

Research Article

Enhancing Early Detection of Breast Cancer Through Community-Based Screening and Awareness in Harar Town, Eastern Ethiopia

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Abstract

Background: Breast cancer is the leading cause of cancer-related morbidity and mortality among women globally, with disproportionate impacts in low-resource settings due to delayed diagnosis and limited access to screening. In Ethiopia, breast cancer accounts for over 30% of all female cancers, yet early detection remains critically underutilized. Harar Town, located in Eastern Ethiopia, presents unique challenges and opportunities for community-based interventions. This study aimed to strategically advance breast cancer prevention through a market-centered screening and awareness initiative targeting women in Shewa-Ber, the largest public market in Harar. **Materials and Methods:** A cross-sectional, community-based screening program was conducted on October 28–29, 2023. Women aged 16 years and above who visited Shewa-Ber market were recruited using convenience sampling. A total of 204 women underwent clinical breast examinations performed by trained healthcare professionals, and 166 completed structured interviews. The survey instrument captured socio-demographic data, reproductive history, substance use, breast health complaints, and knowledge and practice of self-breast examination (SBE). Ethical clearance was obtained, and referrals were provided for suspected cases. **Results:** Among the 166 respondents, only 43.4% had prior knowledge of SBE, and 23.5% reported practicing it. Notably, 13.3% of screened women exhibited clinical signs suggestive of breast cancer and were referred for further diagnostic evaluation. Risk factors included early menarche (≤ 13 years), family history of breast cancer (4.2%), contraceptive use (41%), and substance exposure (chat: 24.7%, alcohol: 5.4%, tobacco: 1.8%). Educational attainment was low, with 25.3% of participants having no formal education. Despite 26.5% reporting breast-related symptoms, only one woman had previously accessed ultrasound screening. The intervention revealed significant gaps in awareness, screening access, and health-seeking behavior. **Conclusion:** This initiative demonstrated the feasibility and effectiveness of decentralized, community-based breast cancer screening in a high-traffic public setting. The findings underscore the urgent need for integrated public health strategies that combine education, screening, and referral systems to improve early detection and reduce mortality in underserved populations. **Recommendations:** We recommend scaling this model across similar urban and peri-urban markets in Ethiopia. Health authorities should prioritize training of frontline health workers in breast cancer awareness, embed SBE education into routine outreach, and establish referral linkages for diagnostic follow-up. Future studies should assess longitudinal outcomes, cost-effectiveness, and integration with national cancer control programs.

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Keywords

Breast Cancer Screening, Community Health Intervention, Self-Breast Examination (SBE), Early Detection Strategies, Harar, Ethiopia

1. Background

Breast cancer has emerged as a significant global health challenge, particularly in low- and middle-income countries (LMICs), where mortality rates remain disproportionately high. Globally, breast cancer is the most frequently diagnosed cancer among women and a leading cause of cancer-related deaths. In 2018, an estimated 2.1 million new cases and 627,000 deaths were attributed to breast cancer, underscoring its growing burden worldwide [1]. While high-income countries have witnessed improvements in survival rates due to early detection and advanced treatment modalities, LMICs continue to experience poor outcomes, primarily due to late-stage diagnosis and limited access to care [1].

Ethiopia exemplifies this trend, with cancer burden escalating over the past two decades. According to the Global Burden of Disease analysis, Ethiopia recorded approximately 53,560 new cancer cases and 39,480 deaths in 2019, reflecting a substantial public health concern [2]. Breast cancer is the most common malignancy among Ethiopian women, accounting for nearly 30.2% of all cancer cases, followed by cervical (13.4%) and colorectal cancers [3]. Despite this prevalence, national screening programs remain limited, and awareness of preventive practices such as self-breast examination (SBE) is low, contributing to delayed diagnosis and high mortality rates.

The situation is further complicated in sub-Saharan Africa, where breast cancer mortality rates range between 15 and 20 deaths per 100,000 women, comparable to high-incidence countries despite lower overall incidence [3]. Contributing factors include late presentation, inadequate diagnostic infrastructure, scarcity of treatment options, and high prevalence of aggressive tumor sub-types. Additionally, socio-cultural barriers and limited health literacy exacerbate delays in seeking care.

