KNOWLEDGE OF EARLY DETECTION AND SCREENING UPTAKE AMONG FIRST DEGREE RELATIVES OF CANCER PATIENTS IN BENIN CITY, EDO STATE, NIGERIA.

BY

OKUNBOR ELOGHOSA HAPPY	**MED1807464**
OMOKARO FREDRICK	**MED1807469**

DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE,
COLLEGE OF MEDICINE, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE,
NIGERIA

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DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE,
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MEDICINE AND BACHELOR OF SURGERY (MBBS) DEGREE IN
UNIVERSITY OF BENIN, BENIN CITY

MAY 2026

DECLARATION

We hereby declare that this project work is original and will be carried out by the under-listed student under the supervision of Dr (Mrs) O.E Obarisiagbon and Dr Gregory A. Oko-oboh and has not been published elsewhere either for the award of degree or certificate.

OKUNBOR ELOGHOSA HAPPY
MED1807464
+2348107914286
Johnmayor340@gmail.com

FREDRICK OMOKARO

MED1807469

+2347032486313

Dr.Phred.Enogie@gmail.com

CERTIFICATION

This is to certify that this research work titled “**knowledge of early detection and screening uptake among first degree relatives of cancer patients in Benin City**” will be carried out in the Department of Public Health and Community Medicine, School of Medicine, College of Medical Sciences, University of Benin, Benin City, Edo State, Nigeria as part of the requirements for the award of Bachelor of Medicine, Bachelor of Surgery (MBBS) by **OKUNBOR ELOGHOSA HAPPY** with matriculation number **MED1807464** and **OMOKARO FREDRICK** with matriculation number **MED1807469.**

______________________________ ________________________

DR. (Mrs) O.E Obarisiagbon **DATE**
MBBS; FMCPH; MPH
Associate Professor/Consultant (Project Supervisor)
Department of Community Health,
School of Medicine,
College of Medical Sciences.
University of Benin,
Benin City, Edo State, Nigeria.

______________________________ ________________________

DR. G. Oko-Oboh **DATE**
MBBS; MPH; MSc; FWACP
Adjunct lecturer (Project Co-Supervisor),
Department of Community Health,
School of Medicine,
College of Medical Sciences.
University of Benin Teaching Hospital

______________________________ ________________________

DR. (Mrs) O.E Obarisiagbon **DATE**
Head of Department
Associate Professor/Consultant
Department of Public Health and
Community Medicine,
School of Medicine,
University of Benin/University of Benin Teaching Hospital (UBTH),
Benin City, Edo State, Nigeria.

DEDICATION

This project is dedicated to God Almighty who by his grace and mercy has made all these possible. This work is also dedicated to our beloved parents, and our supervisors and wonderful lecturers whose teachings contributed to its success.

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LIST OF ABBREVIATIONS

BRCA1: Breast cancer gene 1

BRCA2: Breast cancer gene 2

BSE: Breast self-examination

CRC: Colorectal cancer

CBE: Clinical breast examination

DDRI: Digestive Disease Research Institute

FDRs: First-degree relatives

FOBT: Fecal occult blood test

GLOBOCAN: Global Cancer Observatory

LDCT: Low-dose computed tomography

NPC: National Population Commission

SD: Standard deviation

SPSS: Statistical Package for the Social Sciences

TUMS: Tehran University of Medical Sciences

UBTH: University of Benin Teaching Hospital

DEFINITION OF TERMS

Asymptomatic: Having a disease or condition but exhibiting no noticeable symptoms. Asymptomatic individuals can still transmit certain diseases to others.

Adherence: In a medical context, it refers to the extent to which a patient correctly follows medical advice, including medication schedules, lifestyle changes, and follow-up appointments.

Colonoscopy: An examination of the colon's inner lining using a flexible, camera-equipped tube inserted through the rectum. It's used to detect abnormalities like polyps or cancer.

Disparities: Differences in health outcomes and access to healthcare among different population groups, often influenced by social, economic, and environment factors.

Epidemiological: Pertains to epidemiology, which is the study of how diseases affect the health and distribution of populations. It involves analyzing patterns, causes, and effects of health and disease conditions.

Early Detection: The identification of a disease at an early stage, often before symptoms appear, which can lead to more effective treatment and better outcomes.

Genetic Susceptibility: The increased likelihood of developing a particular disease based on a person's genetic makeup. Individuals with certain genetic variations may be more prone to specific health conditions.

Incidence: The number of new cases of a particular disease that develop in a specific population during a defined time period. It provides insight into the risk of developing the disease within that population

Malignancies: Another term for cancers; refers to abnormal cells that divide uncontrollably and have the potential to invade or spread to other parts of the body.

Morbidity: Refers to the presence of illness or disease within a population. It encompasses the incidence and prevalence of diseases, indicating how widespread a disease is within a specific group.

Mortality: Denotes the incidence of death within a population. It is often expressed as a mortality rate, representing the number of deaths in a given population during a specific time period.

Physical Examination: A clinical assessment conducted by a healthcare professional to evaluate an individual's body for signs of disease, often involving inspection, palpation, percussion, and auscultation.

Prevalence: The total number of cases, both new and existing, of a disease in a given population at a specific point in time. It reflects the overall burden of disease in the population.

Prognosis: The likely course and outcome of a disease; it includes the chances of recovery, recurrence, and expected survival rates.

Risk Factors: Attributes, characteristics, or exposures that increase the likelihood of developing a disease or health disorder. They can be modifiable (e.g., smoking) or non-modifiable (e.g., age, genetics).

Stigma: A mark of disgrace associated with a particular circumstance, quality, or person. In health, it often refers to negative perceptions and discriminations against individual with certain diseases

Neoplasia: The process of abnormal and uncontrolled cell growth, which can lead to the formation of tumors. Neoplasms can be benign or malignant.

Screening Uptake: The proportion of individuals who participate in screening programs out of those who are eligible or invited. High uptake rates are essential for the success of public health screening initiatives.

Screening Tests: Medical tests or procedures performed on asymptomatic individuals to detect potential diseases or conditions early. Examples include mammograms for breast cancer and colonoscopies for colorectal cancer.

Self-Examination: A personal check performed by an individual to detect any unusual signs or changes in their body, such as lumps or skin changes, which may indicate a health issue.

Sigmoidoscopy: Similar to a colonoscopy but focuses on examining the sigmoid colon and rectum. It helps detect issues in the lower part of the colon.

Warning Symptoms: Early signs or indicators that may suggest the presence of a disease. Recognizing these symptoms can prompt timely medical evaluation and intervention.

ABSTRACT

Background: Cancer remains a major cause of morbidity and mortality worldwide, and early detection through screening significantly improves treatment outcomes and survival. First-degree relatives (FDRs) of cancer patients are at increased risk of developing cancer due to shared genetic, environmental, and lifestyle factors. Despite this increased risk, screening uptake among FDRs remains low. This study assessed the knowledge of early cancer detection and screening uptake among first-degree relatives of cancer patients in Benin City, Edo State, Nigeria.

Objectives: The objective of this study was to assess the knowledge of early detection and screening uptake among the first-degree relatives of cancer patients.

Methodology: A descriptive cross-sectional study was conducted among 410 first-degree relatives of cancer patients attending the Radiotherapy/Clinical Oncology Department of the University of Benin Teaching Hospital (UBTH), Benin City. A systematic random sampling technique was used to select participants. Data were collected using a pretested self-administered questionnaire and analyzed using IBM SPSS version 25. Descriptive statistics, frequencies, percentages, and chi-square tests were used for analysis, with statistical significance set at $p < 0.05$.**Results**: The mean age of respondents was 35.75 ± 13.34 years, and the majority were females 265 (64.6%). Overall, 268 (65.4%) respondents were aware of early cancer detection and screening. Among those aware, television/radio was the major source of information 104 (38.8%). Mammography was the most recognized screening method 144 (53.7%). Most respondents 209 (78.0%) demonstrated good knowledge of cancer screening and early detection. However, only 96 (23.4%) respondents had previously undergone cancer screening. Ethnicity ($p = 0.035$) and monthly income ($p = 0.014$) showed statistically significant associations with knowledge of cancer screening and early detection. Major barriers to screening included poor awareness, fear of diagnosis, inadequate physician recommendation, and limited access to screening services.

Conclusion: Although the majority of respondents demonstrated good knowledge of early cancer detection and screening, screening uptake among first-degree relatives of cancer patients was poor. Improved public health education, increased healthcare provider involvement, and enhanced accessibility and affordability of screening services are recommended to improve cancer screening uptake among high-risk populations.

Keywords: Cancer screening, early detection, first-degree relatives, knowledge, screening uptake, Benin City,

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Cancer remains one of the leading causes of morbidity and mortality worldwide, with an increasing incidence that poses a significant public health burden[1]. Early detection and timely intervention through cancer screening have been shown to improve survival rates and reduce disease-related complications[1]. However, despite strong evidence supporting the benefits of early detection, screening uptake remains suboptimal in many populations, particularly among high-risk groups such as first-degree relatives (FDRs) of cancer patients[2].

FDRs parents, siblings, and children of individuals diagnosed with cancer are at an increased risk of developing the same type of cancer due to shared genetic susceptibility, environmental exposures, and lifestyle factors[2]. The elevated risk has been well-documented, with studies indicating that individuals with a positive family history are significantly more likely to develop malignancies such as breast, colorectal, and ovarian cancers[3]. For example, BRCA1 and BRCA2 gene mutations, which are commonly found in families with a history of breast and ovarian cancer, substantially increase the risk of developing these malignancies[2]. Similarly, individuals with a family history of colorectal cancer are at a higher risk of developing the disease and are recommended to undergo earlier and more frequent screenings compared to the general population[4].

Despite the well-established genetic and epidemiological evidence linking familial cancer risk to increased incidence rates, many FDRs do not adhere to recommended screening guidelines[5]. One of the primary reasons for this low adherence is a lack of awareness regarding the importance of early detection and screening[4]. Studies indicate that many

FDRs either underestimate their personal cancer risk or remain unaware of screening recommendations, leading to delayed or missed screening opportunities[5]. Additionally, misconceptions and misinformation regarding cancer screening procedures contribute to reluctance in undergoing regular tests[6]. Psychosocial factors also play a significant role in influencing screening behavior among FDRs. Fear of a cancer diagnosis, anxiety about screening results, and fatalistic beliefs regarding cancer prognosis have been identified as major barriers to screening adherence[6] . Some individuals perceive a cancer diagnosis as a death sentence, leading to avoidance behaviors that prevent them from seeking preventive healthcare[7]. Furthermore, cultural beliefs and societal stigma associated with cancer contribute to lower screening uptake, particularly in certain populations where discussing cancer risk is considered taboo[8].

Socioeconomic disparities further exacerbate the problem by limiting access to cancer screening services. Studies have shown that individuals from lower-income backgrounds face multiple barriers, including the cost of screening, lack of health insurance, and limited access to healthcare facilities[7]. In low- and middle-income countries, these challenges are even more pronounced, as healthcare infrastructure and cancer screening programs are often inadequate[7]. Additionally, logistical issues such as long travel distances to screening centers and the unavailability of specialized screening services pose further obstacles to screening adherence[7].

Healthcare provider engagement is another critical factor influencing screening uptake among FDRs[8]. Physicians play a key role in educating high-risk individuals about their cancer risk and encouraging them to undergo regular screenings. However, research indicates that many healthcare providers fail to effectively communicate the importance of screening to FDRs[9]. Some physicians may not prioritize discussions about familial cancer risk during consultations, leading to missed opportunities for preventive interventions[9]. Additionally, time constraints in clinical settings often limit the depth of conversations about cancer risk and screening recommendations[8].

Efforts to improve screening uptake among FDRs must focus on addressing these barriers through targeted interventions. Educational programs that increase awareness about familial cancer risk and the benefits of early detection have been shown to improve screening adherence[10]. Genetic counseling has also emerged as an effective strategy to help at-risk individuals understand their risk and make informed decisions about screening and preventive measures[10]. Furthermore, integrating culturally sensitive communication strategies into public health campaigns can help overcome social stigma and encourage proactive health-seeking behaviors[10].

Policy-level interventions, such as subsidizing cancer screening costs and expanding healthcare coverage for high-risk individuals, are also essential in increasing accessibility to screening services[11]. In countries with well-established screening programs, higher adherence rates have been observed, indicating that structural improvements in healthcare systems can positively influence screening behaviors[11]. Moreover, leveraging digital health technologies, such as mobile health applications and telemedicine, can facilitate risk communication and increase screening participation, especially in remote or underserved areas[9].

Given the critical role of early detection in reducing cancer mortality, there is an urgent need for research focused on understanding the knowledge, attitudes, and behaviors of FDRs regarding cancer screening. Identifying the factors influencing their screening uptake will provide valuable insights for designing effective interventions aimed at improving adherence rates. By bridging the knowledge gap and addressing barriers to screening, this research will contribute to reducing the burden of cancer and enhancing early detection efforts among high-risk populations.

1.2. STATEMENT OF PROBLEM

Cancer remains one of the leading causes of morbidity and mortality worldwide, with early detection and screening playing a crucial role in reducing disease burden and improving survival rates[1]. First-degree relatives (FDRs) of cancer patients—parents, siblings, and children—are at an elevated risk of developing the same type of cancer due to shared genetic predisposition, environmental factors, and lifestyle behaviors[2]. Despite the well-documented benefits of early detection, cancer screening uptake among FDRs remains suboptimal, posing a significant public health challenge[3].

Evidence suggests that a substantial proportion of FDRs lack adequate knowledge regarding their heightened cancer risk and the recommended screening guidelines for early detection[4]. Studies have shown that many at-risk individuals underestimate their susceptibility, remain unaware of screening recommendations, or hold misconceptions about screening procedures[5]. Furthermore, psychological barriers such as fear of a cancer diagnosis, fatalistic beliefs, and anxiety about screening tests contribute to screening hesitancy[6]. Socioeconomic factors, including financial constraints, limited access to healthcare services, and inadequate health insurance coverage, further compound the problem, particularly in low- and middle-income countries[7].

Healthcare provider engagement plays a critical role in encouraging screening uptake among FDRs; however, studies indicate that many clinicians fail to effectively communicate familial cancer risks to at-risk individuals[8]. Additionally, cultural and social factors, such as stigma, misinformation, and gender disparities, further hinder proactive health-seeking behaviors[9]. These barriers collectively contribute to a significant gap in cancer prevention efforts, leading to missed opportunities for early diagnosis and intervention.

The lack of structured and accessible educational interventions tailored for FDRs of cancer patients exacerbates this issue. While genetic counseling and targeted awareness campaigns have shown promise in improving screening rates, their availability and accessibility remain limited in many regions[10]. Given the critical role of early detection in reducing cancer mortality, there is an urgent need to assess the level of knowledge, perceptions, and screening behaviors among FDRs of cancer patients. Identifying the factors influencing their engagement with screening programs will provide valuable insights for designing effective interventions that promote cancer prevention and early diagnosis[11].

This study aims to address these gaps by evaluating the knowledge of early cancer detection and screening uptake among FDRs of cancer patients. By identifying the barriers and facilitators of screening adherence, the research will contribute to the development of evidence-based strategies to enhance awareness, improve healthcare provider communication, and promote early detection practices among high-risk populations.

1.3. JUSTIFICATION OF STUDY

Cancer is a major public health concern globally, and early detection through screening has been proven to significantly reduce morbidity and mortality[1]. First-degree relatives (FDRs) of cancer patients are at an increased risk of developing the disease due to genetic predisposition, shared environmental exposures, and lifestyle factors[2]. Despite the well-established benefits of early detection, evidence suggests that screening uptake among FDRs remains insufficient[3]. This gap in preventive healthcare necessitates research to understand the knowledge, awareness, and barriers affecting screening behaviors among FDRs.

A major concern is the lack of awareness among FDRs regarding their heightened risk and the recommended screening guidelines[4]. Studies indicate that many FDRs do not perceive themselves as high-risk individuals, leading to low adherence to early detection practices[5]. Psychological barriers, such as fear of a cancer diagnosis and fatalistic beliefs about the disease, further discourage screening participation[6]. Moreover, socioeconomic disparities, including financial constraints and limited access to healthcare services, disproportionately impact screening rates, particularly in resource-limited settings[7]. Understanding these challenges is critical for developing targeted interventions that can increase screening uptake and improve early cancer detection.

