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Risk Factors and Prevention Methods of Breast Cancer among Women Residing in Southeast Nigeria

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Abstract

Background: Breast cancer is a significant health issue in Southeast Nigeria, contributing to high morbidity and mortality rates among women. This study aims to identify the risk factors and prevention methods of breast cancer in this region.

Methods: A cross-sectional descriptive survey was conducted among women aged 18 years and above residing in Southeast Nigeria. Stratified sampling was used to ensure representation from both urban and rural areas. A total of 360 participants were selected through a multi-stage sampling process involving the random selection of states, local government areas (LGAs), hospitals, and participants. Data were gathered using a structured questionnaire.

Results: The majority of participants were aged 30-39 years (52.50%), had secondary education (58.89%), and were married (84.17%). Key findings included that 16.39% had been diagnosed with breast cancer, 16.94% had a family history of breast cancer, and 12.12% had diabetes. Lifestyle factors revealed low alcohol consumption and smoking rates but inconsistent exercise habits. Only 38.33% performed regular breast self-examinations, and 22.50% had ever had a mammogram. Awareness of breast cancer risk factors was low, with only 18.61% fully aware. Access to healthcare was limited, with 70.56% lacking access to breast cancer screening services.

Conclusion: The study highlights significant gaps in awareness, screening, and prevention of breast cancer among women in Southeast Nigeria. Interventions focusing on education, improved access to screening services, and addressing cultural barriers are essential to enhance breast cancer prevention and early detection in this region.

Keywords: breast cancer; risk factors; prevention methods; southeast Nigeria; women's health; screening; awareness

Introduction

Breast cancer remains a significant global health concern, representing the most frequently diagnosed cancer among women and a leading cause of cancer-related mortality. According to the World Health Organization (WHO), breast cancer accounts for approximately 15% of all cancer deaths among women globally [1]. Despite advances in diagnostic and therapeutic interventions, the incidence and mortality rates of breast cancer continue to rise, particularly in low- and middle-income countries (LMICs) [2]. This trend underscores the necessity for targeted research to identify region-specific risk factors and effective prevention strategies, particularly in areas with distinct socio-cultural and economic contexts, such as Southeast Nigeria. The epidemiology of breast cancer in Nigeria reflects a troubling pattern of late-stage diagnosis and high mortality rates. Studies indicate that breast cancer is the most common cancer among Nigerian women, with increasing incidence rates reported over the past few decades [3]. The high mortality rate is often attributed to factors such as delayed presentation, limited access to healthcare facilities, and inadequate cancer awareness [4]. In Southeast Nigeria, these challenges are compounded by cultural beliefs and practices that influence health-seeking behaviours and the acceptance of medical interventions [5]. Identifying the risk factors for breast cancer is critical for developing effective prevention strategies.

Globally, several risk factors have been well-documented, including genetic predisposition, reproductive history, hormonal factors, lifestyle choices, and environmental exposures [6]. However, the relevance and impact of these factors can vary significantly across different populations. In Southeast Nigeria, specific risk factors have been identified through various studies. Genetic mutations, such as BRCA1 and BRCA2, are known to significantly increase breast cancer risk [7]. Reproductive factors, including early menarche, late menopause, nulliparity, and use of hormonal contraceptives, have also been implicated [5]. Additionally, lifestyle factors such as diet, physical activity, alcohol consumption, and obesity have been shown to influence breast cancer risk [8]. Socio-cultural factors play a crucial role in the epidemiology and management of breast cancer in Southeast Nigeria. Cultural beliefs and stigma associated with cancer can lead to delays in seeking medical help and adherence to traditional healing practices [9]. Furthermore, gender roles and expectations may affect women's access to healthcare services and their ability to make autonomous health decisions [10]. These socio-cultural dynamics necessitate culturally sensitive approaches in breast cancer prevention and education programs.