Harar, a fortified historic town in eastern Ethiopia located approximately 525 km from Addis Ababa, represents a unique setting for community-based interventions. Based on 2012 figures from the Central Statistical Agency of Ethiopia, the Harar region has a population of about 263,657, with one-quarter residing in urban Harar City [4]. Women constitute nearly half of this population, estimated at 98,854 individuals [4]. Given the demographic profile and limited access to specialized oncology services, targeted awareness and screening initiatives in Harar are critical for reducing breast cancer morbidity and mortality.

Community-based screening programs, such as those conducted in local markets, offer an opportunity to bridge gaps

in early detection and education. These initiatives not only identify women at risk but also promote knowledge and practice of SBE, which remains a cornerstone of secondary prevention in resource-limited settings [5]. Strengthening such interventions aligns with Ethiopia's broader health system goals of decentralizing cancer care and improving outcomes through early diagnosis and timely referral.

2. Materials and Methods

2.1. Study Design and Setting

A community-based cross-sectional study was conducted on October 28–29, 2023, at Shewa Ber, the largest market in Harar Town, Ethiopia. The site was selected for its high population density and accessibility, enabling outreach to a diverse group of women. The screening initiative was organized in collaboration with the Harari Health Bureau, Clinton Health Access Initiative (CHAI), Haramaya University, Hiwot Fana Specialized University Hospital, and Ali Bira Cancer Center.

2.2. Study Population and Sampling

The study targeted women aged 16 years and above who were present at the market and voluntarily agreed to participate. A non-probability convenience sampling method was employed, appropriate for public health outreach settings. A total of 204 women underwent breast screening, and 166 participants completed the structured survey questionnaire.

2.3. Data Collection

Data collection involved two components:

Clinical breast screening, performed by trained healthcare professionals.

Structured interviews, using a pre-tested questionnaire administered to consenting participants.

The questionnaire was designed to capture the following variables:

Socio-demographic characteristics: age, educational status, marital status, parity.

Reproductive health history: contraceptive use, type of contraceptive used, age at menarche, age at menopause.

Behavioral and lifestyle factors: use of substances such as chat, alcohol, and tobacco.

Breast health awareness and practices:

- Awareness of self-breast examination (SBE).
- Practice of SBE.
- History of breast screening and methods used (e.g., clinical examination, ultrasound).
- Family history of breast cancer.
- Breast-related symptoms and complaints.

These variables were selected to assess knowledge, attitudes, and practices related to breast cancer, as well as potential risk factors and barriers to early detection.

2.4. Procedure

Participants were approached by trained facilitators and healthcare professionals. After explaining the purpose of the screening and survey, verbal informed consent was obtained [6, 7]. Breast examinations were conducted in private settings by 16 healthcare professionals, including general practitioners and medical interns. Women with suspicious findings were referred for free ultrasound screening.

2.5. Ethical Considerations

This study was conducted in accordance with the Declaration of Helsinki (WMA, 2024), which outlines ethical principles for medical research involving human subjects [8]. As the activity was a non-interventional public health screening service, it did not require formal Institutional Review Board (IRB) approval or ethical clearance. Participation was voluntary, and data collection occurred only with the participant’s consent. No personal identifiers were recorded, and confidentiality was strictly maintained [9]. The initiative was supported by local health authorities and aligned with Ethiopia’s National Guideline for Breast Health and Early Diagnosis

(2024–2028) [10].

2.6. Data Analysis

Quantitative data collected through the survey were analyzed using descriptive statistics. Categorical variables were summarized using frequencies and percentages. These included socio-demographic characteristics, reproductive health indicators, behavioral factors, breast health awareness and practices, and screening history.

3. Results

3.1. Sociodemographic Characteristics

A total of 166 women participated in the survey. The age distribution ranged from adolescence to post-menopausal stages, reflecting a diverse reproductive profile. Educational attainment was low overall, with 25.3% of participants having no formal education and 26.5% having completed only primary education. Regarding parity, 21.7% of women had at least one child, and 16.3% had up to five children.

Table 1. Educational Status of Participants in the Study “Enhancing Early Detection of Breast Cancer Through Community-Based Screening and Awareness in Harar Town, Eastern Ethiopia”.

