DETERMINANTS OF BREAST CANCER SCREENING AMONG NUNS IN THE CATHOLIC ARCHDIOCESE OF NAIROBI

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Determinants of Breast Cancer Screening among Nuns in the Catholic Archdiocese of Nairobi

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

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DEDICATION

I dedicate this Research project to my congregation for overwhelming support and Next Generation Leadership Programme (**NGLP**) Kenya for their encouragement throughout the duration of my masters' studies.

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LIST OF ABBREVIATIONS AND ACCRONYMS

BCA	Breast Cancer
BCS	Breast Cancer Screening
BSE	Breast Self-Examination
CDC	Centres for Disease Control and Prevention
MRI	Magnetic Resonance Imaging
SPSS	Statistical Package for Social Science
SSA	Sub-Saharan Africa
WHO	World Health Organisation

DEFINITION OF TERMS

Cancer	Uncontrolled proliferation of abnormal cells in the body which is capable of metastasizing to neighboring tissues (WHO, 2021).
Care needs	The requirement of some actions and or resources in care that is essential to attain ideal wellbeing and quality of life by patients with breast cancer.
Quality of life	is subjectively defined as a complete appraisal of life by patients with breast cancer and being satisfied with their present level of functioning compared with what the patients recognize to be real.
Screening	Refers to the use of simple tests across a healthy population to identify those individuals who have a disease, but do not yet have symptoms.
Supportive care	The provision of services (physical, health system and information, sexuality, psychological, and patient care and support) to cancer patients, their immediate families and caregivers to enable them deal with the effects of the disease and its treatment and to improve their quality of life (Heena, 2019).
Unmet needs	Is the gap between breast cancer patient's experience of services and the tangible services required.

ABSTRACT

Breast cancer is a significant global challenge. According to WHO, the risk of breast cancer among nuns is high due to the basis of nulliparity. Among the effective approaches to addressing breast cancer is early screening. However, there are concerns over the uptake of screening across all populations, including nuns. The aim of this study is to assess the determinants of breast cancer screening among nuns in the catholic Archdiocese of Nairobi. This research used the analytical cross-sectional design with qualitative and quantitative approaches. The study population was 384 nuns of reproductive age (18-49 years). The data was collected using semi structured questionnaires and in-depth interviews. The questionnaire comprises of closed and open-ended questions. The data analysis was done through descriptive statistics to report participants' sociodemographic characteristics. Chi-square and binary and Multivariate logistic regression were used to determine association between social economic factors and BCS. Thematic analysis was used for the interviews, which were recorded and transcribed. Our findings revealed that the prevalence of breast cancer screening among nuns was 30.7%. The findings established that those who had knowledge on breast cancer screening (AOR =25.52, 95%CI: 8.87 – 73.45, $p<0.001$) and those who had congregational financial support (AOR = 1.97, 95%CI: 1.68 – 5.74, $p=0.021$) were more likely to undergo breast cancer screening. Those who had hospital check-up in more than six months prior to the study (AOR =0.001, 95%CI: 0.000 – 0.008, $p<0.001$) and those who never had a hospital check-up, (AOR =0.001, 95%CI: 0.000 – 0.006, $p<0.001$) were less likely to undergo breast cancer screening. Also, the present study revealed that awareness on breast cancer, experiences with breast cancer screening, barriers and facilitators were major themes identified defining perception and lived experiences among nuns. In conclusion, the study showed low uptake of breast cancer screening. Knowledge on breast cancer screening access to congregational support and hospital check-up were associated with breast cancer screening. Therefore, there is need to create awareness and educated the nuns through aggressive education campaign programs so as to eliminate misconceptions relating to the breast cancer screening. There also need to integrate free access to screening services in the government health institutions for nuns.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Breast cancer remains a global challenge. According to the World Health Organisation (WHO), approximately 2.3 million women were diagnosed with the condition in 2020, and the global number of deaths was about 685,000. By the end of 2020, the number of women diagnosed and living with breast cancer were 7.8 million (WHO, 2021). These statistics reflect on the prevalence of the condition, and WHO notes that it is the most prevalent type of cancer compared to other types of cancer that affect women such as colorectal, endometrial, lung, cervical, skin, and ovarian cancers at a prevalence rate of 30%. Another core factor describing the impacts of the condition is that among all types of cancer, breast cancer has the highest number of lost disability-adjusted life years. Breast cancer also occurs in every nation among women of all ages after puberty, and the prevalence increases with age. The prevalence leads to the cause of cancer-based mortality and morbidity in Sub-Saharan Africa (SSA).

1.2 Background to the Study

In Kenya, the National Cancer Screening Guidelines, in collaboration with the National Cancer Control Strategy (2017-2022), focuses on early cancer screening and prevention (Ministry of Health, Kenya, 2018). This reflects on the country's strategies to respond to the rising cases of the condition. Among the core consideration factors is increasing the screening, which informs early treatment. According to Antabe *et al.* (2020), the prevalence of breast cancer in Kenya is 34 in 100,000. These figures are obtained from the 2015 Kenya Stepwise Survey of the Non-Communicable Disease Risk Factors Report. The prevalence amounts to 23% of all cancer cases.

The changes and improvements in mortality and morbidity of the condition commenced in the 1980s due to education programs and innovative treatment

approaches to eradicate the condition. Among them, breast cancer screening (BCS) is an effective measure. As described by the Centre for Disease Control and Prevention (CDC) (2020), BCS entails checking the woman's breasts for any symptoms or signs of breast cancer. Every individual should be informed about the BCS approaches available for them. This information is essential in making informed decisions regarding the screening process and whether it is suitable for the person. This reflects on the shared decision-making process and person-centred care model. Breast cancer screening does not treat or prevent the condition. However, as espoused by Bevers *et al.* (2018), BCS plays a crucial role in identifying the signs of the condition, prompting for an early and effective treatment plan.

The Centres for Disease Control and Prevention (CDC) describes the BCS tests, including mammogram and breast magnetic resonance imaging (MRI). Other exams include the clinical breast exam and breast self-awareness (CDC, 2021). Each examination approach has its benefits and risks. The benefits of the screening are identifying the cancer early at a time when it is easy to treat. However, there are risks, including a false positive result where the physician observes somethings that resembles cancer, yet it is not. This can result in requesting for more tests, which are invasive, expensive, cause anxiety, and are time-consuming. The tests can also result in over-diagnosis, where the cancer could have reduced on its own or result in less problems and symptoms. A treatment of these cancers is referred to as misdiagnosis, such as radiation therapy and surgery, which would have been avoided. Among the approaches of evaluating breast cancer is self-examination. According to Rahman *et al.* (2019), self-exam entails the regular examination of own breasts for determining potential symptoms of the cancer. The self-exam has increased, and has significantly reduced the mortality and morbidity related to breast cancer. However, the self-diagnosis should be accompanied by a doctor's assessment to avert the possibility of unnecessary biopsies.

The mortality rate associated with breast cancer among nuns is also high. According to Whitaker (2012), there are concerns over the 'hazards of nulliparity' comprising of increased breast cancer risks and other types, including uterine and ovarian. Whitaker (2012) builds on Fraumeni's work between 1900 and 1954, which showed an

increase in mortality among nuns due to breast cancer across all ages. According to Imami (2019), breast cancer was referred to as the nun's disease, attributed to the high number of nuns being diagnosed with breast cancer compared to the non-nun individuals. This demonstrates the prevalence of the condition among the nuns and the history.

1.3 Statement of the Problem

Breast cancer in developing countries, including SSA, remains a significant challenge (Orindi *et al.,* 2016). According to Antabe *et al*. (2020), policy recommendations on breast cancer screening in Kenya are aimed at increasing the community's awareness about the condition and the importance of the tests. However, the screening rate remains low, which affects the effectiveness of the interventions (Antabe *et al*., 2020; Gatumo *et al.,* 2018). For instance, the National Cancer Control Strategy, which involves various interventions to promote national screening, is affected by a lack of awareness, fear, and resources (Gatumo *et al.,* 2018). This reflects on the issue impeding breast cancer screening, which can be classified using the social determinants of health belief model. Social elements include the demographics, poor access to healthcare facilities, and literacy level. Economic issues include health insurance requirements, poverty, and unemployment.

There is insufficient information regarding BCS among nuns in Kenya. The data available shows a low uptake of screening among all communities. A significant challenge is the high prevalence of breast cancer in Kenya among all communities. The rate of prevalence of breast cancer among nuns globally is high. However, the uptake of BCS among African societies remains low. There is little information regarding the rate of BCS among nuns in Kenya, which is the foundation of this study. It is, therefore, essential to determine the socio-economic factors influencing breast cancer screening among nuns in the Nairobi Archdiocese.

1.4 Justification

The Archdiocese of Nairobi holds the highest number of nuns in Kenya, including the new ones. This allows a wide selection. It has representation for both urban and

rural population, the nuns as the target population are selected since they are a less studied population about breast cancer issues. Besides, breast cancer was previously referred to as a nuns' disease, yet it has few studies, particularly in Africa and Kenya. As described by Whitaker (2012), more evidence is required concerning breast cancer screening among nuns. This research will advance the knowledge and existing sources and information about BCS among nuns in Kenya. Another significance of this research is identifying the key personal, social, and economic factors influencing BCS. These insights are essential in developing effective recommendations mitigating these factors.

1.5 Research Questions

1) What is the prevalence of breast cancer screening among nuns in the Catholic Archdiocese of Nairobi?
2) What is the level of awareness on breast cancer screening among nuns in the Catholic Archdiocese of Nairobi?
3) What socio-economic factors influence breast cancer screening among nuns in the Catholic Archdiocese of Nairobi?
4) What are the perceptions of nuns on breast cancer screening in the Catholic Archdiocese of Nairobi?
5) What are lived experiences of nuns on breast cancer screening in the Catholic Archdiocese of Nairobi?

1.6 Study Objectives

1.6.1 Broad Objective

This study aims at assessing the determinants of breast cancer screening among nuns in the Catholic Archdiocese of Nairobi.

1.6.2 Specific objectives

1) To determine the prevalence of breast cancer screening among the nuns of reproductive age in the Catholic Archdiocese of Nairobi.

2) To determine the socio-economic factors associated with breast cancer screening among nuns in the Catholic Archdiocese of Nairobi.
3) To explore the perceptions of nuns on breast cancer screening in the Catholic Archdiocese of Nairobi.
4) To assess the level of awareness on breast cancer screening among nuns in the catholic Archdiocese of Nairobi.
5) To establish lived experiences of nuns on breast cancer screening in the catholic Archdiocese of Nairobi.

1.7 Hypothesis

H0: There is no association between socio-economic factors and breast cancer screening among nuns in the Catholic Archdiocese in Nairobi.

H1: There is an association between socio-economic factors and breast cancer screening among nuns in the Catholic Archdiocese in Nairobi.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Breast cancer is a disease in which abnormal breast cells grow out of control and form tumours. Breast cancer cells begin inside the milk ducts and/or the milk-producing lobules of the breast. In 2020, breast cancer accounted for about 11% of all cancers worldwide making it the most prevalent followed by Lung cancer, Colorectal cancer, Prostrate cancer, Skin care cancer and Cervical cancer.