Prevention and early detection of breast cancer are vital components of reducing the burden of the disease. Primary prevention strategies include lifestyle modifications, such as maintaining a healthy diet, regular physical activity, and avoiding alcohol and tobacco use [11]. Secondary prevention focuses on early detection through screening methods like mammography, clinical breast examination (CBE), and breast self-examination (BSE) [12]. In Southeast Nigeria, the implementation of these strategies faces several obstacles, including limited access to screening facilities, lack of trained healthcare professionals, and financial constraints [13]. Promoting awareness and education about breast cancer, alongside improving healthcare infrastructure and accessibility, are essential steps towards enhancing early detection and reducing mortality rates. Recent advances in breast cancer research offer promising directions for improving outcomes. Molecular profiling and personalized medicine approaches are gaining traction, allowing for more tailored treatment regimens based on individual genetic and molecular characteristics [14]. However, the application of these advanced technologies in LMICs, including

Southeast Nigeria, remains limited due to resource constraints. There is also a pressing need for more region-specific research to understand the unique risk factors and effective prevention methods for breast cancer in Southeast Nigeria. Comprehensive studies that integrate epidemiological data, socio-cultural analyses, and healthcare accessibility assessments are crucial for developing targeted interventions.

Research Methodology

Study Design

A cross-sectional descriptive survey was conducted to assess the risk factors and prevention methods of breast cancer among women in Southeast Nigeria.

Study Area

Southeast Nigeria, comprising states such as Abia, Anambra, Ebonyi, Enugu, and Imo, faces significant health challenges, including breast cancer. Breast cancer is a leading cause of morbidity and mortality among women in this region. Several factors contribute to this high burden, including limited access to healthcare facilities, lack of awareness about breast cancer symptoms, and cultural stigmas that delay diagnosis and treatment. Healthcare infrastructure in Southeast Nigeria is relatively underdeveloped, with many rural areas lacking adequate medical services. This results in late-stage presentations of breast cancer, which significantly reduces survival rates. Efforts to improve early detection through awareness campaigns and mobile screening units are vital. Additionally, addressing cultural barriers and educating women on the importance of regular breast self-examinations and seeking prompt medical attention can improve outcomes.

Population and Sampling

Target Population

The target population comprised women aged 18 years and above residing in Southeast Nigeria.

Sampling Method

A stratified sampling method was employed to ensure representation from both urban and rural areas within the southeast states. The steps involved were:
Selection of States: Three states were randomly selected from the five states in Southeast Nigeria.
Selection of Local Government Areas (LGAs): Six LGAs were selected from each state, with an equal representation of urban and rural areas (three urban and three rural LGAs per state).

Selection of Hospitals: Two general hospitals were randomly chosen from each LGA.

Selection of Participants: From each hospital, ten participants were selected, resulting in a total sample size of 360 women.

Data Collection

Instrument

Data was collected using a structured questionnaire developed by the research team. The questionnaire was divided into different sections covering socio-demographic information, medical history, lifestyle factors, breast cancer screening and prevention, access to healthcare, awareness of breast cancer risk factors, and attitudes towards breast cancer prevention.

Procedure

Pre-testing: The questionnaire was pre-tested on a small sample of women to ensure clarity and appropriateness of the questions.

Training of Data Collectors: Data collectors were trained on the objectives of the study, ethical considerations, and the administration of the questionnaire.

Data Collection: Face-to-face interviews were conducted with the participants in their local languages or English, depending on their preference.

Variables

Dependent Variables

Risk Factors: Age at first menstrual period, age at first childbirth, family history of breast cancer, personal history of other cancers, history of chronic conditions (diabetes, hypertension, obesity), lifestyle factors (alcohol consumption, smoking, exercise, diet), and use of hormonal contraceptives.

Prevention Methods: Awareness and practice of breast self-examination, mammography, maintaining a healthy weight, avoiding smoking, limiting alcohol consumption, regular exercise, and healthy diet.

Independent Variables

Socio-Demographic Factors: Age, educational level, marital status, employment status, and residence (urban/rural).

Access to Healthcare: Frequency of healthcare visits, availability of breast cancer screening services, barriers to accessing screening services.

Awareness and Attitudes: Awareness of breast cancer risk factors, belief in the preventability of breast cancer, importance of breast cancer prevention, and willingness to participate in prevention programs.

Data Analysis

Data were analyzed using descriptive statistics such as frequencies and percentages to summarize the socio-demographic characteristics, medical history, lifestyle factors, screening and prevention methods, access to healthcare, awareness, and attitudes towards breast cancer prevention. Cross-tabulations were used to explore associations between the dependent and independent variables.

Ethical Considerations

Written informed consent was obtained from all participants before the interviews. Participant anonymity was ensured by assigning codes to the questionnaires and keeping all information confidential. The study protocol was approved by the relevant ethics committees in each of the selected states.

