Fig 4.4: Pie Chart Showing Percentage of Job Category Of Respondents

The pie chart shows the distribution between academic and non-academic staff. 52.61% of respondents belong to the non-academic category, while 47.39% are academic staff. The difference is slight, suggesting that both groups have relatively equal access to health information and screening services.

4.1.2 Awareness of Mammography

Awareness is a critical factor in mammography uptake, as knowledge of screening services influences participation. This section evaluates respondents' familiarity with mammography and their sources of information.

Table 4.2: Respondents Indication to Knowledge of Mammography And Source of Information.

ITEM	RESPONSE	FREQUENCY	PERCENTAGE
HEARD OF MAMMOGRAPHY	YES	145	47.4
	NO	161	52.6
SOURCE OF INFORMATION	HEALTH PROVIDER	67	21.9
	MEDIA	65	21.2
	INTERNET/SOCIAL MEDIA	64	20.9
	FRIENDS/FAMILY	50	16.3
	EDUCATIONAL INSTITUTION	60	19.6

The data reveals that 52.6% of respondents have never heard of mammography, while 47.4% have, the leading sources of information were healthcare providers (21.9%) and media (21.2%), Social media (20.9%) is an emerging source of health information among respondents.These findings indicate the need for improved awareness campaigns using trusted sources.

Table 4.3: Respondents Response on Knowledge, Awareness and Utilization of Mammography.

ITEM	SA	A	N	D	SD	MEAN	Σ
Mammograms Detect Cancer	57	75	54	60	60	2.97	1.40
Regular Mammography Screening	75	62	56	37	76	2.92	1.51
Mammography Reduces Advanced Cancer	71	49	72	57	57	2.93	1.42
Knowing About Mammography Increases Screening	62	62	61	65	56	2.97	1.40
Fear of Pain Prevents Mammogram	65	57	56	57	71	3.04	1.46
Belief Knowledge Leads to Screening	63	68	65	59	51	2.89	1.37
Awareness Programs Influence Screening	62	56	58	66	64	3.05	1.43

The findings indicate that fear of pain (Mean = 3.04) is a major concern, while awareness programs (Mean = 3.05) play a key role in influencing screening behavior. There is mixed response regarding the effectiveness of mammography (Mean = 2.93), but respondents acknowledge that increased knowledge could encourage screening uptake (Mean = 2.97).

4.1.3 Perception of Mammography

This section evaluates respondents' attitudes, beliefs, and misconceptions about mammography.

Table 4.4 Respondents Knowledge Regarding the Primary Use of Mammography Examination.

PRIMARY USE OF MAMMOGRAPHY	Frequency	Percent
DETECTING BREAST CANCER	83	27.1
DETECTING HEART DISEASE	67	21.9
DETECTING LUNG DISEASE	85	27.8
NOT SURE	71	23.2
Total	306	100.0

This table shows that only 27.1% of respondents correctly identified mammography as a tool for detecting breast cancer, while 27.8% mistakenly associated it with lung disease, and 21.9% believed it detects heart disease, Additionally, 23.2% were unsure of its purpose. This demonstrates significant misconceptions about mammography, reinforcing the need for better education on its primary function.

4.1.4 Utilization of Mammography Screening

Despite the well-documented benefits of mammography in early breast cancer detection, its utilization remains low in many developing countries. This section examines the extent to which female staff members at the University of Benin have undergone mammography screening. The findings highlight the percentage of eligible women (40 years and above) who have participated in screening, their screening frequency, and factors influencing their decision to undergo or forgo mammography. The results provide critical insights into the barriers affecting screening uptake and the gaps in preventive healthcare practices..

Table 4.5: Showing Respondents Experience of Past Mammography and Suggestion to Frequency Of Mammography Examination.