2.2 Breast Cancer Screening

BCS is recommended for the early identification of breast cancer symptoms. The information is crucial in determining the most effective treatment plan to manage cancer. Two of the most common BCS tests and approaches include mammograms, described as an X-ray of the breast, and breast magnetic resonance imaging (MRI), which involves the use of radio waves and magnets to take breast pictures. The mammogram is suitable for most women and is effective in the early identification of cancer before the lumps and masses are huge. Regular mammograms are essential in lowering the risk of breast cancer mortality. Breast MRI is not preferred for women at average risk of breast cancer. This is based on the images appearing abnormal even in situations where there is no cancer. The two approaches can be used together for individuals at high risk of the condition (CDC, 2020). Other BCS exams include a clinical breast examination and breast self-awareness. The exam involves the examination doctor using the hands to feel for breast changes or lumps.

The early prognosis of breast cancer is critical in reducing mortality and morbidity. According to Heena (2019), through a cross-sectional study, BCS is among the primary approaches to early detection and ensuring timely treatment. This is consistent with the recommendation of the CDC for increasing the rate of BCS in both developed and developing nations (Rivera-Franco & Leon-Rodriguez, 2018). An essential element in the early screening and diagnosis is enhancing the awareness

of various stakeholders, including the nurses, physicians, and the population. This ensures that the individuals understand how to detect the early signs of breast cancer.

Breast self-examination as described by Breastcancer.org involves assessing own breasts regularly, essential in detecting the symptoms early. Rahman *et al.* (2019) in a cross-sectional study involving 241 undergraduate female students aged above 18 years from three Sharjah university campuses found out that women undertake self-examination based on the awareness about the factors to look for, such as lumps. Approximately 68.5% of the participants had an idea about BCS but only a few performed the actual self-examination due to low knowledge. This, therefore, is among the key factors that should be considered when determining the socio-economic factors impacting BCS. Similar findings about awareness and self-breast exam were found by Sadoh *et al.* (2021) through a pre-post interventional study in Benin, involving 2538 female students. The findings revealed that training the students about breast cancer was crucial, especially in the low resource areas. Self-examination was significantly associated with awareness and was crucial in early diagnosis for intervention.

Breast self-exam involves several approaches. The individual, as described by Dadzi and Adam (2019) through a cross-sectional study involving 385 women between 15-49 years should look for several aspects. These include the change in breasts, in terms of shape, colour, and size, any distortion or swelling, bulging of the skin, dimpling, puckering, changed nipple position, rushes, and redness. Another symptom to look for is the fluid from the nipples, which could be yellow or milky. The importance of adequate knowledge about self-examination is to enhance the understanding of the symptoms to look for. As described by Zeru *et al.* (2019) through a cross-sectional study, there is a need to assess the knowledge, attitude, and practice (KAP) among the participants, which is essential in determining the areas of improvement. Among the areas of concern are the symptoms, signs, and the practice of breast cancer self-examination (BCSE).

2.3 Prevalence of Breast Cancer among Nuns

The prevalence of breast cancer among nuns remains high. Research revealed that the prevalence of breast cancer among nuns was 30.7% (Mbuthia 2023). In 2020, breast cancer accounted for about 11% of all cancers worldwide making it the most prevalent followed by Lung cancer, Colorectal cancer, Prostrate cancer, Skin care cancer and Cervical cancer. This is further reflected in the labelling of the condition as a nun's disease (Kent, 2012). Historically, there are findings encouraging such a labelling. In the 1700s, for instance, an Italian doctor, Dr. Bernardino Ramazzini, who is considered the founder of occupational medicine, found out that in the nun occupation, members were more likely to die from breast cancer compared to other female communities (Imami, 2019). The reason for this was that these nuns were not reproductive, increasing their risk of getting cancer. The evidence informing the Nun's Disease theory relates to the protective measures of bearing children and breastfeeding. Nuns have high mortality of breast cancer in the age span of 40-74 years compared to the control group (Gebel *et al.*, 2017). These findings support those by Whitaker (2012) that more evidence is required regarding breast cancer prevalence and associated factors. In Kenya, there is limited current research about breast cancer among nuns. This study will therefore be fundamental in advancing the understanding of the condition among nuns in not only Kenya but the entire SSA.

Breast cancer among nuns is significantly associated with their celibate lifestyles. This is described by Brito-Marcelino *et al.,* (2020) through an integrative literature review. This review revealed that the relationship between occupational factors and breast cancer has been studied for long in the literature. In the 18th century, Bernardino Ramazzini showed that breast cancer is prevalent among the nuns compared to the general population, which can be attributed to the nuns' celibate lifestyle. Being a nun is also associated with the recovery process. This was discussed by Suwankhong and Liamputtong (2018) who noted that women become Buddhist nuns in Thailand to hide their treatment process and effects, including the loss of hair due to chemotherapy. This is essential in helping them appear normal to the outsiders. Through a qualitative study, involving interviews, one of the respondents noted that she had to become a nun to help in acting normal. The study

by Suwankhong and Liamputtong (2018) reveals that being a nun is not only associated with the high prevalence of breast cancer but also the recovery process. This introduces the stigmatisation issue among the breast cancer patients.

The prevalence of mortality and morbidity among nuns is high compared to the general population. A total of 1,103 women were classified as nuns based on their titles of "Sister" or "SR". Their mortality experience was compared to other female radiologic technologists and to U.S. white females. Five hundred eighty-three nuns (53%) were deceased as of January 1, 1995. Compared to other technologists, nuns were at significantly increased risk of dying from breast cancer according Morin Doody (2000). According to Fraumeni *et al.*, (1969), through a study comparing nuns with women not bound by celibacy revealed that the probability of nuns aged 70-79 years dying from breast cancer was double that of women within the same age control group. However, these studies are aged, thus the need for more recent research to determine the current prevalence and issues. You *et al.,* (2018) through a bivariate correlation examining the relationship between breast cancer and the reproductive lifestyle shows that the condition was high among nuns in studies done 300 years ago. This was associated with female childbearing behaviour, which lacked among the nulliparous Catholic nuns. This is explained by the pregnancy breaking menstrual cycles reducing the breast exposure to oestrogen.

2.4 Socio-economic Factors Influencing Breast Cancer Screening

Several factors influence breast cancer screening uptake. Wu *et al. (*2019), through a systematic review of 19 studies published in three Chinese databases, PsycINFO, PubMed, EMBASE, and CINAHL showed that there are several factors influencing breast cancer in mainland China. These factors include previous screening behaviours, history of the breast disease, geographical region, overall check-up behaviour, attitude, and ethnicity. Other factors included social support, access to a healthcare facility, marital status, education, beliefs, and age.

Barriers to taking breast cancer screening can be categorized into institutional, personal, and awareness levels. Orindi *et al.* (2016) randomly sampled 147 students

aged 13-22 in Kisii South sub-county regarding their fear, beliefs, and attitude toward taking breast cancer screening. Through correlational analysis using the statistical package for social science (SPSS), 75.5% of the respondents noted not taking any form of breast cancer screening. The findings showed that fear, beliefs, and socio-economic status influenced undertaking breast cancer screening. Specifically, it was revealed that students from low social and economic statuses were less likely to undertake the screening. These findings are critical in informing the government's policies and programs to promote early screening and health-seeking behaviour among all populations. The impacts of awareness and its influence on health-seeking behaviour were further described by Abeje, Seme, and Tibelt (2019) through a cross-sectional study involving 633 respondents in Addis Ababa. From the findings, out of the women who had knowledge about breast cancer screening, 97% noted that the examination increased the survival chance due to early detection of the symptoms and developing a treatment plan. These factors can be categorized into personal, social, and economic dimensions.

In Kenya, the uptake of breast cancer screening is affected by several factors, including poverty, low literacy level, particularly in the rural areas, and lack of access to adequate medical facilities (Mwangi *et al.*, 2021). According to Antabe *et al.* (2020), through the Kenya Demographic and Health Survey multivariate analysis, taking BCS is dependent on factors such as geographic location and the individual's economic wellbeing. Educated and insured individuals are likely to take BCS compared to the uninsured and unemployed. Orindi's (2016) study in Kisii sub-county adds to these factors and note that BCS is influenced by psychological, institutional, and student levels. These factors should be critically considered in policy development.

2.5 Level of Awareness on Breast cancer screening

Breast health awareness campaigns have been inadequate, coupled with lack of affordable screening facilities, especially in most rural centers (Huertha & Grey, 2010). Where screening facilities are available the cost is prohibitively high (WHO, 2009). Due to lack of logistics and funds, health agencies can only provide Breast

Health Education and promotion (Huertha & Grey, 2007). Lack of major cancer registries in Africa pose a major challenge in providing statistics about breast cancer for planning purposes (WHO, 2006). In addition, we strongly emphasized on the "golden age" for awareness by targeting the young adult female population only. Public education about a disease is pragmatic and simple, yet a pivotal tool that would help in early detection and would subsequently improve the prognosis by providing better chances for successful treatments and definitive cures.

For effective breast cancer control programs, five key approaches have been described; integration of breast cancer into national cancer control strategic planning by policymakers, development of diagnosis and management guidelines, review of evidence-based practices by clinicians, identification of priority breast cancer control opportunities by advocates and implementation research training and mentorship. Breast cancer is the leading cause of cancer morbidity in Kenya, constituting approximately 13% of all cancer cases; and the third leading cause of cancer deaths with approximately 2600 deaths in 2018. Even in tertiary facilities, about a third of breast cancer cases are diagnosed in stage four, with metastases to bone, brain, lung or liver. This is associated with high costs of treatment and low overall survival rates. In Kenya, breast cancer occurs earlier in women between ages 35 and 45 years which is 10–15 years earlier than the peak incidence in developed countries. Knowledge on approaches for early detection of breast cancer is low, especially in the rural areas. Kenya does not have a mass breast cancer screening program at the population level yet; screening is currently opportunistic and individual-based. The Kenya National Cancer Screening Guidelines 2018 identify breast cancer as one of the cancers planned for population-based screening. However, there were concerns about the low utilization of the equipment for breast cancer screening and early diagnosis. Therefore, the National Cancer Control Program conducted a breast cancer awareness and screening pilot, to assess the feasibility of utilizing mammography equipment available at county referral facilities to support a national, population-based breast cancer screening program.

The breast health awareness and screening pilot was a 2 month intervention launched in Nyeri County in October 2019 and ran until November 2019. The pilot had two

phases; awareness creation, and linkage to screenings services. The pilot involved community mobilization, training of healthcare workers in clinical breast examination, conduction of mammograms, biopsy taking, as well as monitoring and evaluation.

2.6 Perceptions and lived experiences on Breast Cancer Screening among Nuns

Breast cancer screening is a challenging and involving process that requires a careful approach. Therefore, effective breast cancer requires competence in various skills, including communication and empathy. According to Pagliarin *et al.,* (2021), through a systemic review woman were satisfied with breast cancer screening, mainly due to the staff's interpersonal skills, communication, and delivery of results. Conducting breast cancer screening further requires the healthcare providers to demonstrate competence in managing anxiety. According to Health Quality Ontario (2016), some of the challenges associated with breast cancer screening are false-negative results of the mammography tests which makes individuals lose confidence with the tests.

These challenges are addressed through effective screening and increasing the individual's knowledge about the screening technologies. It is therefore essential to enhance the individual's awareness about the entire process and the technologies. There are also issues with pain and presentation of the results, especially the negative ones. As described by Gabel *et al.* (2017), through questionnaires emailed to 3000 women in the Central Denmark Region, it was revealed that women are highly satisfied with breast cancer screening, although there is discomfort and feelings of obligation. Therefore, it is essential to use less painful approaches and respect the individual's modesty. This research will evaluate the lived experience of the nuns, which is less studied, especially in Africa. Kent (2012) notes that the risk of breast cancer is high among nuns.