Results

In terms of age, most participants were between 30-39 years (52.50%), with smaller groups under 20 (5.28%), 20-29 (23.89%), and 40 and above (18.33%). A majority had secondary education (58.89%), while others had primary (8.89%), tertiary education (29.17%), or no formal education (3.06%). Marital status was predominantly married (84.17%), with single (10.00%) and divorced/widowed (5.83%) individuals making up the rest. Employment status showed that 56.94% were self-employed, 25.83% unemployed, and 17.22% employed, with no retirees. Residency was evenly split between rural and urban areas (50.00% each) (Table 1).

Table 1: Socio-Demographic Information of Participants.

Socio-Demographic Information	Frequency (n = 360)	Percentage (%)
Age (in Years)		
Less than 20	19	5.28
20 – 29	86	23.89
30 – 39	189	52.50
40 and above	66	18.33
Educational Level		
No formal Education	11	3.06
Primary Education	32	8.89
Secondary Education	212	58.89
Tertiary Education	105	
Marital Status		
Single	36	10.00
Married	303	84.17
Divorced/Widowed	21	5.83
Employment Status		
Employed	62	17.22
Self-Employed	205	56.94
Unemployed	93	25.83
Retiree	00	
Residence		
Rural	180	50.00
Urban	180	50.00

Regarding medical history, 16.39% had been diagnosed with breast cancer, and 16.94% reported a family history of it. A small portion had other cancers (8.89%). Among other health conditions, hypertension (16.25%) and diabetes (12.12%) were most common, while 63.64% reported no such conditions (Table 2).

Table 2: Medical History of Participants.

Variables	Frequency (n = 360)	Percentage (%)
Have you ever been diagnosed with breast cancer?		
Yes	59	16.39
No	301	83.61
Do you have a family history of breast cancer?		
Yes	61	16.94
No	299	83.06
Have you ever had any other type of cancer?		
Yes	32	8.89
No	328	91.11
*Do you have a history of any of the following conditions? (Check all that apply) (n = 363)		
Diabetes	44	12.12
Hypertension	59	16.25
Obesity	29	7.99
None	231	63.64

* Signifies multiple responses

Lifestyle factors revealed that a significant majority never consumed alcohol (75.00%) or smoked (89.72%). Exercise habits varied, with 60.83% exercising occasionally and smaller percentages exercising regularly (12.50%) or daily (3.06%). A substantial number (77.50%) regularly consumed fruits and vegetables. Over half (55.28%) used hormonal contraceptives. The majority had their first menstrual period between ages 15-17 (56.11%) and had children (88.33%), with most having their first

child at 25-29 years old (61.00%). Breastfeeding was prevalent among mothers (86.67%) (Table 3).

Table 3: Lifestyle Factors of Participants.

Variables	Frequency (n = 360)	Percentage (%)
How often do you consume alcohol?		
Daily	00	0.00
Regularly	00	0.00
Occasionally	28	7.78
Rarely	61	16.94
Never	270	75.00
Do you smoke?		
Yes	13	3.61
No	323	89.72
Quit	24	6.67
How often do you exercise?		
Daily	11	3.06
Regularly	45	12.50
Occasionally	219	60.83
Rarely	72	20.00
Never	13	3.61
Do you regularly consume fruits and vegetables?		
Yes	279	77.50
No	81	22.50
Do you use hormonal contraceptives?		
Yes	199	55.28
No	161	44.72
At what age did you have your first menstrual period?		
Under 12	9	2.50
12 – 14	138	38.33
15 – 17	202	56.11
18 and above	11	3.05
Have you had children?		
Yes	318	88.33
No	42	11.67
If yes, at what age did you have your first child?		
Under 20	24	7.55
20 – 24	51	16.04
25 – 29	194	61.00
30 and above	49	15.41
Have you breastfed your children?		
Yes	312	86.67
No	6	1.67
Not Applicable	42	11.67

Screening and prevention showed that 61.11% had heard of mammograms, but only 22.50% had ever had one, with annual screening being rare (25.93%). Regular breast self-examinations were performed by 38.33%, but many did so rarely (42.03%). Awareness of breast cancer prevention methods was low (36.11%), and common barriers included lack of awareness (51.11%) and financial constraints (15.56%). Information sources were mainly internet/social media (48.61%) and healthcare providers (26.67%) (Table 4).

Table 4: Screening and Prevention of Breast Cancer.

