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KNOWLEDGE AND PRACTICE OF BREAST SELF-EXAMINATION FOR BREAST CANCER PREVENTION AMONG ADULT NIGERIAN WOMEN RESIDING IN SUNDERLAND, UNITED KINGDOM

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ABSTRACT

Breast cancer is a major global health concern, significantly contributing to morbidity and mortality among women. Early detection is essential for reducing breast cancer-related deaths, and breast self-examination (BSE) represents a simple and cost-effective preventive strategy. However, the practice of BSE among specific migrant populations remains insufficiently studied. This study evaluates the knowledge and practice of BSE among adult Nigerian women residing in Sunderland, United Kingdom. A cross-sectional study was conducted using a structured questionnaire distributed to 126 Nigerian women aged 18 years and above residing in Sunderland, UK. The questionnaire evaluated participants' knowledge of BSE, frequency of practice, perceived barriers, and factors influencing adherence. Descriptive statistics, including percentages, and inferential analysis using chi-square tests were applied for data analysis. A substantial majority (88.10%) of respondents reported awareness of BSE, with health workers identified as the primary source of information. Participants also demonstrated a high level of BSE practice, with 40.48% performing it weekly. Additionally, a statistically significant association was found between knowledge and practice of BSE in breast cancer prevention among the study population ($p < 0.05$). The findings highlight the necessity of ongoing education regarding breast cancer prevention strategies. Healthcare professionals are encouraged to intensify awareness initiatives by providing Nigerian women with information on the optimal timing and techniques for performing BSE, thereby improving adherence and early detection outcomes.

Keywords: Knowledge, Practice, Breast Self-Examination, Breast Cancer Prevention, Nigerian Women, Sunderland

INTRODUCTION

Breast cancer remains a critical global health issue. Its incidence and mortality rates have risen significantly in recent years (Arnold et al., 2022). In 2020, the World Health Organisation (WHO) projected approximately 10 million new cases of breast cancer. However, actual figures surpassed these estimates, reaching 19.3 million, highlighting the widespread nature of the disease (WHO, 2021). WHO forecasts a 50% increase in breast cancer incidence by 2040. This underscores the urgent need for preventive and early detection strategies. Additionally, breast cancer remains the leading cause of cancer-related deaths among women, with 685,000 fatalities reported globally in 2020 (Arzanova & Mayrovitz, 2022).

Although breast cancer affects women worldwide, disparities in incidence and mortality rates exist between regions. Low- and middle-income countries experience higher fatality rates due to limited access to early detection, diagnosis, and treatment services (Sarker et al., 2022). Even in high-income countries with well-established breast cancer screening programmes, racial and ethnic disparities persist. Women of African descent, including Nigerians, are more likely to develop breast cancer at a younger age, often before 40 years compared to their White counterparts. This emphasizes existing health inequities (American Cancer Society, 2023). In Nigeria, Africa's most populous country, breast cancer incidence is rising rapidly due to urbanization, changing lifestyles, and inadequate healthcare infrastructure (Fatiregun et al., 2021). Despite lower incidence rates than some Western nations, Nigeria has one of the highest breast cancer mortality rates globally, with a prevalence of 22.7% and approximately 12,000 deaths reported in 2018 (Fatiregun et al., 2021). An estimated 100,000 new cancer cases are diagnosed annually in Nigeria. Breast cancer contributes to the highest case fatality rate among women (Jedy-Agba et al., 2021).

A key factor contributing to the high breast cancer mortality rate in Nigeria is late-stage diagnosis, primarily due to insufficient awareness and poor access to early detection services. Nigerian women are more frequently diagnosed with aggressive breast cancer subtypes, such as triple-negative breast cancer, at younger ages compared to women of European ancestry (Health Think, 2021). Studies have consistently shown that survival rates among Nigerian women remain low, as most cases are detected at advanced stages when treatment options are limited (Adebamowo & Adekunle, 1999; Ihekwaba, 1992). This highlights the need for effective prevention, early detection, and intervention strategies to reduce breast cancer mortality among Nigerian women, both within Nigeria and in diaspora communities.

Early detection is crucial for improving breast cancer outcomes, as timely intervention significantly increases survival rates (WHO, 2021). WHO (2021) emphasizes mammography, clinical breast examination, and breast self-examination (BSE) as essential early detection strategies. Among these methods, BSE is a cost-effective and accessible approach that enables women to detect breast abnormalities, such as lumps or changes in texture, which may indicate the presence of cancer (WHO, 2021). BSE empowers women to take an active role in monitoring their breast health and facilitates early medical consultation when abnormalities are identified (Isara & Ojedokun, 2011). According to the National Cancer Institute (2020), approximately 40% of

confirmed breast cancer cases are first detected by women themselves through BSE, highlighting the importance of promoting this practice.

Evidence suggests that adequate knowledge of BSE significantly influences early detection behaviours and health-seeking attitudes (Thomas et al., 2002; Kosters & Gotzsche, 2003). However, cultural beliefs, societal norms, and lack of awareness often serve as barriers to the adoption of BSE, particularly among African women (Morsiglia & Booth, 2014). Nigerian women, both in Nigeria and in diaspora communities, may face additional challenges in accessing breast cancer awareness programs due to stigma and misinformation. This lack of awareness often results in low rates of early detection, contributing to delayed diagnoses and increased mortality.

While various studies have examined breast cancer awareness and BSE practices in different populations, there is limited research specifically focusing on Nigerian women in diaspora communities, such as Sunderland, United Kingdom. Sunderland has a significant Nigerian population, yet little is known about their knowledge, attitudes, and practices related to BSE. Given that Nigerian women tend to develop more aggressive breast cancer subtypes and are often diagnosed at later stages (Aluko et al., 2014), understanding their awareness and practice of BSE is essential for developing targeted health promotion initiatives.