Educational Status	Count
No Education	42
Primary Education	44

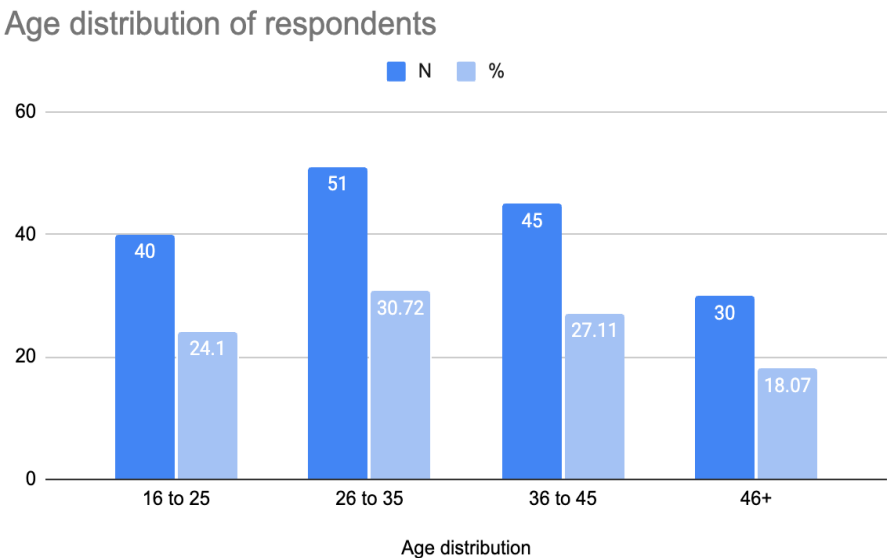


Figure 1. Adjusted Age Distribution of Participants (N = 166) in Harar Town, Eastern Ethiopia.

3.2. Reproductive Health History

Participants reported a range of ages at menarche, from 10 to 17 years. A smaller subset provided data on age at menopause. Contraceptive use was common, with pills/Implanon and injectables being the most frequently used methods.

Table 2. Parity (Number of Children) Among Participants in Harar Town, Eastern Ethiopia.

Parity	Count
At least 1 child	36

Parity	Count
Up to 5 children	27

Table 3. Contraceptive Use Among Participants in Harar Town, Eastern Ethiopia.

Contraceptive Use	Count
Pills/Implanon	27
Injectables	13

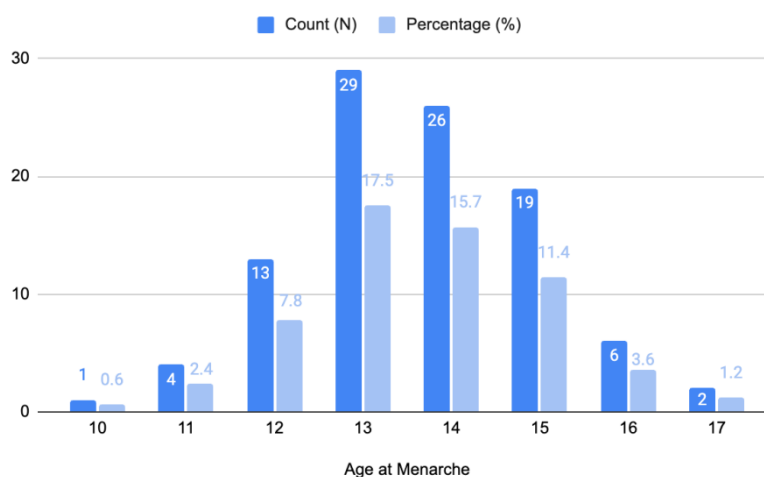


Figure 2. Distribution of Age at First Menarche Among Participants (N = 166) in Harar Town, Eastern Ethiopia.

3.3. Substance Use and Family History

Substance use was reported among participants, including khat chewing, alcohol consumption, and cigarette smoking. A small number of women reported a family history of breast cancer, primarily among first-degree relatives.

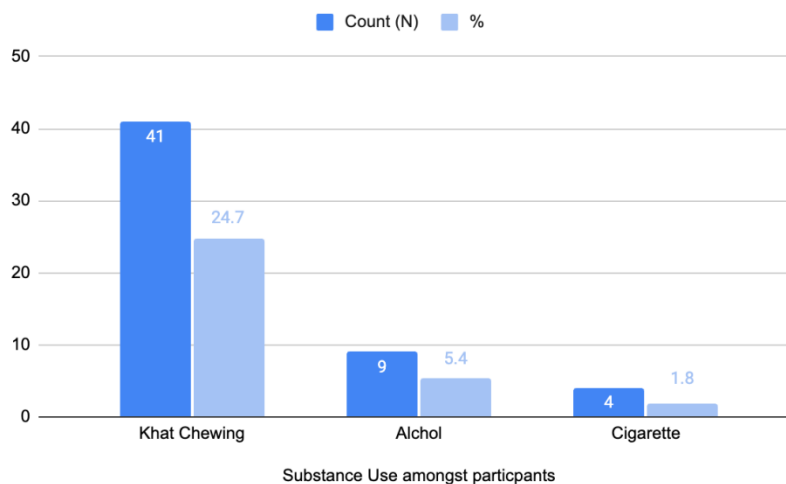


Figure 3. Substance Use Among Participants Screened in Harar Town, Eastern Ethiopia.