Variables	Frequency (n = 360)	Percentage (%)
Have you ever heard of a mammogram?		
Yes	220	61.11
No	140	38.89
Have you ever had a mammogram?		
Yes	81	22.50
No	279	77.50
If yes, how often do you get a mammogram?		
Annually	21	25.93
Every two years	08	9.88
Occasionally	16	19.75
Only once	36	44.44
Do you perform regular breast self-examinations?		
Yes	138	38.33
No	222	61.67
If yes, how often?		
Monthly	38	27.54
Every few months	23	16.67
Annually	19	13.77
Rarely	58	42.03
Do you know about any breast cancer prevention methods?		
Yes	130	36.11
No	230	63.89
*If yes, please specify which methods you are aware of. (Select all that apply) (n = 773)		
Regular screening (mammograms)	220	28.46
Preventive medications	7	0.91
Maintaining a healthy weight	68	8.80
Avoiding smoking	74	9.57
Limiting alcohol consumption	82	10.61
Regular exercise	101	13.07
Healthy diet	123	15.91
Breast self-examinations	98	12.68
Other	00	0.00
What are the Barriers to Breast Cancer Screening?		
Lack of awareness	184	51.11
Fear of diagnosis	44	12.22
Financial constraints	56	15.56
Cultural beliefs	11	3.06
Accessibility issues	65	18.06
What are your sources of information on breast cancer prevention? (Check all that apply)		
Healthcare providers	96	26.67
Internet/Social media	175	48.61
TV/Radio	51	14.17
Friends/Family	32	8.89
Other	06	1.67

* Signifies multiple responses

Awareness of breast cancer risk factors was limited, with 46.94% not aware and only 18.61% fully aware (Figure 1). In terms of healthcare access, regular check-ups were infrequent, with 66.39% visiting a provider only when sick. Access to breast cancer screening services was limited, with 70.56% lacking access, mainly due to lack of facilities (20.98%) and high costs (30.24%). Beliefs about breast cancer prevention varied, with 53.33% believing it can be prevented, while 33.33% were unsure (Figure 2). Attitudes

towards breast cancer prevention showed that 31.11% considered it moderately important, while 25.56% found it not important (Figure 3). Willingness to

participate in prevention programs was high, with 39.72% very willing and 24.17% extremely willing (Figure 4).
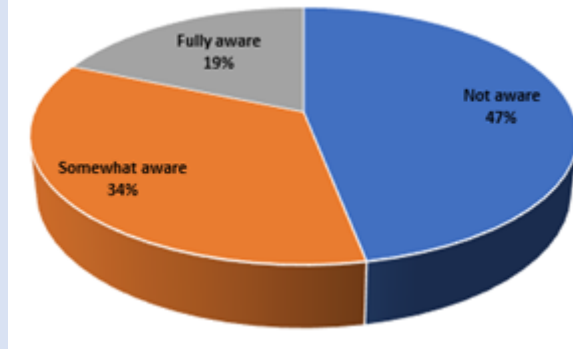

Figure 1: Awareness of Breast Cancer Risk Factors.

Table 5: Access to Healthcare.

| Variables	Frequency (n = 360)	Percentage (%)
How often do you visit a healthcare provider for a check-up?		
Regularly (at least once a year)	74	20.56
Occasionally (once every few years)	47	13.06
Rarely (only when sick)	239	66.39
Never	00	0.00
Do you have access to breast cancer screening services in your area?		
Yes	106	29.44
No	254	70.56
***If no, what are the main barriers to accessing these services? (Select all that apply) (n = 367)**		
Lack of facilities	77	20.98
High cost	111	30.24
Lack of awareness	131	35.69
Cultural beliefs	37	10.08
Fear of diagnosis	11	3.00
Other	00	0.00