The historical studies show that the high prevalence among nuns is related to their reproductive lifestyle (Fraumeni *et al.,* 1969; You *et al.,* 2018). The main challenge in these studies is that they are outdated, implying the need for more recent research. A literature search shows no recent studies about the prevalence of breast cancer

among nuns, thus the need for this study. The risk factor of breast cancer among nuns is associated with child bearing behaviour and the reproductive process. Another lived experience dimension is the stigmatisation associated with being a nun. As described by Suwankhong and Liamputtong (2018), there are individuals that prefer being nuns to avert the stigmatisation and other issues associated with breast cancer management process, including chemotherapy, which results in loss of hair.

2.7 Research Gap

Breast cancer screening remains crucial in treating breast cancer, mitigating the mortality and morbidity rates. Women should understand the different breast cancer screening approaches and discuss the most suitable strategies with the doctors (CDC, 2020; Heena, 2019). Several factors influence the uptake of breast cancer screening. These factors can be categorized into social, personal, economic, and institutional (Orindi *et al.,* 2016; Wu *et al.,* 2019). Breast cancer is also prevalent among nuns, attributed to reproductive practices. As noted by Kent (2012), breast cancer mitigation strategies, including having children, is not solution for the nuns. Also, the manipulation of the oestrogen window that is influenced by late menopause or early menarche is also not considered. However, there is paucity of data on the uptake of breast cancer screening among nuns in Kenya. The current studies focus on breast cancer among the general population, and there is no evidence of research about BCS among the nuns. This research will be crucial in understanding breast cancer screening among nuns in the Archdiocese of Nairobi to contribute to the literature, specifically in Africa.

2.8 Theoretical Framework: Health Belief Model

The factors influencing breast cancer screening can be categorized and evaluated using the health belief model. According to Sheppard and Thomas (2021), the health belief model is a theoretical approach that guides the disease prevention and health promotion activities. It is used to predict and explain the person's change in behaviours. The main aspects in the health belief model are a focus on the person's beliefs about the healthcare conditions, which predict one's behaviour. The model also describes the factors underpinning one's susceptibility and perceived severity.

Also, the model helps in understanding the benefits of an action, barriers, exposure, and the confidence or ability to succeed. To implement the health belief model, it is essential to collect sufficient information about the needs, convey about the consequences of the health issue, and communicate to the target individuals about the steps and the recommendations. There is also assistance to identify and avert the barriers to action. In the breast cancer screening context, the primary aspect in relation to the health belief model is the belief about the health conditions by the nuns. Perception on breast cancer also present an understanding on barriers and facilitators of breast cancer screening among nuns.

2.9 Conceptual Framework

The conceptual framework below shows the relationship between three variables, including the independent and the dependent. These variables aim at describing the socio-economic factors influencing breast cancer screening. The conceptual framework also shows some of the aspects that influence the individual's acceptance of breast cancer screening. The independent variables are those perceived to influence the dependent ones. Examples include awareness, level of education, previous encounters, and the individual's attitude. The extraneous variables include those that influence the relationship between the dependent and the independent ones.

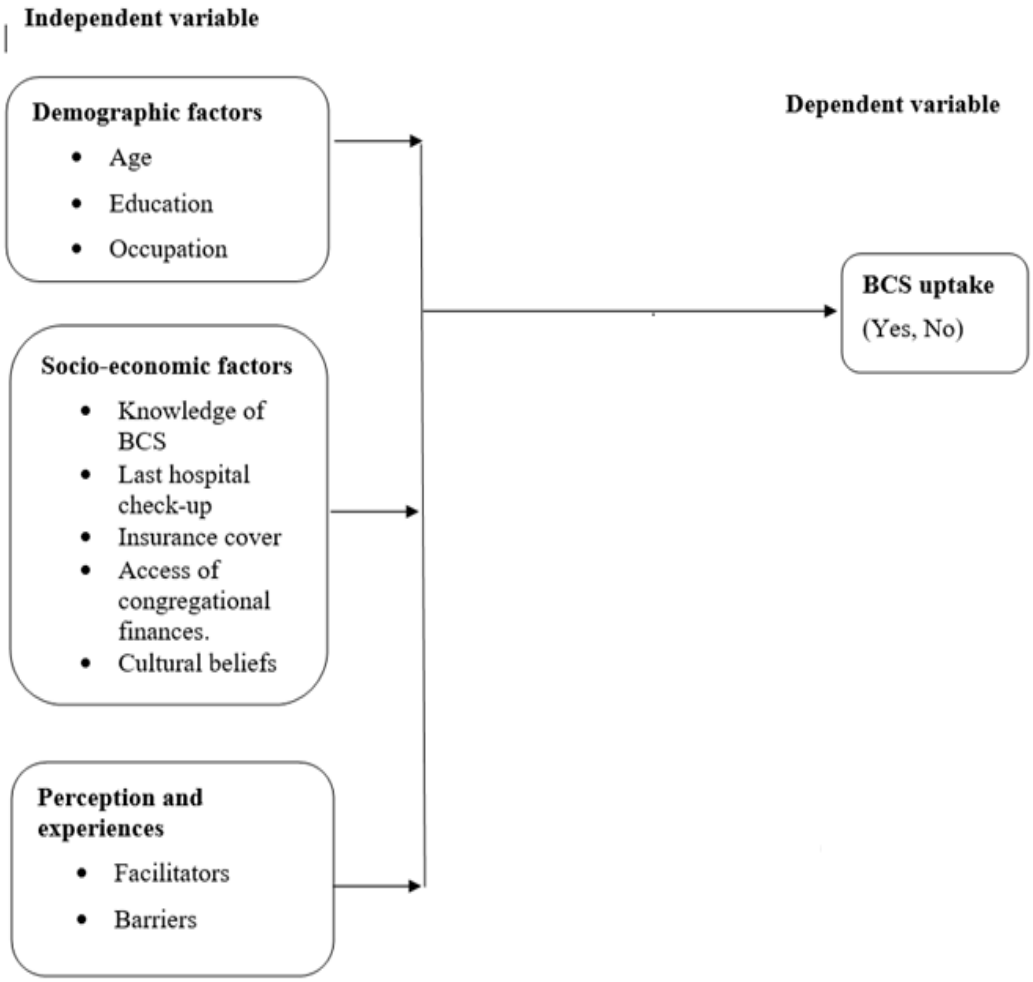


Figure 2.1: Conceptual Framework (Adopted from the health belief model)

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter involved the data collection process and method. It provides the methodology and design, data collection instrument, sampling, population, and analysis on breast cancer screening among nuns at the catholic Archdiocese of Nairobi. Ethical considerations are also provided.

3.2 Research Philosophy

This research involved the objective and subjective understanding of BCS among nuns at the Catholic Archdiocese of Nairobi. This reflects on the application of both positivism and interpretivism philosophy. There is no manipulation of the phenomena, which is also a key characteristic of interpretivism philosophy.

3.3 Research Methodology and Design

This research used the analytical cross-sectional design with both quantitative and qualitative data approaches. The analytical cross-sectional design aimed to obtain data from a group at only one point. In this research, the design was applied to determine the prevalence of breast cancer screening among nuns and the social, and economic factors influencing this prevalence.

3.4 Study Population

The study population comprised of nuns at the Catholic Archdiocese of Nairobi.

3.4.1 Sample Size Determination

The sample size was calculated using the Fischer formula as provided below. The population was 594 nuns at the Catholic Archdiocese of Nairobi. Since the population was less than 10000the researcher modified the sample size.

$$n = \frac{z^2 P(1-P)}{e^2}$$

n is the desirable sample size, z-score is the normal deviation at the desired confidence interval, p is the proportion of the characteristic in the population, and e is the confidence interval.

In this research, the confidence interval was 95%, which has a z-score of 1.96 was used. A confidence interval of ±5% and a standard deviation of 0.5 were selected. The P of 0.5 was selected since the prevalence of breast cancer screening among nuns in Kenya was unknown. 50% was selected since there are no prevalence statistics about breast cancer screening among nuns in Kenya. Substituting the values to the formula.

$$n = \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2}$$

Therefore, n = 384

The sample size for the research was selected as 384 nuns.

For the qualitative data, involving in-depth interviews (IDIs), the sample size was 12 individuals. According to Vasileiou *et al*., (2018), the sample size in interviews and qualitative research ranges from 2 to 72. The low number of these individuals is attributed to the complexity in analysing the information. The IDIs was guided by data saturation.

3.5 Inclusion and Exclusion Criteria

3.5.1 Inclusion Criteria

The inclusion elements included the individual being of the reproductive age (18-49), stationed at the Archdiocese of Nairobi. Those who undergone breast cancer screening also those who have not involved in the breast cancer screening.

3.5.2 Exclusion Criteria

Those who had breast cancer and on treatment could have been excluded and those above 49 years. Nuns that do not communicate in English or Kiswahili. Nuns who declined consent.

3.5.3 Sampling Procedure

Stratified sampling was applied in the research. Nuns in the arch-diocese of Nairobi were divided into five strata which comprised of 163 congregations. In each of the strata a proportionate sample of nuns was randomly selected. All the sisters in the selected convents were included until the sample size was achieved. The data was sampled from the five orders as shown in the Table 3.1. The sampling of nuns in each of the strata, random sampling technique was used where each nun who met the inclusion criteria was recruited. In sampling each participant, the researcher folded papers written 'Yes' and 'No'. The 'Yes' papers were equivalent to the sample size sought in each of the stratas.

Table 3.1: Sample size distribution

Order	Congregations	Number of nuns	Sample size
Order of Carmelities (OCOM)	20	100	(100/594)*384 = 65
Order of Fransciscan (OFM)	33	198	(198/594)*384 = 128
Dominican Order(OP)	43	102	(102/594)*384 = 66
Benedictine Order(OSB)	39	110	(110/594)*384 = 71
Order of St. Augustine(OSA)	28	84	(84/594)*384 =54
Total	163	594	384

3.6 Data Collection

3.6.1 Data Collection Tools

This research used both semi structured questionnaire and interview guides. The researcher gave questionnaires with both open-ended and closed-ended questions were essential in collecting the data about the prevalence and the socio-economic factors. The questions were developed from the literature. Notably, interviews allowed one to explore the participants' views, experiences, beliefs, and motivations. The interviews involved 10 open-ended questions and were mainly applied to understand the perceptions and lived experiences of nuns. The selection of open-ended questions allows for obtaining vast information from the participants. They also allow for follow-up and a better understanding of the individual's experiences.

3.6.2 Quality Assurance

The questions for the questionnaire were adopted from literature to enhance the validity and reliability. This also applied to the interview questions. A pre-test was conducted among nuns in Order of Fransciscan (OFM) where the study tool was revised to meet the study objectives.

3.6.3 Data Collection Procedure

Quantitative: Questionnaire

The questionnaires, administered by the researcher were collected physically within the Catholic Archdiocese of Nairobi. The questionnaires were presented to the respondents for filling and returned to the principal investigator for analysis. The questionnaires were collected over one month due to the high number of respondents.

Qualitative: Interviews

The interviews were conducted face-to-face, which were effective in engaging the individual and increased the chances of obtaining the right information. The interviews were recorded and transcribed for analysis. The interviews lasted between

30 and 45 minutes and were conducted within two days. The interviewer reached saturation after conducting 12 interviews.

3.7 Data Management and data analysis

Quantitative data

The collected data was summarised in an excel spreadsheet. The numerical data was grouped according to the research questions. The data was stored in a computer folder protected using a password. The data analysis process involved making the collected information meaningful. The data analysis in this research was statistical. The data analysis was done using the statistical package of social sciences (SPSS), version 24.0. This involved both descriptive and inferential analysis. The descriptive analysis involved determining the mean, mode, and median for the different aspects, such as the socio-economic factors. The inferential analysis was used to determine the association between social-economic factors and BCS. Chi square and logistic regression (Binary and Multivariate) were used.