ITEM	RESPONSE	FREQUENCY	PERCENTAGE
HAD MAMMOGRAPHY EXAMINATION (40 years and above only responded).	YES	49	19.9
	NO	197	80.1
FREQUENCY OF MAMMOGRAPHY EXAMINATION	EVERY YEAR	57	18.6
	EVERY TWO YEARS	60	19.6
	EVERY FIVE YEARS	59	19.3
	ONLY WHEN SYMPTOMS ENSUE	65	21.2
	NOT SURE	65	21.2

Among respondents aged 40 and above, only 19.9% have had a mammogram, while 80.1% have not. This suggests low screening rates despite age-related risks.Regarding mammography frequency, opinions are varied, with 21.2% preferring screenings only when symptoms appear, and similar proportions (19.6% and 19.3%) suggesting every two or five years, respectively. Another 21.2% were unsure.These findings highlight gaps in knowledge and screening accessibilities.

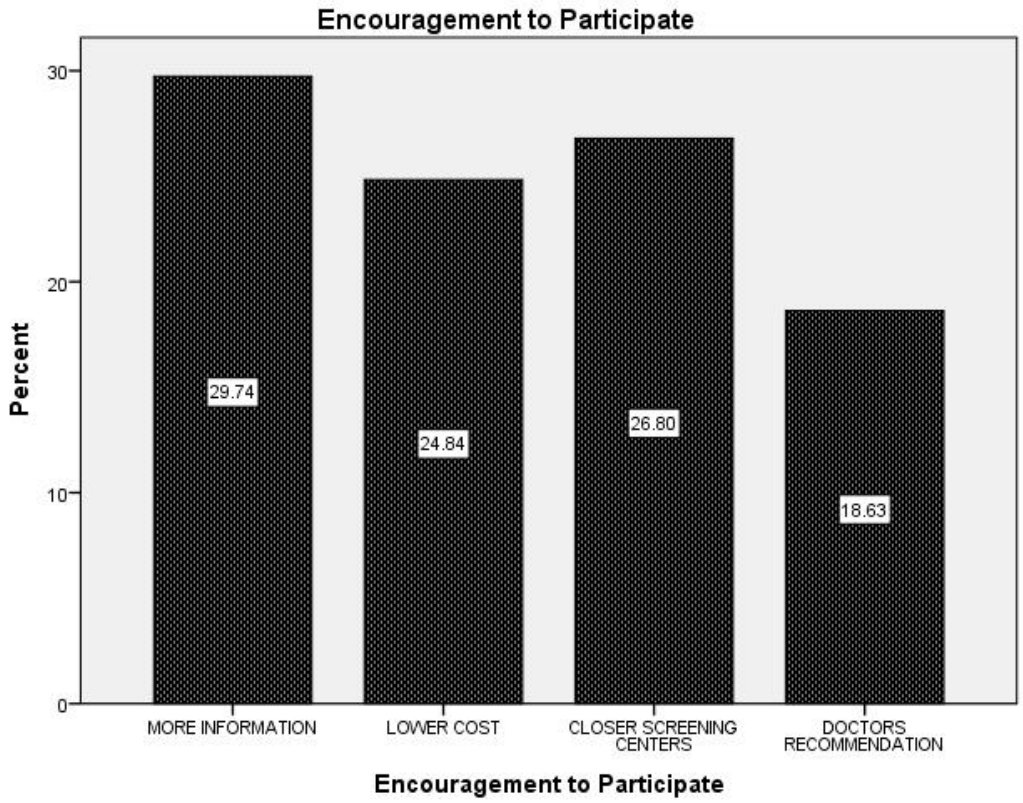

Fig 4.5: Bar Chart Showing Respondents Suggestion to Factors that Would Encourage Participation in Mammography Screening.

The chart presents factors that would encourage participation in mammography screening. The most cited factor is the need for more information (29.74%), suggesting that awareness campaigns can significantly improve screening rates. Other key motivators include closer screening centers (26.60%), lower cost (24.84%), and doctor recommendations (18.63%). These results highlight the importance of targeted interventions to boost screening uptake.