* Signifies multiple responses
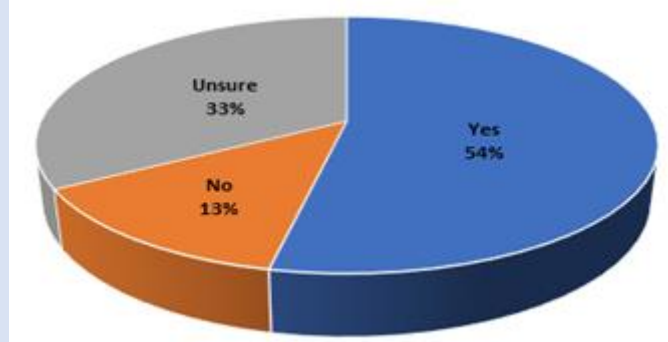
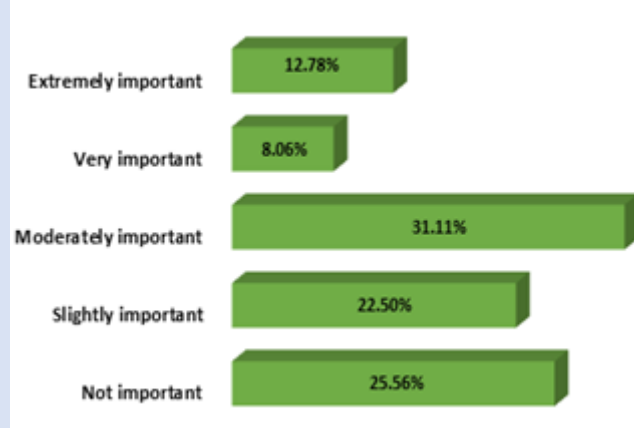**Figure 2:** Belief in the Prevention of Breast Cancer.

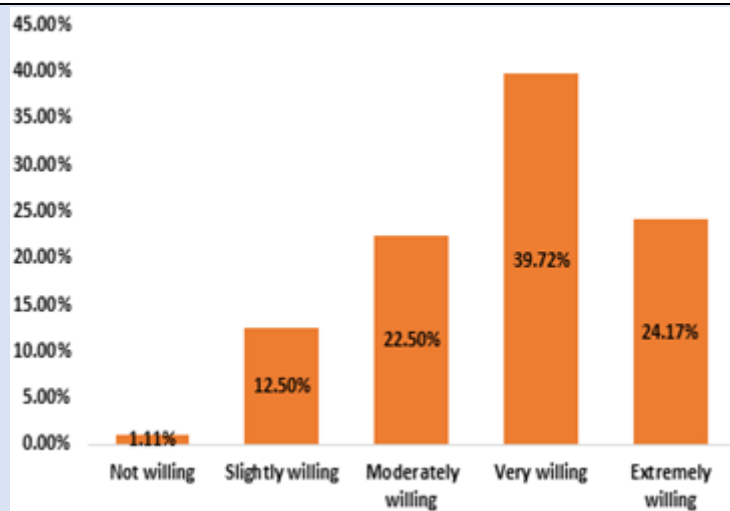**Figure 3:** Attitude towards Breast Cancer Prevention.

Figure 4: Willingness to Participate in Breast Cancer Prevention Programs.

Discussion

The socio-demographic profile of the participants in this study reveals significant insights into the population's composition. The majority of participants fall within the age range of 30-39 years (52.50%), followed by 20-29 years (23.89%), indicating a predominantly young adult population. This aligns with the age distribution patterns observed in other studies conducted in developing regions, where younger populations are often more prevalent due to higher birth rates and lower life expectancy compared to developed countries [15]. Educational attainment shows that a significant proportion of participants have completed secondary education (58.89%), with a considerable number having attained tertiary education (29.17%). This level of education is higher compared to some other studies conducted in similar settings, which often report lower levels of educational attainment among women [16]. Higher education levels are crucial as they are associated with better health awareness and utilization of preventive health services. Marital status indicates

that a vast majority (84.17%) of the participants are married, which is consistent with cultural norms in many parts of Nigeria where marriage is a common institution among adults. Employment status reveals that more than half of the participants are self-employed (56.94%), reflecting the economic structure of the region where informal sector employment is predominant [17]. The equal distribution between rural and urban residents (50% each) provides a balanced view of the population and ensures that the findings are representative of both settings.

The prevalence of breast cancer diagnosis among the participants is 16.39%, which is relatively high compared to global statistics but aligns with regional data suggesting increasing breast cancer incidence in sub-Saharan Africa [18]. The study also reveals that 16.94% of the participants have a family history of breast cancer, which is a known risk factor for the disease. This finding is consistent with literature indicating that family history significantly increases breast cancer risk [6]. Interestingly, the prevalence of other cancers among participants is 8.89%, which,

while lower than breast cancer, still indicates a notable presence of malignancies. The occurrence of comorbid conditions such as hypertension (16.25%), diabetes (12.12%), and obesity (7.99%) among participants is significant. These conditions are established risk factors for breast cancer and other chronic diseases, and their presence underscores the need for integrated health management approaches [19]. Comparing these findings with previous studies highlights some similarities and differences. For instance, the educational level of participants in this study is higher than that reported in other studies from similar regions, suggesting improvements in educational attainment over time [20]. The marital status distribution aligns with cultural expectations in Nigeria, as noted in other studies [17]. The prevalence of breast cancer (16.39%) is higher than global averages but comparable to other regional studies, indicating a significant public health concern [18]. The relatively high percentage of participants with a family history of breast cancer (16.94%) aligns with findings from similar studies, reinforcing the role of genetic predisposition in breast cancer risk [6].