Qualitative

The interview data was transcribed and stored in textual format. The thematic analysis was used in qualitative data, which involved classifying the data based on themes and subthemes. It also involved identifying the links in the narrative data. The transcribed data was re-read, identifying the connections in the concepts. The thematic analysis was centred on the literature review, research objectives, and theoretical framework.

3.8 Ethical Considerations

Ethical approval was sought from University of Eastern Africa, Baraton ethical review committee. The research permit was sought from the National Commission for Science, Technology, and Innovation (NACOSTI). For accessing the research site and engaging the nuns of data collection, approval was sought from Association of sisterhoods of Kenya Nairobi Unit Animators.

In this research, the respondents were engaged through an informed consent that outlined the purpose of the research and the data collection process. The individuals were requested to consent to participating in the study and had the freedom to leave the research if they were uncomfortable. This also reflected on respect and autonomy in the decision-making process. Justice and equality involved every participant having an equal chance of participating in the study. It also involved ensuring a fair process for every individual.

3.9 Dissemination of findings

The researchers published the findings in the PAMJ Journal of nursing and international journal of community medicine and public health.

CHAPTER FOUR

RESULTS

4.1 Introduction

The study sought to investigate breast cancer screening among nuns in the Catholic Archdiocese of Nairobi. A total of 384 questionnaires were distributed among study population. All the questionnaires were duly filled and returned for data analysis representing 100% response rate. The study also included 12 in-depth interviews.

4.2 Social demographic characteristics of the respondents

The findings established that 37.2% (n=143) of the respondents were aged between 30 to 39 years, 40.6% (n=156) had diploma level as their highest level of education. Further, 38% (n=146) of the respondents were teachers while 20.6% (n =79) were healthcare workers as shown in Table 4.1.

Table 4.1: Social demographic characteristics of the respondents

Characteristics	Frequency	Percent
Age (Mean ±SD)	34.8±9.72	
18 – 29 years	130	33.9
30 – 39 years	143	37.2
40 – 49 years	69	18.0
=>50 years	42	10.9
Highest education level		
Secondary	80	20.8
Diploma	156	40.6
Undergraduate	95	24.7
Postgraduate	53	13.8
Occupation		
Accountant	32	8.3
Social worker	68	17.7
Catechist	5	1.3
Cateresses	12	3.1
Healthcare worker	79	20.6
Cleaner	9	2.3
Counsellor	16	4.2
Nutritionist	17	4.4
Teacher	146	38.0

4.3 Prevalence of breast cancer screening among the nuns of reproductive age

The results established that 30.7% (n =118) of the respondents had undergone breast cancer screening as shown in Figure 4. 1.

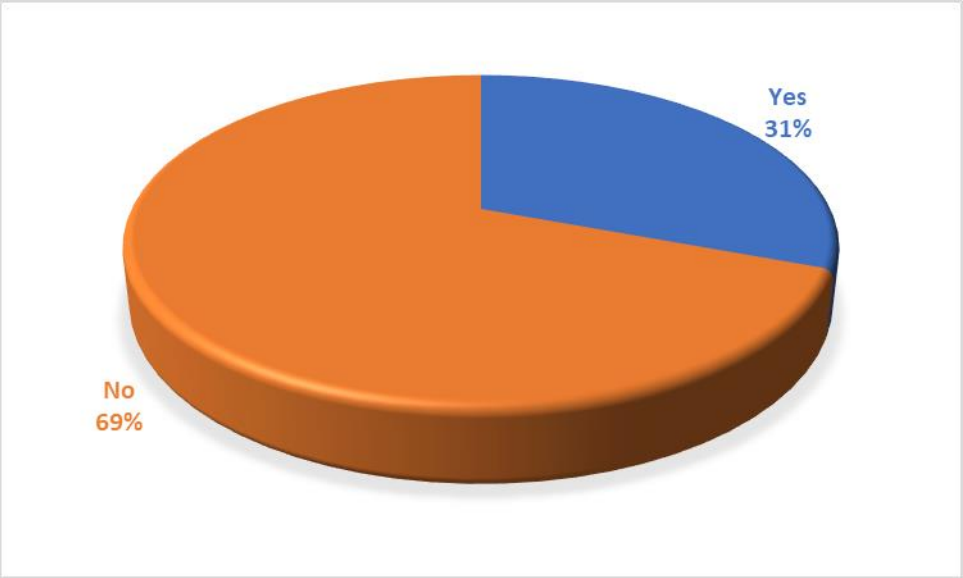


Figure 4.1: Prevalence of breast cancer screening

4.4 Awareness and uptake of breast cancer screening among respondents

Among those who had undergone cancer screening, 55.1% (65) had clinical palpation while 44.9% (53) had self-examination as method of screening. More than half, 58 % (69) had breast cancer screening as a personal initiative while 6.7% (8) had screening because they had noticed a lump in their breast. In investigating the frequency of breast cancer screening among those who had screened, 41.5% (49) of the respondents had breast cancer screening at least once per year, 55.5% (66) had self-examination monthly. Among the respondents who had not had breast cancer screening, 47.4 % (182) cited lack of awareness, 26.3 % (101) fear. The findings also showed that 82.3 % (316) of the respondents knew about the existence of breast cancer screening, 35.8% (113) of these respondents knew about breast cancer screening through learning institution, 26.9% (85) through social media. The results also showed that 46.9 % (180) of the respondents had received health education on breast cancer screening as shown in Table 4.2.

Table 4.2: Knowledge, awareness and barriers to breast cancer screening among respondents

Awareness and uptake	Frequency	Percent
Method of screening n =118)		
Self-examination	53	44.9
Clinical palpation	65	55.1
Purpose of breast cancer screening (n =118)		
Personal initiative	69	58.0
Noticed a lump	8	6.7
Medical grounds	19	16.0
Advice from health worker	22	19.3
Frequency of breast cancer screening (n =118)		
After every six months	22	18.6
At least once per year	49	41.5
Once in two years	47	39.8
Frequency of self-examination (n =118)		
Monthly	66	55.5
Every three months	22	18.5
Once a year	30	26.1
Factors hindering breast cancer screening (n=379)		
Fear	101	26.3
Lack of finances	31	8.1
Lack of awareness	182	47.4
Peer pressure	61	15.9
Time	4	1.0
Knowledge of breast cancer screening (n =384)		
Yes	316	82.3
No	68	17.7
Source of knowledge on breast cancer screening (n =316)		
Learning institution	113	35.8
Social media	85	26.9
Community programs	63	19.9
Conferences and workshops	55	17.4
Received health education on breast cancer screening (n =384)		
Yes	180	46.9
No	204	53.1

4.5 Socio-Economic Factors Influencing Breast Cancer Screening

The findings established that slightly more than half, 53.4% (205) had never visited hospital for check-up. The factors hindering access to check up included fear 50.4% (135) and lack of resources 19.7% (52) among others. Among those who underwent breast cancer screening, 56.8% (67) stated that seeking breast cancer screening was a self-initiative while 28.8% (34) stated that their decision was influenced by the media. About, 29.9% (115) of the respondents had insurance cover, 14.1% (54) had access to congregational financial support. Seventy-seven (64.2%) had average experience to breast cancer screening while 1.3% (5) of the respondents had cultural and religious concerns as shown in Table 4. 3.

Table 4.3: Socio-Economic Factors Influencing Breast Cancer Screening among respondents

Factors	Frequency	Percent
Visited hospital for check-up (n =384)		
Last one month	12	3.1
Last three month	15	3.9
Last six months	42	10.9
Last one year	34	8.9
More than one year ago	76	19.8
Never	205	53.4
Factors hindering access to check up (n =266)		
Time	32	12.1
Resources	52	19.7
Lack of support	47	17.8
Fear	135	50.4
Influenced decision making process for uptake (n =118)		
Sibling	5	4.2
Self	67	56.8
Media	34	28.8
Friend	5	4.2
Referral	8	6.8
Presence of insurance cover (n =384)		
Yes	115	29.9
No	269	70.1
Access to congregational financial support		
Yes	54	14.1
No	330	85.9
Experience to breast cancer screening		
Low	36	30.0
Average	77	64.2
High	7	5.8
Presence of cultural and religious concerns		
Yes	5	1.3
No	379	98.7

4.6 Factors associated with breast cancer screening among respondents

Pearson chi-square and Fischer's exact test were conducted to investigate factors associated with breast cancer screening as shown in Table 4.4. The findings revealed that occupation (χ^2 (3) = 14.524, p = 0.002), knowledge of breast cancer screening (χ^2 (1) = 21.185, p <0.001), receiving health education on breast cancer screening (χ^2 (1) = 4.611, p = 0.032), last hospital check df = 5, p<0.001 and access to congregational financial support, (χ^2 (1) = 14.762, p<0.001) were significantly associated with breast cancer screening.

Table 4.4: Factors associated with breast cancer screening among respondents

	BCS uptake				
Factors	**Yes**	**No**	**Chi-square**	**Df**	**P-value**
Age					
18 – 29 years	34(28.8)	96(36.1)			
30 – 39 years	45(38.1)	98(36.8)	4.867[a]	3	0.182
40 – 49 years	28(23.7)	41(15.4)			
=>50 years	11(9.3)	31(11.7)			
Education level					
Secondary	21(17.8)	59(22.2)			
Diploma	49(41.5)	107(40.2)	1.185[a]	3	0.757
Undergraduate	32(27.1)	63(23.7)			
Postgraduate	16(13.6)	37(13.9)			
Occupation					
Accountant	9(7.6)	23(8.6)			
Social worker	31(26.3)	79(29.7)	14.524[a]	3	0.002
Healthcare worker	44(37.3)	52(19.5)			
Teacher	34(28.8)	112(42.1)			
Knowledge of Breast cancer screening					
Yes	111(94.1)	196(73.7)	21.185[a]	1	p<0.001
No	7(5.9)	70(26.3)			
Received health education on breast cancer screening					
Yes	65(55.1)	115(43.2)	4.611[a]	1	0.032
No	53(44.9)	151(56.8)			
Last hospital check-up					
Last one month	10(8.5)	2(0.8)			
Last three month	14(11.9)	1(0.4)			
Last six months	19(16.1)	23(8.6)		5	p<0.001
Last one year	15(12.7)	19(7.1)			
More than one year ago	58(49.2)	18(6.8)			
Never	2(1.7)	203(76.3)			
Have insurance cover					
Yes	41(34.7)	74(27.8)	1.869[a]	1	0.172
No	77(65.3)	192(72.2)			
Access to congregational financial support					
Yes	33(28)	32(12)	14.762[a]	1	p<0.001
No	85(72)	234(88)			
Presence of cultural beliefs and concerns					
Yes	1(0.8)	4(1.5)		1	0.601
No	117(99.2)	262(98.5)			

4.6.1 Binary logistic regression of factors associated with BCS

Binary logistic regression analysis was conducted as shown in Table 4.5. Those who were accountants by occupation were 64% less likely to undertake breast cancer screening compared to those who were healthcare workers, (COR = 0.36, 95%CI: 0.21 – 0.63, p<0.001). Respondents who had knowledge about breast cancer screening were 5.66 times more likely to undertake breast cancer screening, compared to those who didn`t have knowledge (COR = 5.66, 95%CI: 2.52 – 12.74, p<0.001). Those who received health education on breast cancer screening were 1.6 times more likely to undertake breast cancer screening compared to those who had not received health education on breast cancer screening COR =1.61, 95%CI: 1.04 – 2.49, p =0.032. Those who had hospital check-up for more than six months were 99.4%less likely to undertake breast cancer screening compared to those who had hospital check-up for less than past six months, COR =0.006, 95%CI: 0.001 – 0.026, p<0.001. Further those who had never had a hospital check-up were 99.5% less likely to undertake breast cancer screening, compared to those who had hospital check-up for less than past six months. COR =0.005, 95%CI: 0.001 – 0.021, p<0.001. Those who had congregational financial support were 2.8 times more likely to undertake breast cancer screening compared to those who didn`t have congregational financial support, COR = 2.84, 95%CI: 1.65 – 4.9, p<0.001.