4.1.5: Barriers to Mammography Screening

Barriers to mammography play a crucial role in low utilization rates. The figure below highlights the key obstacles reported by respondents.

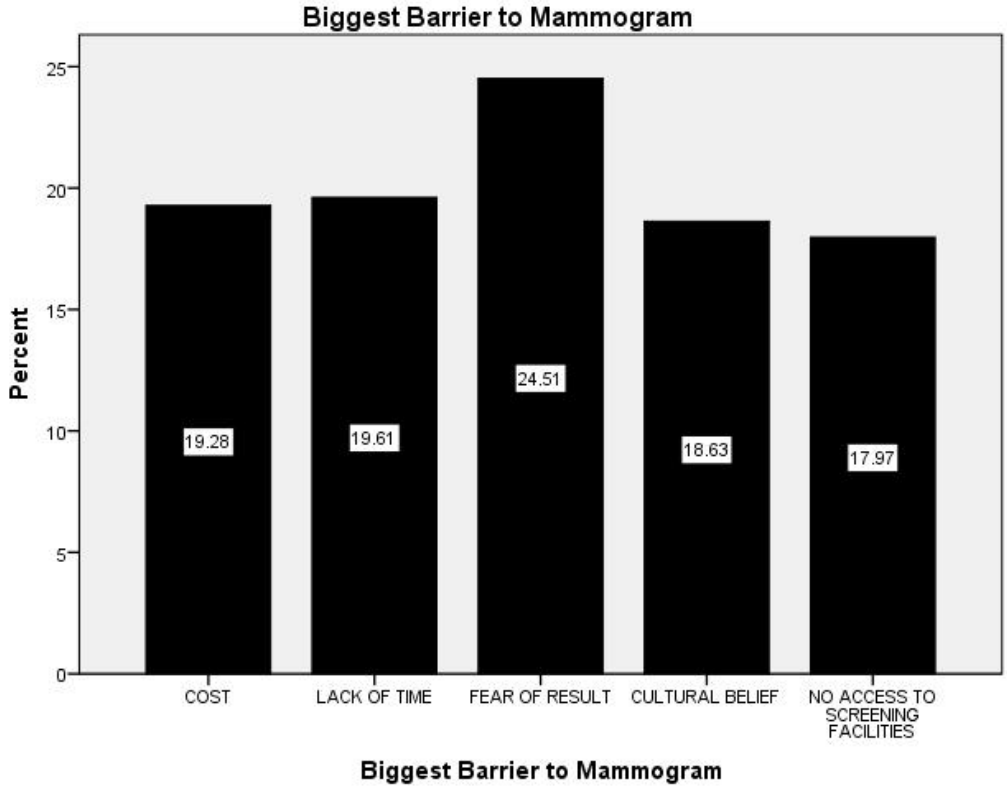

Fig 4.6: Bar Chart Showing Respondents Indications of Barriers to Getting A Mammogram.

This figure highlights the major barriers preventing respondents from undergoing mammography. The most significant barrier is fear of the result (24.51%), followed by cost (19.26%), lack of time (19.61%), cultural beliefs (18.63%), and limited access to screening facilities (17.97%). These findings indicate that psychological concerns, financial constraints, and accessibility issues play key roles in screening decisions.

Table 4.6: Respondents Perceived Barriers and Socio-Demographic Factors Influencing Their Choice of Undergoing Mammography Examination.

ITEM	SA	A	N	D	SD	MEAN	σ
Mammograms are Painful	48	63	68	69	58	3.08	1.34
Cost Prevents Mammography	62	67	59	70	48	2.92	1.37
Unaware of Location for Mammography	73	57	74	39	63	2.88	1.44
Transport Difficulties Prevent Screening	60	65	51	68	62	3.02	1.42
Cultural Beliefs Affect Mammography	71	54	63	53	65	2.96	1.46

The most significant barrier is perceived pain (Mean = 3.08), followed by cost (Mean = 2.92) and lack of awareness about screening locations (Mean = 2.88). Transport difficulties (Mean = 3.02) and cultural beliefs (Mean = 2.96) also contribute to low screening rates. These findings suggest that reducing financial constraints, increasing awareness, and addressing cultural concerns could improve mammography participation.

