ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF MEDICINE

Adherence to 'Choosing Wisely Africa' Guidelines in Breast Cancer Care: A Cross-Sectional Survey of Public Hospitals in Addis Ababa, Ethiopia

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Veronica Afework Abera

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List of Abbreviations and Acronyms

ABIM …… American Board of Internal Medicine

BC ……. Breast Cancer

CWA ……. Choosing Wisely Africa

CXR ……. Chest X-ray

LMICs ……... Low Middle-Income Countries

LABC …… Locally Advanced Breast Cancer

MDT ……. Multi-Disciplinary Team

SSA …… Sub Saharan Africa

TASH ……. Tikur Anbessa Specialized Hospital

Abstract

Background: *Breast cancer is the most common malignancy among women in Ethiopia, yet disparities exist in access to evidence-based care. The Choosing Wisely Africa (CWA) initiative provides recommendations to promote high-value breast cancer care, but hospital-level adherence in Ethiopia remains poorly documented.*

Objective: *To assess hospital adherence to CWA guidelines in breast cancer care in Addis Ababa, focusing on multidisciplinary team (MDT) use, diagnostic staging, histopathology services, and neoadjuvant therapy provision.*

Methods: *A descriptive cross-sectional survey was conducted among ten hospitals providing breast cancer care in Addis Ababa, comprising three teaching tertiary hospitals and seven non-teaching secondary hospitals. A structured questionnaire captured data on MDT practice,*

staging investigation, histology confirmation, and neoadjuvant therapy. Descriptive statistics were used to summarize adherence to CWA guidelines.

Results: *Two of the three teaching hospitals reported regular MDT meetings, access to mammography, ultrasound, and histopathology services, and routine provision of neoadjuvant therapy when indicated. In contrast, none of the non-teaching hospitals had an MDT, mammography, or histopathology diagnosis based on core needle biopsy. Neoadjuvant therapy was available only in one non-teaching hospital, which was reported to treat fewer than 25% of eligible patients, primarily due to long waiting times. Adherence to the CWA guidelines was substantially higher in teaching hospitals (66.7%), while none of the non-teaching hospitals attained it, resulting in an overall adherence of 20%.*

Conclusion: *This study highlights important disparities in hospital-level adherence to CWA recommendations in Ethiopia. Strengthening MDT implementation, diagnostic services, and neoadjuvant treatment capacity in secondary hospitals is critical to ensuring equitable and evidence-based breast cancer care.*

Keywords: *Breast cancer, Choosing Wisely Africa, Multidisciplinary care, Ethiopia, Hospital survey*

1. Introduction

1.1 Background of the study

Female breast cancer (BC) is the second most commonly diagnosed cancer worldwide, with an estimated 2.3 million new cases, and also the 5th leading cause of cancer death with an estimated over 680,000 deaths in 2022(1). Despite global efforts to improve breast cancer outcomes, significant disparities persist, particularly in low- and middle-income countries (LMICs), where access to early detection, diagnosis, and treatment remains limited(2). The age-standardized rates for incidence and mortality of breast cancer in East Africa are one of the highest in the world, with an estimated 33.0 and 17.9 per 100,000 women per year, respectively(3).

Breast cancer is the most common cancer among Ethiopian women, with late-stage diagnosis being prevalent due to limited access to healthcare services and awareness(4). Studies indicate a significant disparity in breast cancer management between urban and rural areas, highlighting the need for standardized, evidence-based approaches to improve outcomes(4–6).

The Choosing Wisely campaign, launched in the United States in 2012, has since expanded to more than 20 countries worldwide(7). Despite differences in health systems, these campaigns are built on shared principles aimed at reducing low-value or harmful practices through engagement of physicians, patients, and other stakeholders(7). Building on this global movement, the Choosing Wisely Africa (CWA) initiative was introduced by the African Organization for Research and Training in Cancer to identify practices that are unnecessary, potentially harmful, and commonly used across low- and middle-income countries on the continent. Through a consensus process involving oncologists, surgeons, radiation specialists, and patient advocates, a list of ten recommendations was developed, covering aspects of treatment, surveillance, and palliative care(8).

The goal of Choosing Wisely Africa (CWA) initiative is to identify and discourage low-value, unnecessary, or harmful practices that are still commonly used in cancer care across African low- and middle-income countries(8). Through a consensus-building process that involved surgeons, medical and radiation oncologists, patient advocates, and representatives from both public and private sectors, a final list of ten practices was agreed upon. These include interventions related to treatment, surveillance, and palliative care, many of which were adapted from existing

Choosing Wisely lists but contextualized for Africa. The initiative emphasizes that reducing the use of such low-value practices is essential for improving the quality, efficiency, and equity of cancer care delivery in sub-Saharan Africa(8).

The Choosing Wisely Africa (CWA) campaign was developed to address the unique challenges of African healthcare systems, including resource constraints, overburdened facilities, and the urgent need for cost-effective cancer care. Its recommendations for breast cancer emphasize early detection, rational use of diagnostic tools, and evidence-based treatment protocols, while discouraging interventions that are unnecessary, harmful, or of little benefit to patients. Although these recommendations align with global standards, they are specifically adapted to the realities of African settings, where access to resources is limited and the burden of breast cancer is rapidly increasing.

Despite the relevance of these recommendations, their uptake across the continent has been uneven. While many oncologists in sub-Saharan Africa report strong agreement with the principles of CWA, awareness of the campaign remains limited, and significant gaps persist in translating recommendations into routine clinical practice contexts(9). Understanding the extent of adherence to these guidelines is therefore critical for improving the quality and efficiency of breast cancer care in Ethiopia and similar resource-limited contexts.

However, despite the availability of these recommendations, there is limited evidence on the extent to which Ethiopian hospitals adhere to them in clinical practice. The gap between evidence-based guidelines and actual practice may lead to suboptimal patient outcomes, inefficient use of limited resources, and increased healthcare costs(8). Understanding the current level of adherence to the CWA recommendations in Ethiopian hospitals is crucial for identifying gaps in care, addressing barriers to implementation, and ultimately improving the quality of breast cancer care in the country.

1.2 Statement of the Problem

Breast cancer is the commonest malignancy diagnosed in Ethiopian women constituting a public health challenge in Ethiopia, characterized by late-stage presentation, poor access to specialized care, and high mortality rates(10). Despite the introduction of the Choosing Wisely Africa recommendations, which are designed to optimize breast cancer care in resource-limited settings,

the extent to which Ethiopian hospitals adhere to these recommendations remains unclear(8). This lack of evidence based practice is worrisome, given the important role that adherence to evidence-based practices plays in improving patient outcomes and ensuring the efficient use of healthcare resources(9).