The data shows that a substantial majority of the participants (75.00%) never consume alcohol, with only a small percentage consuming alcohol occasionally (7.78%) or rarely (16.94%). This low level of alcohol consumption could potentially be a protective factor against breast cancer, as numerous studies have linked alcohol intake to an increased risk of developing breast cancer. According to the World Cancer Research Fund [19], there is convincing evidence that alcohol consumption increases the risk of breast cancer. In contrast, the low incidence of alcohol consumption among these women might suggest a lower risk in this specific population. Smoking is another lifestyle factor closely monitored in cancer studies. In this study, only 3.61% of participants currently smoke, and 6.67% have quit smoking, indicating that 89.72% of the women do not smoke. Smoking has been established as a significant risk factor for breast cancer, particularly in younger women who smoke over an extended period [21]. The low prevalence of smoking among the participants could therefore correlate with a reduced risk of breast cancer in this population. Regular physical activity is known to reduce breast cancer risk. In this study, only 3.06% of participants exercise daily, and 12.50% exercise regularly. The majority (60.83%) exercise occasionally, while 20.00% exercise rarely, and 3.61% never exercise. The relatively low

levels of regular physical activity could be a concern, as physical inactivity is a well-documented risk factor for breast cancer [22]. Increasing the frequency and regularity of physical activity among women in Southeast Nigeria could be a valuable strategy for breast cancer prevention.

A significant majority of the participants (77.50%) regularly consume fruits and vegetables, which is encouraging given the protective effects of a diet rich in fruits and vegetables against breast cancer. Diets high in these food groups are associated with a lower risk of breast cancer, likely due to their high content of fiber, vitamins, minerals, and antioxidants [23]. In this study, 55.28% of participants reported using hormonal contraceptives. The use of hormonal contraceptives has been associated with a slight increase in breast cancer risk, particularly among current and recent users [24]. However, this risk diminishes after cessation of use. The age at first menstruation (menarche) is another important factor, with early menarche being a known risk factor for breast cancer. The majority of participants (56.11%) had their first menstrual period between ages 15 and 17, with only 2.50% experiencing menarche under 12. Early menarche increases the risk of breast cancer due to longer lifetime exposure to estrogen [6]. Childbearing and breastfeeding practices also influence breast cancer risk. A large majority (88.33%) of the participants have had children, with 61.00% having their first child between ages 25 and 29. Early age at first childbirth is generally protective against breast cancer [25]. Additionally, a significant proportion of women (86.67%) have breastfed their children. Breastfeeding has been shown to reduce breast cancer risk, particularly with longer durations of breastfeeding [26].

The findings of this study align with existing literature on breast cancer risk factors and preventive measures. For example, the low prevalence of alcohol and tobacco use among participants is consistent with findings from other African countries, where lifestyle factors often differ significantly from Western populations [27]. Similarly, the high rate of fruit and vegetable consumption among the participants mirrors dietary patterns in many African societies, which traditionally include a high intake of plant-based foods [28]. The reproductive patterns observed in this study also reflect broader trends in sub-Saharan Africa, where higher fertility rates and extended breastfeeding durations are common [29]. These factors collectively contribute to a unique breast

cancer risk profile that may differ from that seen in more industrialized countries. This study also reveals that a significant proportion of women (61.11%) have heard of mammograms, yet only 22.50% have ever undergone one. This discrepancy suggests a gap between awareness and action, which is consistent with findings from similar studies in other low- and middle-income countries (LMICs). For instance, a study in Kenya found that while 73% of women were aware of mammograms, only 20% had ever received one [30]. The low uptake of mammograms could be attributed to factors such as lack of access to healthcare facilities, financial constraints, and limited awareness of the importance of regular screening. Among those who have had a mammogram, the frequency of the screening is suboptimal, with only 25.93% undergoing annual mammograms. This finding aligns with research from Ghana, where only 15% of women reported having annual mammograms [31]. Regular breast self-examinations (BSE) are also underutilized, with only 38.33% of women performing them. This is slightly higher than the 28% reported in a Nigerian study by Akinola et al. [32], yet it still reflects a significant gap in preventive practices.