4.1.6: Hypothesis Testing

Table 4.7: Chi-Square Test of Awareness And Mammography Screening.

Chi-Square Tests					
	Value	**Df**	**Asymp. Sig. (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	4.972[a]	1	.026		
Continuity Correction[b]	4.473	1	.034		
Likelihood Ratio	4.982	1	.026		
Fisher's Exact Test				.029	.017
Linear-by-Linear Association	4.955	1	.026		
N of Valid Cases	306				

The Chi-Square test ($p = 0.026$) shows a significant relationship between awareness of mammography and participation in screening. Since $p < 0.05$, the null hypothesis is rejected, indicating that awareness influences screening behavior among female staff in the University of Benin.

4.2 Discussion of Findings

The findings of this study offer significant fresh insights into awareness, attitude, and mammography screening utilization among female University of Benin employees. Breast cancer continues to be the leading cause of death among women worldwide, even though mammography is now recognized as the gold standard for early diagnosis (Al-Azmy et al., 2013; Kirag & Kizilkaya, 2019). Many people in Nigeria and other places with limited resources are not getting mammograms due to a lack of awareness, money problems, mental health challenges, and obstacles in the healthcare system, even though mammograms are recognized as important. The outcome of this study underlines the continuous disparity in knowledge and practice on breast cancer screening, supporting current studies.

The study found that although some female workers knew about mammography screening, a substantial number stayed either uneducated or misinformed. Considering that this group consisted of educated professionals working in a university environment, it is surprising that from **TABLE 4.2** above you can see that over half of the respondents (52.6%) knew nothing about mammograms. This result aligns with other studies demonstrating quite a poor understanding of mammography in Nigeria, especially in metropolitan areas (Obajimi et al., 2017).

As shown in **TABLE 4.2** the internet and social media played a gradually significant role (20.9%), healthcare practitioners (21.9%) and the media (21.2%) constituted the main sources of information among the informed. The dependence on unofficial sources, such as friends and family (16.3%), illustrates that personal networks impact health decisions, which can be good when accurate information is provided but harmful when misleading knowledge continues.

The study's findings revealed that only a small percentage of respondents (19.9%) had undergone a mammogram since turning 40, despite this being the recommended age for routine breast cancer screening. This low participation rate aligns with global and regional studies that highlight poor mammography utilization in low-resource settings. Research by Obajimi et al. (2017) and Olasehinde et al. (2019) indicates that financial constraints, lack of awareness, and psychological barriers significantly contribute to the underutilization of mammography services among women in Nigeria.

A key factor influencing this low uptake aligns with one fundamental component of the Health Belief Model 'perceived susceptibility' is one main element affecting low mammography participation (Champion, 1999). Studies reveal that many women choose not to undergo screening since they do not consider themselves especially vulnerable to breast cancer. Evidence came from **TABLE 4.5** above which shows that 21.2% of respondents who claimed mammography should be performed just in the presence of symptoms, instead of as a preventive measure. This helps to explain the findings of Lawal et al. (2015), which suggest that women who regard themselves as not personally at risk are less likely to participate in screening. Therefore, public health efforts have to stress personal risk factors to increase perceived susceptibility and support proactive screening behaviours, even though they might concentrate on increasing awareness of breast cancer.the findings is also inconsistent with the global best practice of annual or biennial screening starting at age 40 (Mandrik et al., 2019).

Additionally, healthcare provider influence played a critical role in determining screening participation. Women who received direct recommendations from doctors or nurses were more likely to have undergone a mammogram, reinforcing previous research by Bassey et al. (2020) that found physician recommendations significantly impact screening behaviors.