Table 4.5: Binary logistic regression of factors sociodemographic factors associated with BCS

			95% C.I.		
	S.E.	**COR**	**Lower**	**Upper**	**P-value**
Occupation					
Healthcare worker		Ref			
Social worker	0.439	0.776	0.328	1.835	0.563
Teacher	0.289	0.774	0.439	1.362	0.374
Accountant	0.283	0.359	0.206	0.625	p<0.001
Knowledge of Breast cancer screening					
Yes	0.414	5.663	2.517	12.744	p<0.001
No		Ref			
Received health education on breast cancer screening					
Yes	0.223	1.610	1.041	2.491	0.032
No		Ref			
Last check-up					
≤6 months		Ref			
>6 months	0.753	0.006	0.001	0.026	p<0.001
Never	0.739	0.005	0.001	0.021	p<0.001
Access to congregational financial support					
Yes	0.279	2.839	1.645	4.901	p<0.001
No		Ref			

4.6.2 Multivariate analysis of factors associated with breast cancer screening

The study also investigated independent factors associated with breast cancer screening. Variables that were significant under bivariate model were included in a multivariate model to control for any confounders as shown in Table 4.6. The findings established that those who had knowledge on breast cancer screening were 25.5 times more likely to undertake breast cancer screening compared to those who

didn`t have knowledge of breast cancer screening, AOR =25.52, 95%CI: 8.87 – 73.45, p<0.001. Those who had hospital check-up for more than six months prior were 99.9% less likely to undertake breast cancer screening compared to those who had hospital check-up for less than six months prior, AOR =0.001, 95%CI: 0.000 – 0.008, p<0.001. Also, those who had never had a hospital check-up were99.9% less likely to undertake breast cancer screening compared to those who had hospital check-up for less than six months, AOR =0.001, 95%CI: 0.000 – 0.006, p<0.001. Those who had congregational financial support were 1.97 times more likely to undertake breast cancer screening compared to those who didn`t have congregational financial support, AOR = 1.97, 95%CI: 1.68 – 5.74, p=0.021.

Table 4.6: Multivariate analysis of factors associated with breast cancer screening

			95% C.I.		
	S.E.	**AOR**	**Lower**	**Upper**	**P-value**
Occupation					
Healthcare worker		Ref			
Social worker	1.152	0.203	0.021	1.947	0.167
Teacher	0.511	1.387	0.509	3.777	0.522
Accountant	0.624	0.305	0.090	1.037	0.057
Knowledge of Breast cancer screening					
Yes	0.539	25.517	8.865	73.449	P<0.001
No		Ref			
Received health education on breast cancer screening					
Yes	0.453	1.835	0.756	4.457	0.180
No			Ref		
Last check-up					
Last six months		Ref			
>1 year	0.872	0.001	0.000	0.008	P<0.001
Never	0.858	0.001	0.000	0.006	P<0.001
Access to congregational financial support					
Yes	0.545	1.970	1.676	5.737	0.021
No		Ref			

4.7 Perceptions on breast cancer screening among nuns

The study sought to explore the perceptions of the nuns on BCS. The following is a summary of the themes arising from the qualitative data.

Table 4.7: Perception on breast cancer screening among nuns

Theme	Sub-theme	Illustrative quotes
Awareness on BCS	Breast cancer a major cause of mortality and	*"Breast cancer is a leading cause of female mortality globally*." IDI 4.
	Predisposition of nuns to breast cancer due to nulliparous	"*To nuns, the cancer is common due to the null parity issue, which involves the reproduction activity*." IDI 4
	Need for screening for early detection and management	"*If you are diagnosed early, it's treatable unlike when it is diagnosed in later stages. It's difficult to treat when you are diagnosed later on unlike when it's in the first stage*." IDI 3
	Methods of breast cancer screening	"*Examination palpation of the breast in the four quadrants to see if there are any masses then patients are routinely sent for either ultra sounds or mammograms or screening….. From my knowledge, any swelling and pain is a clear indication of the need to conduct more tests to determine if the masses are cancerous*." IDI 2
	Need to create more awareness on breast cancer screening among nuns	"*I would suggest regular medical camps, especially where the nuns are residing in the congregating maybe through churches, also making it easily accessible for the nuns*" IDI 3 "*Providing nuns with enough knowledge about the cancer screening considering the gender again*." IDI 4

4.6.1 Awareness on breast cancer screening

4.6.1.1 Severity of breast cancer and predisposition of nuns to breast cancer

The respondents demonstrated knowledge on the severity of breast cancer as cause of mortality as illustrated by one of the respondents who had this to say, "*Breast cancer is a leading cause of female mortality globally*." IDI 4. In addition, a number of respondents were aware of the fact that nuns are more predisposed to breast cancer compared to other females as can be observed from the following responses;

"*Among nuns specifically maybe factors that would encourage is the being nulliparous meaning never having conceived children, it's a risk factor for breast cancer, another risk factor maybe is the age as well, some nuns are a bit advanced at age so it's a factor that can be considered as breast cancer screening*." IDI 2

"*They told us that being a nun is one of the factors that can easily predispose you, so you are supposed to have regular check-ups*." IDI 3

"*To nuns, the cancer is common due to the null parity issue, which involves the reproduction activity*." IDI 4

As such the respondents indicated that BCS is an important practice that nuns should adhere to on regular basis as alluded by one the respondent; "They should go for the screening frequently because of probably hormonal reasons" IDI 5.

4.6.1.2 Importance of screening for early detection and management of breast cancer

All the respondents were aware on the need to screen for breast cancer for early detection. They emphasized on the importance of early detection of breast cancer for better outcomes in treatment and management of breast cancer as alluded to by the following responses;

"*From what I hear from the media or when we go to hospital is that any cancer especially for breast cancer we try to go, if it is caught early, it can be treated, but if it is caught very late there will be a problem in treating*." IDI 1

"*We tend to have a lot of late diagnoses because patients rarely come for breast examination and mammograms and ultra sounds, so I think we need to educate more on early diagnosis and screening.*" IDI 2

"*If you are diagnosed early, it's treatable unlike when it is diagnosed in later stages. It's difficult to treat when you are diagnosed later on unlike when it's in the first stage*." IDI 3

"*When it's still early that it can be treated because it is still in the first stages.*" IDI 4

"*Early diagnosis of breast cancer is when the cancer is diagnosed early such that the treatment is more successful and also the prognosis and increases the chances of survival*." IDI 5

"*Early diagnosis, to my understanding I think is that so they have the best chance for successful treatment if it is found positive.*" IDI 6

"*My understanding about early diagnoses is that it helps prevent the spread of cancer to other parts of the organs of the body*" IDI 11

4.6.1.3 Methods of breast cancer screening

They were also knowledgeable on various methods of breast cancer screening including clinical breast examination, imaging – ultrasounds, mammograms as alluded to respondents. Some of them stated that they heard doctors explaining about masses and lumps through physical examination by hand.

"*During the scanning and clinical assessment, I have heard that the doctor will be looking at masses and lumps by feeling the breasts. This is also the case with the scanning where the doctor will look at the images and determine if there are any*

abnormalities. I also hear that the doctor can order more tests including a biopsy to determine the nature of the cells" IDI 1

Some of the respondents were specific regarding the different methods they knew about breast cancer examination.

"*Examination palpation of the breast in the four quadrants to see if there are any masses then patients are routinely sent for either ultra sounds or mammograms or screening. During the imaging process, the doctors will be looking for any abnormalities. From my knowledge, any swelling and pain is a clear indication of the need to conduct more tests to determine if the masses are cancerous*." IDI 2

"*I think it involves assessing the breasts using the hands to determine if there are any differences or abnormalities. I have seen a few clips and heard the explanation that the physician will examine the breasts to determine if there are lumps or unique features. For the mammogram, it involves taking images of the breast, which will reveal any issues*." IDI 3

"*The X-rays are used to explore cancers too small to feel or see*." IDI 6

"*During the physical exam, the physician will feel the breasts and check for any changes, including the cancers and swells. One of the disadvantages of using the physical exam is that one cannot see the small cancers.*" IDI 7

"*For a self-examination, it involves several strategies, including looking oneself on the mirror and examine the breasts for any differences or unique aspects. Self-examination further involves feeling the breasts for any lumps and masses. When using the mammography, it entails the imaging and scanning procedures to check for the differences in the breasts*." IDI 8

"*The mammogram entails an x-ray picture of a breast and is applied to check women breast cancer, especially for individuals that have symptoms and signs of the condition. The screening mammogram entails at least an image or x-ray of every breast. It allows for detecting the changes and cancerous cells for people that have symptoms and signs*." IDI 9

4.6.1.4 Need to create more awareness on breast cancer screening among nuns

The respondents indicated there the need to ensure more nuns undergo breast cancer screening. According to the respondent's lack information on need for screening was a hindrance for the uptake of breast cancer screening. They recommended raising of awareness on the importance of breast cancer screening through seminars and medical camps among others.

"*Increasing awareness among the nuns because not all nuns are in the healthcare profession, so some who are not in the healthcare profession may not even aware about the screening so I think awareness is also a factor that hinders them.*" IDI 2

Others suggested that medical camps are crucial in improving the general level of awareness about breast cancer screening.

"*I would suggest regular medical camps, especially where the nuns are residing in the congregating maybe through churches, also making it easily accessible for the nuns*" IDI 3

"*Providing nuns with enough knowledge about the cancer screening considering the gender again*." IDI 4

Few of the respondents maintained that provision of funds would be integral in helping navigate the existing challenges in breast cancer screening.

"*Lack of knowledge, information that they should go for the frequent screening or maybe funds for the more advanced screening methods like the M.R.I and such. Create awareness for importance of the screenings, frequent medication forums for the importance of the screening of breast cancer. No but I think you should on awareness maybe create a seminar.*" IDI 5

"*I think us nuns should have maybe seminars for people to talk about the cancer*." IDI 6

"*Resources, some of the procedures like the M.R.I are a bit expensive also confidentiality, some of them they fear maybe the information might not be that confidential. Then availability of the health care workers. Health education then we can do maybe things like the medical camps, they help to create awareness*." IDI 7

"*It is important to educate every individual how to do the self-examination… they could employ female nurses for the nuns so that they can be more comfortable to go to the hospital*." IDI 11

"*For those who have the knowledge on how to do it* [self-breast examination] *can teach the others*." IDI 12

4.8 Lived experiences on Breast Cancer Screening among nuns

The study sought to explore the lived experiences of the nuns on BCS. The following is a summary of the themes arising from the qualitative data.