Healthcare provider communication has been identified as a key determinant of screening adherence[8]. However, research shows that discussions about familial cancer risk and screening recommendations are often inadequate in clinical practice[9]. This highlights the need for improved strategies to enhance doctor-patient communication regarding familial cancer risk and the importance of screening. Additionally, cultural and social influences, including stigma and misinformation, continue to play a role in discouraging proactive health-seeking behaviors[10].

Given these pressing concerns, this study is essential in addressing the knowledge gaps and behavioral barriers that hinder cancer screening among FDRs. By identifying the factors influencing screening uptake, the findings will contribute to the development of evidence-based interventions, such as educational campaigns and healthcare policies, to improve early detection efforts. Enhancing awareness, accessibility, and healthcare provider engagement can ultimately lead to increased screening adherence and a reduction in cancer-related mortality[11]

1.4 RESEARCH QUESTIONS

1. What is the level of knowledge regarding early cancer detection and screening uptake among first-degree relatives (FDRs) of cancer patients?
2. What are the screening behaviors and adherence patterns among first-degree relatives of cancer patients?
3. What factors influence the screening behavior of first-degree relatives of cancer patients?
4. What strategies can be implemented to enhance cancer screening uptake among first-degree relatives of cancer patients?

1.5. OBJECTIVES

1.5.1 General Objectives

The aim of this study is to assess the knowledge of early detection and screening uptake among first degree relatives of cancer patients.

1.5.1 Specific Objectives

1. To assess the knowledge of early detection and screening uptake among first degree relatives of cancer patients
2. To assess the screening behavior of first-degree relatives of cancer patients
3. To assess the factors affecting screening behavior among first-degree relatives of cancer patients
4. To assess strategies promoting cancer screening among first-degree relatives of cancer patients

CHAPTER TWO

PREAMBLE

Early detection of cancer greatly increases the chances for successful treatment and thus for survival. Early diagnosis is particularly relevant for cancers of the breast, cervix, skin, mouth, larynx, colon and rectum[12].

Cancers can be detected by awareness of suspicious symptoms (passive detection) or by specific actions undertaken by individuals or participation to medical checks or screening programs (active detection). Early symptoms of cancer include lumps in the breast or other parts of the body, sores that fail to heal, abnormal bleeding from any orifice of the body, persistent indigestion or difficulty in swallowing, nagging coughing and hoarseness, unexplained weight loss, appearance or change in a wart or mole[12].

Some symptoms are specifically associated with a particular type of cancer, while others may be caused by several types of cancer or other diseases. A major problem with the interpretation of these symptoms is the nonspecific nature of many of the warning signals in apparently healthy people. Hence possible cancer symptoms may be easily attributed to common diseases and medical check could be delayed. Recognizing possible warning symptoms of cancer and taking prompt action leads to early diagnosis. Different organizations underline the importance of identifying these symptoms and recommend that a physician should be consulted immediately or within a few weeks[12].

At the same time, several types of cancer can be detected in asymptomatic people by mean of self-examination like breast self-examination and examination of the skin as well as regular check-ups and physical examination by a physician and screening tests. Screening refers to the use of simple tests across a healthy population in order to identify individuals who have disease, but do not yet have symptoms. Examples include breast cancer screening using mammography, cervical cancer screening using cytology screening methods, including Pap smears and colo-rectal cancer screening using faecal immunochemical test or colonoscopy[12].

Studies from different countries showed that increased awareness of possible warning symptoms of cancer and methods of early diagnoses among physicians, nurses and other health care providers as well as among the general public, can have a great impact on the disease[12].

Hence this review is based in four objectives. The first, is to access the knowledge of early detection and screening uptake among first degree relatives of cancer patients. Second, to assess the screening behavior of first-degree relatives of cancer patients. Third, to access the factors affecting screening behavior among FDR of cancer patients. Fourth, to assess strategies promoting cancer screening among first degree relatives of cancer patients.

2.1: TO ASSESS THE KNOWLEDGE OF EARLY DETECTION AND SCREENING UPTAKE AMONG FIRST DEGREE RELATIVES OF CANCER PATIENTS

A descriptive cross-sectional study aimed at assessing FDRS knowledge of CRC (i.e., risk factors, symptoms and screening uptakes) was carried out in the Digestive Disease Research Institute (DDRI), affiliated to Tehran University of Medical Sciences (TUMS), Iran[13]. The initial sample size used comprised of patients with histologically verified malignancy in the colon or rectum referred to as index patients reported by the national cancer registry system between 2010 and 2013,during this course of this study conducted in Iran, proper medical ethics were applied, male and female FDRS were enrolled if they were forty years old and ten years prior to the earliest diagnosis in their family; those who had a personal history of inflammatory bowel disease(i.e. Crohn’s disease or Ulcerative colitis) were excluded from the study[13]. A total number of 1017 FDRs belonging to 340 index patients (mean 3.0 relatives per patient) were enrolled into the study between 2013 and 2014 measuring their data on demographics, cancer knowledge and colonoscopy uptake. Of the 1017 FDRs that participated in the study, 633 were siblings, 371 were offsprings and 13 were parents. The summary of the characteristics of the index patients and their FDRs who participated in the study: The mean age (SD) of the index patients at diagnosis of cancer was 55.0±11.5 years, In 61.0% (n=620) of FDRs, the index patient was younger than 60 years at the time of diagnosis, About 13% of FDRs reported having at least two members affected with CRC in their family, In relation to the type of familial relationship of the FDRs with the index patient, 62.2% (n=633) were siblings and 37.8% (n=384) were parents/off-spring of the index patient, The mean age (SD) of the FDRs was 52.00±10.6 years (range=22–86) and only 75 years.). Of the total sample, over 58% were women, 91% were married and all were insured[2]. About 43.1% (n=438) were employed or self-employed and 62.2% had 12 or more years of education. Overall, about 20% of the FDRs reported having already one symptom suggestive of CRC, for example, rectal bleeding, abdominal pain. As it pertains to the FDRs knowledge about cancer and its risk levels data collected and analyzed in this study showed that Overall, only 4.1% (n=42) of the FDRs provided correct responses to all the 11 items regarding cancer knowledge. About 28% (n=284) answered that they were aware of the increased risk for the development of CRC in relatives. Advanced age was cited as a risk factor of CRC by 26.2% of the FDRs and 25.4% knew that polyps may turn into cancer over time. While a minority of the participants (22.5%) noted that early CRC often has no symptoms, only 10.4% were able to correctly recognize the alarming symptoms of CRC. Further analysis of the data collected during this study showed that only 16.5% and 35.0% of the FDRs had ever heard about FOBT and sigmoidoscopy/colonoscopy, respectively. About 22% of FDRs knew that they should receive screening at age 40 or earlier and nearly 19% stated that all adults aged 50 years and older should get screened regularly for CRC. Almost 20% of FDRs were aware that early polyp removal helps prevent CRC. Most FDRs (72.2%) were found to be at higher risk for CRC, that is, already presenting at least one CRC-related symptom or having a young index patient or several members affected in their family. No significant differences for cancer knowledge between high-risk FDRs and those at moderate risk of CRC was recorded in this study[13].

As it pertains to screening uptake the study showed that About 65% (n=657) of FDRs expressed their willingness to have a screening colonoscopy with a duration of 6 months, of which 76.1% (500/657), corresponding to 49.2% (500/1017) of the total sample completed the procedure. The mean age of screened relatives was 47.5±10.8 (range 22–75) years, and women comprised 54.0% (n=270) of them. Advanced neoplasia was identified in 13.4% (67/500) of the screened FDRs and cancer in 1.8% (n=9), 7 at stage II and 2 at stage III[13].

During the course of the study data collection was initially carried out through phone calls and was later completed via in-person interviewers once FDRS attended the screening Centre, in-person interviewers used a previous questionnaire which contained 11 true-false statements (Cronbach's a=0.81). FDRs were also grouped into high-risk group and moderate-risk groups in order to determine if the knowledge of FDRs was affected by level of familial risk. Continuous variables were reported as the mean and SD and the qualitative variables as numbers and percentages. The χ 2 or Fisher's exact tests were applied to describe differences between the subgroups. All statistical tests were two tailed and a p value of <0.05 was considered statically significant, Stata/MP software V.12 was used for analyses[13].

The findings of this study conducted in Iran showed that only about 28% of FDRs were aware of their increased risk for cancer, near 35.0% had ever heard about colonoscopy with 22% aware of the correct age to start screening. Comparing cancer knowledge of FDRs at high risk versus those at moderate risk, we recorded non-significant differences (p>0.05). Almost two-thirds of

FDRs expressed willingness to undergo a colonoscopy and 49.2% completed the procedure, of which 12.8% had advanced neoplasm. This study indicated that FDRs of patients with CRC enrolled in a population-based screening programme are clearly lacking in basic knowledge about CRC and screening tests[13].

A descriptive cross-sectional study aimed at assessing knowledge regarding early detection of cancer among female first-degree relatives of cancer patients was performed between October 2010-February 2011 in the state oncological institute, Ion Chiricuta from Cluj-Napoca, Romania[14]. A sample size of 160 women was obtained. Data was obtained using a self-administered anonymous questionnaire[14]. The data collected were analyzed using SPSS 20.0 statistical program. The results on socio-demographic characteristics showed that the educational level of sample was as following: 15.6% with low educational level (only junior high school or less), 42.5% with medium educational level (only high school), 41.9% with high educational level (university studies). A percentage of 38.1% of the women were living in rural areas, and 61.9% from urban areas. The results of linear regression analyses pertaining to the knowledge regarding symptoms of cancer showed that younger women ($B=-0.390$, $p>0.01$), persons from urban areas ($B=0.872$, $p>0.01$) and those having higher educational level ($B=0.883$, $p<0.001$) had statically significant higher level of knowledge with respect to cancer symptoms[14]. The results of linear regression analyses about the knowledge regarding methods for cancer detection showed that the level of knowledge regarding the detection was higher among younger ages ($B=-0.260$; $p<0.001$)[14]. Only about 10% of the women were able to identify all eight of the symptoms used in this study, according to the results. Over two-thirds of the women were aware that symptoms like breast or body lumps or thickenings, bleeding, and unusual weight loss could be signs of cancer, but they were less aware of other symptoms like a persistent cough or hoarseness, difficulty swallowing, or changes in a wart or mole. Meanwhile, the findings revealed that over two-thirds of the participants knew how to diagnose cervical and breast cancer. Relatively few participants knew how to identify skin cancer (less than 16%) and colon-rectal cancer (less than 44%), and only 10% knew all of the detection techniques mentioned.

2.2: TO ASSESS THE SCREENING BEHAVIOR OF FIRST-DEGREE RELATIVES OF CANCER PATIENTS

A cross-sectional study to assess the screening behavior of cancer patients FDR was conducted among FDRs of patients with gastric cancer enrolled at the Peking University Cancer Hospital in Beijing, China[15]. A sample size of 197 FDR's was obtained and participants were selected using a convenience sampling technique. Data was obtained using Four questionnaires: a demographic questionnaire, a knowledge questionnaire of risk factors and warning symptoms for gastric cancer, the Gastric Cancer Health Belief Scale, and a questionnaire screening for behavioral motivators and barrier. The statistical analysis of data collected was performed in IBM SPSS Statistics for Windows Version 20.0[15]. The results of the study as it pertains to the characteristics of the participants showed that mean age of the 197 FDRs was 40.73 years (range: 23–63 years); 84.26% were married; 53.30% were men. Regarding educational background, 39.09% had obtained a bachelor's degree or higher. Regarding insurance status and income level, 91.88% of the participants had different types of insurance, and 36.04% had high income[15]. The results of the study as it pertains to the knowledge among the FDRs showed that a total of 28 (14.21%) participants had low knowledge, 78 (39.59%) participants had moderate knowledge, and 91 (46.19%) participants had high knowledge. Statistically significant differences in overall knowledge of gastric cancer and its risks were observed among the FDRs of patients with gastric cancer with different screening behaviors, the scores for gastric cancer risk knowledge and overall knowledge of gastric cancer in FDRs who underwent gastric cancer screening were significantly higher than those without screening[15]. The results of the study as it pertains to the screening behavior among FDRs of Gastric cancer patients showed that 30.96% (61/197) of participants underwent screening for gastric cancer. The others had never been screened for gastric cancer. Among those who participated in screening for gastric cancer, the most common screening methods were gastroscopy and H. pylori testing, both of which were applied in 63.93% (39/61) of the participants, followed by serum tumor marker testing, which accounted for 55.74% (34/61). Only 29.51% (18/61) of the participants underwent gastric cancer screening through barium meal examination of the upper digestive tract[15]. The most common motivator for gastric cancer screening was an annual physical examination organized by an employer. Among the participants, 136 did not undergo screening for gastric cancer. The two main reasons were that most of them considered screening to be unnecessary when they did not feel uncomfortable, and many of them feared the potential discomfort caused by the examination[15].

A study to assess the screening behavior of colorectal cancer FDRs was conducted in 2024 in the Department of Medical Oncology of a tertiary hospital in Baoding City[16]. The participants of the study were selected using the objective sampling method. Data was obtained using semi-structured interviews in the form of audio, to ensure the accuracy of the data collected during the research the researchers transcribed audio data collected which was then sent to the participants for verification with which there was no objection from participants to ensure the accuracy of the data collected[16]. The data collected was analyzed using MAXQDA 20.4 software and the Colaizzi 7-step analysis method.

The Result of the Study showed the following:

1. Of the fifteen FDRs who participated in this study, The average age of the participants was 45.5 years, and all were married. Their educational levels ranged from primary school to undergraduate degrees. Seven participants were from urban areas, 5 had employee medical insurance, and 3 had religious beliefs. Only 1 first-degree relative (6.7%) had previously undergone colonoscopy screening, and 8 first-degree relatives (53.3%) had plans to undergo colonoscopy screening[16].

2. It showed that some first-degree relatives had a negative attitude toward screening due to excessive psychological pressure. Influenced by the ideology of "avoiding medical treatment and talking about cancer discoloration," many first-degree relatives were worried that the adverse results of screening would bring tremendous pressure to their lives, so they showed adverse psychological reactions such as anxiety, fear, and uncertainty[16].

3. It showed that some first-degree relatives have cognitive biases due to a lack of understanding of the disease and equate the absence of uncomfortable symptoms with health[16].

4. It showed that some first-degree relatives firmly believe in the fatalistic idea that fate is determined by heaven and think that the disease is related to the arrangement of God, and even if screening is carried out, there is no way to change it[16].

5. It showed that the support of family members, the personal experience and suggestions of friends, the advice of professional medical staff, and the publicity of online media have a role in promoting the participation of first-degree relatives in colonoscopy screening[16].

6. It showed that the characteristics of bowel preparation and the specificity of screening sites caused some first-degree relatives to feel pain and embarrassment which directly interfere with emotions, attention, and ability to deal with things and indirectly affect the colonoscopy screening behavior of first-degree relatives[16].

7. It showed many obstacles for first-degree relatives to participate in colonoscopy screening, such as the busy life and work, the medical treatment process and transportation convenience and the cost of screening[16].

However, there was some limitations in this study conducted due to small sample size and the fact that all participants were married preventing the study from actually exploring the views of unmarried individuals regarding colonoscopy screening[16].

A descriptive study to assess the screening behavior of cancer patients FDR was conducted among 240 FDRs of 133 patients with breast cancer at the Oncology and Chemotherapy unit of the biggest university hospital in southwestern Turkey between March and May, 2014. Data collected was done using the Descriptive Characteristics Form. Data collected was analyzed using the Statistical Package for the Social Sciences SPSS for Windows, version 20.0 (SPSS Inc.; Chicago, IL, USA)[16]. The results of the study were as follows:

The Results generated about the Socio-demographic characteristics of the participants which showed that the mean age of the 240 participants was 43.1+12.9 years ranging from 21 to 72 years, with 52.5% of women being older than 40 years. Most participants were married (89.6%), had completed high school and higher (50.0%), and/or were employed (57.5%). Seventy-one-point seven percent of the participants were residing in the Antalya city center, 76.3% had less income than their expenses and all had social security[16].

The Results generated through this study about participants screening behaviors showed that Seventeen percent of participants were performing BSE, 18% were receiving CBE and 17% had mammography, 48% haven’t had screening. However, the study was limited because the probability sampling technique was not used in selection of participants and the sample size was small[16].