The study indicates that 36.11% of women are aware of breast cancer prevention methods. This figure is similar to the 34% reported in a study in Ethiopia [33]. The most recognized prevention methods include regular screening (28.46%), maintaining a healthy diet (15.91%), and regular exercise (13.07%). These findings are consistent with the global literature emphasizing the importance of lifestyle modifications in reducing breast cancer risk [1]. The most significant barriers identified are a lack of awareness (51.11%), financial constraints (15.56%), and accessibility issues (18.06%). These barriers are widely recognized in LMICs. For example, in a study conducted in Uganda, lack of awareness was the primary barrier to breast cancer screening [34]. Financial constraints are also a common issue, as highlighted in a South African study where 40% of women cited cost as a major barrier to screening [35]. The primary sources of information identified in this study are the internet and social media (48.61%), healthcare providers (26.67%), and TV/radio (14.17%). This finding is in line with trends observed globally, where digital media has become a dominant source of health information [36]. However, the reliance on the internet and social media underscores the need for accurate and accessible online health information, particularly in regions with limited healthcare infrastructure. The findings of this study align with those of previous research in several key areas, reflecting common challenges and gaps in breast cancer awareness and prevention in LMICs. Similar to the results reported by Ng'ang'a et al. [30] in Kenya, the awareness-action gap in Southeast Nigeria highlights the need for enhanced educational interventions and accessible screening programs. The low frequency of mammograms and BSE parallels findings in Ghana [31] and Nigeria [32], suggesting that increasing the regularity of these practices remains a critical challenge.

Moreover, the barriers identified in this study are consistent with those documented in other LMICs, emphasizing the persistent issues of awareness, financial constraints, and accessibility [34,35]. The role of digital media as a primary information source highlights the growing influence of technology in health education, a trend supported by Rains [36]. The results of this study indicate that awareness of breast cancer risk factors among women residing in Southeast Nigeria is relatively low. As depicted in Figure 1, 46.94% of the participants were not aware of breast cancer risk factors, 34.44% were somewhat aware, and only 18.61% were fully aware. These findings are consistent with previous research conducted in other regions of Nigeria and similar developing countries, where awareness levels are often found to be suboptimal [4,7]. The low level of full awareness (18.61%) is particularly concerning, as knowledge of risk factors is crucial for early detection and preventive measures. A study by Okobia et al. [5] highlighted that in Edo State, Nigeria, a significant proportion of women had inadequate knowledge about breast cancer, which adversely affected their screening practices. Furthermore, in a comparative study across African countries, Jedy-Agba et al. [3] found that awareness levels in rural areas were significantly lower than in urban centres, pointing to a pervasive issue of health education dissemination in less accessible regions. The findings related to access to healthcare present a challenging picture. According to Table 5, only 20.56% of women reported visiting a healthcare provider regularly (at least once a year), while 66.39% visited only when sick. This irregular interaction with healthcare services hampers the chances of early detection of breast cancer. Previous studies have shown that regular medical check-ups are linked to higher rates of early diagnosis and better prognosis in breast cancer cases [37].

Moreover, access to breast cancer screening services is alarmingly low, with only 29.44% of the participants having access to such services. The barriers to accessing these services, as identified in this study, include a lack of facilities (20.98%), high cost (30.24%), lack of awareness (35.69%), cultural beliefs (10.08%), and fear of diagnosis (3.00%). These barriers reflect a multifaceted problem that encompasses economic, educational, and socio-cultural dimensions. In comparison to the study by Oche and Ayodele [38], which also investigated breast cancer awareness and screening in Northwest Nigeria, our findings show a slightly lower level of awareness and access to screening services. Oche and Ayodele reported that approximately 35% of their respondents were aware of breast cancer screening methods, whereas our study shows only 29.44% having access to screening services. This difference may be attributed to regional disparities in healthcare infrastructure and educational outreach programs. Similarly, a study by Akinola, et al. [32] in Southwest Nigeria found that 40% of women had never heard of breast cancer screening methods, indicating a higher level of awareness compared to the 46.94% in our study who were not aware of risk factors. This underscores the regional variations within Nigeria, highlighting the need for localized interventions. The barriers identified in our study, such as high cost and lack of facilities, are recurrent themes in the literature. For instance, Ezeome and Ezugwu [39] reported that financial constraints and inadequate healthcare facilities were significant obstacles to breast cancer screening in Enugu, Southeast Nigeria. Additionally, the lack of awareness and cultural beliefs as barriers were also documented by Nwafor and Imman [40], who emphasized the role of cultural and societal norms in shaping health-seeking behaviours.