Table4.8: Lived experiences on breast cancer screening among nuns

Theme	Sub-theme	Illustrative quotes
Experiences of BCS	Fear of the procedure	*I was fearful, now when we being taught about cancer, I thought maybe what if I do this and it turns out to be positive, maybe I get a lump but I thank God it was not positive*." IDI 6
	Preference of self-breast exam as opposed to clinical palpation	*During the self-examination, one is trained on checking the masses and lumps and is encouraged to go for further assessment and I would definitely recommend it". ID5*
	Preferences for female Health workers for clinical breast examination	*I would say we should arrange for a female gynecologist us nuns you know we are very personal, we live a very personal life, we have to encourage to have female doctors to do the screenings for the nuns. ID6*
Factors hindering uptake of BCS	Lack of funds/ insurance	*I think major challenges include Lack of knowledge, information that they should go for the frequent screening or maybe funds for the more advanced screening methods" ID5*
	Lack of information	*I would say lack of information because like myself it's because of the training we once underwent that made me realize the importance of doing the screening." ID3*
	Lack of time	*I think the factors, exposure and time mostly us nuns we don't create the time maybe wherever you are, you are being sent somewhere by the congregation you don't have much time but you can go for the screenings. ID6*

4.8.1 Experiences of breast cancer screening

4.8.1.1 Fear of the procedure

Despite the fact that the respondents understood the importance of breast cancer screening, they expressed fear of undergoing the procedure as can be noted from the responses below;

"*I feared, I went once, I was unwell then the doctor said I should get a screening and they examined if there were any lumps or swelling in the breast that would suggest if I had the cancer*." IDI 1

"*I was fearful, now when we being taught about cancer, I thought maybe what if I do this and it turns out to be positive, maybe I get a lump but I thank God it was not positive*." IDI 6

4.8.1.2 Preference of self-breast exam as opposed to clinical palpation

Some respondents prefer to perform self-breast examination as opposed to clinical examination of the breast for different reasons. This includes lack of time and expenses associated with clinical examination as illustrated below;

"*I find it easy doing it on myself because it doesn't take so long*" IDI 3

"*Because we don't have an insurance, some of us cannot be able to go for breast cancer screening because it is expensive*" IDI 9

Some of the participants were comfortable with any of the breast cancer screening methods

"*To be honest the only one that I have gone is self- breast examination and then the scan I have gone for it… For myself the one I have used its okay is comfortable because it's myself I don't know if I will be comfortable with the mammogram because I don't know what it entails.*" IDI 10

4.8.1.3 Preferences for female Health workers for clinical breast examination

Many of the respondents expressed a desire and preference to being examined by female medical personnel. Some regarded their experience of being examined by male doctors and nurses as uncomfortable. In addition to this, some respondents stated that they were more comfortable with going for clinical examination when they were accompanied by fellow nuns as they offered moral support. This what the respondents had to say;

"*When we go to a hospital we find a fellow nun, we will be more positive to allow the examination or when we find female doctors, or maybe if we go as group, we give each other support*." IDI 1

"*For nuns the biggest challenge sometimes is dealing maybe with health care workers who are of the opposite sex so I think encouraging nuns to seek health services from females who they might feel a bit more comfortable with, those factors can encourage. This affects the person's self-esteem issues and openness*." IDI 2

"*When it comes to gender, we prefer female doctors***.**" IDI 4

"*We should arrange for a female gynaecologist us nuns you know we are very personal, we live a very personal life, we have to encourage to have female doctors to do the screenings for the nuns*" IDI 6

"*I was not that comfortable because sometimes especially when it is done by a male health worker it is not comfortable*." IDI 7

"*We still don't know whether you still have to be exposed for it. I will be very comfortable with a female doctor*." IDI 10

"*They could employ female nurses for the nuns so that they can be more comfortable to go to the hospital*." IDI 11

4.8.2 Challenges hindering screening

According there was low uptake of breast cancer screening which they attributed to lack of funds as well as time to go for the screening. Similarly, lack of information among most nuns hindered BCS among the nuns. Some of the respondents had this to say:

"*I would say lack of information because like myself it's because of the training we once underwent that made me realize the importance of doing the screening*" IDI 3

"*Mostly us nuns we don't create the time maybe wherever you are, you are being sent somewhere by the congregation you don't have much time but you can go for the screenings*" IDI 6

"*Because we don't have an insurance, some of us cannot be able to go for breast cancer screening because it is expensive… they should give us an insurance cover even if it won't cover the whole amount that is supposed to be used for the breast cancer screening*" IDI 9

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter entailed the discussion of the findings as per objectives conclusions, and recommendation of the study.

5.2 Discussion

5.2.1 Demographic characteristics

The present study investigated the breast cancer screening among nuns in the Catholic Archdiocese of Nairobi. These findings contrast those from a study conducted in Uganda which revealed that 57.7% were aged between 41 to 60 years (Basaza et al., 2022). Another study conducted by Thiel (2008) in a study conducted in United States where the average age of age of participants was 64 years. This could be attributed to the difference in target population. In our present study, the target population comprised of nuns at the Catholic Archdiocese of Nairobi while in their studies, the population consisted of only nuns who came for digital mammography at the hospital. Thus, breast cancer screening is recommended for women between 50 and 74 years who considered at high risk for breast cancer (Ribnikar *et al.,* 2015). This explains why in their study, majority of respondents were aged more than 40 years.

These findings comparable to a study in Nigeria by Onyawoi (2014) which revealed that 52% of the respondents had tertiary level education while 20.1% had postgraduate level education. Catholic nuns dedicate their lives to service. They work tirelessly to improve the conditions of their congregations and communities. They are also addressing many of the serious issues that plague the African continent. African nuns are also deeply trusted members of their communities. They are leading and serving where the needs are the greatest services sectors such as in schools, in healthcare facilities, and in human service, environmental and economic projects

across the continent. These settings require that they gain additional skills and knowledge through tertiary and post graduate education.

5.2.2 The prevalence of breast cancer screening

Our findings revealed that the prevalence of breast cancer screening among nuns was 30.7%. The low breast cancer screening practice among nuns has been revealed in other studies (Allen et a*l.,* 2014;Memuna, Onyawoi, 2014;Sayed et *al.,* 2019). Allen *et al.,* (2014) in a study conducted among Catholic Latinos revealed that breast cancer screening uptake was low at 24%. The barriers to screening among Latinos has been investigated which include lack of health insurance, concerns about cost, perceived discrimination, inadequate awareness and lack of provider recommendations. The role of religious factors in cancer screening behaviours may be especially pertinent to Latinos in the U.S. who, as a whole, express high levels of religious devotion and religious service attendance. Therefore, understanding the role of religious beliefs, traditions, bodies of doctrine, and ministry in shaping health beliefs and behaviours is of critical importance. Onyawoi (2014) in a study conducted in Nigeria investigating cancer screening among catholic nuns found that prevalence of breast cancer screening was 27%. Breast cancer screening in general population has been slightly higher compared to the prevalence among nuns. This is evident in a qualitative study conducted in Kenya investigating breast cancer screening in coastal Kenya established that prevalence of breast cancer screening was 40 percent (Sayed *et al.,* 2019). This is mainly attributed to less restrictions especially in terms of finances required to undergo breast cancer screening or presence of medical camps across different settings which are uncommon for nuns.

5.2.3 The socio-economic factors associated with breast cancer screening

The current study revealed that knowledge on breast cancer screening was significantly associated with breast cancer screening among nuns. Those findings are comparable to Abeje *et al.,* (2019) in Ethiopia who revealed that women who had knowledge about breast cancer screening were more likely to have breast cancer screening where 97 percent among those who had breast cancer knowledge had undergone breast cancer screening. Similarly, a study conducted in Coastal Kenya,

revealed that knowledge about breast cancer screening was associated with increased breast cancer seeking behaviour (Sayed *et al.,* 2019). In Nigeria, a study conducted by Madu and Nkem (2014) revealed that having low knowledge level was associated with poor breast cancer screening behaviour. Education and continuous sensitization to the signs and symptoms of breast cancer, the fact that early detection increases the chances for cure, and the options for screening, diagnosis and treatment will be key to empowering people with accurate knowledge and dispelling some of the myths about breast cancer, which will encourage women to seek breast health services in a timely manner.

Our present findings also revealed that, having hospital check-up was associated with breast cancer screening. Having a hospital check is significantly associated with positive health seeking behaviour. In our present study, those who had hospital check-up of more than six months prior to the study had a reduced chance of seeking breast cancer screening. These findings were comparable to past studies by Orindi *et al.(*2016); Basaza et *al.* (2022). Orindi *et al.* (2016) in a study conducted in Kisii, Kenya revealed that those who had poor health seeking behaviour were less likely to undergo breast cancer screening. Health seeking behaviour in this context involve having hospital check which helped in identification of common illnesses. Similarly, Basaza *et al.* (2022) in a study in Uganda revealed that those who had hospital check-up had a higher likelihood of breast cancer screening.

The current study revealed that respondents who received congregational financial support were more likely to have breast cancer screening. These findings compared with those from Orindi *et al.* (20106) in a study done in Kenya which stated that low socio-economic status was associated with low breast cancer screening. Breast cancer screening is a payable process where those seeking screening are required to pay. Congregational financial support is one of the ways that nuns have access to finances and thus those who have access to these funds are able to pay for their cancer screening.

5.2.4 The level of awareness on breast cancer screening among nuns

The present findings established that most of the respondents were aware that breast cancer is the leading cause of death among women although there is lack of awareness on breast screening among nuns with almost half of the respondents citing lack of awareness as a barrier. These findings compare with those from a study in Uganda which found that awareness was a key barrier to utilization of breast cancer screening among reverend sisters (Basaza *et al.,* 2022). Nuns, often devoted to a life of service and prayer, may not prioritize their health or preventive care as much as others. This could be due to a number of factors. Nuns may have limited exposure to mainstream healthcare information and public awareness campaigns due to their secluded lifestyles. In addition, cultural and religious beliefs may lead some nuns to prioritize their spiritual well-being over physical health. They may view health screenings as unnecessary or contrary to their faith. Fear of a breast cancer diagnosis or associated stigma may deter nuns from seeking screening services.

The findings also established that most of the respondents knew that it is beneficial to have breast cancer screening early. Early breast cancer screening is a powerful weapon in our arsenal against this formidable disease. It saves lives, reduces the burden of treatment, lowers healthcare costs, and offers emotional and psychological relief. Furthermore, it empowers individuals to take control of their health and make informed decisions (Farzaneh *et al.,* 2017). By prioritizing early breast cancer screening, we can move closer to a future where breast cancer is not only treatable but preventable. The benefits of early screening are undeniable, and its importance cannot be overstated. It is a step towards a healthier, happier, and brighter tomorrow for all.

5.2.5 Perceptions on breast cancer screening among nuns

The present study revealed that awareness on breast cancer, experiences with breast cancer screening, barriers, and facilitators were major themes identified defining perception and lived experiences among nuns. The current study revealed that majority of the respondents were aware of breast cancer as a major cause of mortality. Most of them knew that they were at a higher risk due to the null parity

issue they face. Almost all of the respondents stated that early screening essential in management of breast cancer and were also aware of breast cancer screening. These findings comparable to other studies (Mulmi *et al.*, 2021; Farzaneh *et al.*, 2017). According to a study conducted in Nepal, it was revealed that those who had high level of awareness were more likely to have high breast cancer screening (Mulmi *et al.*, 2021). The screening practices of women depends on their awareness, attitudes, socio-demographic characteristics and cultural issues. Farzaneh *et al.* (2017) revealed that most of the respondents were aware that early breast cancer screening was associated with better management of breast cancer.