A cross-sectional study to assess the screening behaviors of FDRS of breast cancer patients was conducted among 296 FDRs of breast cancer patients at the breast cancer clinic and in-patient wards of the Uganda Cancer Institute (UCI), Kampala, Uganda[17]. Consecutive sampling was used to select participants of this study and the data was collected using an interviewer-administered questionnaire either in English or Luganda. Data analysis for the study was carried out using Epidata version 3.1 software[17]. The results of the study showed that one hundred and sixty-five (55.7%, 165/296) participants self-reported ever performing Breast Self-Examination (BSE); 66% (109/165) of them had last examined their breasts within a month of this study interview. The median age (Interquartile range, IQR) at which first degree relatives began performing BSE was 28 (22-37) years. Only 21.6% (64/296) of the first-degree relatives had ever visited a healthcare professional for a Clinical Breast Examination (CBE). Of those who underwent CBE, 42.2% (27/ 64) visited a healthcare professional for CBE because they wanted to know their breast cancer status. Only 7.8% (23/296) of all first-degree relatives had ever had an ultrasound scan of the breast[17]. The most cited reason for performing an ultrasound scan of the breast was self-noticed changes in the breast (60.9%, 14/23)[17].

2.3: TO ASSESS THE FACTORS AFFECTING SCREENING BEHAVIOR AMONG FDR OF CANCER PATIENTS

Lung cancer remains the leading cause of cancer-related deaths globally, with low survival rates primarily due to late-stage diagnosis. Early detection through low-dose computed tomography (LDCT) significantly reduces mortality rates among high-risk populations[18]. However, participation in lung cancer screening remains low globally and in South Korea, despite national programs to promote LDCT screenings[18].

A descriptive cross-sectional study involving 186 individuals, aged 50–74 years, with a 20-pack-year smoking history published in the Asia-Pacific journal of Oncology Nursing investigated factors affecting the screening behavior of FDR of 186 lung cancer patients[18]. The data was collected using an online questionnaire. The findings of the study showed that Stress level, perceived risk, self-efficacy, and cancer prevention behaviors were significant predictors of intention, explaining 34.7% of variance, Perceived benefits of screening correlated positively with intention while perceived barriers hindered participation, Limited knowledge about the cancer risk groups and screening schedule was noted although knowledge about LDCT’s benefits was higher, Engagement in preventive behaviors, such as regular health check-ups, positively impacted intention[18]. The findings underscore the importance of targeted education and psychological interventions to increase perceived risk and self-efficacy, essential for encouraging participation in LDCT screenings. Health providers play a critical role in improving awareness and addressing barriers through personalized communication and education. However, there were certain limitations in this study because the study's online recruitment potentially excluded less tech-savvy participants, limiting generalizability. Additionally, the cross-sectional design precludes establishing causality[18].

Breast cancer is the most common cancer among women globally, with incidence rates steadily increasing in Turkey[19]. First-degree relatives (FDRs) of women with breast cancer, such as mothers, sisters, and daughters, are at a significantly higher risk due to genetic predispositions, accounting for approximately 5-10% of all cases. Early detection and preventive screening, including breast self-examination (BSE), clinical breast examination (CBE), and mammography, play critical roles in reducing mortality among high-risk populations[19]. The study aimed to evaluate the breast cancer screening behaviors of FDRs of women receiving breast cancer treatment in Turkey and identify the factors influencing these behaviors[19]. A descriptive study design was employed, involving 240 FDRs recruited from an oncology unit in a university hospital. Data were collected using two tools:

1. Descriptive Characteristics Form**:** Assessed socio-demographics, health history, and breast cancer risk level.
2. Breast Cancer Screening Behavior Evaluation Form**:** Evaluated screening behaviors such as BSE, CBE, and mammography

The findings of the study showed:

1. **S**creening Rates:

BSE: 17%

CBE: 18%

Mammography: 17%

Nearly 48% of participants reported no screening behavior[8].

Key Determinants:

- Perceived Susceptibility: Increased BSE by 0.57 times and mammography by 0.77 times.
- Regular Physical Activity: Positively influenced CBE (0.21 times) and mammography (0.13 times).
- Socio-Demographic Factors: Higher education and income levels were associated with increased screening participation

This study underscores the importance of tailored educational programs to enhance awareness and perceived susceptibility among FDRs. Healthcare providers should encourage routine screenings and promote healthy lifestyle changes to mitigate breast cancer risks. Addressing psychological barriers and embedding culturally sensitive strategies could improve adherence to preventive practices[19]. There were certain limitations:

1 The study was confined to a single hospital, limiting its generalizability.

2 non-probability sampling may have introduced selection bias[19].

2.4: TO ASSESS STRATEGIES PROMOTING CANCER SCREENING AMONG FDR OF CANCER PATIENTS

A study to assess the strategies and interventions promoting uptake of cancer screening was conducted among 83 female FDRs of cancer patients in which the inclusion criteria was a follow: FDRs were meant to mothers, sisters or daughters of cancer patients. Eligibility in this study was conducted via a baseline study[20]. The sample used in the study was selected using the random sampling technique. Method of data collection was via phone interviews and questionnaires. Data analysis was carried using standard statistical approaches. To assess the impact of interventions, 3 months and 12 month follow up surveys of each FDR was carried out via the phone[20]. The study data collected was analyzed using SAS 9.4., 83 (96.5%) completed the baseline survey and 35 were assigned to the high-intensity intervention arm and 48 to the low-intensity intervention arm. Follow-up was completed at three months for 24 FDRs in the high-intensity arm and 38 in the low-intensity arm and at 12 months for 23 in the high-intensity arm and 34 in the low-intensity arm. Among the 62 FDRs completing surveys at three months, nine (14.5%) did not complete a survey at 12 months, and among the 56 completing surveys at 12 months, three (5.4%) did not complete surveys at three months[20]. The results showed that there were no significant imbalances in covariate values between intervention arms for the FDRs at baseline nor were there imbalances at three months or 12 months. As summarized in Figure 4, at three months, 25.0% of FDRs in the high-intensity arm reported getting a mammogram since study enrollment, compared with 7.9% in the low-intensity arm, although the difference was only approaching significance (p = 0.06). At 12 months, 60.9% in the high-intensity arm had received a mammogram, compared with 32.4% in the low-intensity arm (p = 0.03)[20]. Pooling across the arms, 25/57 (43.9%) of these FDRs (all nonadherent at enrollment) had received screening mammography by month 12. The results also showed that a higher percentage of FDRs in the high-intensity (compared with low-intensity) arm received mammography, both at three months and at 12 months. The breast cancer screening rate among all FDRs successfully interviewed for study eligibility was 61.3%[9]. However, because of the random sampling technique used in this study, it is expected that the findings of this research may not be adequate enough to cover a whole population[20].

A cross-sectional study to assess the strategies promoting cancer screening uptake among FDRs of cancer patients was conducted among 318 FDRs of 164 Colorectal cancer patients treated at Tel-Aviv Sourasky Medical Center[21]. The data was collected with a questionnaire using l-Change Model[10]. The results of the research showed that Adherence to interval colonoscopy was low with only 73 FDRs (23.0%)[21]. Greater adherence was associated with socio-demographic variables (older age, siblings, having spouse, higher level of education and income) and behavioral variables (healthier lifestyle, utilization of preventive health services)[21]. Family physicians and kin were identified as the most influential figures on uptake[21]. Intention, affective barriers, positive attitudes, social support, cues to action, age, and health maintenance were the strongest determinants of participation in CRC screening[21].

CHAPTER THREE

METHODOLOGY

3.1: STUDY AREA

The study was conducted in Benin City, Edo State, at the University of Benin Teaching Hospital (UBTH). This state is one of six in the south-south geopolitical zone of Nigeria, which is bordered to the west by Ondo and Ekiti states, to the northeast by Kogi state, and to the south by Delta state. Nineteen thousand seven hundred forty-three square kilometers (19,743sqkm) make up its nineteen local government areas[22]. Benin City is the capital of Edo State, which is situated in Nigeria's South-South region. It is the location of the Federal Government-owned University of Benin Teaching Hospital (UBTH), a tertiary medical facility. Edo State has a population of 3,233,366 according to the 2006 census[23]. At a 2.5% growth rate, Edo's population is expected to reach 5,042,947 in 2024. The hospital provides medical services to people in Edo and other neighboring states. UBTH is situated at Ugbowo, Lagos Road, Benin City, and was founded in 1973. With over 2000 admissions three times a month, over 25,000 outpatients on average, and bed occupancy rates around 90% in several of its wards, UBTH is among the busiest hospitals in Nigeria. In order to provide patients with both basic and advanced medical care, the hospital contains 71 clinical and non-clinical departments and sections[24].

The department of radiotherapy/clinical oncology in University Of Benin Teaching Hospital' Benin City, Edo State was used to carry out the study. The department of radiotherapy/clinical oncology came into being in the year 2007, during the second phase of the Federal Government of Nigeria/ Vamed Engineering Rehabilitation of Teaching Hospitals project, under the then President Olusegun Obasanjo. it provides specialized Clinical Services at Local and National Level. Patients are assessed into the department through Accident and Emergency Unit. Both inpatients and outpatients can access the services of the department of department of radiotherapy/clinical oncology. The oncology unit offers the following services: the provision of excellent oncology healthcare to the public in all ramifications, provision of quality teaching and academic training at undergraduate and postgraduate level to all stakeholders in cancer care, participation and continuous development of a research programme that will advance the field of oncology worldwide, establishment and promotion of multidisciplinary team work in cancer management at all levels.

3.2. STUDY DESIGN

The study was descriptive cross-sectional study.

3.3 SCOPE OF THE STUDY

The study was done to assess the prevalence of early detection and screening uptake among first degree relatives of cancer patient in UBTH.

3.4. STUDY DURATION

This study was carried out for one year from March 2025 - May 2026.

- Conceptualization and initial write up: 4 months
- Data collection: 3 months
- Analysis: 2 months
- Final write-up: 3 months

3.5. STUDY POPULATION

This study was conducted among FDRS of UBTH oncology inpatient and outpatient.

3.6 SELECTION CRITERIA:

3.6.1: Inclusion Criteria

- FDRs of patients who were admitted at the department of oncology within the period of study.
- FDRs of patients with cancer (including children, siblings, and parents of the patients) 18 years of age, who were able to communicate clearly and without barriers; were cancer-free with no prior history of cancer; were willing to participate in this study voluntarily via signed informed consent.
- Age≥18years; voluntary participation in this study; Be aware and be able to express one's views clearly.

3.6.2: Exclusion Criteria

- Have severe cognitive impairment or a history of prior psychiatric illness.
- Have a history of other significant diseases.
- Language communication barrier.

3.7. SAMPLE SIZE DETERMINATION

The minimum sample size (n) was calculated using the Cochrane formula used for descriptive studies[25].

$n = Z^2pq/d^2$

Where:

n = Minimum Sample Size.

Z = Standard normal deviate set at 1.96 (at 95% confidence interval).

p = Prevalence rate of a particular characteristic of the target population.

prevalence among the first-degree relatives (FDRs) of Chinese patients with gastric cancer in the article is 30.96% (61 out of 197 participants)[26].

Now to calculate for sample size:

$n=Z^2*p*(1-p)/d^2$ (Cochran's formula)

where:

n = required sample size

Z = Standard normal deviate set at 1.96 (at 95% confidence interval).

p = Prevalence rate of a particular characteristic of the target population.

prevalence among the first-degree relatives (FDRs) of Chinese patients with gastric cancer in the article is 30.96% (61 out of 197 participants)[26]

d = margin of error (commonly 5% or 0.05)

Using Cochran's formula $n=Z^2*p*(1-p)/d^2$ (Cochran's formula)

Z=1.96 (Z-score for **95% confidence level)**

P= **0.3096** (prevalence from my referenced study, **30.96%** screening uptake)

d= **0.05** (margin of error, **5%**)

Step 1: $Z^2=1.96^2=3.8416$

Step 2: $p*(1-p) = 0.3096*(1-0.3096)$

$= 0.3096*0.6904$

$= 0.2137$

Step 3: $3.8416*0.2137=0.8212$

Step 4: $d^2 = 0.05^2=0.0025$

$0.8212/0.0025 = 328.48= 328$

In anticipation for 10% non-response rate or non-compliance[27]:

$n_{adjusted}=n/1-r$

$328/1-0.1 = 328/0.9 = 364.44$

In anticipation for 20% non-response rate

$n_{adjusted}$=n/1-r

328/1-0.20 = 328/0.80 = 410.

3.8. SAMPLING TECHNIQUE

This study used a systematic random sampling technique to select First Degree Relatives (FDRs) of cancer patients attending selected clinics and wards in the University of Benin Teaching Hospital.

The study was conducted in the following units of the hospital:

Consultant Outpatient Clinic
Oncology Clinic
Gynae-oncology Ward
Paediatric-Oncology Ward
Hemato-Oncology Ward
Female Surgical Ward
Male Surgical Ward

The registers of these clinics and wards served as the sampling frame from which eligible respondents were selected.

The total number of patients recorded in the registers during the study period was:

Study Area	Number in Register
Oncology clinic	600
General Outpatient Clinic	700
Paediatric Oncology Clinic	60
Gynae-Oncology Ward	30
Hemato-Oncology Ward	80
Female Surgical Ward	20
Male Surgical Ward	30
Total	1520

The minimum sample size for the study was calculated to be 410 respondents. To obtain the respondents proportionately from each clinic and ward, proportional allocation was first carried out using the formula:

$n_h = \frac{Nh}{N} \times n$

Where:

n_h = sample size allocated to each ward/clinic

N^h = population of each ward/clinic

N = total study population (1,520)

n = total sample size (410)

Using this formula, the sample size for each unit was calculated as follows

Study Area	Register Population(N_h)	Calculation	Allocated Sample Size
Oncology Clinic	600	600/1520 × 410	162
General Outpatient Clinic	700	700/1520 ×410	189
Paediatric Oncology ward	60	60/1520 ×410	16
Gynae-Oncology Ward	30	30/1520 ×410	8
Hemato-Oncology Ward	80	80/1520 × 410	22
Female Surgical Ward	20	20/1520 × 410	5
Male Surgical Ward	30	30/1520 × 410	8
Total	1520		410

Thereafter, systematic random sampling technique was used within each clinic and ward to select eligible respondents.

The sampling interval () for each study location was determined using the formula:

$K = N_h / n_h$

Where:

K = sampling interval

N_h = total number of patients in the register for that clinic/ward

n_h= allocated sample size for that clinic/ward

The calculated sampling interval were approximately:

Study Area	Population	Sample Size	Sampling interval
Oncology Clinic	600	162	4
Consultant Outpatient Clinic (COPD)	700	189	4
Paediatric-Oncology ward	60	16	4
Gynae-Oncology Ward	30	8	4
Hemato-Oncology Ward	80	22	4
Female Surgical Ward	20	5	4
Male Surgical Ward	30	8	4

A random starting point between 1 and 4 was selected in each clinic or ward using simple random balloting. Thereafter, every 4th eligible first degree relative of cancer patients listed in the register was recruited until the allocated sample size for that unit was obtained.

Eligible respondents who declined participation or did not meet the inclusion criteria were skipped and the next eligible respondent was selected. This process continued until the total sample size of 410 respondents was achieved.

3.9 DATA MANAGEMENT

Data was collected using a self-administered questionnaire with open-ended and closed-ended questions.

3.9.1 DATA COLLECTION TOOL

For this study, a pretested a self-administered questionnaire was used. It was be divided into the sections below, in a bid to address the objectives of the study and contained both open-ended and closed-ended questions.

SECTION A: Socio-demographic data of patients FDR

SECTION B: Knowledge of early detection and screening uptake among FDRs of cancer patients

SECTION C: Screening behaviour of FDRs of cancer patients

SECTION D: Factors affecting screening behaviour among FDRs of cancer patients

SECTION E: Strategies promoting cancer screening among FDRs of cancer patients

3.9.2 METHOD OF DATA COLLECTION

Data was collected using a quantitative method through a self-administered questionnaire.