The Ethiopian healthcare system is strained by numerous challenges in providing comprehensive breast cancer care. These challenges include inadequate diagnostic and treatment infrastructure, a shortage of trained healthcare professionals, and systemic barriers that hinder the implementation of best practices(4–6,10–17). Additionally, cultural factors and socioeconomic barriers further complicate the delivery of breast cancer care, leading to delayed diagnosis and treatment, particularly among women in rural areas(14,18).

In the face of the above mentioned challenges, the Choosing Wisely Africa recommendations offer a framework for improving the quality of breast cancer care by focusing on interventions that are most likely to benefit patients while avoiding unnecessary or harmful practices(8). However, there is inadequate data on how well these recommendations are integrated into routine clinical practice in hospitals in Ethiopia. This knowledge gap raises concerns about the quality and consistency of breast cancer care being provided across the country.

The lack of adherence to CWA recommendations could have several implications. First, it may lead to suboptimal patient outcomes, as patients may not receive the most effective and appropriate care across the country(19). Second, it could result in the inefficient use of limited healthcare resources, with potential overuse of expensive or unnecessary interventions that do not improve patient outcomes(20). Third, non-adherence could contribute to inequities in care, with some patients receiving better care than others depending on the hospital or region in which they are treated(21).

Given these concerns, there is an urgent need to assess the current state of adherence to the Choosing Wisely Africa recommendations in breast cancer care within Ethiopian hospitals. Such an assessment will provide valuable insights into the strengths and weaknesses of the current healthcare system in managing breast cancer and identify areas where improvements are needed(3). Understanding the barriers and facilitators to guideline adherence is critical for designing interventions that improve breast cancer care in Ethiopia. Research has shown that lack of infrastructure, equipment, diagnostic capacity, awareness among providers, patient

financial burden, and geographic access are all major barriers; conversely, provider training, supportive management, effective communication, and decentralized care delivery are important facilitators of adherence(22).

1.3 Significance of the Study

This study was aimed to assess the adherence of major public Hospitals in the capital to some of the selected domains from the CWA guidelines. Following these guidelines has the potential to transform breast cancer care and patient outcomes in Ethiopia. In our study, stronger adherence would imply more women with breast cancer being discussed at a multidisciplinary tumor board meeting rather than treatment decisions being made by a single treating physician. It also ensures timely diagnosis and definitive histologic confirmation, receiving the right treatment at the right time, and ultimately, fewer lives lost to breast cancer. By highlighting gaps, such as limited utilization of multidisciplinary team (MDT) approaches, it may help to generate evidences that help policy makers to act accordingly.

Given the significant resource constraints within Ethiopia's healthcare system, making the most of available resources is critical. Assessing adherence to CWA recommendations provides an opportunity to pinpoint where resources may be underused or misdirected. Redirecting efforts toward evidence-based practices not only improves patient care but also helps stretch limited budgets, ensuring that investments are focused on the interventions with the greatest impact.

In Ethiopia, significant disparities in healthcare access and quality persist, particularly between urban and rural areas and among different regions. This study provides an opportunity to examine how adherence to breast cancer care recommendations differs across hospitals and regions, highlighting existing gaps in service delivery. Understanding these differences is crucial for developing specific interventions that are designed to ensure all women. In different geographic locations and varied socio-economic status receive timely and high-quality care care(23). By pinpointing areas of need, the findings can inform strategies to reduce inequities and improve health outcomes for women with breast cancer across the country

Except for one study on the implementation of the Choosing Wisely Africa recommendations in three sub-Saharan African countries, there is a lack of sufficient data in the existing literature on

breast cancer care and Choosing Wisely initiatives in Africa(8). This study will contribute to the global knowledge base by providing context-specific data on the implementation of the CWA recommendations in a resource-limited setting. Additionally, the findings could serve as a model for similar assessments in other African countries facing comparable challenges in breast cancer care, helping to strengthen the overall quality of cancer care across the continent.

2. Literature Review

2.1 Global Overview of Breast Cancer

Breast cancer is the most commonly diagnosed malignancy among women worldwide, with approximately 2.3 million new cases diagnosed in 2020(24). It is also the leading cause of cancer-related mortality among women, with an estimated 685,000 deaths globally in 2020(1). Even though the burden of female breast cancer is significant across all regions of the world, there are significant disparities in outcomes between high-income and low- and middle-income countries (LMICs). In high-income countries, advances in screening and early detection, diagnostics, and treatment have resulted in high survival rates, where the 5-year survival of women with early stage cancer is in general greater than 95%(25). However, in LMICs, including many SSA countries, women often present to health care facilities at an advanced stage of the disease leading to poorer outcomes and higher mortality rates(2).

2.2 Breast Cancer in Africa and Ethiopia

According to GLOBOCAN 2020 data, breast cancer is the most commonly diagnosed cancer and the leading cause of cancer-related deaths among women in Africa(2). The incidence and mortality rates of Breast cancer in Africa are increasing. What are striking and unique for Africa are the disproportionately high mortality rates and the challenges in managing the cancer(3). These specific challenges include lack of awareness, limited access to healthcare services, late-stage presentation, inadequate diagnostic facilities, and a shortage of trained healthcare professionals(2). As in many SSA countries, Ethiopia also faces a major challenge in diagnosis and treatment of female breast cancer(26).

The under-resourced healthcare system, lack of specialized infrastructure, and limited availability of trained healthcare professionals are among the major challenges in Ethiopia(14). As a result, many women present with advanced-stage disease, when treatment options are limited and prognosis is poor(5,10–13,16,27). This situation is compounded by low levels of awareness about breast cancer, cultural stigma, and barriers to accessing healthcare services, particularly in rural areas(26). Studies indicate a significant disparity in breast cancer management between urban and rural areas in Africa, highlighting the need for standardized, evidence-based approaches to improve outcomes(28).

Ethiopia's healthcare system is under-resourced, with significant disparities in access to care between urban and rural areas(29). Breast cancer patients in Ethiopia often present with advanced-stage disease due to low levels of awareness, cultural barriers, and limited access to screening and diagnostic services(6,15). The high mortality rate associated with breast cancer in Ethiopia highlights the urgent need for improvements in early detection, diagnosis, and treatment(14,17)

2.3 Choosing Wisely Initiative: An Overview

The Choosing Wisely initiative, launched by the American Board of Internal Medicine (ABIM) Foundation in 2012, aims to promote high-value care by reducing unnecessary medical tests, treatments, and procedures(30). The initiative encourages healthcare providers and patients to engage in conversations about the necessity and potential harm of specific interventions, with the goal of improving patient outcomes and reducing healthcare costs(30). The Choosing Wisely recommendations are developed by various medical specialty societies, based on the best available evidence, and are intended to guide clinical decision-making in a wide range of medical conditions, including cancer(31).