5.2.6 Lived Experiences on breast cancer screening among nuns

The current findings also revealed that among the experiences among nuns, fear of the procedure, preference of self-breast exam and preference of female health workers were the major factors identified. These findings are consistent with Orindi *et al.*, (2016) who revealed that fear and influence of individual and cultural beliefs defined individual perceptions. A study conducted in Nepal by Mulmi *et al.* (2021) found that majority of participants preferred self-breast exam rather than clinical palpation. This limited the interpretation of findings since clinical palpation is fundamental in accurately diagnosing breast cancer. Gabel *et al.*, (2017) also affirmed that majority of nuns were sceptical of care from male practitioners. This is mainly because of their faith and lifestyle which restricts their interaction with male individuals whether healthcare providers or not.

5.3 Conclusion

The findings from the current study have showed that breast cancer screening among nuns was low at 30.7%.

The findings revealed that occupation of nuns was associated with breast cancer screening. Those who worked as accountants were less likely to undergo breast cancer screening. The low breast cancer screening was associated with knowledge of breast cancer screening, having hospital check-up of less than six months and having access to congregational financial support.

The study that noted there is no association between social economic factors and breast cancer screening among nuns. We therefore reject Null hypothesis.

Most of the participants maintained a positive perception about breast cancer screening with high level of awareness and implication of early diagnosis.

Lived experiences of participants on breast cancer screening revealed that fear of the procedure, preference of self-breast exam and preference of female health workers were the major experiences.

5.4 Recommendations

- Create adequate awareness and the sisters educated through aggressive education campaign programs so as to eliminate misconceptions relating to the breast cancer screening.
- Provide health insurance cover for nuns to alleviate the challenge of financial support in seeking breast cancer screening.
- Provide breast cancer screening camps in different orders to improve health check-up and increased understanding of their overall wellbeing.
- Provide regular health education among nuns on the importance of breast cancer screening and common examination methods they can employ to improve uptake.

5.5 Suggestion for further study

Longitudinal studies should be undertaken to identify the extent of breast cancer screening in a multicentred setting.

REFERENCES

Abeje, S., Seme, A., & Tibelt, A. (2019). Factors associated with breast cancer screening awareness and practices of women in Addis Ababa, Ethiopia. *BMC women's health*, *19*(1), 1-8.

Alkabban, F. M., & Ferguson, T. (2020). *Breast Cancer*. Treasure Island (FL): StatPearls Publishing.

Antabe, R., Kansanga, M., Sano, Y., Kyeremeh, E., & Galaa, Y. (2020). Utilization of breast cancer screening in Kenya: what are the determinants? *BMC health services research*, *20*(1), 1-9.

Artiga, S., & Hinton, E. (2018). Beyond health care: The role of social determinants in promoting health and health equity. KFF. Retrieved from https://www.kff.org/racial-equity-and-health-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/

Bevers, T. B., Helvie, M., Bonaccio, E., Calhoun, K. E., Daly, M. B., Farrar, W. B., ... & Kumar, R. (2018). Breast cancer screening and diagnosis, version 3.2018, NCCN clinical practice guidelines in oncology. *Journal of the National Comprehensive Cancer Network*, *16*(11), 1362-1389.

Bolf, E. L., Sprague, B. L., & Carr, F. E. (2019). A linkage between thyroid and breast cancer: a common etiology? *Cancer Epidemiology and Prevention Biomarkers*, *28*(4), 643-649.

Brito-Marcelino, A., Duarte-Tavares, R. J., Marcelino, K. B., & Silva-Neto, J. A. (2020). Breast cancer and occupational exposures: an integrative review of the literature. *Revista Brasileira de Medicina do Trabalho*, *18*(4), 488.

CDC (2020). What is Breast Cancer Screening? Retrieved from https://www.cdc.gov/cancer/breast/basic_info/screening.htm

Chan, D. S., Abar, L., Cariolou, M., Nanu, N., Greenwood, D. C., Bandera, E. V., ... & Norat, T. (2019). World Cancer Research Fund International: Continuous Update Project—Systematic literature review and meta-analysis of observational cohort studies on physical activity, sedentary behavior, adiposity, and weight change and breast cancer risk. *Cancer causes & control*, *30*(11), 1183-1200.

Dadzi, R., & Adam, A. (2019). Assessment of knowledge and practice of breast self-examination among reproductive age women in Akatsi South district of Volta region of Ghana. *PLoS One*, *14*(12), e0226925.

Dougherty, M.R., Slevc, L.R. & Grand, J.A., (2019). Making research evaluation more transparent: Aligning research philosophy, institutional values, and reporting. *Perspectives on Psychological Science*, *14*(3), 361-375.

Fraumeni Jr, J. F., Lloyd, J. W., Smith, E. M., & Wagoner, J. K. (1969). Cancer mortality among nuns: role of marital status in etiology of neoplastic disease in women. *Journal of the National Cancer Institute*, *42*(3), 455-468.

Gabel, P., Larsen, M. B., Nielsen, P. B., Svendstrup, D. B., & Andersen, B. (2017). Satisfaction, discomfort, obligations, and concerns in population-based breast cancer screening: cross-sectional study in a Danish population. *BMC health services research*, *17*(1), 1-10.

Gatumo, M., Gacheri, S., Sayed, A. R., & Scheibe, A. (2018). Women's knowledge and attitudes related to cervical cancer and cervical cancer screening in Isiolo and Tharaka Nithi counties, Kenya: a cross-sectional study. *BMC cancer*, *18*(1), 1-9.

Harrison, H., Birks, M., Franklin, R., & Mills, J. (2017). Case study research: Foundations and methodological orientations. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, *18*(1).

Health Quality Ontario. (2016). Women's Experiences of Inaccurate Breast Cancer Screening Results: A Systematic Review and Qualitative Meta-synthesis. *Ontario health technology assessment series*, *16*(16), 1.

Heena, H., Durrani, S., AlFayyad, I., Riaz, M., Tabasim, R., Parvez, G., & Abu-Shaheen, A. (2019). Knowledge, attitudes, and practices towards cervical cancer and screening amongst female healthcare professionals: a cross-sectional study. *Journal of oncology*, *2019*.

Heiman, H. J., & Artiga, S. (2015). *Beyond health care: the role of social determinants in promoting health and health equity* (Vol. 4). November.

Imami, E. (2019). Why breast cancer was called 'Nun's disease.' Retrieved from https://www.floridatoday.com/story/life/wellness/2019/09/17/why-breast-cancer-called-nuns-disease/2340315001/

Kent, A. (2012). Nuns and contraceptives. *Reviews in Obstetrics and Gynecology*, *5*(3-4), e166.

Leatherdale, S.T. (2019). Natural experiment methodology for research: a review of how different methods can support real-world research. *International Journal of Social Research Methodology*, *22*(1), 19-35.

McKinney, S. M., Sieniek, M., Godbole, V., Godwin, J., Antropova, N., Ashrafian, H., ... & Shetty, S. (2020). International evaluation of an AI system for breast cancer screening. *Nature*, *577*(7788), 89-94.

Ministry of Health, Kenya (2018). Kenya National Cancer Screening Guidelines. Retrieved from https://www.health.go.ke/wp-content/uploads/ 2019/ 02/National-Cancer-Screening-Guidelines-2018.pdf

Mwangi, K., Gathecha, G., Nyamongo, M., Kimaiyo, S., Kamano, J., Bukachi, F., ... & Anyona, M. (2021). Reframing non-communicable diseases and injuries for equity in the era of universal health coverage: findings and

recommendations from the Kenya NCDI Poverty Commission. *Annals of global health*, *87*(1).

Orindi, O. T. (2016). *Factors that influence the uptake of breast cancer screening among secondary school students: a case of Kisii south sub-county, Kenya.* Unpublished MSc thesis, Nairobi: University of Nairobi.

Orindi, O. T., Amimo, F., Odado, S. P, & Sereta, B. (2016). Factors that influence the uptake of breast cancer screening among secondary school students: a case of Kisii south sub-county, Kenya. *Oncology and Cancer Case Reports*, *2*(1).

Pagliarin, F., Pylkkanen, L., Salakari, M., & Deandrea, S. (2021). Are women satisfied with their experience with breast cancer screening? Systematic review of the literature. *European Journal of Public Health*, *31*(1), 206-214.

Rahman, S. A., Al–Marzouki, A., Otim, M., Khayat, N. E. H. K., Yousef, R., & Rahman, P. (2019). Awareness about breast cancer and breast self-examination among female students at the University of Sharjah: a cross-sectional study. *Asian Pacific journal of cancer prevention: APJCP*, *20*(6), 1901.

Rivera-Franco, M. M., & Leon-Rodriguez, E. (2018). Delays in breast cancer detection and treatment in developing countries. *Breast cancer: basic and clinical research*, *12*, 1178223417752677.

Roth, W. M., & von Unger, H. (2018, September). Current perspectives on research ethics in qualitative research. In *Forum qualitative sozialforschung/forum: Qualitative social research*, *19*(3).

Sadoh, A. E., Osime, C., Nwaneri, D. U., Ogboghodo, B. C., Eregie, C. O., & Oviawe, O. (2021). Improving knowledge about breast cancer and breast self-examination in female Nigerian adolescents using peer

education: a pre-post interventional study. *BMC women's health*, *21*(1), 1-9.

Sheppard, J., & Thomas, C. B. (2021). Community pharmacists and communication in the time of COVID-19: Applying the health belief model. *Research in Social and Administrative Pharmacy*, *17*(1), 1984-1987.

Suwankhong, D., & Liamputtong, P. (2018). Physical and emotional experiences of chemotherapy: a qualitative study among women with breast cancer in Southern Thailand. *Asian Pacific Journal of Cancer Prevention: APJCP*, *19*(2), 521.

Vasileiou, K., Barnett, J., Thorpe, S. and Young, T. (2018). Characterizing and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period. *BMC medical research methodology*, *18*(1), 1-18.

Villa, G., Manara, D. F., Brancato, T., Rocco, G., Stievano, A., Vellone, E., & Alvaro, R. (2018). Life with a urostomy: A phenomenological study. *Applied Nursing Research*, *39*, 46-52.

Westhoff, C. L., & Pike, M. C. (2018). Hormonal contraception and breast cancer. *Contraception*, *98*(3), 171-173.

Whitaker, L. (2012). *The plight of nuns: hazards of nulliparity*. BMJ Sexual and Reproductive Health. http://dx.doi.org/10.1136/jfprhc-2012-100339

WHO (2021a). Breast Cancer – WHO | World Health Organization. Retrieved from https://www.who.int/news-room/fact-sheets/detail/breast-cancer#:~:text=In%202020%2C%20there%20were%202.3,the%20world's%20most%20prevalent%20cancer.

WHO (2021b). Maternal, newborn, child and adolescent health and ageing. Retrieved from https://www.who.int/data/maternal-newborn-child-adolescent-ageing/indicator-explorer-new/mca/proportion-of-women-

of-reproductive-age-(aged-15-49-years)-who-have-their-need-for-family-planning-satisfied-with-modern-methods

Wu, Z., Liu, Y., Li, X., Song, B., Ni, C., & Lin, F. (2019). Factors associated with breast cancer screening participation among women in mainland China: a systematic review. *BMJ open*, *9*(8), e028705.

You, W., Symonds, I., Rühli, F. J., & Henneberg, M. (2018). Decreasing birth rate determining worldwide incidence and regional variation of female breast Cancer. *Advances in Breast Cancer Research*, *7*(01), 1-14.

Zeru, Y., Sena, L., & Shaweno, T. (2019). Knowledge, Attitude, practice, and associated factors of breast cancer self-examination among urban health extension workers in Addis Ababa, Central Ethiopia. *Journal of Midwifery and Reproductive Health*, *7*(2), 1662-1672.