3.9.3 PRETESTING

Pretesting of questionnaire was carried out among first degree relatives of cancer patients in St. Philomena Hospital. 10% of the sample size in the proportion was used for pretesting. Pretesting was conducted to test the questionnaire for correctness and appropriate understanding by the respondents so as to aid appropriate collection of data. Appropriate corrections were made to the questionnaire where applicable before the commencement of the survey

3.9.4 METHOD OF DATA ANALYSIS

Before entering and conducting the analysis, the data was checked for accuracy and completeness before coding using IBM Statistical Package for Social Sciences (SPSS) version. Utilising frequency distribution tables, text, and graphs/charts, the results were presented. Categorical data like sex, age, marital status, tribe and religion were analysed in frequencies and percentages. The mean and standard deviation were used to express numerical data like age.

3.9.4.1 SCORING OF VARIABLES

Knowledge Score:

Knowledge was scored using a standard binary scoring system:

Correct answer = 1 mark

Incorrect answer/Do no know = 0 mark

The knowledge section contained multiple questions assessing:

Aware of cancer screening

Knowledge of screening methods

Purpose of screening

Appropriate screening age

Benefits of screening

Knowledge of screening locations

Lifestyle modification and cancer prevention

Incorrect responses or “Do not know” responses attracted 0 score

The total obtainable score depended on the total number of knowledge questions included in the questionnaire.

The respondents score were converted to percentages using the formula:

Knowledge Score (%) = (respondent’s score ÷ Total obtainable score) × 100.

A modified Bloom’s cut-off point was used:

Percentage Score	Interpretation
≥50%	Good knowledge
<50%	Poor knowledge

Respondents who scored 50% and above were categorized as having good knowledge while those who scored below 50% were categorized as having poor knowledge.

Screening Behaviour Score

Screening behaviour was assessed based on participation in recommended cancer screening practices.

Responses were scored as follows:

Response	Score
Positive/appropriate screening behaviour	1
Negative/inappropriate screening behaviour	0

Variables Assessed

Ever undergone cancer screening

Frequency of screening

Adherence to physician recommendation

Willingness to undergo screening

Participation in mammography, papsmear, colonoscopy, PSA testing, or other screening methods

Grading Of Screening Behaviour

Percentage Score	Interpretation
≥50%	Good screening behaviour
<50%	Poor screening behaviour

Respondents who engaged in at least half of the recommended screening practices were categorized as having good screening behaviour.

Factors Affecting Screening Behaviour

Scoring Method:

Factors affecting screening behaviour were measured using Likert-scale responses.

Scoring System:

Response	Score
Strongly agree	4
Agree	3
Disagree	2
Strongly Disagree	1

Factors Assessed:

- Fear of cancer diagnosis
- Financial constraints
- Lack of awareness
- Lack of physician recommendation
- Distance to screening centre
- Cultural beliefs and stigma
- Fear of pain/discomfort
- Lack of time
- Inadequate healthcare access

Interpretation

Mean scores were calculated for each factor.

Mean Score	Interpretation
≥ 2.5	Significant factor affecting screening
< 2.5	Not a significant factor

A mean score of 2.5 and above indicated that factor significantly influenced screening behaviour.

Strategies To Promote Screening Uptake

Strategies promoting cancer screening uptake were also assessed using a 4-point Likert scale.

Response	Score
Strongly Agree	4
Agree	3
Disagree	2
Strongly Disagree	1

Strategies Assessed

Public awareness campaigns
Free or subsidized screening
Increased healthcare provider education
Media campaigns
Improved accessibility of screening centres
Community outreach programs
Mobile screening services
Health insurance coverage

Interpretation

Mean Score	Interpretation
≥ 2.5	Accepted strategy
<2.5	Rejected strategy

Strategies with mean score of 2.5 and above were considered effective and acceptable methods for improving screening uptake.

3.9.4.2 DATA PRESENTATION

The data for the study was collected and entered into IBM Statistical Package for Social Sciences (IBM – SPSS) Statistics software version 25. Tables and charts were used in the presentation of data. Data to be entered into the software was cross-checked for errors and corrected. Data was categorized and analyzed using descriptive statistics., frequencies and percentage based on the total number of respondents.

3.10 ETHICAL CLEARANCE

Ethical clearance was gotten from the Ethics and Research Committee of the University of Benin Teaching Hospital with protocol number ADM/E 22/A/VOL. VII/1486549127275 Respondents and participants were required to provide written informed consent. Privacy and confidentiality were ensured. Prior to data collection, permission was gotten from the hospital's Head of department of radiotherapy/clinical oncology.

3.10. LIMITATIONS OF STUDY

The first limitation of this study was that sample selection bias existed. In the study, the FDRs of patients with cancer was selected from only one hospital. Participants recall of behavior was biased.

CHAPTER FOUR

RESULTS

A total of 435 first degree relatives of cancer patients participated in this study with 410 questionnaires retrieved giving it a response rate of 100%. The results are presented in the following sessions in line with the specific objectives:

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

SECTION B: KNOWLEDGE OF EARLY CANCER DETECTION AND SCREENING AMONG RESPONDENTS

SECTION C: SCREENING BEHAVIOUR OF FIRST-DEGREE RELATIVES OF CANCER PATIENTS

SECTION D: FACTORS AFFECTING CANCER SCREENING BEHAVIOUR AMONG RESPONDENTS

SECTION E: STRATEGIES TO PROMOTE CANCER SCREENING UPTAKE AMONG RESPONDENTS

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Table 1A: Socio-demographic characteristics of respondents

Variable	Frequency (n= 410)	Percent
Age group (years)		
16–24	86	21.0
25–34	143	34.9
35–44	81	19.8
45–54	60	14.6
≥55	40	9.8
Mean ± SD (35.75 ± 13.34)		
Sex		
Male	145	35.4
Female	265	64.6
Ethnicity		
Benin	147	35.9
Igbo	95	23.2
Esan	73	17.8
Yoruba	57	13.9
Others	38	9.3
Marital Status		
Single	165	40.2
Married	206	50.2
Divorced	24	5.9
Widowed	15	3.7
Religion		
Christianity	350	85.4
Islam	46	11.2
African Traditional Religion	14	3.4
Relationship to Cancer Patient		
Parent	131	32.0
Sibling	145	35.4
Child	134	32.7
Level of Education		
No formal education	33	8.0
Primary	49	12.0
Secondary	110	26.8
Tertiary	218	53.2

Most respondents were aged 25–34 years 143 (34.9%), with a mean age of 35.75 ± 13.34 years. Females predominated 265 (64.6%). The majority were Benin 147 (35.9%), and most were married 206 (50.2%). Christianity was the predominant religion 350 (85.4%). Siblings constituted the largest group of first-degree relatives 145 (35.4%). Over half of the respondents had tertiary education 218 (53.2%), while few had no formal education 33 (8.0%).Table 1A shows that most respondents were aged 25–34 years 143 (34.9%), with a mean age of 35.75 ± 13.34 years. Females predominated 265 (64.6%). The majority were Benin 147 (35.9%), and most were married 206 (50.2%). Christianity was the predominant religion 350 (85.4%). Siblings constituted the largest group of first-degree relatives 145 (35.4%). Over half of the respondents had tertiary education 218 (53.2%), while few had no formal education 33 (8.0%).

Table 1B: Socio-demographic characteristics of respondents

Variables	Frequency	Percent
Skill level		
Level 0	67	16.3
Level 1	49	12.0
Level 2	265	64.6
Level 3	29	7.1
Socioeconomic status		
Upper class	27	6.6
Middle class	314	76.6
Lower class	69	16.8
Monthly Income (₦)		
≤70,000	185	45.1
70,001–140,000	133	32.4
140,001–210,000	52	12.7
>210,000	40	9.8
Mean ± SD = 95951 ± 68284		
Health Insurance	97	23.7
Place of Residence		
Urban	324	79.0
Rural	86	21.0
Undergone Cancer Screening	96	23.4
Chronic Illness	49	12.0

Most respondents were at skill level 2 265 (64.6%), with the majority belonging to the middle socioeconomic class 314 (76.6%). About one-third earned ≤₦70,000 monthly 185 (45.1%), while 40 (9.8%) earned >₦210,000. Most respondents resided in urban areas 324 (79.0%). Only 97 (23.7%) had health insurance coverage, and 96 (23.4%) had previously undergone cancer screening. A small proportion had chronic illness 49 (12.0%).

SECTION B

KNOWLEDGE OF EARLY CANCER DETECTION AND SCREENING

Table 2: Awareness of early cancer detection and screening uptake among respondents

Variables	Frequency (n=410)	Percent
Awareness of Cancer Screening		
Yes	268	65.4
No	142	34.6

Of the 410 respondents who participated in this study, 268 (65.4%) respondents were aware of early cancer dectection and screening while 142 (34.6%) respondents were not aware of the subject matter.

Table 2A: Knowledge of early cancer detection and screening uptake among respondents

Variables	Frequency (n = 268)	Percent
Source of information		
Tv/radio	104	38.8
Social media	74	27.6
Healthcare professionals	60	22.4
Family/friends	30	11.2
Knowledge of screening methods		
Mammogram	144	53.7
Pap smear	65	24.3
Colonoscopy	38	14.2
PSA test	21	7.8
Confidence in knowledge		
Very confident	115	42.9
Somewhat confident	100	37.3
Not confident at all	53	19.8
Perceived screening frequency		
Annually	112	41.8
Every few years	69	25.7

Variables	**Frequency (n = 268)**	**Percent**
Only when sick	31	11.6
Never	56	20.9
Screening prevents death	163	60.8
Purpose of screening		
Early detection	178	66.4
Prevention	51	19.0
Diagnosis confirmation	16	6.0
Do not know	23	8.6

The main source of information on cancer screening was TV/radio 104 (38.8%), followed by social media 74 (27.6%) and healthcare professionals 60 (22.4%). Mammography was the most identified screening method 144 (53.7%), while PSA test was the least 21 (7.8%). A higher proportion of respondents were very confident in their knowledge 115 (42.9%), and most believed screening should be done annually 112 (41.8%).

Overall, 163 (60.8%) agreed that screening prevents death, and most correctly identified early detection as the main purpose of screening 178 (66.4%).

Table 2B: Knowledge of early cancer detection and screening uptake among respondents

Variables	Frequency	Percent
Screening age for high-risk individuals		
Before 30 years	148	55.2
30–40 years	57	21.3
40–50 years	22	8.2
Above 50 years	8	3.0
Do not know	33	12.3
Cancer screening prevents cancer deaths	216	80.6
Lifestyle reduces cancer risk	202	75.4
Knowledge of screening location	141	52.6
Doctor recommendation for screening	122	29.8

More than half of the respondents 148 (55.2%) correctly identified screening for high-risk individuals should start before 30 years.

A majority 216 (80.6%) agreed that cancer screening prevents cancer deaths, while 202 (75.4%) recognized that healthy lifestyle reduces cancer risk.

About half 141 (52.6%) reported knowledge of where screening services are available, while only 122 (29.8%) stated that doctors recommended screening to them.

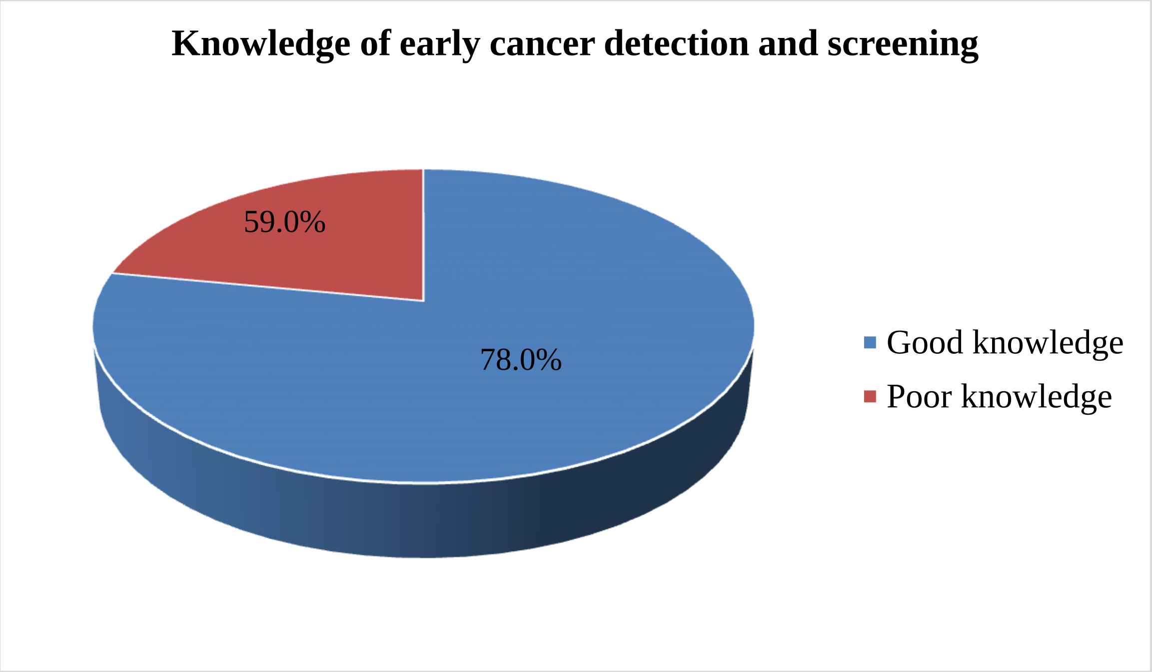

Figure 1: Knowledge of early cancer detection and screening among respondents

Of the 268 respondent who were assessed for knowledge of cancer screening and detection, 209 (78.0%) participants had good knowledge while 59 (22.0%) respondents had poor knowledge of the subject matter.

Table 3: Knowledge of early cancer detection and screening uptake and sociodemographic characteristics

Variables	**Knowledge of early cancer screening and detection**		**Test statistics**	**p-value**
	Good knowledge (n = 209) Freq (%)	**Poor knowledge (n = 59) Freq (%)**		
Age (in years)				
16 – 24	39 (67.2)	19 (32.8)	7.257	0.123
25 – 34	77 (79.4)	20 (20.6)		
35 – 44	47 (83.9)	9 (16.1)		
45 – 54	27 (75.0)	9 (25.0)		
≥55	19 (90.5)	2 (9.5)		
Sex				
Male	70 (78.7)	19 (21.3)	0.034	0.853
Female	139 (77.7)	40 (22.3)		
Ethnicity				
Benin	76 (76.8)	23 (23.2)	10.330	**0.035**
Igbo	53 (86.9)	8 (13.1)		
Esan	39 (83.0)	8 (17.0)		
Yoruba	23 (60.5)	15 (39.5)		
Others	18 (78.3)	5 (21.7)		

Marital status				
Married	104 (79.4)	27 (20.6)	2.760	0.431
Single	85 (75.9)	27 (24.1)		
Divorced	13 (72.2)	5 (27.8)		
Widowed	7 (100.0)	0 (0.0)		
Religion				
Christianity	182 (79.8)	46 (20.2)	3.541	0.156
Islam	23 (69.7)	10 (30.3)		
ATR	4 (57.1)	3 (42.9)		
Relationship to cancer patient				
Child	75 (80.6)	18 (19.4)	2.549	0.288
Sibling	72 (72.7)	27 (27.3)		
Parent	62 (81.6)	14 (18.4)		

ATR*: African traditional religion

Most socio-demographic variables were not significantly associated with knowledge of early cancer detection and screening ($p > 0.05$). Good knowledge was highest among respondents aged ≥55 years 19 (90.5%) and lowest among those aged 16–24 years 39 (67.2%), though this was not statistically significant (□ = 7.257, $p = 0.123$). There was no significant association between knowledge and sex ($p = 0.853$), marital status ($p = 0.431$), religion ($p = 0.156$), or relationship to the cancer patient ($p = 0.288$). However, ethnicity showed a statistically significant association with knowledge ($p = 0.035$), with Igbo respondents having the highest proportion of good knowledge 53 (86.9%) compared to Yoruba respondents who had the lowest 23 (60.5%)

Table 4B: Knowledge of early cancer detection and screening uptake and sociodemographic characteristics

Variables	Knowledge of early cancer screening and detection		Test statistics	p-value
	Good (n = 209) Freq (%)	Poor (n = 59) Freq (%)		
Socioeconomic status				
Upper class	20 (90.9)	2 (9.1)	2.575	0.303
Middle class	167 (77.3)	49 (22.7)		
Lower class	22 (73.3)	8 (26.7)		
Monthly income				
≤70,000	81 (66.4)	41 (33.6)	10.669	**0.014**
70,001–140,000	81 (87.1)	12 (12.9)		
140,001–210,000	22 (84.6)	4 (15.4)		
>210,000	25 (92.6)	2 (7.4)		
Health insurance				
Yes	62 (83.8)	12 (16.2)	2.002	0.157
No	147 (75.8)	47 (24.2)		
Residence				
Urban	172 (79.6)	44 (20.4)	1.754	0.185
Rural	37 (71.2)	15 (28.8)		
Undergone cancer screening				
Yes	62 (87.3)	9 (12.7)	4.991	0.082
No	79 (73.8)	28 (26.2)		
Not sure	68 (75.6)	22 (24.4)		
Chronic illness				
Yes	19 (73.1)	7 (26.9)	0.404	0.525
No	190 (78.5)	52 (21.5)		

Socioeconomic status, health insurance, residence, cancer screening history, and chronic illness were not significantly associated with knowledge of early cancer detection and screening ($p > 0.05$). Although not statistically significant, respondents in the upper class had the highest proportion of good knowledge 20 (90.9%), while those in the lower class had lower knowledge 22 (73.3%) ($p = 0.303$). Monthly income showed a statistically significant association with knowledge ($p = 0.014$), with respondents earning >₦210,000 having the highest good knowledge 25 (92.6%) compared to those earning ≤₦70,000 who had the lowest 81 (66.4%).