2.4 Choosing Wisely Africa (CWA) and Breast Cancer Care

Recognizing the unique challenges faced by African healthcare systems, the Choosing Wisely initiative was adapted for the African context, leading to the creation of Choosing Wisely Africa(8). CWA focuses on optimizing care in resource-limited settings, where unnecessary interventions can have particularly detrimental effects due to the scarcity of healthcare resources(8). The CWA recommendations for breast cancer care emphasize the importance of early detection, appropriate use of diagnostic tools, and evidence-based treatment protocols, while discouraging interventions that provide little or no benefit to patients(8).

The CWA recommendations align with global guidelines but are tailored to the specific needs and constraints of African healthcare settings(24). Adherence to these recommendations is crucial for improving breast cancer outcomes in Africa, where healthcare resources are limited, and the burden of the disease is growing(3).

2.5 Adherence to Guidelines in Breast Cancer Care

Adherence to evidence-based guidelines is a key determinant of the quality of care and patient outcomes in breast cancer management(21,24). Studies from high-income countries have shown that adherence to guidelines improves survival rates, reduces complications, and enhances the overall quality of life for breast cancer patients(20,21). However, in LMICs, adherence to guidelines is often suboptimal due to a variety of factors, including limited resources, lack of awareness among healthcare providers, and systemic barriers within the healthcare system(2,14,23).

In Africa, the implementation of evidence-based guidelines for breast cancer care faces several significant challenges, as highlighted by various studies(2). These challenges are multifaceted and impact the effectiveness of breast cancer management across the continent.

A major obstacle is the lack of adequate resources in many healthcare facilities. Numerous African countries struggle with insufficient infrastructure, limited equipment, and a shortage of trained personnel necessary for the full implementation of guidelines(23,29,32). For instance, access to essential services such as mammography, pathology, and radiation therapy is often restricted, which complicates adherence to recommended diagnostic and treatment protocols(33–35). The scarcity of these critical resources can delay diagnosis and hinder the delivery of optimal care.

Another significant issue is the limited access to continuing medical education and training for healthcare providers in low- and middle-income countries (LMICs). This gap in education can lead to a lack of up-to-date knowledge about the latest guidelines, resulting in inconsistencies in their application(14). Such variability in knowledge and awareness contributes to differences in the quality of care provided, which can adversely affect patient outcomes(25).

Cultural beliefs and socioeconomic factors further complicate the implementation of evidence-based care. In many African communities, traditional or alternative medicine may be preferred over conventional treatments, which can delay diagnosis and treatment adherence(23,28). Socioeconomic constraints, such as financial limitations and access issues, also play a crucial role in shaping healthcare-seeking behavior and adherence to treatment protocols(2,14,15).

Systemic issues, including fragmented cancer diagnostic and therapeutic services and inadequate coordination between different levels of care, also pose significant challenges. The lack of standardized protocols and quality assurance mechanisms can lead to variations in practice and hinder effective guideline implementation(23,29). These systemic barriers contribute to inconsistencies in care and limit the overall effectiveness of breast cancer management strategies.

Similar challenges have been shown to exist in Ethiopia, and there is limited data on the extent to which breast cancer care practices align with evidence-based guidelines(4,11,14). Given the critical role of adherence in improving patient outcomes, understanding the current level of adherence to the CWA recommendations in Ethiopian hospitals is essential for identifying gaps in care and areas for improvement(11,17)

A multidisciplinary team (MDT) treatment approach, involving surgeons, oncologists, radiologists, pathologists, and other healthcare professionals, is crucial in breast cancer management. Evidence suggests that MDTs improve treatment planning, enhance patient outcomes, and ensure comprehensive care(36,37). However, the implementation of MDTs in Ethiopian healthcare, particularly in peripheral centers, remains inconsistent(37).

Research has shown that MDT-based care improves adherence to clinical guidelines, enhances the quality of decision-making, and leads to better patient outcomes in breast cancer management (36)(37). In high-income countries, the MDT approach is widely adopted and has been associated with higher survival rates and improved patient satisfaction(1,20). However, in LMICs, including Ethiopia, the implementation of MDTs is often limited by resource constraints, lack of infrastructure, and challenges in coordinating care across different levels of the healthcare system(4,14,17,28).

In Ethiopia and most SSA countries, access to diagnostic and staging investigations is often limited. Particularly in rural centers, patients often undergo definitive surgery without proper pre-operative work-up(11,14). Staging of Breast cancer using radiologic investigations, such as abdominal ultrasound, and CXR, are essential for the diagnosis and treatment planning in breast cancer care in LMICS, where access to advanced imaging modalities such as MRI and CT-scan is limited to certain areas of the continent and often concentrated at large referral hospitals(28,33).

Histologic confirmation through biopsy before surgery is a standard practice in breast cancer management. It ensures accurate diagnosis and appropriate treatment planning(35). However, in many Ethiopian healthcare settings, especially in peripheral centers, there are delays or omissions in obtaining histologic confirmation, leading to suboptimal treatment outcomes(4,35).

Neoadjuvant treatment, including chemotherapy or hormone therapy before surgery, is indicated in certain cases of breast cancer to shrink tumors and increase the likelihood of successful surgery(28). Studies have shown that neoadjuvant therapy can improve surgical outcomes and survival rates(28,38). However, its use in Ethiopia is limited due to various barriers. Based on a study assessing the neoadjuvant chemotherapy response among patients with locally advanced breast cancer at TASH, of 78 patients with LABC who were assessed at the MDT and for whom neoadjuvant treatment was decided, more than one third had received less than 4 cycles of chemotherapy or they were lost from follow up(38).

3. Objectives

3.1 General Objective:

- To assess the adherence of breast cancer care practices in the major public hospitals in Addis Ababa to the 'Choosing Wisely Africa' recommendations.

3.2 Specific Objectives:

- To evaluate the level of utilization of MDT approaches in breast cancer diagnosis and treatment across the selected public hospitals.
- To assess the commonly utilized diagnostic tools for radiologic staging in breast cancer before definitive treatment.
- To Examine the practice of histologic confirmation of cancer before definitive surgery.
- To Evaluate the use of neoadjuvant treatment before surgery when indicated.

4. Methodology

4.1 Study Design and Setting

This study employed a descriptive cross-sectional design to evaluate institutional practices in breast cancer care against the **Choosing Wisely Africa (CWA) recommendations**. The survey was conducted in Addis Ababa, Ethiopia, which is the country's largest urban center and the hub of oncology care. The city is home to both tertiary-level teaching hospitals affiliated with medical schools and secondary-level non-teaching hospitals that deliver general and specialized care.