APPENDICES

Appendix I: Informed Consent

Consent form

Hello, my name is Sr. Alfena Joseph from the Franciscan Sisters of Immaculate Heart of Mary, Archdiocese of Nairobi. I am a Post graduate student at Jomo Kenyatta University of Agriculture and Technology (JKUAT). I am conducting a study about breast cancer screening among nuns. Specifically, I will collect information about the socio-economic factors affecting breast cancer screening. I am using a mixed methodology method, including a questionnaire and interview. I kindly request for your participation in the study. The process is confidential and your information will not be shared with anybody without your consent.

The interview will take less than an hour. I would like to ask your permission for taping the session because I do not want to miss any of your ideas and suggestions. Although I am going to take some notes during the session, I cannot possibly write fast enough to get it all down. Because we are on tape, please be sure to speak up so that we do not miss your ideas. I want to note again that the information you provided will be confidential. Any information we use from your interview will be combined with information from other women with breast cancer. It will not be possible to identify what you have said.

I, the undersigned, confirm that, as I give consent to participate in the study, it is with a clear understanding of the objectives and conditions of the study and with recognition of my right to withdraw from the study if I change my mind.

I _____ do herby give consent to _____ be interviewed. I have been given the necessary information about the research. I have also been assured that I can withdraw my consent at any time without penalty or loss of benefits. The thesis has been explained to me in the language I understand.

Nun’s signature: _____Date: _____/_____/_____

Name of interviewer: _____ Date: _____/_____ / _____

Thank you for agreeing to participate

Appendix II: Questionnaire

Respondent Identifiable Number:

Questionnaire

Title: Determinants Breast Cancer Screening among Nuns in the Catholic Archdiocese of Nairobi

Instructions

Please tick as appropriate

Part 1: Demographics

1. Age (Please fill in your age in years)

_____

2. Please indicate your congregation.

_____

3. Education level

   (a) Did not finish high school
   (b) High school graduate
   (c) College degree
   (d) Undergraduate degree
   (e) Postgraduate degree

4. What is your occupation?

(a) Healthcare worker (HCW)
(b) Social worker
(c) Teacher
(d) Accountant
(e) Others (Please specify) _____

Part 2: Awareness and Uptake of Breast Cancer Screening

1. Do you understand what is breast cancer screening?

   Yes ()

   No ()

2. Name the methods of breast cancer screening

   _____
   _____

   _____

3. Where did you hear about breast cancer and screening?

   Social media ()

   College ()

   Seminars and conferences ()

   Local community programs ()

4. Have you received health education/seminar about breast cancer screening?

Yes ()

No ()

5. Have you ever undergone breast cancer screening?

Yes ()

No ()

5b. If your answer is yes, what method of breast cancer screening did you undergo?

_____

5c. If your answer is no, what hindered you from undergoing breast cancer screening?

Fear ()

Lack of awareness ()

Finances ()

Peer pressure ()

Others (*Please State)*

6. How frequent do you undergo clinical breast cancer screening?

   After every six months ()

   At least once per year ()

   Once in every two years ()

   Not applicable ()

7. How frequent do you undergo self-breast examination?

   Monthly ()

   Every three months ()

   Once a year ()

Part 3: Socio-Economic Factors Influencing Breast Cancer Screening

8. When is the last time you visited the hospital for a check-up?

   The one month ()

   The last three months ()

   The last six months ()

   The last one year ()

   More than a year ago ()

9. If you have undergone breast cancer screening, what was the purpose?

   Advice from the health worker ()

   Medical grounds ()

   Noticed a lump ()

   Personal health check-up initiative. ()

10. What hinders access to check-up

    Time ()

    Resources ()

    Lack of support ()

    Others (specify) ()

11. Who influenced your decision-making process to uptake breast cancer screening?

    (a) Friend
    (b) Sibling
    (c) Media
    (d) Self-initiative
    (e) Referral (HCW).

12. `Do you have any insurance cover?

    Yes ()

    No ()

13. Do you have access to any congregation financial support for breast cancer screening?

    Yes ()

    No ()

14. What is your experience to accessing breast cancer screening?

    High ()

    Average ()

    Low ()

15. Do you have any concerns? Please list them.

    _____

_____

_____

16. Do you have any cultural and religious beliefs and concerns undergoing breast cancer screening?

    Yes ()

    No ()

Thank you for your time and information.

Kind Regards

Appendix III: Interview Questions

Interview Questions

1. What is your understanding about breast cancer?
2. What is your understanding about early diagnosis?
3. What is your understanding of breast cancer screening?

   What types of screening do you know?

4. How often do you undergo breast cancer screening?

   If yes, when is the last time?

   Which method did you undergo?

5. What is your experience with BCS?
6. Could you narrate your experience during the last time you underwent breast cancer screening?
7. What factors encourage breast cancer screening among nuns?
8. What factors hinder breast cancer screening among nuns?
9. What are your suggestions about how to improve the uptake of breast cancer screening among nuns?
10. Do you have any questions for us?

Appendix IV: Institutional Scientific Ethics Review Committee University of eastern Africa Baraton

OFFICE OF THE CHAIRPERSON
INSTITUTIONAL SCIENTIFIC ETHICS REVIEW COMMITTEE
UNIVERSITY OF EASTERN AFRICA, BARATON
P.O. BOX 2500-30100, Eldoret, Kenya, East Africa

B5623032022 March 29, 2022

TO: Sr. Alfena Julie Joseph
Jomo Kenyatta University of Agriculture and Technology (JKUAT)
Department of Nursing (Midwifery/Reproductive Health)

Dear Sr. Alfena Julie Joseph,

RE: Determinants of Breast Cancer Screening Among Nuns in the Catholic Archdiocese of Nairobi

This is to inform you that the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton has reviewed and approved your above research proposal. Your application approval number is UEAB/ISERC/56/3/2022. The approval period is 29th March, 2022 – 29th March, 2023.
This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton within 72 hours of notification.
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton within 72 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton.

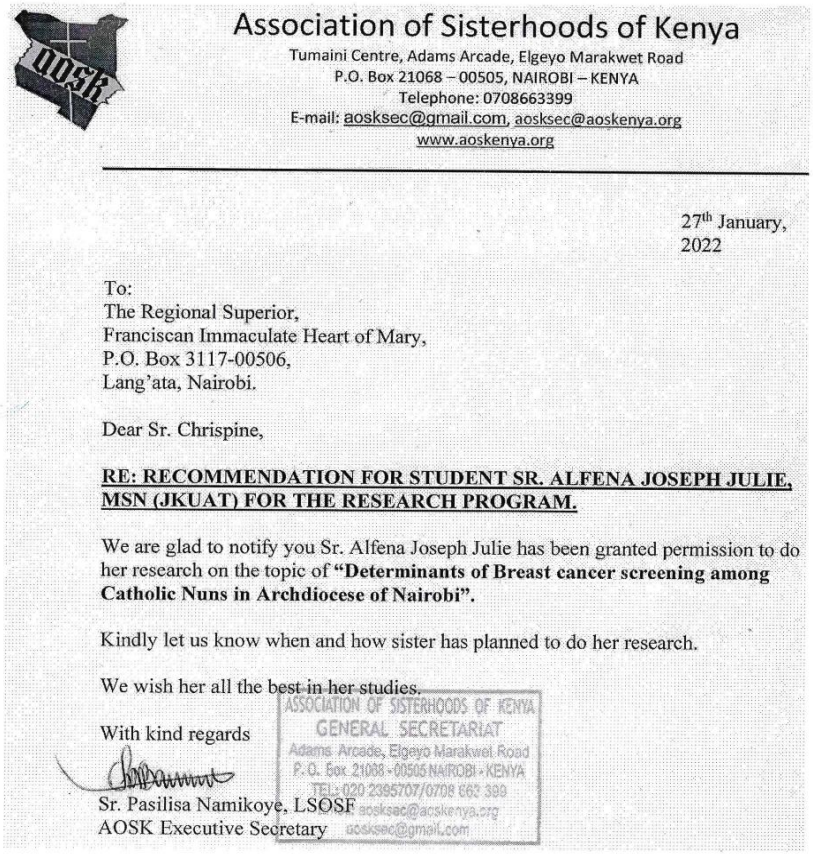
Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

Sincerely yours,

Prof. Jackie K. Obey, PhD
Chairperson, Institutional Scientific Ethics Review Committee

University of Eastern Africa, Baraton
30 MAR 2022
ELDORET
Research Ethics Committee

Appendix V: Association of sisterhoods of Kenya



Association of Sisterhoods of Kenya
Tumaini Centre, Adams Arcade, Elgeyo Marakwet Road
P.O. Box 21068 – 00505, NAIROBI – KENYA
Telephone: 0708663399
E-mail: aosksec@gmail.com, aosksec@aoskenya.org
www.aoskenya.org

27th January, 2022

To:
The Regional Superior,
Franciscan Immaculate Heart of Mary,
P.O. Box 3117-00506,
Lang'ata, Nairobi.

Dear Sr. Chrispine,

RE: RECOMMENDATION FOR STUDENT SR. ALFENA JOSEPH JULIE, MSN (JKUAT) FOR THE RESEARCH PROGRAM.

We are glad to notify you Sr. Alfena Joseph Julie has been granted permission to do her research on the topic of **"Determinants of Breast cancer screening among Catholic Nuns in Archdiocese of Nairobi".**

Kindly let us know when and how sister has planned to do her research.

We wish her all the best in her studies.

With kind regards

ASSOCIATION OF SISTERHOODS OF KENYA
GENERAL SECRETARIAT
Adams Arcade, Elgeyo Marakwet Road
P.O. Box 21068 - 00505 NAIROBI - KENYA
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aosksec@aoskenya.org
aosksec@gmail.com

Sr. Pasilisa Namikoye, LSOSF
AOSK Executive Secretary

Appendix VI: JKUAT Introductory letter to Institution of ethcal review committee and NACOSTI

JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY
SCHOOL OF NURSING

DEPARTMENT OF NURSING EDUCATION, LEADERSHIP, MANAGEMENT & RESEARCH
P.O. BOX 62000-00200, NAIROBI. TELEPHONE: 067- 58-70001/4 EXTENSION : 4070 Email :nursingeducation@jkuat.ac.ke

12th July, 2022

TO WHOM IT MAY CONCERN

RE : SR. ALFENA JULIE JOSEPH – HSN311-1152/2020

This is to confirm that the above named is a bonafide student at Jomo Kenyatta University of Agriculture and Technology pursuing Masters in Nursing.

She has successfully defended her proposal titled "***Determinants of Breast Cancer Screening Among Nuns in the Catholic Archdiocese of Nairobi***" and is to proceed for approval to an Institutional Ethical Review Committee and NACOSTI.

We therefore kindly request you to grant her the permit.

Yours faithfully,

JKUAT
www.jkuat.ac.ke
P. O. Box 62000 - 00200, NAIROBI
14 JUL 2022
CHAIRMAN DEPARTMENT
OF NURSING

ROSEMARY KAWIRA
COD, NURSING EDUCATION, LEADERSHIP, MANAGEMENT & RESEARCH

Appendix VII: NACOSTI Approval

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **529828**

Date of Issue: **13/July/2022**

RESEARCH LICENSE

This is to Certify that Sr.. Alfena JULIE Joseph of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research in Nairobi on the topic: DETERMINANTS OF BREST CANCER SCREENING AMONG NUNS IN THE CATHOLIC ARCHDIOCESE OF NAIROBI for the period ending : 13/July/2023.

License No: **NACOSTI/P/22/18948**

529828

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code

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