Table 5: Predictors of knowledge of early cancer detection and screening uptake

Variables	**B Regression coefficient**	**Odds ratio**	**95% CI for OR**		**p-value**
			Lower	**Upper**	
Age (in years)	-0.014	0.986	0.960	1.013	0.316
Ethnicity					
Edo-indigenes	-0.040	0.961	0.527	1.753	0.897
Non-Edo-indigenes*		1			
Monthly income					
≤70,000	0.051	2.861	1.173	6.976	**0.021**
70,001–140,000	0.250	1.284	0.476	3.469	0.621
140,001–210,000	0.382	1.465	0.548	3.919	0.447
>210,000		1			
Undergone cancer screening					
Yes	-0.805	0.447	0.187	1.068	0.070
No	-0.072	0.931	0.474	1.829	0.835
Not sure*		1			

*Reference category, CI: Confidence interval, OR: Odds ratio. $\mathbf{R^2}$ = 15.8 – 28.6%

With increasing age, respondents were 1.01 times less likely to have good knowledge of early cancer detection and screening (OR = 0.986; 95% CI: 0.960-1,013; p = 0.316). Edo indigenes were 0.961 times less likely to have good knowledge compared to non-Edo indigenes (OR = 0.961; 95% CI: 0.527-1.753: p = 0.897). Respondents earning ≤₦70,000, ₦70,001-₦140,000 and ₦140,001-₦210,000 were 2.9 times, 1.3 times, and 1.5 times more likely respectively to have good knowledge compared to those earning >₦210,000. However, only respondents earning ≤₦70,000 showed a statistically significant association (OR = 2.861; 95% CI: 1.173-6.976; p = 0.021). Respondents who had undergone cancer screening were 2.2 times less likely to have good knowledge (OR = 0.447; 95% CI: 0.187-1.068; p = 0.070), while those who had undergone screening were 1.1 times less likely to have good knowledge compared to respondents who were not sure of their screening status (OR = 0.931; 95% Cl: 0.474-1.829; p= 0.835).

SECTION C

SCREENING BEHAVIOUR OF FIRST-DEGREE RELATIVES OF CANCER PATIENTS

Table 6A: Screening behavior of first-degree relatives of cancer patients

Variable	**Frequency (n = 268)**	**Percent**
Ever undergone cancer screening	108	40.3
Type of screening undertaken (n = 108)		
Breast cancer	44	40.7
Cervical cancer	27	25.0
Prostate cancer	20	18.5
Colorectal cancer	17	15.7
Reasons for not undergoing screening (n = 160)		
Do not think at risk	67	41.9
No doctor recommendation	34	21.3
Do not know where to screen	23	14.4
Screening is expensive	18	11.3
Fear of results	18	11.3
Frequency of medical check-ups		
Annually	72	26.9
Every few years	55	20.5
Only when sick	106	39.6
Never	35	13.1
Delayed screening despite risk (n = 108)	60	55.8
Early detection improves survival	227	84.7

Majority 108 (40.3%) of respondents had ever undergone cancer screening. Among those screened, breast cancer screening was the most common 44 (40.7%), while colorectal cancer screening was the least 17 (15.7%). The main reason for not screening was not perceiving personal risk 67 (41.9%), followed by lack of doctor recommendation 34 (21.3%). Regarding medical check-ups, most respondents only sought care when sick 106 (39.6%). More than half 60 (55.8%) reported delaying screening despite being at risk, while the majority 227 (84.7%) agreed that early detection improves survival.

Table 6B: Screening behavior of first-degree relatives of cancer patients

Variables	Frequency (n = 268)	Percent
Comfort Discussing Screening with Doctor		
Very comfortable	137	51.1
Somewhat comfortable	85	31.7
Not comfortable at all	46	17.2
Healthcare provider explained screening	161	60.1
Know someone who has been screened	156	58.2
Effect of free screening on cancer screening participation	156	58.2
Likelihood of screening in next year		
Very likely	125	46.6
Somewhat likely	79	29.5
Unlikely	64	23.9

About half of the assessed 137 respondents (51.1%) were very comfortable discussing cancer screening with a doctor, while 85 (31.7%) were somewhat comfortable. Most respondents 161 (60.1%) reported that healthcare providers had explained cancer screening to them, and 156 (58.2%) knew someone who had undergone screening. The same proportion 156 (58.2%) indicated that free screening services would improve participation. Regarding future behavior, 125 (46.6%) were very likely to undergo screening within the next year, while 64 (23.9%) were unlikely to do so. For those who had not undergone screening, the most frequently reported reason was the perception of not being at risk, 153 (43.1%). Other notable barriers included lack of knowledge of where to access screening services, 72 (20.3%), and absence of a doctor’s recommendation, 58 (16.3%). Financial constraints were also reported by 38 (10.7%) respondents, while fear of

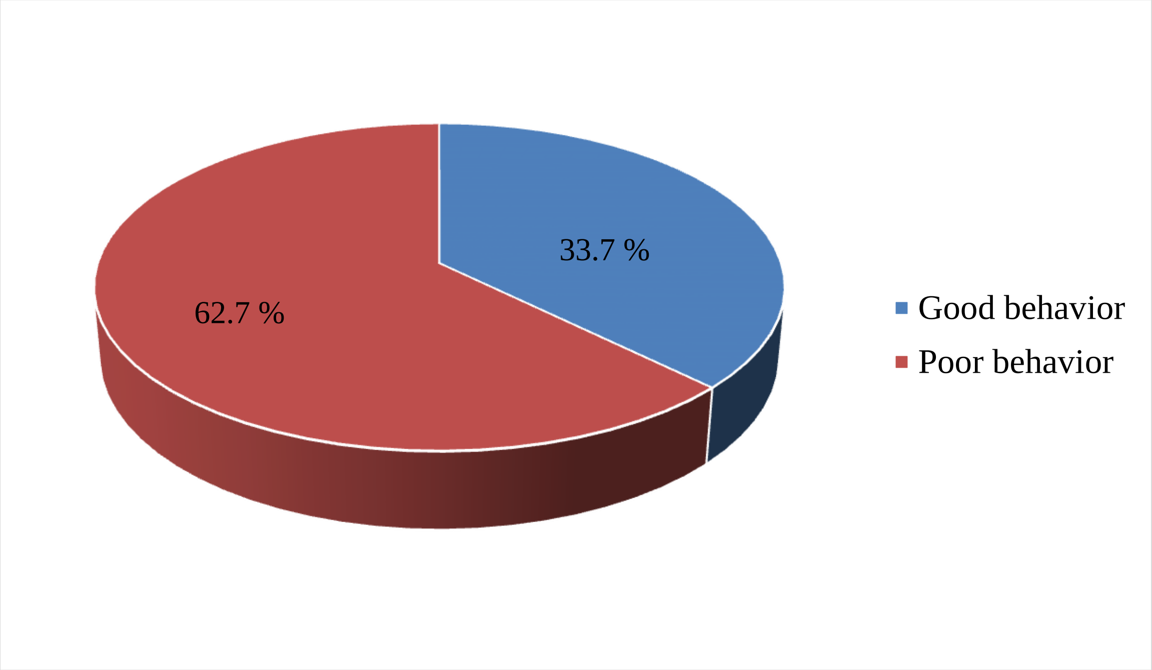

Figure 2: Cancer screening behavior among respondents

Of the 268 respondents who were assessed for cancer screening behavior of first-degree relatives of cancer patients, 100 (37.3%) participants had good behaviors towards cancer screening while 168 (62.7%) had poor behavior towards the subject matter.

Table 7A: Screening behavior of respondents and sociodemographic characteristics

Variables	Screening behavior		Test statistics	p-value
	Good (n = 100) Freq (%)	**Poor (n = 168) Freq (%)**		
Age (in years)				
16 – 24	17 (29.3)	41 (70.7)	8.861	0.065
25 – 34	30 (30.9)	67 (69.1)		
35 – 44	29 (51.8)	27 (48.2)		
45 – 54	15 (41.7)	21 (58.3)		
≥55	9 (42.9)	12 (57.1)		
Sex				
Male	29 (32.6)	60 (67.4)	1.274	0.259
Female	71 (39.7)	108 (60.3)		
Ethnicity				
Benin	32 (32.3)	67 (67.7)	9.024	0.061
Igbo	18 (29.5)	43 (70.5)		
Esan	20 (42.6)	27 (57.4)		
Yoruba	16 (42.1)	22 (57.9)		
Others	14 (60.9)	9 (39.1)		
Marital status				
Married	54 (41.2)	77 (58.8)	4.083	0.253

Single	35 (31.3)	77 (68.8)		
Divorced	9 (50.0)	9 (50.0)		
Widowed	2 (28.6)	5 (71.4)		
Religion				
Christianity	84 (36.8)	144 (63.2)	0.619	0.734
Islam	14 (42.2)	19 (57.6)		
ATR*	2 (28.6)	5 (71.4)		
Relationship to cancer patient				
Sibling	42 (42.4)	57 (57.8)	1.754	0.416
Child	32 (34.4)	61 (65.6)		
Parent	26 (34.2)	50 (65.8)		

ATR*: African traditional religion

None of the socio-demographic variables had a statistically significant association with screening behavior ($p > 0.05$). Although not significant, respondents aged 35–44 years had the highest proportion of good screening behavior 29 (51.8%), while those aged 16–24 years had the lowest 17 (29.3%) ($p = 0.065$). Similarly, others ethnic group recorded the highest good screening behavior 14 (60.9%), though this was not statistically significant ($p = 0.061$). There was also no significant association with sex ($p = 0.259$), marital status ($p = 0.253$), religion ($p = 0.734$), or relationship to the cancer patient ($p = 0.416$).

Table 7B: Screening behavior of respondents and sociodemographic characteristics

Variables	**Screening behavior**		**Test statistics**	**p-value**
	Good (n = 100) Freq (%)	**Poor (n = 168) Freq (%)**		
Socioeconomic status				
Upper class	7 (31.8)	15 (68.2)	3.832	0.147
Middle class	77 (35.6)	139 (64.4)		
Lower class	16 (53.3)	14 (46.7)		
Monthly income				
≤70,000	37 (30.0)	86 (70.0)	2.209	0.530
70,001–140,000	35 (36.5)	61 (63.5)		
140,001–210,000	13 (41.9)	18 (58.1)		
>210,000	15 (83.3)	3 (16.7)		
Health insurance				
Yes	26 (35.1)	48 (64.9)	0.207	0.649
No	74 (38.1)	120 (61.9)		
Residence				
Urban	80 (37.0)	136 (63.0)	0.036	0.849
Rural	20 (38.5)	32 (61.5)		
Undergone cancer screening				
Yes	31 (43.7)	40 (56.3)	2.722	0.256
No	34 (31.8)	73 (68.2)		
Not sure	35 (38.9)	55 (61.1)		
Knowledge level				
Good knowledge	81 (38.8)	128 (61.2)	0.845	0.358
Poor knowledge	19 (32.2)	40 (67.8)		

Although not significant, respondents in the lower socioeconomic class had higher good screening behavior 16 (53.3%), while those in the upper class recorded lower levels 7 (31.8%) ($p = 0.147$). Monthly income, health insurance status, residence, and previous cancer screening history also showed no significant associations with screening behavior ($p > 0.05$), though respondents who had previously undergone screening had relatively higher good screening behavior 31 (43.7%). Respondents with poor knowledge, 40 (67.8%) also had significantly poorer cancer screening behavior.

Table 8: Predictors of cancer screening behaviors among respondents

Variables	B Regression coefficient	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age	-0.014	0.986	0.965	1.008	0.217
Ethnicity					
Edo-indigenes	0.184	1.202	0.728	1.985	0.472
Non-Edo-indigenes		1			
Marital status					
Married	-0.192	0.825	0.481	1.414	0.485
Unmarried		1			
Knowledge level					
Good	-0.238	0.788	0.424	1.467	0.453
Poor		1			

*Reference category, CI: Confidence interval, OR: Odds ratio. **R^2** = 16.2 – 22.6%

With increasing age, respondents were 1.01 times less likely to have good screening behavior (OR = 0.986; p = 0.217). Edo indigenes were 1.2 times more likely to have good screening behavior compared to non-Edo indigenes (OR = 1.202; p = 0.472). Married respondents were about 1.2 times less likely to have good screening behavior compared to unmarried respondents (OR = 0.825; p = 0.485). Similarly, respondents with good knowledge were 1.3 times less likely to have good screening behavior compared to those with poor knowledge (OR = 0.788; p = 0.453).

SECTION D

FACTORS AFFECTING CANCER SCREENING BEHAVIOUR AMONG RESPONDENTS

Table 9: Factors affecting cancer screening behavior among respondents

Variables	Frequency (n = 410)	Percent
Main barriers to screening		
Lack of awareness	191	46.6
Fear of cancer diagnosis	90	22.0
High cost of screening	75	18.3
Lack of access to facilities	44	10.8
Religious/cultural beliefs	10	2.4
Availability of screening services	119	29.0
Concern about screening cost	256	62.4
Exposure to misinformation	155	37.8
Cultural influence on screening	217	52.9
Cancer stigma affects screening willingness	216	52.7
Fear of cancer diagnosis on screening	245	59.8
Effect of time constraint on cancer screening uptake	184	44.9
Feelings about invasive procedures		
Comfortable	102	24.9
Uncomfortable	198	48.3
Not sure	110	26.8
Difficulty accessing screening facility due to distance or transportation	181	44.1
Government support for cancer screening programs	136	33.2
Influence of religious beliefs on cancer screening decisions	171	41.7

The major barrier to cancer screening was lack of awareness 191 (46.6%), followed by fear of cancer diagnosis 90 (22.0%) and high cost of screening 75 (18.3%). Concern about screening cost was reported by 256 (62.4%), while fear of diagnosis also significantly influenced screening behavior 245 (59.8%). Over half of respondents reported cultural influence 217 (52.9%) and stigma 216 (52.7%) affecting willingness to screen. Nearly half of the respondents were uncomfortable with invasive procedures 198 (48.3%), and 181 (44.1%) reported difficulty accessing screening due to distance or transportation. Only 136 (33.2%) reported adequate government support for screening services.