Breast cancer is managed in both hospital types, but resources and service availability vary considerably. Teaching hospitals are referral centers that provide comprehensive diagnostic and treatment services, while non-teaching hospitals typically serve as secondary-level facilities with more limited oncology infrastructure. The study was conducted between January and March, 2025.

4.2 Study Population and Sampling Strategy

The study population consisted of public hospitals in Addis Ababa that provide services for breast cancer diagnosis and/or treatment. A total of ten hospitals were identified through consultation with the Addis Ababa Health Bureau and professional oncology networks. These comprised:

- **Three tertiary teaching hospitals**: large referral centers affiliated with universities, providing specialized oncology care, residency and fellowship training, and multidisciplinary cancer management.
- **Seven secondary non-teaching hospitals**: public institutions offering general and surgical care, with variable access to oncology diagnostic and therapeutic services, but no structured training programs.

Given the limited number of hospitals providing breast cancer services in the capital, a **census approach** was used whereby all eligible hospitals were included in the survey to ensure representativeness and to avoid sampling bias.

4.3 Data Collection Tool

Data were collected using a structured, hospital-level questionnaire developed specifically for this study. The tool was adapted from the **Choosing Wisely Africa breast cancer recommendations (2020)** and refined through expert review by two breast surgeons and one oncologist to ensure contextual appropriateness.

The questionnaire assessed four major domains:

1. **Multidisciplinary Team (MDT) Practice** – existence of a formal MDT, its composition (surgical oncology, medical oncology, radiology, pathology, radiation oncology, nursing), frequency of meetings, and proportion of breast cancer cases reviewed.
2. **Radiologic Diagnostic Tools for Staging** – availability and use of mammography, breast ultrasound, CT, MRI, and PET-CT, as well as whether imaging was routinely performed before initiating treatment.
3. **Histologic Confirmation Prior to Surgery** – availability of pathology services (in-house or external), type of biopsy techniques (fine-needle aspiration, core biopsy, excisional biopsy), and proportion of patients undergoing histologic confirmation before surgery.
4. **Neoadjuvant Treatment Provision** – availability of chemotherapy, radiotherapy, and hormonal therapy, presence of formal treatment protocols, and the proportion of eligible patients receiving neoadjuvant treatment before surgery.

The final tool contained both closed-ended (yes/no, multiple choice) and semi-structured items to allow for clarification on institutional practices.

4.4 Data Collection Procedure

Data collection was conducted between January and February, 2025 by two trained data collectors with medical and oncology backgrounds. Prior to fieldwork, the tool was piloted in

one hospital outside Addis Ababa to assess clarity and relevance; minor modifications were made accordingly.

At each hospital, the survey was administered through structured interviews with department heads (surgery, oncology, or gynecology) or senior staff designated by hospital leadership. Where possible, responses were triangulated with hospital service records, departmental protocols, and pathology/laboratory reports to improve reliability. Each interview lasted approximately 30–45 minutes.

To ensure standardization, data collectors received a two-day training on the study objectives, survey administration, ethical issues, and strategies for minimizing interviewer bias. Completed forms were reviewed daily by the principal investigator for completeness and accuracy before data entry.

4.5 Study Variables

4.5.1 Independent variable: type of hospital (teaching tertiary vs non-teaching secondary).

4.5.2 Dependent variables: adherence to each of the four CWA domains. Adherence was operationally defined as:

- *MDT adherence*: presence of a formal MDT that meets regularly and reviews breast cancer cases.
- *Diagnostic adherence*: availability and routine use of basic staging investigations such as CXR and ultrasound for initial evaluation.
- *Pathology adherence*: histologic confirmation prior to definitive surgery in ≥75% of breast cancer patients.
- *Neoadjuvant adherence*: provision of neoadjuvant chemotherapy before surgery in ≥75% eligible patients.

4.6 Data Management and Analysis

All completed questionnaires were checked daily for completeness and consistency by the principal investigator. Data from the structured survey were coded and entered into SPSS

Version 27 using a double-entry method to minimize transcription errors. After entry, the two data sets were compared, and discrepancies were corrected by referring back to the original questionnaires.

4.6.1 Data Cleaning

The dataset was carefully reviewed to identify and address missing or inconsistent responses. Where clarification was possible, the respective hospital stakeholders were contacted. In cases where no clarification could be obtained, missing values were handled by reporting them as "not available (NA)" rather than imputing data, since the small sample size (n=10 hospitals) limited the utility of imputation.

4.6.2 Variable Coding

- Independent variable:
  - Type of hospital (1 = Teaching/Tertiary; 2 = Non-teaching/Secondary).
- Dependent variables (CWA adherence domains):
  - MDT adherence: coded as 1 = "Formal MDT with regular meetings and breast cancer case discussions" and 0 = "No formal MDT or irregular case discussions."
  - Staging Investigations adherence: coded as 1 = "CXR and ultrasound routinely available and used; advanced imaging only as indicated" and 0 = "No routine access/use of recommended diagnostic tools."
  - Histologic confirmation adherence: coded as 1 = "≥76% of patients receive histologic confirmation before surgery" and 0 = "<75% or histology not routinely performed."
  - Neoadjuvant treatment adherence: coded as 1 = "Eligible patients routinely offered neoadjuvant therapy in ≥76% and 0 = "Neoadjuvant therapy not consistently offered when indicated."

Each hospital's adherence was scored across the four domains, generating an institutional-level adherence profile. A composite adherence score (ranging from 0–4) was also computed by summing the domains, with higher scores reflecting closer alignment with CWA recommendations.

4.6.3 Data Analysis

Analysis was primarily descriptive given the small number of hospitals.

- Hospital characteristics (e.g., type of hospital, availability of oncology services) were summarized using frequencies and proportions.
- Adherence to each domain was summarized as the number and percentage of hospitals meeting the criteria.
- Stratified analysis: Results were compared between teaching/tertiary hospitals (n=3) and non-teaching/secondary hospitals (n=7) using cross-tabulations.
- Where relevant, adherence gaps were highlighted by calculating the proportion of hospitals failing to meet the CWA benchmarks in each domain.
- Data visualization: Adherence patterns were presented using tables and bar charts to facilitate comparison between hospital types and across the four domains.

4.6.4 Interpretation Strategy

Given the descriptive and exploratory nature of this study, emphasis was placed on identifying trends, disparities, and potential barriers to adherence rather than on statistical significance testing. The findings were interpreted in light of contextual challenges in the Ethiopian healthcare system, with particular attention to differences between tertiary-level teaching hospitals and secondary-level non-teaching hospitals.

4.7 Ethical Considerations

Ethical approval for the study was obtained from Addis Ababa University, College of Health Science Institutional Review Board. Administrative clearance was also obtained from the Addis Ababa Health Bureau and the respective hospital administrations prior to data collection.