3.4. Breast Health Awareness and Practices

Awareness of self-breast examination (SBE) was limited. Only 43.4% had heard of SBE prior to the screening, while 56.6% learned about it during the event. The most common sources of information were health professionals (15.1%), followed by family and friends (4.8%). Despite awareness, only 23.5% of women practiced SBE regularly.

Table 4. Awareness of Self-Breast Examination (SBE) Among Participants in Harar Town, Eastern Ethiopia.

SBE Awareness	Count
Heard Before	73
Learned During Screening	94

3.5. Breast Screening History and Methods

Screening history varied among participants. Only one woman had undergone advanced screening via ultrasound. Most had limited exposure to screening, with 13 women screened once, 7 screened three times, and only one screened

five times. Screening methods included self-examination (15.1%), clinical examination by health professionals (7.8%), and ultrasound (0.6%).

Table 5. Frequency and Methods of Breast Screening Among Participants in Harar Town, Eastern Ethiopia.

Screening Methods	Count
SBE	25
Clinical Exam	13
Ultrasound	1

3.6. Breast-Related Complaints

A total of 44 women (26.5%) reported breast-related symptoms. These included tenderness (18 cases), lumps (9), discharge (6), pain during breastfeeding (2), and swelling (1). These complaints were used to guide referrals for further diagnostic evaluation.

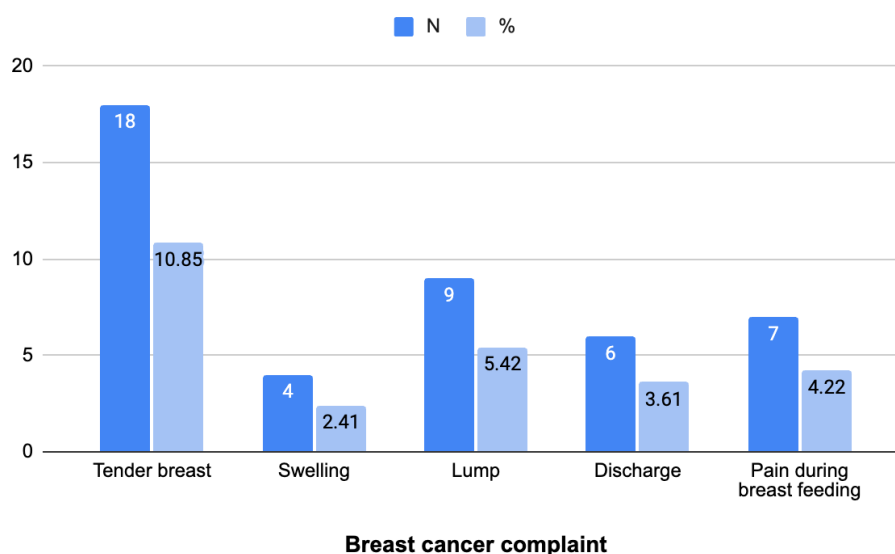


Figure 4. Complaint before Community Breast Cancer Screening Among Participants in Harar Town, Eastern Ethiopia.

3.7. Screening Outcomes

Of the 204 women screened, 22 (13.3%) were found to have signs suggestive of breast cancer. These individuals

were referred for free ultrasound screening at Ali-Bira Cancer Center. The remaining 144 women had no suspicious findings.