However, many respondents in this study did not have such guidance, highlighting a gap in preventive healthcare communication.

Apart from the absence of knowledge, perceived barriers were the main factor influencing non-participation in mammography. Even knowing about mammography, the study revealed that several financial, psychological, and institutional obstacles stopped women from engaging in screening. As shown in **FIG 4.6** the highest reported barrier was fear of result (24.51%), followed by cost (19.28%). Given many respondents said cost was one of the biggest obstacle while reporting incomes between ₦50,000 and ₦150,000, financial limitations were especially clear. This is consistent with earlier research like Olasehinde et al. (2019), which revealed that Nigerian women who pay more for healthcare tend not to give mammography screening a priority. Even with screening accessible, the cost weight of mammography—which runs from ₦12,000 to ₦25,000 for each session—was enough to deter participation. According to the Health Belief Model, people are reluctant to act when visible challenges exceed expected rewards (Rosenstock, 1974). The findings of this study support the hypothesis that psychological and financial barriers hinder many women from participating in screening even if many of them appreciate the need for mammography.

Psychological issues like anxiety about a cancer diagnosis and fear of pain increase expected difficulties even more. Reflecting significant cultural and emotional responses to disease, a considerable number of the respondents confessed that their dread of a probable cancer diagnosis deterred them from getting checked. This is in line with other research, such as Al-Mousa et al. (2020), which revealed that in many African nations, cancer is commonly considered a fatal diagnosis, which causes avoidance instead of proactive screening programs. The Health Belief Model holds that raising knowledge of the effects of screening lowers the likelihood of individuals choosing preventative medical treatments (Champion, 1999). By

highlighting the benefits of early diagnosis and structured treatment and education, women can overcome their fears. They will understand that mammograms improve chances of survival rather than confirming worst-case scenarios, which will help ease their worries.

The study also highlighted its beneficial effects on screening behaviour. Although many of the respondents recognized the importance of mammography, the data shows that many women do not completely appreciate its preventive benefits. This was evident in the common misconception that mammography should only be performed when symptoms start to appear. This is consistent with earlier studies demonstrating women who see the advantages of early detection are more willing to participate in screening campaigns (Mandrik et al., 2019). To raise screening rates, public health campaigns must stress the life-saving ability of routine mammography rather than let screening be largely linked with illness confirmation. The basic element of the Health Belief Model is signals to action, environmental stimuli triggering conduct. Direct advice from a doctor or nurse significantly inspired action, according to the study, since women who had it were more inclined to consider screening. This outcome complements research by Bassey et al. (2020), demonstrating that physician recommendations greatly affect mammography utilization. Targeted treatments should give women regular encouragement and reminders from healthcare professionals high priority, given the considerable influence of physician guidance on decision-making on mammography.

Participation in mammography also depends on efficacy, that is, the faith in one's ability to act. A higher degree of educated women were more likely to understand and think about mammography screening, which reflects more self-efficacy according to the study. Still, factors like cost, accessibility, and fear lowered this confidence and made it more difficult for women to pursue screening even if they were aware of it. This is in line with the findings of

Kirag & Kizilkaya (2019), which suggest that specialized education and support programs help to raise self-efficacy, hence increasing screening participation. Public health campaigns must incorporate methodical education, community support, and sponsored activities to raise self-efficacy, empowering women's ability to take knowledge into action.

The chi-square test revealed a significant relationship ($p = 0.026$), confirming that awareness significantly influences screening behaviour. This statistical finding validates the link between knowing about mammography and the likelihood of participating in screening. However, even though awareness is a necessary first step in behaviour change, the results suggest that awareness alone is insufficient to increase screening rates significantly.