This study involved only institutional-level data collection and did not include individual patient records or identifiers. As such, informed patient consent was not required. All hospital responses were anonymized during data entry, and findings are presented in aggregate form to protect confidentiality.

4.8 Dissemination of Findings

The study findings will first be presented to the Department of Surgery, College of Health Sciences, Addis Ababa University, and the final report submitted in both hard and electronic copies. Results and recommendations will then be shared with Tikur Anbessa Specialized Hospital (TASH), the Federal Ministry of Health, and other cancer centers in Ethiopia through presentations and stakeholder meetings.

To ensure broader visibility, the manuscript will be submitted to an international peer-reviewed journal and shared at regional and international conferences. This will allow the findings to inform local practice, guide national policy, and contribute to the global dialogue on strengthening breast cancer care in resource-limited settings.

5. Results

5.1 Hospital Characteristics

A total of ten hospitals participated in the study: three tertiary teaching hospitals and seven non-teaching specialized or comprehensive hospitals (Figure 1). The teaching hospitals reported managing the highest volume of breast cancer cases, with more than 200 new cases annually (Figure 2).

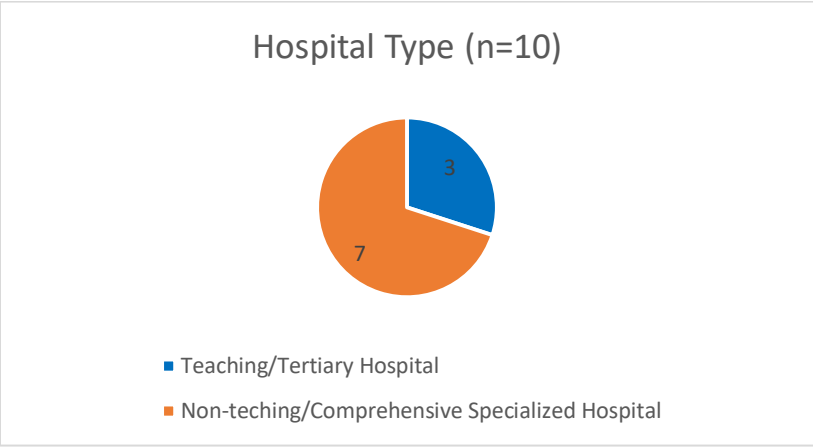

Figure 1*: Distribution of Participating Hospitals by Type*

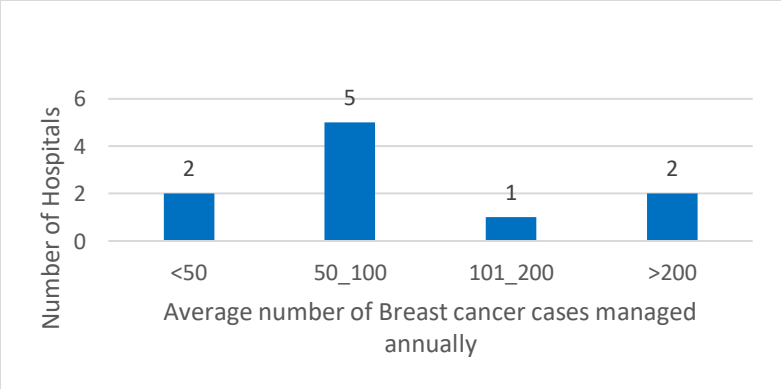

Figure 2*: Annual number of breast cancer cases managed on average*

5.2 Multidisciplinary Team (MDT) Practices

Among the ten participating hospitals, regular and coordinated breast MDT meetings were observed in only two institutions (20%). These included two of the three tertiary teaching hospitals, while none of the non-teaching specialized/comprehensive hospitals had such meetings in place (Figure 3). In both hospitals, breast MDT meetings were held weekly, reflecting a consistent scheduling practice.

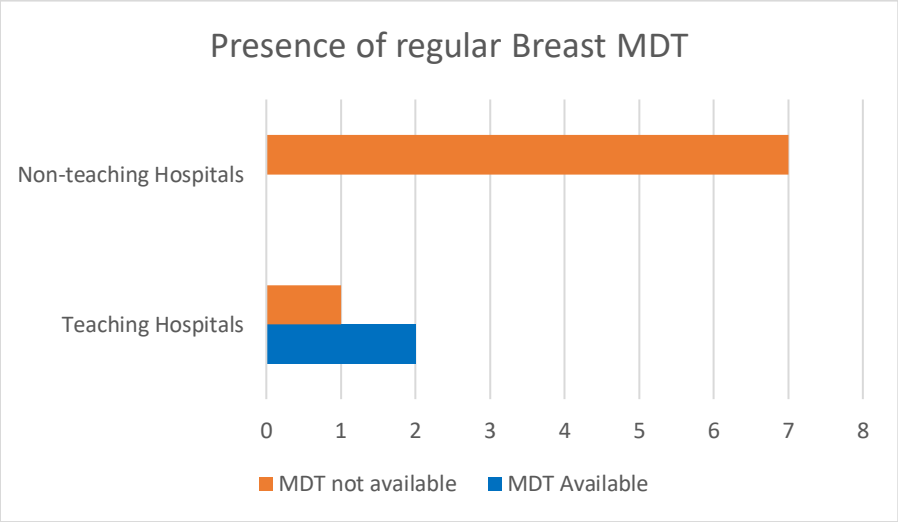

Figure 3*: Presence of regular breast MDT*

Pathology and radiology units with breast imaging capabilities were the most commonly available departments in non-teaching hospitals, present in five and four hospitals, respectively. In contrast, all three teaching hospitals reported having oncology, pathology, and radiology units with breast imaging capabilities, as well as chemotherapy infusion and palliative care units. Breast surgeons were available in all three teaching hospitals and in one non-teaching hospital (Table 1).

Breast Cancer Care Services	Type of hospital			
	Teaching		Non-teaching	
	Available	Not available	Available	Not available
Breast surgery unit	3	0	1	6
Oncology	3	0	3	4
Radiology unit with breast imaging capability	3	0	4	3
Pathology	3	0	5	2
Chemotherapy infusion unit	3	0	1	6
Palliative care	3	0	3	4

Table 1 ***Availability of Key Breast Cancer Care Services by Hospital Type***

5.3 Routine Diagnostic and Staging Imaging Availability

Mammography was consistently available in two of the three teaching hospitals (67.7%), whereas none of the non-teaching hospitals had mammography services and primarily relied on breast ultrasound for evaluating breast lumps. Chest X-ray and abdominal ultrasound were the two most commonly utilized imaging modalities for staging patients with breast cancer and were routinely available in all ten hospitals. Advanced imaging modalities, such as CT and MRI, were available in two teaching hospitals and in only one non-teaching hospital. In the non-teaching hospitals, patients requiring advanced imaging were either referred to private facilities or were not staged using these modalities.