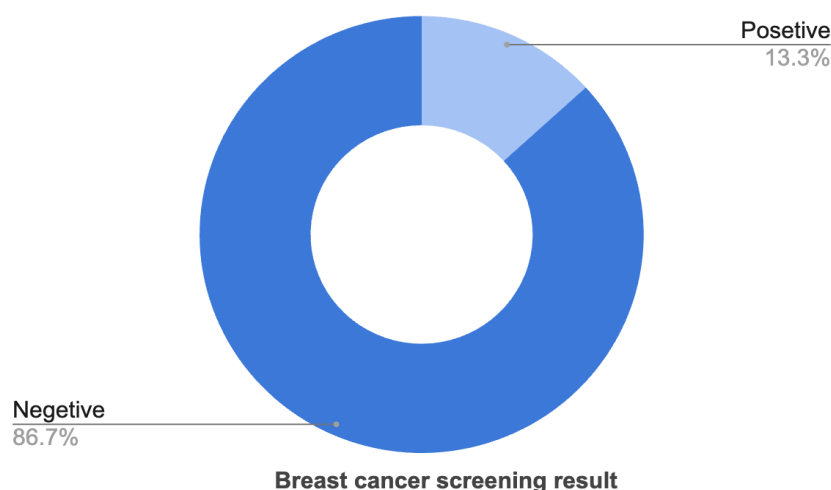


Figure 5. Breast Cancer Screening Outcomes (Positive vs. Negative) Among Participants in Harar Town, Eastern Ethiopia.

4. Discussion

This community-based breast cancer screening initiative at Shewa-Ber market in Harar provides critical insights into awareness, practices, and screening outcomes among Ethiopian women. Our findings reveal substantial gaps in knowledge and preventive practices, echoing patterns observed in other Ethiopian studies and across sub-Saharan Africa.

4.1. Comparison with Ethiopian Evidence

The low awareness and practice of self-breast examination (SBE) in our study (43.4% awareness; 23.5% practice) aligns with previous Ethiopian research. Abeje et al. (2019) reported that only 35.5% of women in Addis Ababa were aware of any breast cancer screening method, and SBE practice was 24.3%, similar to our findings [11]. Likewise, studies among pastoralist women in Oromia found SBE practice rates as low as 14.6%, with education and income strongly associated with uptake [12]. These parallels underscore persistent structural and educational barriers, despite ongoing national efforts.

The Ethiopian National Guideline for Breast Health (2024–2028) emphasizes early detection through SBE and clinical breast examination (CBE) as cost-effective strategies in resource-limited settings [10]. However, our data, where most women had never undergone formal screening and only one had advanced imaging, illustrates the gap between policy and practice. This gap is consistent with systematic reviews showing that 64% of Ethiopian breast cancer cases present at late stages, contributing to high mortality [13].

4.2. Screening Outcomes and Regional Context

Our detection rate (13.3% positive findings) is notable

compared to other Ethiopian community-based initiatives. For instance, a large-scale decentralized program screened 21,000 women nationwide, yet late-stage diagnosis remained prevalent due to limited awareness and referral delays [3]. Similarly, a cluster randomized trial in Ethiopia demonstrated that community-based education interventions increased SBE practice from 33.3% to 59.9%, highlighting the potential impact of structured health promotion [14].

4.3. Broader African Comparisons

Across sub-Saharan Africa, breast cancer screening uptake remains critically low. A pooled analysis of DHS data from six African countries reported an overall clinical breast examination prevalence of 14.2%, with Namibia highest (24.5%) and Tanzania lowest (5.2%). Our findings mirror these trends, reinforcing that Ethiopia faces similar systemic challenges, limited infrastructure, cultural barriers, and financial constraints [15].

Mobile and market-based screening models, like ours, resonate with successful African initiatives. In South Africa, mobile screening programs such as PinkDrive and I Love Boobies have significantly improved early detection in underserved communities, demonstrating that community outreach combined with education can bridge access gaps. Ghana's "Bu O' Forfor" campaign also illustrates how culturally tailored interventions can enhance participation and awareness [16, 17].

4.4. Screening History and Methods

Our data show that only one participant had undergone advanced screening (ultrasound), reflecting systemic gaps in diagnostic capacity. This is consistent with national evidence indicating that over 65% of breast cancer cases in Ethiopia present at late stages. Even with recent decentralization efforts that expanded breast cancer services from 2 to 24 hospitals, late-stage diagnosis remains prevalent [18]. Similar

challenges are reported across Africa, where clinical breast examination prevalence averages 14.2%, with Namibia highest (24.5%) and Tanzania lowest (5.2%).

4.5. Implications for Policy and Practice

Our findings reinforce the urgent need for integrated, culturally sensitive strategies that combine education, screening, and referral systems. Ethiopia's national guideline and WHO's Global Breast Cancer Initiative advocate for early detection programs at the primary care level, yet implementation remains inconsistent. Evidence from Ethiopia and other African nations suggests that community-based interventions, mobile screening units, and health literacy campaigns are effective in improving uptake and reducing late-stage presentation [10, 19].