SECTION E

STRATEGIES TO PROMOTE CANCER SCREENING UPTAKE AMONG RESPONDENTS

Table 10: Strategies to promote cancer screening uptake among respondents

Variables	**Frequency (n = 410)**	**Percent**
Preferred Strategies to Encourage Screening		
Free/subsidised screening programmes	284	69.3
More awareness campaigns	80	19.5
Healthcare provider recommendation	22	5.4
Mobile screening units	17	4.1
Testimonials from survivors	7	1.7
Doctor recommendation influence	365	89.0
Effectiveness of Social Media Campaigns		
Very effective	249	60.7
Somewhat effective	110	26.8
Not effective	51	12.5
Support for Mandatory Screening	377	92.0
Support for Community-Based Screening	376	91.7
Support for School-Based Education	380	92.7
Role of Religious/Cultural Leaders	378	92.2
Family Encouragement Influence	361	88.0
Preferred Information Channels		

Variables	**Frequency (n = 410)**	**Percent**
Social media	104	25.4
Hospitals	92	22.4
TV/Radio	86	21.0
Community health programmes	85	20.7
Religious institutions	43	10.5
Training Healthcare Providers	401	97.8

The most preferred strategy to improve cancer screening uptake was free or subsidized screening programs 284 (69.3%), followed by increased awareness campaigns 80 (19.5%). Most respondents 365 (89.0%) reported that doctor recommendation strongly influences screening uptake. Social media campaigns were considered very effective by 249 (60.7%) of respondents. A high proportion supported mandatory screening 377 (92.0%), community-based screening 376 (91.7%), school-based education 380 (92.7%), involvement of religious/cultural leaders 378 (92.2%), and training of healthcare providers 401 (97.8%)

DISCUSSION

This study assessed the knowledge of early detection and screening uptake among first-degree relatives (FDRs) of cancer patients attending the oncology unit at the University of Benin Teaching Hospital (UBTH), Benin City, Edo State, Nigeria. A total of 410 first-degree relatives participated in the study, providing important insights into the understanding, behaviors, and barriers that influence cancer screening among this high-risk population.

The majority of respondents were aged 25 to 34 years with a mean age of 35.75 ± 13.34 years. This finding indicates that most first-degree relatives of cancer patients are within the young to middle-aged adult bracket. This age group is important because they are often the primary caregivers and decision-makers for their families.[2]

The finding of this study is in tandem with a study conducted among first-degree relatives of breast cancer patients in Turkey, where the mean age of participants was 43.1 ± 12.9 years.[35]

Early exposure to cancer prevention knowledge at this age is critical because these individuals are at the stage of life where they can adopt and maintain healthy screening behaviors. Healthcare providers at UBTH should use every opportunity of patient contact to educate these young to middle-aged relatives about their increased cancer risk and the importance of regular screening.

Two-thirds of respondents were females, while males constituted one-third of the respondents. This female predominance is expected in cancer-related studies because women are more likely to accompany their relatives to hospitals, participate in health research, and take on caregiving roles for family members with chronic illnesses.[41]

The finding of this study is in tandem with a study conducted among first-degree relatives of gastric cancer patients in China, where more than half of the participants were also women.[25]

However, this finding is in contrast with a study conducted among first-degree relatives of colorectal cancer patients in Iran, where males and females were more evenly represented.[13]

The lower participation of males in this study is concerning because male first-degree relatives also have significantly elevated cancer risks.[3]

The hospital should develop strategies to encourage male relatives to participate in health education and screening programs. Male-centered outreach programs could be organized through religious institutions and workplaces to reach more men.

The majority of respondents were of Benin ethnicity, followed by Igbo, Esan, Yoruba, and others. This finding is expected because the study was conducted in Benin City, which is located in Edo State, a region predominantly inhabited by the Benin ethnic group.[21] Cultural background significantly influences health beliefs, perceptions about disease, and willingness to participate in screening programs.[7] The finding of this study is in tandem with a study conducted in Benin City among undergraduate students, where the Benin ethnic group also had the highest representation.[33]

The hospital should develop culturally sensitive cancer education programs that address specific beliefs and misconceptions that may be common among different ethnic groups. Community health workers who speak local languages should be involved in health education efforts.[8]

Majority of respondents were married, followed by single respondents which constituted a quarter, divorced, and widowed. Marriage can provide social support that may encourage positive health behaviors, including cancer screening. Married individuals often have someone who can accompany them to screening appointments and remind them to undergo regular check-ups. The finding of this study is in tandem with a study conducted among first-degree relatives of colorectal cancer patients in China, where the majority of participants were also married.[15] The hospital should leverage family structures by involving spouses in health education sessions, as married individuals may have better support systems to facilitate screening uptake.

The majority of respondents were Christians, followed by Muslims and African Traditional Religion adherents. This distribution reflects the religious demographics of Edo State, where Christianity is the dominant religion. Religious beliefs can influence health behaviors either positively or negatively. Some religious teachings promote care for the body as a temple of God, which can encourage screening, while others may promote fatalistic beliefs that discourage preventive health actions.[37] The finding of this study is in tandem with a study conducted in southwestern Nigeria, where Christianity was also the predominant religion.[35] Religious leaders should be engaged as partners in cancer education. Churches and mosques can serve as platforms for disseminating accurate information about cancer screening and early detection.[41]

The findings of this study showed that siblings constituted the largest group of first-degree relatives, representing over one-third of the study population, followed by children (nearly one-third) and parents (nearly one-third). This distribution is important because siblings of cancer patients share approximately half of their genes with the affected individual, putting them at significantly elevated risk for developing similar cancers.[2]

The finding of this study is in tandem with a study conducted in Iran among first-degree relatives of colorectal cancer patients, where siblings also formed the majority of participants.[51]

Healthcare providers should pay special attention to siblings of cancer patients during health education sessions. Specific screening recommendations for siblings based on the type of cancer affecting their family member should be clearly communicated.[4]

Over half of the respondents had tertiary education, while a quarter had secondary education, nearly a quarter had primary education, and less than a quarter had no formal education. This high educational level is expected because the study was conducted at a teaching hospital located in an urban area with better access to educational institutions. Higher education is generally associated with better health literacy, greater access to health information, and more positive health behaviors. The finding of this study is in tandem with a study conducted among first-degree relatives of gastric cancer patients in China, where a significant proportion of participants also had higher education.[25]

However, educated individuals can still have knowledge gaps about specific cancer screening guidelines. The hospital should not assume that educated individuals already know what they need to know about cancer screening. Targeted education should be provided to all regardless of educational background.[36]

Majority of respondents belonged to the middle socioeconomic class, while less than one-quarter were in the lower class and only a few were in the upper class. This finding reflects the socioeconomic reality of most Nigerians who access healthcare services at public teaching hospitals.[34]

Middle-class individuals often have some financial resources but may still struggle with the costs of cancer screening, which can be expensive.[7]

The finding of this study is in tandem with a study conducted in southwestern Nigeria, where most participants were also from the middle socioeconomic class.[32]

Healthcare policymakers should prioritize the subsidization of cancer screening services because cost is a major barrier for middle and lower socioeconomic groups. Health insurance schemes should expand coverage for cancer screening procedures.[36]

Majority of the respondents resided in urban areas, while only quarter resided in rural areas. This urban predominance is expected because UBTH is located in Benin City, an urban center, and rural residents may face additional challenges in accessing the hospital.[41]

Urban residence is generally associated with better access to healthcare facilities, more health information, and higher health literacy.[7]

However, the finding of this study showed that only a quarter of respondents had health insurance coverage, which is very low despite urban residence. This finding is in contrast with studies from developed countries where health insurance coverage is much higher.[36]

The government should implement policies to increase health insurance enrollment among all Nigerians, including urban residents who may think they do not need insurance because they are not seriously ill.[34]

Two-thirds of respondents were aware of early cancer detection and screening, while one-third had no prior awareness. This finding indicates that although more than half of first-degree relatives have heard about cancer screening, a significant proportion remain completely unaware despite having a family member currently receiving cancer treatment. This is a major public health concern because these individuals are at elevated genetic risk and should be the first to know about screening.[3]

The finding of this study is in tandem with a study conducted among first-degree relatives of colorectal cancer patients in Iran, where about two-thirds of participants were aware of screening.[13] However, the finding of this study is higher than a study conducted in Romania, where only about half of female relatives had good awareness.[12] The oncology department at UBTH should implement a mandatory family education program where every cancer patient is required to bring their first-degree relatives for at least one counseling session about familial cancer risk and screening recommendations.[10]

Among the 268 respondents who were aware of cancer screening, majority demonstrated good knowledge while a quarter had poor knowledge. This high proportion of good knowledge is encouraging and indicates that once individuals become aware of cancer screening, they tend to acquire adequate knowledge. The finding of this study is higher than a study conducted in Iran among first-degree relatives of colorectal cancer patients, where only a few of respondents could correctly answer all knowledge questions.[13] The better knowledge in this study may be attributed to the fact that all participants were recruited from a teaching hospital where they accompany their relatives, giving them direct exposure to cancer discussions.[33] The hospital should build on this good knowledge base by providing more detailed information about specific screening guidelines, including when to start screening, how often to screen, and which specific tests are recommended based on the type of cancer in the family.[36]

The findings of this study showed that the main source of information about cancer screening was television and radio, reported by two-thirds of aware respondents, followed by social media, healthcare professionals, and family or friends. This finding indicates that mass media plays a crucial role in health information dissemination, but healthcare professionals are not reaching enough at-risk individuals. The finding of this study is in contrast with a study conducted in China where healthcare professionals were the primary source of information for first-degree relatives.[25] The low proportion of respondents receiving information from healthcare professionals is concerning because doctors and nurses are the most trusted and accurate sources of health information.[8]

Healthcare providers at UBTH must be trained to proactively discuss cancer risk and screening with every first-degree relative who accompanies a cancer patient to the hospital. A simple checklist should be added to the patient's file reminding staff to counsel family members.

The findings of this study showed that mammography was the most recognized screening method, identified by two-thirds of aware respondents, followed by Pap smear represented by a quarter, colonoscopy, and PSA test. This finding reflects the fact that breast cancer awareness campaigns have been very successful in Nigeria compared to awareness campaigns for other cancers.[32] However, the low recognition of colonoscopy and PSA testing is concerning because colorectal and prostate cancers are also major causes of cancer death in Nigeria.[1] The finding of this study is in tandem with a study conducted in Romania, where breast and cervical cancer screening methods were better known than colorectal cancer screening methods.[12] Public health authorities should intensify awareness campaigns for colorectal and prostate cancers, especially targeting first-degree relatives of patients with these cancers. Community health workers should be trained to educate families about all major cancer types and their screening methods.[41]

Two-thirds of aware respondents correctly identified early detection as the main purpose of screening, while thought screening was for prevention, one-third for diagnosis confirmation, and a quarter did not know. This finding is encouraging because the majority understand the fundamental purpose of screening, which is to detect cancer at an early stage before symptoms appear.[39] The finding of this study is in tandem with a study conducted in Iran where most respondents also correctly identified early detection as the purpose of screening.[13] However, the significant minority who misunderstand the purpose of screening may delay seeking screening because they incorrectly believe screening is only for people who already have symptoms.[38] Educational interventions should clearly explain that screening is for healthy individuals without symptoms and that early detection saves lives.[36]

Over half of aware respondents correctly identified that screening for high-risk individuals should start before 30 years of age. This knowledge is particularly important for first-degree relatives who are at elevated genetic risk and need earlier and more frequent screening than the general population.[4]

The finding of this study is higher than a study conducted in Iran, where only over one-fifth of respondents knew the correct age to start screening.[51] The better knowledge in this study may be because all participants have a family member with cancer, making them more attentive to cancer-related information.[2] However, the fact that nearly half of respondents did not know the correct screening age indicates a significant knowledge gap. Oncologists and nurses must specifically tell first-degree relatives at what age they should begin screening and how often they should be screened based on the age at which their family member was diagnosed.[10]

Majority of aware respondents agreed that cancer screening prevents cancer deaths, and majority recognized that a healthy lifestyle reduces cancer risk. These high percentages indicate that most first-degree relatives understand the value of screening and the importance of lifestyle modification.[11] The finding of this study is in tandem with a study conducted in Turkey where most participants also believed screening reduces mortality.[18] The positive attitude toward screening is a good foundation for behavior change. Health educators should reinforce these positive beliefs and translate them into action by providing practical guidance on how to access screening services. Testimonials from cancer survivors who were diagnosed early through screening can be very powerful in motivating screening uptake.[19]

Over half of aware respondents knew where screening services are available, and only one-quarter reported that a doctor had ever recommended screening to them. These findings reveal critical gaps in the healthcare system. Even among individuals who have good knowledge about screening, many do not know where to go for screening services, and most have never received a doctor's recommendation.[8] The finding of this study is in contrast with a study conducted in China where healthcare provider recommendation was more common.[25] The low rate of doctor recommendation is unacceptable because physician advice is one of the strongest predictors of screening uptake. Every healthcare provider who comes into contact with first-degree relatives of cancer patients should make it a routine practice to recommend appropriate screening tests. The hospital administration should implement a policy requiring documentation of family counseling in patient records.

The findings of this study showed that monthly income was significantly associated with knowledge of early cancer detection and screening, with respondents earning above ₦210,000 having the highest proportion of good knowledge compared to those earning ≤₦70,000 who had the lowest good knowledge. This finding indicates that socioeconomic status influences health knowledge, possibly because wealthier individuals have better access to information through private healthcare, the internet, and other resources.[7] The finding of this study is in tandem with a study conducted in the United States where higher income was associated with better cancer knowledge.[6] This socioeconomic disparity in knowledge is concerning because lower-income individuals are often at higher risk due to lifestyle factors and have less access to healthcare.[41] Government and non-governmental organizations should specifically target lower-income communities with free cancer education programs delivered through community health workers and local organizations.[29]

The findings of this study showed that ethnicity was significantly associated with knowledge, with Igbo respondents having the highest proportion of good knowledge and Yoruba respondents having the lowest. This ethnic difference may be related to variations in access to health information, cultural beliefs about cancer, or educational levels across ethnic groups.[7] The finding of this study is in tandem with studies conducted in multi-ethnic countries where knowledge levels vary by ethnicity.[3] Culturally tailored educational interventions are needed to address the specific knowledge gaps and misconceptions prevalent in different ethnic communities. Health information should be disseminated in local languages and through trusted community channels such as traditional rulers, religious leaders, and town hall meetings.[8]

Only two-thirds of respondents who were aware of cancer screening had ever undergone any form of cancer screening. This means that despite having good knowledge, the majority of first-degree relatives have not translated their knowledge into action. This knowledge-behavior gap is a major public health challenge. The finding of this study is lower than a study conducted in China where about 60% of first-degree relatives underwent screening[25], but higher than a study conducted in Turkey where only about 17% of female relatives performed breast self-examination.[18] The low screening uptake among high-risk individuals in this study is alarming because these individuals have a genetic predisposition to cancer.[2] The oncology department should implement a patient navigator program where specially trained staff help first-degree relatives overcome barriers and schedule screening appointments before they leave the hospital.[19]

Among those who had undergone screening, breast cancer screening was the most common, followed by cervical cancer, prostate cancer, and colorectal cancer. This pattern reflects the success of breast and cervical cancer awareness campaigns in Nigeria, particularly through initiatives like Breast Cancer Awareness Month and free cervical cancer screening programs. The finding of this study is in tandem with a study conducted in Uganda where breast cancer screening was also the most common among first-degree relatives.[27] However, the very low uptake of colorectal cancer screening is concerning because colorectal cancer is increasingly common in Nigeria.[1] The hospital should partner with gastroenterology societies to offer free or subsidized colonoscopy screenings for first-degree relatives of colorectal cancer patients, especially during awareness months.

The most common reason for not undergoing screening was the perception of not being at risk, reported by over one-third of those who had never screened. Other reasons included no doctor recommendation, not knowing where to screen, screening being expensive, and fear of results.