5.4 Histologic Confirmation Prior to Surgery

All hospitals reported confirming malignancy in 100% of patients prior to definitive surgery, using either cytology or histology. One teaching hospital routinely performed histologic confirmation—typically via core needle or excisional biopsy—in more than 75% of patients before definitive surgery, while another teaching hospital achieved a core needle biopsy confirmation rate of 25–50%. In contrast, the remaining eight hospitals performed histologic confirmation in less than 25% of patients. Most hospitals relied primarily on fine-needle aspiration cytology (FNAC) as the initial diagnostic method, with excisional biopsy reserved for

cases with inconclusive FNAC results, largely due to limited trained personnel, cost, and lack of equipment (Figure 4).

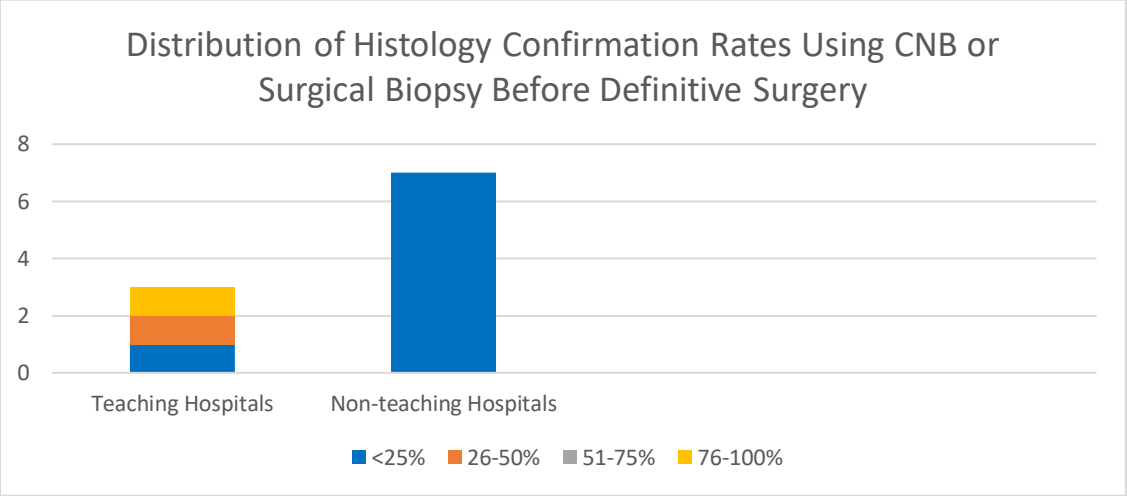

Figure 4 ***Histologic Confirmation of Breast Cancer Prior to Surgery***

5.5 Neoadjuvant Therapy

Only 20% (2/10) of hospitals—both tertiary teaching hospitals with well-established MDTs—administered neoadjuvant chemotherapy to more than 75% of eligible patients, while the remaining eight hospitals treated fewer than 25%. Among the seven non-teaching hospitals, six lacked in-house chemotherapy services and therefore did not provide neoadjuvant therapy. Key barriers included drug shortages, limited oncologist availability, absence of treatment protocols, and long waiting lists.

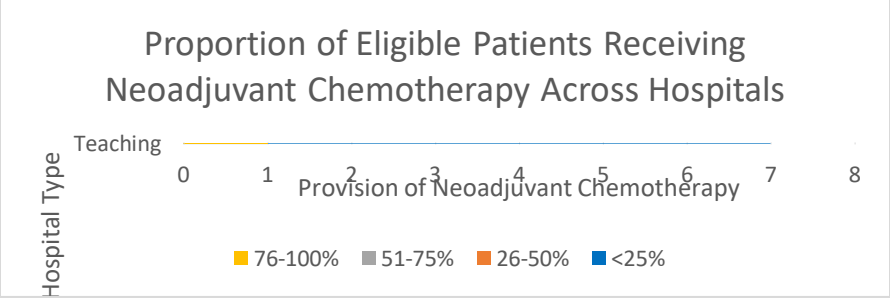

Figure 5*: Provision of Neoadjuvant Chemotherapy*

5.6 Composite Adherence Score

Overall, composite adherence—defined as meeting at least three of the four CWA domains (regular MDT, preoperative staging, histologic confirmation, and neoadjuvant therapy)—was achieved by 66.7% (2/3) of teaching hospitals, 0% of non-teaching hospitals, and 20% (2/10) of all hospitals, highlighting significant disparities in adherence to recommended breast cancer care practices (Table 2).

Domain	**Type of hospital**	
	Teaching (n=3)	Non-teaching (n=7)
Regular Breast MDT present	2	0
Routine pre-operative staging with at least CXR and abdominal ultrasound	3	7
Histology confirmation before Surgery ≥75% patients	1	0
Neoadjuvant therapy offered in ≥75% eligible patients	2	0
Composite adherence ≥3 domains achieved	2/3 (66.7%)	0/7 (0%)

Table 2*: Adherence to Choosing Wisely Africa breast cancer care recommendations by hospital type*

6. Discussion

This study provides a comprehensive assessment of hospital-level adherence to Choosing Wisely Africa (CWA) breast cancer care recommendations in Addis Ababa, highlighting significant disparities between tertiary teaching and non-teaching hospitals. Overall, only two of the ten hospitals (20%) achieved composite adherence, defined as meeting at least three of the four CWA domains (regular MDT, preoperative staging, histologic confirmation, and neoadjuvant therapy), with both being teaching hospitals with well-established multidisciplinary teams (MDTs). In contrast, none of the non-teaching hospitals met this benchmark. These findings underscore critical gaps in the implementation of evidence-based breast cancer care practices in Ethiopia.

6.1 Hospital Characteristics and Case Volume

Consistent with prior reports on healthcare capacity in Ethiopia, teaching hospitals managed the highest number of breast cancer cases, exceeding 200 new cases annually (Feuchtner et al., 2019; Kantelhardt et al., 2014). High patient volume in tertiary centers likely facilitates the establishment of specialized units and multidisciplinary care pathways, whereas non-teaching hospitals, despite serving substantial patient populations, lack essential infrastructure and trained personnel (Meshesha et al., 2022; Wondimagegnehu et al., 2024). This disparity reflects broader resource allocation challenges in low- and middle-income countries (LMICs), contributing to late-stage presentation and poor outcomes (Bray et al., 2024; McKenzie et al., 2018; Jedy-Agba et al., 2016).