Women who are aware of mammography are more likely to consider screening, yet practical barriers such as lack of availability, high costs, and emotional concerns limit actual participation. This study highlights that low participation in mammography is a multifaceted issue involving financial constraints, healthcare access, psychological concerns, and a lack of information. The findings align with the Health Belief Model, demonstrating how self-efficacy, perceived barriers, and perceived sensitivity influence screening behaviours.

CHAPTER FIVE:

RECOMMENDATIONS, CONCLUSION, AND SUGGESTED AREAS FOR FURTHER STUDY

5.1 Conclusion

The research indicates that although female personnel at the University of Benin are aware of mammography screening, substantial information deficiencies, financial barriers, accessibility challenges, and psychological apprehensions persist as important obstacles to participation. A significant percentage of women within the advised screening age range do not participate in mammography, and misunderstandings regarding its purpose continue to exist. The results highlight that mere awareness is inadequate to incite action; tangible interventions are necessary to connect knowledge with application. The notable correlation between awareness and screening participation ($p = 0.026$) underscores the necessity for focused initiatives that integrate education with accessible and cost-effective screening alternatives.

5.2 Recommendations

Based on the findings of this study, focused interventions should be carried out to remove the obstacles thereby enhancing mammography knowledge and screening participation.

1. Mass media, social media, and workplace health education initiatives should all help public health campaigns be enlarged in order to raise awareness and dispel false impressions regarding mammography screening.

2. To increase affordability and promote regular screening, mammography screening expenses ought to be subsidised or covered via national health insurance programs.

3. Particularly for women in underprivileged areas where screening centres are not easily accessible, mobile mammography devices should be added to improve access.

4. During regular medical visits, doctors should aggressively advise mammography to underline its significance and impact on decision-making.

5. Counselling initiatives should be carried out to assist women in overcoming worry and dread related to screening so that they realise early diagnosis greatly increases survival rates.

6. Periodic breast cancer screening programs for female staff members should be included into workplace policy to inspire involvement in preventative medicine.

7. Emphasising a more informed and proactive approach to breast cancer prevention, community outreach initiatives should concentrate on clearing cultural and religious misunderstandings that restrict screening participation.

5.3 Suggested Areas for Further Study

This study offers insightful analysis of mammography screening awareness and use; more study is required to investigate long-term interventions and policy-driven solutions.

1. Future research to evaluate the long-term effects of organised awareness campaigns on mammography acceptance to evaluate whether constant education results in higher involvement over time.

2. Studies on government-sponsored screening programs to examine how well they improve accessibility and affordability, thereby guaranteeing that cost constraints are greatly lowered.

3. Research to investigate how digital health communication—including telehealth services and mobile apps—might help to raise mammography awareness and involvement.

4. Additional studies to evaluate the psychological elements affecting screening choices among Nigerian women in order to create focused treatments addressing fear and anxiety connected to breast cancer screening.

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APPENDIX I

Questionnaire

Mammography Awareness and Utilization Questionnaire

Dear Participant,
This questionnaire assesses awareness, beliefs, and factors influencing the use of mammography for breast cancer screening. Your responses are valuable and will be used for research purposes only.
Thank you for your participation.

SECTION A: Demographic Information

1. Gender: ☐ Female ☐ Male

2. Age: ☐ <35 ☐ 35–39 ☐ 40–49 ☐ 50–59 ☐ 60–65 ☐ 66+

3. Are you a Nigerian? ☐ Yes ☐ No

4. Ethnicity: _____

5. Marital Status: ☐ Single ☐ Married ☐ Divorced ☐ Widowed

6. Employment Status: ☐ Full-time ☐ Part-time ☐ Contract

7. Job Category: ☐ Academic staff ☐ Non-academic staff

8. Monthly Income (₦): ☐ <50,000 ☐ 50,000-100,000 ☐ 100,000-200,000 ☐ >200,000

9. Highest Education Level: ☐ PhD/D-Tech ☐ Masters/M-Tech ☐ Honours/B-Tech ☐ Degree/Diploma/Certificate

SECTION B: Knowledge of Mammography and Breast Cancer Screening

1. Have you heard of mammography? ☐ Yes ☐ No

2. If yes, where did you learn about it? (Select all that apply)

☐ Healthcare provider ☐ Media (TV, radio, newspapers) ☐ Internet/social media ☐ Friends/Family ☐ Educational Institution