The finding that many first-degree relatives do not perceive themselves as being at risk despite having a family member with cancer is very concerning and indicates poor risk communication.[6] The finding of this study is in tandem with a study conducted in China where the same reason was most commonly cited.[25] Healthcare providers must explicitly tell first-degree relatives that having a parent, sibling, or child with cancer significantly increases their own risk.[2] Simple language should be used, such as "because your mother had breast cancer, your risk is higher than a woman whose mother did not have breast cancer".[4]

Over one-third of respondents only seek medical care when they are sick, while only one-quarter have annual check-ups and less than a quarter have check-ups every few years. This finding indicates a predominant sick-care mentality rather than preventive healthcare behavior among first-degree relatives. The finding of this study is in tandem with a study conducted in Nigeria among the general population, where similar patterns were observed. The healthcare system in Nigeria is largely reactive rather than proactive.[34] The government should invest in preventive healthcare by subsidizing regular health check-ups and creating awareness that screening is for healthy individuals, not only for those with symptoms.[41] Health insurance schemes should cover annual preventive health visits.[36]

Over half of respondents who had undergone screening reported delaying screening despite knowing they were at risk. This finding reveals that even among those who eventually screen, many do not adhere to recommended screening schedules. The finding of this study is in tandem with a study conducted in Israel where adherence to interval colonoscopy screening among first-degree relatives was low.[20] Fear of diagnosis and discomfort with procedures are major contributors to delay.[37] The hospital should implement reminder systems such as text messages or phone calls to encourage first-degree relatives to schedule their screening appointments on time.[19] Patient education should address fears directly by explaining that most screening results are normal and that early detection greatly improves treatment outcomes.[11]

Majority of respondents agreed that early detection improves survival. This high percentage indicates that most first-degree relatives understand the benefit of screening, which should theoretically motivate them to screen[36]. The finding of this study is in tandem with a study conducted in Turkey where a majority also recognized the survival benefits of early detection.[18] However, there is a disconnect between this belief and actual screening behavior. When people say early detection saves lives but still do not screen, something else is blocking action.[38] The hospital should conduct qualitative research to understand the specific barriers that prevent first-degree relatives from translating their positive beliefs into action.[8]

Half of the respondents were very comfortable discussing cancer screening with a doctor, and majority of them reported that healthcare providers had explained screening to them. These figures are better than many studies from low- and middle-income countries, but they also mean that nearly half of respondents are not fully comfortable discussing screening, and nearly over one-third have never had a provider explain screening to them.[8] The finding of this study is in contrast with a study conducted in the United States where higher rates of provider-patient communication about screening were reported.[9] The hospital should train all clinical staff, including nurses, pharmacists, and community health workers, to initiate conversations about cancer screening with first-degree relatives. A simple script can be provided to staff to ensure consistent messaging.[41]

Over a half of the respondents knew someone who had undergone screening, and the same percentage indicated that free screening services would improve participation. These findings highlight the importance of social influence and financial accessibility in screening behavior. When people see their peers undergoing screening, they are more likely to do so themselves. The finding of this study is in tandem with a study conducted in the United States where peer influence and cost were major factors.[19] The government should allocate funds for free cancer screening programs targeting high-risk groups, including first-degree relatives of cancer patients.[11] Success stories of individuals who detected cancer early through screening should be shared through social media and community events.[41]

The main barrier to cancer screening was lack of awareness, reported by over one-third of all respondents. This was followed by fear of cancer diagnosis, high cost of screening, lack of access to facilities, and religious or cultural beliefs which were all below one quarter. The finding that lack of awareness is the single biggest barrier is actually encouraging because awareness can be improved through education.[39]

The finding of this study is in tandem with a study conducted in Iran where lack of awareness was also the primary barrier.[13] The government should launch a national cancer awareness campaign specifically targeting first-degree relatives of cancer patients.[11] The campaign should use multiple channels including television, radio, social media, posters in healthcare facilities, and community outreach events.[29]

Two-thirds of respondents who participated in the study were concerned about the cost of screening, and over half reported that fear of a cancer diagnosis affected their screening behavior. These psychological and financial barriers are major obstacles that cannot be ignored.[7]

The finding of this study is in tandem with studies conducted in multiple countries where cost and fear are consistently cited as top barriers.[33,37] The fear of being diagnosed with cancer is understandable, but it leads to avoidance behavior that can result in later diagnosis when treatment is more difficult and less successful.[38] Hospitals should offer free or heavily subsidized screening for first-degree relatives, especially during awareness months.[36] Psychological counseling should be offered alongside screening services to address fear and anxiety.[8]

Over half of the of respondents who participated in the study reported that cultural factors influence their screening decisions, and similarly over half of the respondents stated that cancer stigma affects their willingness to screen. These findings highlight the powerful role of social and cultural factors in health behavior.[7]

In many Nigerian communities, cancer is associated with death, witchcraft, or punishment from God, leading families to hide a cancer diagnosis rather than discuss it openly.[32]

The finding of this study is in tandem with a study conducted in Uganda where stigma was a major barrier to breast cancer screening.[27] Traditional rulers, religious leaders, and community elders should be engaged as champions to reduce cancer stigma.[41] These influential figures should publicly share messages that cancer is not a punishment, is not contagious, and can be treated successfully if detected early.[11]

Nearly half of the respondents were uncomfortable with invasive screening procedures, and over one-third of respondents reported difficulty accessing screening facilities due to distance or transportation challenges. The discomfort with invasive procedures is particularly relevant for tests like colonoscopy and mammography, which can cause physical discomfort or embarrassment.[15] The finding of this study is in tandem with a study conducted in China where discomfort and embarrassment were major barriers to colonoscopy screening.[15] Healthcare providers should explain procedures clearly before they are performed, including what patients will experience and why the procedure is necessary.[8] The hospital should also implement mobile screening units that can travel to remote communities, reducing transportation barriers.[29] Mobile mammography and Pap smear services have been successful in many countries.[41]

Over one-third of respondents reported adequate government support for cancer screening programs, and a little over two-fifths of the respondents stated that religious beliefs influence their screening decisions. The low perception of government support reflects the reality that cancer screening is not well-funded in Nigeria compared to many other countries.[34] The finding of this study is in contrast with countries like the United Kingdom where national screening programs are well-established.[36] The government should increase budget allocation for cancer screening, establish a national cancer screening registry, and provide free screening services for high-risk population.[11] Regarding religious beliefs, faith-based organizations should be engaged as partners in health promotion.[41] Religious leaders should be trained to deliver health messages from the pulpit, emphasizing that seeking medical care and undergoing screening are not signs of weak faith.[8]

The findings of this study showed that the most preferred strategy to improve cancer screening uptake was free or subsidized screening programs, selected by two-third of respondents. This was followed by more awareness campaigns (one-fifth), healthcare provider recommendation (one twentieth), mobile screening units (one twenty-fifth), and testimonials from survivors (one sixtieth). The overwhelming preference for free screening indicates that cost is the most significant modifiable barrier.[7] The finding of this study is in tandem with a study conducted in the United States where cost reduction strategies were highly effective in increasing screening uptake.[19] The government and hospital administration should prioritize the removal of financial barriers by providing free screening for first-degree relatives.[11] Corporate organizations and non-governmental organizations should also sponsor screening programs as part of their corporate social responsibility initiatives.[41]

Majority of respondents reported that doctor recommendation strongly influences screening uptake. This finding highlights the enormous influence that healthcare providers have on patient behavior.[8]

When a doctor recommends a screening test, patients are much more likely to complete it.[20]

The finding of this study is in tandem with a study conducted in Israel where physician recommendation was one of the strongest determinants of colorectal cancer screening.[20] Unfortunately, only over quarter of the respondents in this study had ever received a doctor's recommendation for screening. Every doctor, nurse, and community health worker must be trained to recommend appropriate screening tests to every first-degree relative of a cancer patient.[9] A simple policy requiring documentation of family risk counseling in every cancer patient's file should be implemented.[19]

Two-third of respondents considered social media campaigns very effective, and a little over quarter of the respondents considered them somewhat effective, meaning that nearly the majority of respondents view social media as at least somewhat effective for health communication. This finding reflects the increasing role of digital platforms in health information dissemination, especially among younger adults.[41] The finding of this study is in tandem with studies from multiple countries where social media has been successfully used to promote cancer screening.[11] The hospital should establish a strong social media presence on platforms like Facebook, WhatsApp, Instagram, and Twitter.[8] Short videos, infographics, and patient testimonials should be regularly posted to educate followers about cancer screening.[19] Social media influencers who have personal experience with cancer could be engaged to spread messages to their followers.[41]

The overwhelming majority of the respondents supported mandatory screening, community-based screening, school-based education, involvement of religious and cultural leaders, and training of healthcare providers. The near-universal support for these strategies indicates that first-degree relatives recognize the need for multi-level interventions that go beyond individual education. The finding of this study is in tandem with a study conducted in Canada where community-based and school-based interventions were effective in increasing screening uptake.[36] The government should develop comprehensive cancer control policies that include mandatory screening for high-risk populations, establishment of community screening centers, integration of cancer education into school curricula, training of religious and community leaders as health advocates, and continuous professional development for healthcare providers on cancer prevention and early detection.[11,4]

CONCLUSION

- The findings revealed that although a majority of first-degree relatives have good knowledge about cancer screening, the actual screening uptake remains low. There is a significant gap between knowledge and behavior.
- The most common barriers to screening include lack of awareness (nearly half), fear of cancer diagnosis (over one-fifth), high cost of screening (over one-sixth), cultural factors (over half), and stigma (over half).
- The preferred strategies to improve screening uptake include free or subsidized screening programs (majority), increased awareness campaigns (one-fifth), healthcare provider recommendation (majority reported), and mobile screening units (one twenty-fifth).
- There is an urgent need for multi-level interventions targeting individuals, healthcare providers, communities, and policymakers to address the identified barriers and improve screening uptake among this high-risk population.

RECOMMENDATIONS

To the First-Degree Relatives of Cancer Patients

1. First-degree relatives should take personal responsibility for their health by asking their doctors specifically about their cancer risk and recommended screening tests based on their family history
2. They should discuss cancer screening openly with family members and share information with siblings and children who may also be at increased risk.

To the University of Benin Teaching Hospital (UBTH)

1. The oncology department should implement a mandatory family counseling program where every cancer patient is required to bring their first-degree relatives for at least one dedicated educational session about familial cancer risk and screening recommendations.
2. A patient navigator program should be established where trained staff help first-degree relatives overcome barriers and schedule screening appointments before leaving the hospital.
3. Reminder systems such as text messages, phone calls, or letters should be implemented to encourage timely repeat screening for first-degree relatives.

To Healthcare Providers

1. Every doctor, nurse, and community health worker should make it a routine practice to ask cancer patients about their family members and recommend appropriate screening tests to first-degree relatives.
2. Providers should use simple, clear language when explaining cancer risk and avoid medical jargon that may confuse patients and their relatives.

To the Edo State Ministry of Health

1. Free or heavily subsidized cancer screening programs should be established specifically targeting first-degree relatives of cancer patients, including mammography, Pap smear, PSA testing, and colonoscopy.

2. Mobile screening units should be deployed to reach first-degree relatives in remote and rural communities who cannot easily access the teaching hospital.

To the Federal Government of Nigeria (Federal Ministry of Health)

1. A national cancer screening registry should be established to track screening uptake among high-risk populations and evaluate the effectiveness of screening programs.

2. Cancer education should be integrated into school curricula at all levels to create a generation that understands cancer prevention and early detection.

3. Health insurance schemes should be expanded to cover annual preventive health visits and cancer screening tests for individuals with a family history of cancer.

To Religious and Community Leaders

1. Religious leaders should use their platforms to reduce cancer stigma by teaching that cancer is not a punishment from God and that seeking medical care is not a sign of weak faith.

2. Traditional rulers and community elders should champion cancer awareness campaigns and openly discuss their own screening experiences to encourage others.

To Non-Governmental Organizations

1. NGOs focused on cancer control should prioritize outreach to first-degree relatives of cancer patients through support groups and educational workshops.

2. Funding should be provided for free screening days specifically targeting family members of cancer patients.

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APPENDIX I: QUESTIONNAIRE
DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE,
UNIVERSITY OF BENIN, BENIN CITY

KNOWLEDGE OF EARLY DETECTION AND SCREENING UPTAKE AMONG FIRST DEGREE RELATIVES OF CANCER PATIENTS IN BENIN CITY.

This questionnaire aims to collect data on the knowledge of early detection and screening uptake among first degree relatives of cancer patients. Your responses will contribute significantly to the advancement of knowledge in this area and provide data to aid policy formulation for effective interventions. Your responses will remain anonymous and confidential. Thank you.

Section A: Socio-Demographic Characteristics

1. Age as last birthday: ……………………
2. Gender: ☐ Male ☐ Female
3. Tribe: ☐ Benin ☐ Igbo ☐ Yoruba ☐ Esan ☐ Others (please specify): …………
4. Marital Status: ☐ Single ☐ Married ☐ Divorced ☐ Widowed
5. Religion: ☐ Christianity ☐ Islam ☐ African Traditional Religion ☐ Others (please specify): ………………
6. Relationship to Cancer Patient: ☐ Parent ☐ Sibling ☐ Child
7. Level of Education: ☐ No formal education ☐ Primary ☐ Secondary ☐ Tertiary
8. Occupation: _________________________
9. Monthly Income Level: ☐ ≤ 70,000 ☐ 70,001-140,000 ☐ 140,000-210,000 ☐ >210,000
10. Do you have health insurance? ☐ Yes ☐ No

11. Do you live in a rural or urban area? ☐ Rural ☐ Urban
12. Has any of your family members (excluding the cancer patient) undergone cancer screening? ☐ Yes ☐ No ☐ Not sure
13. Do you have any chronic illnesses? ☐ Yes (please specify: ____) ☐ No

Section B: Knowledge of Early Cancer Detection and Screening

14. Have you ever heard about cancer screening before? ☐ Yes ☐ No. If no skip to 18
15. What is your source of information? ☐ TV/radio ☐social media ☐ Healthcare professionals ☐ Family/friends ☐ others: ______
16. Which cancer screening tests have you heard of? (Select all that apply)

    ☐ Mammogram ☐ Colonoscopy ☐ Pap smear ☐ PSA (Prostate-Specific Antigen) Test

    ☐ Other: ____
17. How confident are you in your knowledge about cancer screening?

    ☐ Very confident ☐ Somewhat confident ☐ Not confident at all
18. How often should cancer screening be done for high-risk individuals?

    ☐ Annually ☐ Every 2–3 years ☐ Only when symptoms appear ☐ I don’t know
19. Do you believe first degree relatives of cancer patients have a higher risk of developing cancer? ☐ Yes ☐ No ☐ Not sure
20. What do you think is the purpose of cancer screening?

    ☐ To detect cancer early ☐ To prevent cancer ☐ To confirm a cancer diagnosis ☐ I don’t know

21. At what age should high-risk individuals start cancer screening? ☐ Before 30 ☐ 30–40 ☐ 40–50 ☐ Above 50 ☐ I don’t know
22. Do you think cancer screening can help prevent death from cancer? ☐ Yes ☐ No ☐ Not sure
23. Can lifestyle changes (e.g., diet, exercise) reduce cancer risk? ☐ Yes ☐ No ☐ Not sure
24. Do you know where to get screened for cancer in your area? ☐ Yes ☐ No
25. Have you ever been advised by a doctor to undergo cancer screening? ☐ Yes ☐ No

Section C: Screening Behavior of First-Degree Relatives of Cancer Patients

26. Have you ever undergone any form of cancer screening? ☐ Yes ☐ No
27. If yes, which type of cancer screening have you undergone? (Select all that apply)

    ☐ Breast cancer ☐ Cervical cancer ☐ Prostate cancer ☐ Colorectal cancer ☐ Other: ____
28. If no, why haven’t you undergone cancer screening? (Select all that apply)

    ☐ I don’t think I’m at risk

    ☐ I don’t know where to get screened

    ☐ Screening is expensive

    ☐ I am afraid of the results

    ☐ No doctor has recommended it

    ☐ Other: ____

29. How frequently do you undergo routine medical checkups?

    ☐ Annually ☐ Every few years ☐ Only when sick ☐ Never

30. Have you ever delayed or avoided screening despite knowing you are at risk? ☐ Yes ☐ No

31. Do you think early detection improves cancer survival rates? ☐ Yes ☐ No ☐ Not sure

32. How comfortable are you discussing cancer screening with your doctor?

    ☐ Very comfortable ☐ Somewhat comfortable ☐ Not comfortable at all

33. Has a healthcare provider ever explained the benefits of screening to you? ☐ Yes ☐ No

34. Do you know someone (apart from your relative) who has undergone cancer screening?

    ☐ Yes ☐ No

35. If a free screening program were available, would you participate? ☐ Yes ☐ No

36. How likely are you to undergo cancer screening in the next year?

    ☐ Very likely ☐ Somewhat likely ☐ Unlikely

Section D: Factors Affecting Screening Behavior

37. What are the main challenges preventing you from undergoing cancer screening? (Select all that apply)

    ☐ Lack of awareness

    ☐ Fear of cancer diagnosis

    ☐ High cost of screening

    ☐ Lack of access to screening facilities

☐ Religious/cultural beliefs

☐ Other: ____

38. Do you think cancer screening is widely available in your area? ☐ Yes ☐ No ☐ Not sure
39. Are you concerned about the cost of cancer screening? ☐ Yes ☐ No
40. Have you ever received misinformation about cancer screening? ☐ Yes ☐ No
41. Do you think cultural beliefs influence cancer screening uptake in your community? ☐ Yes ☐ No
42. Does stigma associated with cancer affect your willingness to get screened? ☐ Yes ☐ No
43. Are you afraid of getting a cancer diagnosis if you go for screening? ☐ Yes ☐ No
44. Does lack of time prevent you from going for screening? ☐ Yes ☐ No
45. How do you feel about invasive screening procedures (e.g., colonoscopy, biopsy)?