6.2 Multidisciplinary Team Practices

MDT meetings were observed in only two hospitals (20 %), both of which are teaching centers, with none reported in non-teaching hospitals. While weekly MDTs in the teaching hospitals illustrate structured care, their absence elsewhere is concerning, as multidisciplinary input is vital for timely surgical, systemic, and radiotherapy planning(8). Limited MDT use may contribute to delays and poorer outcomes, consistent with reports of late-stage diagnosis and prolonged treatment initiation in Ethiopia(8,10,17) Globally, MDTs have become central to managing the

growing complexity of breast cancer, with evidence suggesting improved coordination, patient experience, and even survival(36). However, challenges such as heavy caseloads, inconsistent attendance, poor leadership, and neglect of holistic needs can reduce their effectiveness(36). Our finding that MDT services were concentrated in teaching hospitals aligns with observations from Rwanda, where utilization of Tumor Board Meetings was reported to be growing but similarly concentrated in large teaching hospitals providing comprehensive cancer care(37). This parallel highlight a regional pattern in which resource-intensive MDT structures are more feasible in higher-level facilities, while non-teaching hospitals remain underserved.

6.3 Diagnostic and Staging Investigations

Radiology units with breast imaging capabilities were present in most teaching hospitals and a subset of non-teaching hospitals, yet mammography was limited to two teaching hospitals (67.7%), with non-teaching hospitals relying primarily on ultrasound. Chest X-ray and abdominal ultrasound were universally available for staging, whereas advanced imaging modalities, including CT and MRI, were limited to two teaching hospitals and one non-teaching hospital. In non-teaching hospitals, patients requiring advanced imaging were referred externally or were not staged adequately. This limited access to diagnostic and staging services parallels findings from Addis Ababa and other sub-Saharan African settings, where constrained resources and lack of equipment hinder comprehensive breast cancer evaluation(14,34). A broader study across 47 hospitals in 15 SSA countries reported similar gaps, noting that while ultrasound was widely available, it was not routinely functional in a quarter of hospitals, and although CT was present in most centers, it was non-functional in over one-fifth(33). Such limitations highlight how inadequate diagnostic capacity contributes to delays in treatment, incomplete staging, and challenges in selecting appropriate therapeutic strategies(2,11).

6.4 Histologic Confirmation Prior to Surgery

All hospitals reported confirming malignancy in 100% of patients prior to definitive surgery using cytology or histology. However, practice varied widely: only one teaching hospital achieved histologic confirmation in more than 75% of patients, another in 25–50%, while the remaining eight hospitals reported confirmation in fewer than 25% of patients. Fine-needle

aspiration cytology (FNAC) was the predominant diagnostic method, with excisional biopsy used mainly for inconclusive cases, reflecting limitations in personnel, cost, and equipment availability. These findings mirror a survey of breast cancer pathology services in sub-Saharan Africa, where FNAC was the most widely used invasive diagnostic procedure due to its low cost and minimal equipment requirements(35). According to the survey, although core needle biopsy (CNB) was available in many centers, its routine use remained limited, with most relying on FNAC as it is more practical in low-resource settings. These findings highlight a critical gap in adherence to CWA recommendations especially in the non-teaching hospitals, as histologic confirmation via core needle biopsy is essential to guide definitive surgery and avoid unnecessary or inappropriate interventions(8).

6.5 Provision of Neoadjuvant Therapy

Provision of neoadjuvant chemotherapy was limited to the two teaching hospitals with established MDTs, each treating more than 75% of eligible patients. Among the seven non-teaching hospitals, six lacked in-house chemotherapy services, while the remaining hospital provided treatment to fewer than 25% of eligible patients. Barriers included drug shortages, limited oncologist availability, absence of treatment protocols, and long waiting lists. These findings align with prior reports highlighting the scarcity of systemic therapy services in Ethiopia and other LMICs, which delays treatment and negatively affects survival outcomes(4). A prior study done in one of the teaching hospitals in Ethiopia has also shown that among 141 breast cancer patients evaluated by breast surgeons and oncologists at a breast multidisciplinary team (MDT), 51 patients with LABC had received NACT highlighting its utilization and importance in our setting especially for patients presenting with Locally advanced disease; where Neoadjuvant chemotherapy for patients with LABC has significantly reduced tumor size in most patients, allowing modified radical mastectomy. The close association between the presence of MDTs and higher neoadjuvant therapy utilization underscores the importance of coordinated care and structured clinical pathways in improving guideline adherence(8).

Neoadjuvant chemotherapy (NACT) was available only in the two teaching hospitals with established MDTs, where more than 75% of eligible patients received treatment. In contrast, six of the seven non-teaching hospitals lacked in-house chemotherapy services, and the remaining

hospital treated fewer than 25% of eligible patients. Key barriers included drug shortages, limited oncologist availability, absence of standardized protocols, and long waiting lists. These findings mirror earlier reports from Ethiopia and other LMICs, where restricted access to systemic therapy contributes to treatment delays and poorer survival outcomes(4). In one Ethiopian teaching hospital, for example, 51 of 141 breast cancer patients with locally advanced disease (LABC) received NACT through an MDT, with most showing tumor shrinkage sufficient to allow modified radical mastectomy(38). This close link between MDT presence and higher NACT utilization highlights the importance of coordinated care and structured clinical pathways in improving treatment access and adherence to guidelines.

6.6 Composite Adherence to CWA Guidelines

Overall, composite adherence—achieving at least three of the four CWA domains—was attained by 66.7% of teaching hospitals and none of the non-teaching hospitals, resulting in an overall adherence of 20%. This stark disparity highlights the inequitable distribution of resources and clinical capacity, with non-teaching hospitals consistently lagging in MDT implementation, histologic confirmation, and neoadjuvant therapy provision. Similar disparities have been observed in sub-Saharan Africa, where hospital-level infrastructure, personnel, and treatment availability directly influence adherence to evidence-based guidelines and ultimately affect patient survival(9).

6.7 Implications for Breast Cancer Care

The findings underscore the urgent need for system-level interventions to strengthen cancer care capacity in secondary hospitals. Key priorities include institutionalizing multidisciplinary team (MDT) practices—even in resource-limited settings such as through tele-MDTs—expanding access to mammography and ultrasound, strengthening pathology services and training in core needle biopsy, and ensuring reliable access to chemotherapy and hormonal therapy. Regular monitoring of adherence to Choosing Wisely Africa (CWA) recommendations is essential to track progress and address persistent gaps.