Cultural beliefs and fear of diagnosis, though less frequently cited, are crucial factors. Cultural perceptions about cancer, as explored by Adebamowo et al. [27], often include fatalistic attitudes and misconceptions that prevent women from seeking timely medical help. Our findings that 10.08% cited cultural beliefs and 3.00% cited fear of diagnosis align with these earlier observations, suggesting the need for culturally sensitive educational campaigns.

The data from our study shows that slightly over half (53.33%) of the women in Southeast Nigeria believe that breast cancer can be prevented. This figure is consistent with findings from similar studies in different geographical locations. For instance, a study conducted in Ghana found that 55% of women believed in the possibility of preventing breast cancer [41]. This similarity suggests that there is general optimism about the prevention of breast cancer among women in West Africa, despite regional variations. However, the proportion of women who are unsure (33.33%) or do not believe in prevention (13.33%) highlights a significant gap in awareness and education. This uncertainty could be attributed to a lack of adequate information and education about breast cancer prevention methods. This is supported by findings from a Nigerian study that indicated low levels of awareness about breast cancer prevention strategies among women [5]. These gaps suggest a critical need for comprehensive education and awareness programs to bridge the knowledge deficit and enhance belief in prevention. Attitudes towards breast cancer prevention among women in our study varied significantly. While 31.11% of respondents considered prevention moderately important, only 8.06% and 12.78% regarded it as very important and extremely important, respectively. This distribution indicates a moderate level of priority given to breast cancer prevention.

Previous studies have highlighted similar trends. In a study by Akhigbe and Omuemu [42], it was noted that only a small fraction of women regarded breast cancer prevention as a high priority. This finding points to a possible cultural influence where immediate health concerns are often prioritized over preventive measures due to economic and educational constraints. The substantial proportion of women who deem breast cancer prevention as slightly important (22.50%) or not important (25.56%) further emphasizes the need for targeted educational campaigns. According to Smith et al. [43], addressing cultural beliefs and misconceptions about breast cancer through community-based interventions can significantly improve attitudes towards prevention. The willingness of women to participate in breast cancer prevention programs is notably high in our study, with 39.72% being very willing and 24.17% extremely willing. This positive inclination towards participation is a promising indicator for public health initiatives aimed at reducing breast cancer incidence.

Comparatively, a study in Kenya reported that 45% of women were willing to participate in breast cancer screening programs [44]. This slight difference may be due to varying levels of program accessibility and public health infrastructure. The low percentage

(1.11%) of women not willing to participate in prevention programs in our study suggests that with appropriate outreach and resources, participation rates could be significantly enhanced. The data also indicates that while willingness to participate is high, there is a need to convert this willingness into actual participation. According to research by Nwozor and Oragudosi [45], facilitating access to screening services and educating women about the importance of early detection are critical steps in ensuring high participation rates in prevention programs. When comparing our findings with previous studies, it is evident that there are both consistencies and disparities in the beliefs, attitudes, and willingness regarding breast cancer prevention among women in different regions. The general belief in the preventability of breast cancer aligns with regional studies in West Africa [5,41]. However, the moderate attitude towards the importance of breast cancer prevention seen in our study is less encouraging and suggests that more intensive efforts are needed to raise awareness. Moreover, the high willingness to participate in prevention programs seen in our study is encouraging and mirrors findings from other African studies [44,45]. This willingness is crucial for the success of prevention programs and should be leveraged by public health officials to design and implement effective breast cancer prevention strategies.

Conclusion

The study highlights significant gaps in awareness, screening practices, and healthcare access related to breast cancer among women in Southeast Nigeria. Addressing these through targeted education, improving healthcare infrastructure, and culturally sensitive interventions could enhance early detection and prevention efforts.

Declarations

Conflict of Interests

The authors declare no potential conflict of interest in relation to this study.

Authors' Declaration

The authors hereby declare that the work presented in this article is original and that any liability for claims relating to the content of this article will be borne by them.

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