4.6. Strengths and Limitations

This study's strength lies in its real-world, community-based approach, targeting women in a high-traffic market setting. However, limitations include reliance on self-reported practices and the absence of confirmatory diagnostic follow-up for all positive cases, which may affect outcome interpretation.

5. Conclusion and Recommendations

This study reveals critical gaps in breast cancer awareness and screening practices among women in Harar, Ethiopia. Despite global and national efforts to promote early detection, our findings show that knowledge and practice of self-breast examination (SBE) remain low, with only 43.4% aware of SBE and 23.5% practicing it regularly. Advanced screening methods were virtually absent, and most participants had never undergone clinical breast examination or imaging. These findings mirror national trends, where over 65% of breast cancer cases present at late stages, contributing to high mortality rates. The detection of 13.3% of women with signs suggestive of breast cancer during a short-term market-based screening campaign underscores the potential of community outreach programs to identify at-risk individuals who might otherwise remain undiagnosed.

To address these gaps, Ethiopia must accelerate implementation of its National Guideline for Breast Health (2024–2028) and align with WHO's Global Breast Cancer Initiative, which targets 60% early-stage diagnosis and timely treatment completion. Evidence from Ethiopia and other African countries demonstrates that community-based interventions, mobile screening units, and culturally tailored education campaigns significantly improve awareness and uptake of preventive practices. Successful models such as South Africa's PinkDrive and Ghana's Bu O' Forfor campaign illustrate the effectiveness of combining outreach with health education to overcome structural and cultural

barriers.

Based on these findings, we recommend scaling up community-based screening programs in high-traffic areas, integrating culturally sensitive education campaigns to promote SBE, and strengthening referral and diagnostic systems for timely follow-up. Training health workers in breast health and early detection techniques at the primary care level is essential, alongside leveraging partnerships with NGOs and private sector initiatives to replicate successful African models. Finally, monitoring and evaluation using standardized indicators aligned with WHO targets will ensure accountability and measure progress toward reducing late-stage presentation and improving survival outcomes for Ethiopian women.

Abbreviations

BC	Breast Cancer
CBE	Clinical Breast Examination
IRB	Institutional Review Board
CHAI	Clinton Health Access Initiative
LMICs	Lower and Middle-Income Countries
WMA	World Medical Association
NGOs	Non-Governmental Organisations
SBE	Self Breast Examination
WHO	World Health Organisation

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Author Contributions

Michael Shawel Lemma: Supervision, Resources, Writing – review & editing

Nahom Wondwossen: Supervision, Writing – review & editing

Selamawit Sete: Data Curation, Investigation, Writing – review & editing

Habtamu Seife: Data Curation, Investigation, Writing – review & editing

Mahlet Shewangizaw: Data Curation, Investigation, Writing – review & editing

Edilawit Abebaw Abera: Data Curation, Investigation,

Writing – review & editing

Yehenaw Tadele Tenaw: Data Curation, Investigation, Writing – review & editing

Biruk Habtamu: Supervision, Visualization, Writing – review & editing

Nahom Girma Belete: Conceptualization, Methodology, Formal Analysis, Investigation, Data Curation, Visualization, Project Administration, Supervision, Writing – original draft, Writing – review & editing

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Data Availability Statement

The data is available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

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<https://globalhealthprogress.org/collaboration/implementation-of-the-global-breast-cancer-initiative-gbci-framework/> (Accessed January 1, 2025).

Biography

Nahom Girma Belete holds a Bachelor of Science in Nursing and a Master of Public Health in Nutrition from Haramaya University, Ethiopia. He has over five years of experience in public health research, having contributed to and co-authored several published studies addressing nutrition, oral health, and aging populations. His work demonstrates a strong commitment to improving evidence-based interventions and advancing health outcomes in underserved communities. His current research interests center on oncology, healthcare access and equity, nutrition, and global health. He is particularly passionate about exploring the intersection of health economics and policy to promote sustainable and equitable healthcare systems. Nahom currently serves as the Research and Program Coordinator at the October Cancer Support Association in Harar, Ethiopia.

Research Field

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Selamawit Sete: Dermatology, Skin cancer screening, Clinical dermatology, Dermatologic oncology, Patient education in dermatology.

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Nahom Girma Belete: Public health, Cancer epidemiology, Community-based screening, Health systems strengthening, Global health policy, Implementation science.