    ☐ Comfortable ☐ Uncomfortable ☐ Not sure
46. Have you ever had difficulty accessing a screening facility due to distance or transportation? ☐ Yes ☐ No
47. Do you feel there is enough government support for cancer screening programs? ☐ Yes ☐ No
48. Does your religious belief influence your decision about cancer screening? ☐ Yes ☐ No

Section E: Strategies to Promote Cancer Screening Among FDRs

49. What would encourage more people to go for cancer screening? (Select all that apply)

    ☐ Free/subsidized screening programs

☐ More awareness campaigns

☐ Healthcare providers recommending screening

☐ Availability of mobile screening units

☐ Testimonials from cancer survivors

50. Would you be more likely to go for screening if you received a direct recommendation from a doctor? ☐ Yes ☐ No
51. How effective do you think social media campaigns are in promoting cancer screening?

    ☐ Very effective ☐ Somewhat effective ☐ Not effective
52. Should the government implement mandatory screening programs for high-risk individuals? ☐ Yes ☐ No
53. Would you support community-based cancer screening initiatives? ☐ Yes ☐ No
54. Do you think more educational programs should be implemented in schools to raise awareness about cancer screening? ☐ Yes ☐ No
55. Should religious and cultural leaders play a role in promoting cancer screening? ☐ Yes ☐ No
56. Would you be more likely to get screened if family members encouraged you? ☐ Yes ☐ No
57. How would you prefer to receive information about cancer screening?

    ☐ social media ☐ Community health programs ☐ Religious institutions ☐ TV/radio ☐ Hospitals
58. Should healthcare providers be trained to better educate high-risk individuals about cancer screening? ☐ Yes ☐ No

APPENDIX II- INFORMED CONSENT FORM

TITLE OF STUDY: Knowledge of Early detection and screening uptake among first degree relatives of cancer patients in Benin City.

INSTITUTION: Department of Public Health and Community Medicine, College of Medicine, University of Benin, Benin city, Edo state, Nigeria.

PRINCIPAL INVESTIGATORS: Okunbor Eloghosa Happy and Omokaro Federick

PARTICIPATION: Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue your participation at any time without penalty or loss of benefits. The principal investigator may decide to withdraw you from the study if we are unable to obtain the necessary information

INTRODUCTION: I'm interested in assessing the knowledge of early detection and screening uptake among first degree relatives of cancer patients in the University of Benin Teaching Hospital, I will only ask questions about the knowledge of early detection and screening uptake among patients FDRs.

PROCEDURES TO BE FOLLOWED

QUESTIONNAIRE: If you agree to participate, I will ask you questions about your knowledge of early detection and screening uptake among your first-degree relatives in Benin City, Edo State.

BENEFITS: You will be enlightened on the advantages and significances of screening uptake, early detection and cancer screenings available to patients FDRs. This is needed in order to assist policymakers, the government and medical professionals in improving screening services.

COMPENSATION: There is no compensation to volunteers for their participation.

DURATION OF PARTICIPATION: This study only requires the questionnaire. There is no follow-up or further information needed.

WHO CAN PARTICIPATE IN THIS STUDY: The study focuses on the first-degree relatives of cancer patients in the University of Benin Teaching hospital.

ASSURANCE OF CONFIDENTIALITY OF VOLUNTEER'S IDENTITY: Records relating to your participation in the study will remain confidential. Your name will not be used in any report resulting from this study. All questionnaires, computerized records, and analysis of data will contain only a unique study number, not your name.

PERSONS AND PLACES FOR ANSWERS REGARDING YOUR RIGHTS AS A RESEARCH SUBJECT: If during the course of this study you have questions concerning the nature of the research or you believe you have sustained a research-related injury or assault, you should contact;

Okunbor Eloghosa Happy
Department of Public Health and Community Medicine, College of Medicine, University of Benin.
Benin city,
Edo State,
Nigeria.
Phone number: 08107914286
Email: okunboreloghosa340@gmail.com

Omokaro Fredrick
Department of Public Health and Community Medicine, College of Medicine, University of Benin.

Benin city,

Edo State,

Nigeria.

Phone number: 07066354530

Email: dr.phred.enogie@gmail.com

Ethics and Research Committee,

Phone number:

Email: ubthresearchethics@gmail.com

IF THERE IS ANY PORTION OF THIS CONSENT AGREEMENT THAT YOU DO NOT UNDERSTAND, ASK THE FIELD WORKER OR INVESTIGATOR BEFORE SIGNING

Please, sign below if you have agreed to participate in the study.

CERTIFICATION OF CONSENT

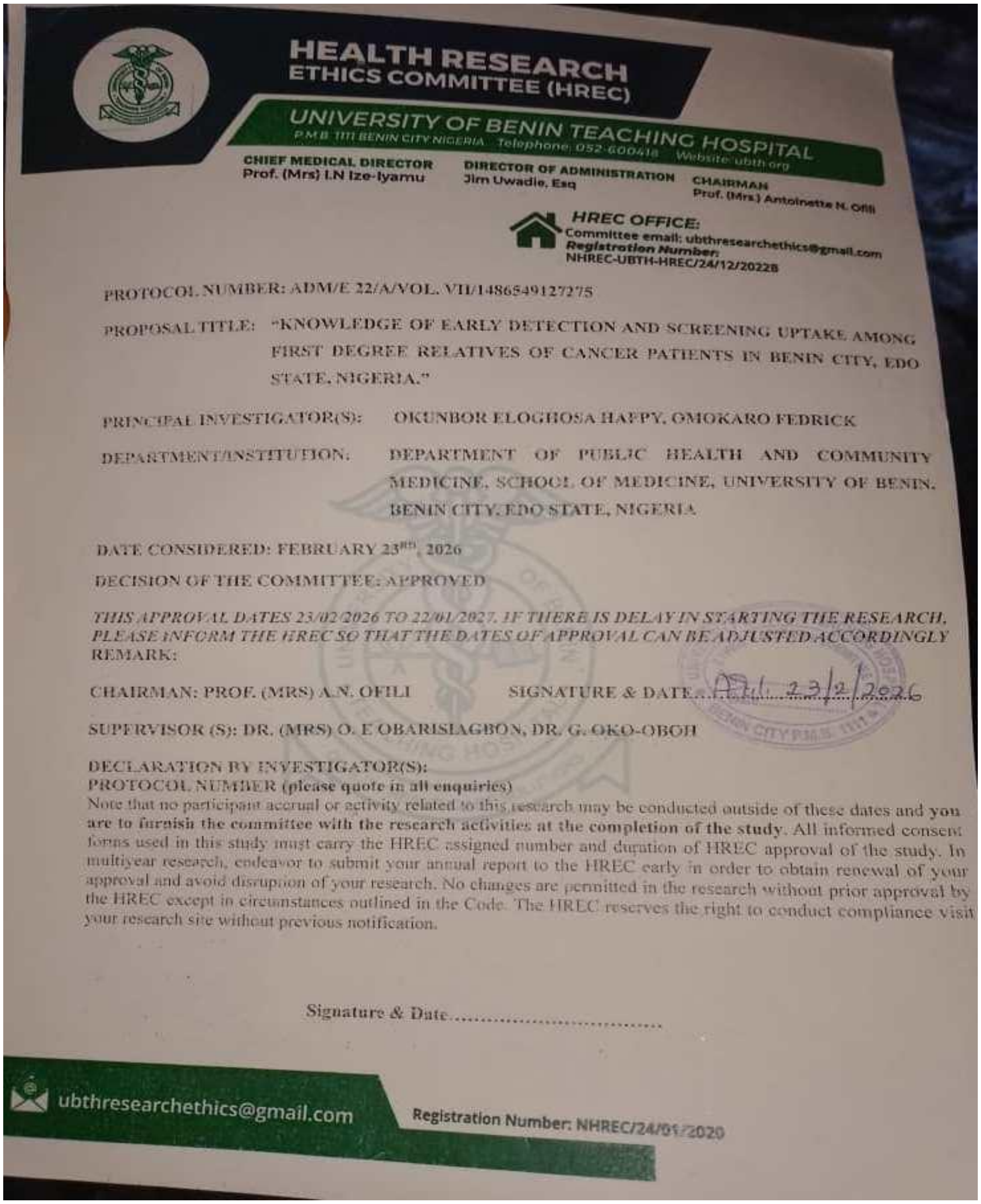
I, …………………………. having full capacity to consent for myself do thereby to my participation in the research study.

The methods and means by which the study will be conducted and the risks which may be reasonably expected have been explained to me by Ethical Committee. I have been given the opportunity to ask question concerning this investigational study, and any such questions have been answered to my full and complete satisfaction.

I understand that I may at any time during the course of this study revoke this consent and withdraw myself from the study without prejudice.

Subject's Signature: _________________

Date: ______________________



HEALTH RESEARCH ETHICS COMMITTEE (HREC)

UNIVERSITY OF BENIN TEACHING HOSPITAL

P.M.B 1111 BENIN CITY NIGERIA Telephone: 052-600418 Website: ubth.org

CHIEF MEDICAL DIRECTOR
Prof. (Mrs) I.N Ize-Iyamu

DIRECTOR OF ADMINISTRATION
Jim Uwadie, Esq

CHAIRMAN
Prof. (Mrs.) Antoinette N. Ofili

HREC OFFICE:
Committee email: ubthresearchethics@gmail.com
Registration Number:
NHREC-UBTH-HREC/24/12/20228

PROTOCOL NUMBER: ADM/E 22/A/VOL. VII/1486549127275

PROPOSAL TITLE: "KNOWLEDGE OF EARLY DETECTION AND SCREENING UPTAKE AMONG FIRST DEGREE RELATIVES OF CANCER PATIENTS IN BENIN CITY, EDO STATE, NIGERIA."

PRINCIPAL INVESTIGATOR(S): OKUNBOR ELOGHOSA HAPPY, OMOKARO FEDRICK

DEPARTMENT/INSTITUTION: DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, SCHOOL OF MEDICINE, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE, NIGERIA

DATE CONSIDERED: FEBRUARY 23RD, 2026

DECISION OF THE COMMITTEE: APPROVED

THIS APPROVAL DATES 23/02/2026 TO 22/01/2027. IF THERE IS DELAY IN STARTING THE RESEARCH, PLEASE INFORM THE HREC SO THAT THE DATES OF APPROVAL CAN BE ADJUSTED ACCORDINGLY
REMARK:

CHAIRMAN: PROF. (MRS) A.N. OFILI SIGNATURE & DATE……23/2/2026

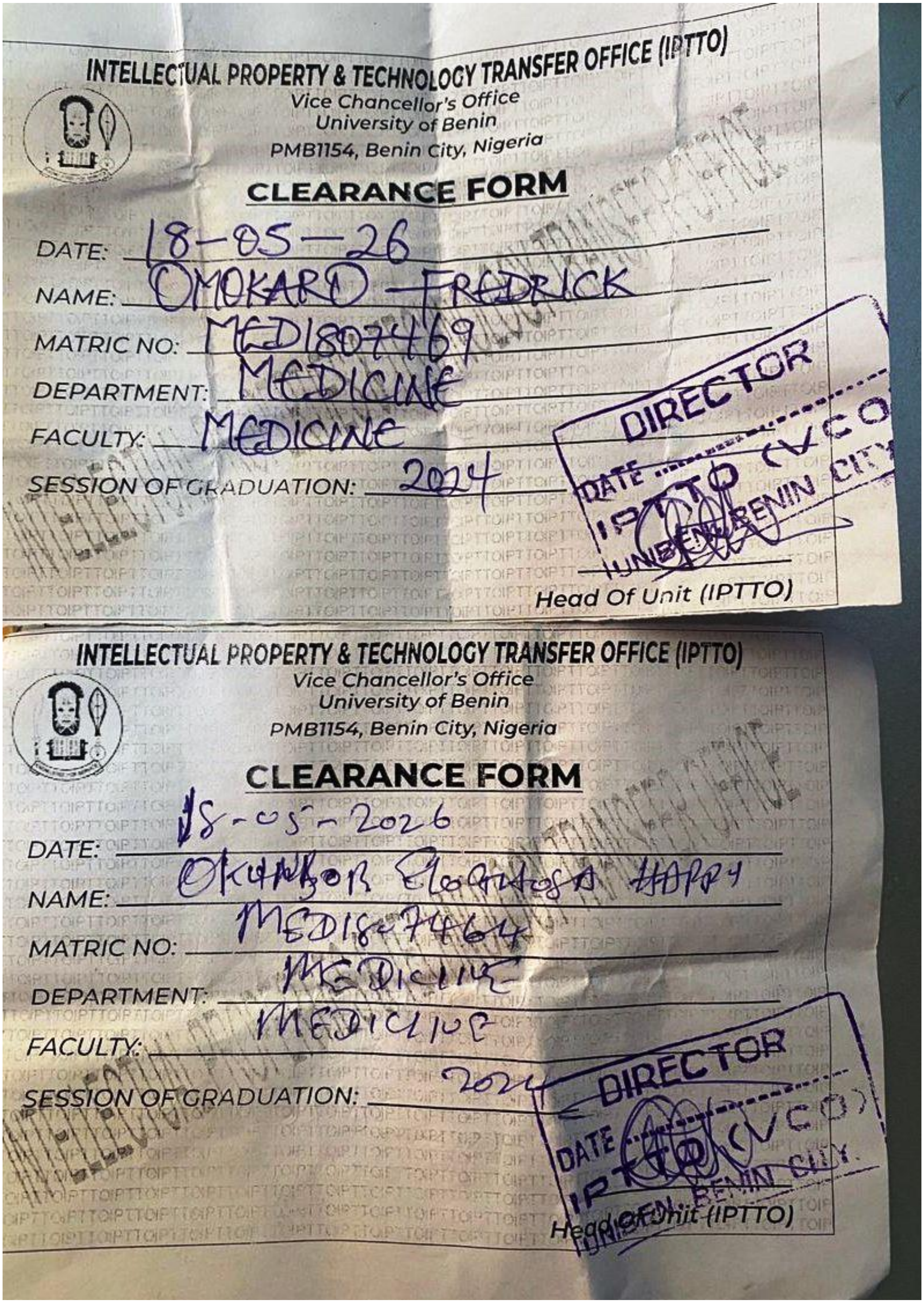
SUPERVISOR (S): DR. (MRS) O. E OBARISIAGBON, DR. G. OKO-OBOH

DECLARATION BY INVESTIGATOR(S):
PROTOCOL NUMBER **(please quote in all enquiries)**
Note that no participant accrual or activity related to this research may be conducted outside of these dates and **you are to furnish the committee with the research activities at the completion of the study**. All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study. In multiyear research, endeavor to submit your annual report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserves the right to conduct compliance visit your research site without previous notification.

Signature & Date……………………………

ubthresearchethics@gmail.com

Registration Number: NHREC/24/01/2020



INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)

Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria

CLEARANCE FORM

DATE: 18-05-26

NAME: OMOKARO FREDRICK

MATRIC NO: MED1807469

DEPARTMENT: MEDICINE

FACULTY: MEDICINE

SESSION OF GRADUATION: 2024

DIRECTOR
DATE ....
IPTTO (VCO)
UNIBEN, BENIN CITY

Head Of Unit (IPTTO)

INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER OFFICE (IPTTO)

Vice Chancellor's Office
University of Benin
PMB1154, Benin City, Nigeria

CLEARANCE FORM

DATE: 18-05-2026

NAME: OKUNBOR Eloghosa HAPPY

MATRIC NO: MED1807464

DEPARTMENT: MEDICINE

FACULTY: MEDICINE

SESSION OF GRADUATION: 2024

DIRECTOR
DATE ....
IPTTO (VCO)
UNIBEN, BENIN CITY.

Head Of Unit (IPTTO)