3. Have you ever had a mammogram? ☐ Yes ☐ No

4. If yes, at what age and for what reason? _____

5. How often should women get a mammogram?

☐ Every year ☐ Every two years ☐ Every five years ☐ Only when symptoms appear ☐ Not sure

6. What do you think is the primary use of mammography?

☐ Detecting breast cancer ☐ Detecting heart disease ☐ Detecting lung disease ☐ Not sure

Please indicate your level of agreement with the following statements:

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Mammograms help in detecting breast cancer early.	☐	☐	☐	☐	☐
Mammography screening should be done regularly.	☐	☐	☐	☐	☐
Mammography reduces the risk of advanced breast cancer.	☐	☐	☐	☐	☐
Knowing about mammography increases the likelihood of getting screened.	☐	☐	☐	☐	☐
Fear of pain prevents me from getting a mammogram.	☐	☐	☐	☐	☐

SECTION C: Awareness and Utilization of Mammography

1. Do you believe that knowing more about mammography would make you more likely to get screened?

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

2. Would increased awareness programs influence you to consider screening?

☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree

3. What are the biggest barriers to getting a mammogram? (Select all that apply)

☐ Cost ☐ Lack of time ☐ Fear of results ☐ Cultural/personal beliefs ☐ No access to screening facilities

4. What would encourage you to participate in mammography screening? (Select up to two)

☐ More information ☐ Lower cost ☐ Closer screening centers ☐ Doctor's recommendation

Perceived Barriers to Mammography Screening:

Barrier	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Mammograms are painful, and this discourages me.	☐	☐	☐	☐	☐
The cost of a mammogram prevents me from getting screened.	☐	☐	☐	☐	☐
I do not know where to go for a mammogram in my city.	☐	☐	☐	☐	☐
Transportation difficulties make it hard for me to get screened.	☐	☐	☐	☐	☐
Cultural beliefs make me hesitant about mammography.	☐	☐	☐	☐	☐

Thank you for participating in this research.

APPENDIX II

RESEARCH ETHICS COMMITTEE
COLLEGE OF MEDICAL SCIENCES
UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

Chairman: Prof. F. A Imarhiagbe
MBChb, FMCP
Cert Clin Res and ethics (NIH), MD.
0803449092

P.M.B 1154, BENIN CITY
Email: researchethics.cms@gmail.com

Our Ref: CMS/REC/01/VOL.2/671 **Date:** 14th January, 2025

Re: ASSESSMENT OF THE AWARENESS OF THE IMPRTANCE OF MAMMOGRAPHY SCREENING AMONG FEMALE STAFFS IN UNIVERSITY OF BENIN

Name of Principal Investigator: **EKHOMALOMEN KAREN EIYA**
Department Of Radiography,
School of Basic Medical Sciences,
University Of Benin,
Benin City.

REC Approval No: CMS/REC/2024/671

This is to inform you that the research described in the submitted proposal, the Informed Consent Forms and other participant information materials have been reviewed and approved by the College Research Ethics Committee, University of Benin.

This approval dates from **14th January, 2025 to 13th January, 2026.** In multi-year research, Endeavour to submit your annual report to the REC early in order to obtain renewal of your approval and avoid disruption of your research.

The National Code of Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the code including ensuring that all adverse events are reported promptly to the REC. No, changes are permitted in the research without prior approval by REC except in circumstances outlined in the code. REC reserves the right to conduct compliance visit to your research site without prior notice. Thank you.

PROF. F.A IMARHIAGBE
Chairman, REC

Promoting best ethical & scientific standard for research in Nigeria