More broadly, improving infrastructure, diagnostic capacity, and multidisciplinary care in non-teaching hospitals is critical. Expanding histopathology services, ensuring availability of systemic therapies, and embedding MDT practices could substantially improve adherence to CWA recommendations and reduce inequities between teaching and non-teaching hospitals. Strengthening these capacities would help mitigate diagnostic and therapeutic delays that contribute to late-stage presentation and high mortality among Ethiopian women with breast cancer.

7. Conclusion

Our study has shown significant disparities in adherence to Choosing Wisely Africa breast cancer care recommendations between teaching and non-teaching hospitals in Addis Ababa. While teaching hospitals demonstrated higher adherence through established MDTs, greater access to diagnostic services, and routine use of neoadjuvant therapy, non-teaching hospitals uniformly lacked most of these essential capacities. Persistent gaps in histologic confirmation, mammography, advanced imaging, and systemic therapy access remain major barriers to delivering high-quality care. Strengthening these domains at all levels of care is essential for improving breast cancer outcomes in Ethiopia.

8. Recommendation

Strengthening multidisciplinary team (MDT) practices, expanding diagnostic and pathology capacity—including training in core needle biopsy—and ensuring reliable access to systemic therapies are critical steps toward reducing inequities in breast cancer care across hospital levels. Prioritizing these interventions in non-teaching hospitals will be essential to improve adherence to Choosing Wisely Africa recommendations and to enhance timely, evidence-based management for women with breast cancer in Ethiopia. Future research should include a broader, nationwide study incorporating peripheral hospitals and additional Choosing Wisely Africa (CWA) domains to provide a more comprehensive assessment of breast cancer care practices in Ethiopia.

9. Limitations of the Study

This study has several limitations. The small sample size of ten hospitals and the exclusion of peripheral or smaller facilities restricts generalizability. Data were self-reported by hospital representatives and may be subject to reporting bias. Nevertheless, the findings provide valuable insights into system-level adherence to evidence-based breast cancer care in Ethiopia.

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Annex

Data Abstraction Tool: Hospital Breast Cancer Care Survey Tool (Based on Choosing Wisely Africa Recommendations)

Instructions:

This questionnaire is to be completed by a senior representative of the hospital's oncology, surgery, or cancer care unit. Please provide information that best reflects the hospital's usual practice. Where exact data are unavailable, estimates are acceptable. All responses will remain confidential and anonymized.

Section A: Hospital Characteristics

Name of hospital _____

Type of hospital

☐ Teaching / Tertiary referral hospital

☐ Non-teaching / Secondary/ Comprhensive hospital

Ownership:

☐ Public (government)

☐ Private / NGO-supported

Annual average number of new breast cancer cases managed (last 12 months):

☐ <50

☐ 50–100

☐ 101–200

☐ >200

Specialized units available (check all that apply):

- ☐ Oncology department
- ☐ Breast surgery unit
- ☐ Radiology unit with breast imaging capacity
- ☐ Pathology department
- ☐ Radiotherapy center
- ☐ Chemotherapy infusion unit
- ☐ Palliative care service

Section B: Multidisciplinary Team (MDT) Practice

Does your hospital have a formal MDT for breast cancer management?

- ☐ Yes
- ☐ No

If yes, which specialists are usually part of the MDT? (check all that apply):

- ☐ Surgical oncologist / breast surgeon
- ☐ Medical oncologist
- ☐ Radiation oncologist
- ☐ Radiologist
- ☐ Pathologist
- ☐ Oncology nurse / breast care nurse
- ☐ Palliative care specialist

☐ Others (please specify): _____

How frequently does the MDT meet?

☐ Weekly

☐ Biweekly

☐ Monthly

☐ Less than monthly

Approximately what percentage of new breast cancer cases are discussed at the MDT before treatment?

☐ 0%

☐ 1–25%

☐ 26–50%

☐ 51–75%

☐ 76–100%

What are the main barriers to effective MDT practice in your hospital? (open-ended)

_____

_____

Section C: Diagnostic Tools for Radiologic Staging

Which of the following diagnostic imaging modalities are available on-site?

☐ Mammography

☐ Breast ultrasound

- [ ] CT scan
- [ ] MRI
- [ ] PET-CT

Which imaging modalities are routinely used in staging breast cancer patients before treatment? (check all that apply)

- [ ] Mammography
- [ ] Ultrasound
- [ ] CT
- [ ] MRI
- [ ] PET-CT
- [ ] CXR
- [ ] Other
- [ ]

For patients suspected of breast cancer, which initial imaging is most commonly used?

- [ ] Mammography
- [ ] Ultrasound
- [ ] Both equally
- [ ] Other (please specify): _____

If some imaging modalities are not routinely available, how do patients usually access them?

☐ Referred to another hospital

☐ Private facilities (out-of-pocket payment)

☐ Not done at all

What are the key barriers to adequate imaging services? (open-ended)

Section D: Histologic Confirmation Prior to Surgery

Does your hospital have on-site pathology services?

☐ Yes

☐ No (specify referral arrangements): _____

Which biopsy methods are available for diagnosis? (check all that apply):

☐ Fine-needle aspiration (FNA)

☐ Core needle biopsy

☐ Excisional biopsy

☐ Incisional biopsy

In your hospital, approximately what proportion of breast cancer patients undergo histologic confirmation before surgery?

☐ <50%

☐ 50–75%

☐ 76–90%

☐ >90%

What challenges does your hospital face in providing timely histologic confirmation? (check all that apply):

- ☐ Lack of trained personnel
- ☐ Delays in pathology reporting
- ☐ Limited biopsy equipment/supplies
- ☐ Financial barriers for patients
- ☐ Other (please specify): _____

Section E: Neoadjuvant and Adjuvant Treatment Provision

Is neoadjuvant chemotherapy provided in your hospital?

- ☐ Yes
- ☐ No

Is adjuvant Chemotherapy provided at your institution when indicated?

- ☐ Yes
- ☐ No

Is adjuvant Hormonal therapy provided at your institution when indicated?

- ☐ Yes
- ☐ No

Is radiotherapy service provided at your institution when indicated?

- ☐ Yes
- ☐ No

What proportion of eligible breast cancer patients receive neoadjuvant therapy before surgery?

- ☐ 0%
- ☐ 1–25%
- ☐ 26–50%
- ☐ 51–75%
- ☐ 76–100%

What are the main barriers to provision of neoadjuvant therapy? (check all that apply):

- ☐ Drug availability
- ☐ Shortage of oncology specialists
- ☐ Lack of treatment protocols
- ☐ Financial constraints for patients
- ☐ Poor follow-up / patient loss-to-follow-up
- ☐ Other (please specify): _____

Section F: Open-Ended Reflections

In your view, what are the biggest gaps in breast cancer care in your hospital compared to international or Choosing Wisely Africa standards?

What resources or support would most improve adherence to evidence-based breast cancer care at your institution?