Existing research underscores the need for improved breast cancer awareness and screening accessibility among Nigerian women worldwide, as early detection is critical to reducing mortality rates (Okoye et al., 2017). Studies indicate that 70% of Nigerian women diagnosed with breast cancer present at advanced stages when treatment options are limited (Hanson, Adejumo, & van Wyk, 2017). This highlights the necessity of public health interventions that educate Nigerian women on the benefits of early breast cancer detection and equip them with the knowledge and skills needed for regular BSE.

This study aims to assess the level of knowledge and practice of BSE among adult Nigerian women (18–65 years) residing in Sunderland, United Kingdom. By examining factors influencing BSE awareness and adoption, the research seeks to generate insights that can inform culturally sensitive health education programs to improve early detection behaviors in this population. Identifying knowledge gaps and barriers to BSE practice among Nigerian women in Sunderland will support the development of targeted interventions that promote proactive breast health management and reduce breast cancer-related mortality.

MATERIALS AND METHODS

Study Design

This research employed a cross-sectional study design, which is widely used in public health research to assess the prevalence of specific behaviours, knowledge, and attitudes within a population at a single point in time (Wang and Cheng, 2020). This approach was chosen to evaluate the level of knowledge and practice of breast self-examination (BSE) among adult Nigerian women residing in Sunderland, United Kingdom. The cross-sectional nature of the study allowed for the collection of data on various factors influencing BSE awareness and adoption, providing valuable insights into potential barriers and facilitators of early breast cancer detection within this population.

Study Area

The study was conducted in Sunderland, a city located in the Northeast of England, on the eastern coast of the United Kingdom. It serves as the administrative centre of the Sunderland metropolitan borough and is historically part of County Durham. The city is situated approximately 10 miles (16 km) southeast of Newcastle upon Tyne and lies at the mouth of the River Wear, which flows into the North Sea. The river also runs through Durham, about 12 miles (19 km) south of Sunderland's metropolitan centre, making Sunderland the second-largest settlement in the Northeast region after Newcastle upon Tyne (Britannica, 2023).

Sunderland is home to the University of Sunderland, which attracts a diverse population, including a notable Nigerian community. The city also features various cultural and recreational attractions, including the Sunderland Museum and Winter Gardens, which houses collections related to art, history, and natural sciences. Additionally, Sunderland's coastal location offers scenic beaches such as Roker Beach and Seaburn Beach, which contribute to the city's appeal. The Stadium of Light, home to Sunderland AFC, is a well-known sporting venue in the region. Residents of the city are commonly referred to as Mackems (Britannica, 2023). Given the diverse and growing populations in Sunderland, this location was chosen for the study to explore breast cancer awareness among Nigerian women in a diaspora setting.

Study Participants

Inclusion Criteria

The study recruited adult Nigerian women aged 18 years and above who are living or residing in Sunderland at the time of the research. These participants were included to assess their knowledge and practice of BSE, as well as their perceptions regarding early breast cancer detection.

Exclusion Criteria

The study excluded non-Nigerian women, those below 18 years of age and those who are not resident in Sunderland.

Study Population

The estimated population of adult Nigerian women (18–65 years) residing in Sunderland is approximately 245 individuals. This estimate was used as the basis for determining the appropriate sample size for the study.

Sample Size

The sample size for the study was determined using Taro Yamane formula (Uniproject Materials Wed Team, 2016).

$S = \frac{N}{(1+N(e)^2}$ is the Taro Yamane Formula, where S is the sample size, e is the margin error (0.05), 1 is the constant value and N is the population.

$S = \frac{245}{(1+245(0.05)^2}$

$= \frac{245}{1+245 \times 0.0025}$

$= \frac{245}{1+0.6125}$

$= \frac{245}{1.6125}$

$\therefore S = 151$

Based on this formula, the sample size was determined to be 151.

Instrument for Data Collection

A semi-structured questionnaire was developed based on a comprehensive review of existing literature to collect relevant data for the study. The instrument was designed to assess knowledge and practice of breast self-examination (BSE) among adult Nigerian women living in Sunderland, with an emphasis on clarity and ease of comprehension for respondents.

The questionnaire comprised three sections, each addressing a distinct aspect of the study. The instrument was adapted from previously published questionnaires assessing breast self-examination knowledge and practice among women (e.g., Dadzi and Adam, 2019; Dinegde et al., 2020; Sarker et al., 2022), with contextual modifications to reflect the study population. The questionnaire was pretested among 15 adult Nigerian women residing in Newcastle upon Tyne, a city geographically close to but distinct from the study area, to assess clarity, comprehensibility, and acceptability of the items. Feedback from the pretest informed minor revisions to wording and sequencing of questions.

To ensure the content validity of the instrument, the questionnaire was reviewed by two experts in the field of public health and oncology. These experts provided feedback on the clarity, relevance, and appropriateness of the questions. Based on their suggestions, minor adjustments were made, including rewording ambiguous questions to improve clarity and eliminating redundant or unclear items to ensure a more focused and efficient questionnaire. The revised version of the questionnaire was finalised after incorporating these expert recommendations.

Recruitment Approach

A multifaceted recruitment strategy was implemented to ensure broad participation among Nigerian women in Sunderland. Both online and face-to-face methods were used to maximize outreach and inclusivity. Digital platforms, including Facebook, WhatsApp, and Telegram, as well as online community groups specific to the Nigerian diaspora in Sunderland, were utilized to distribute the questionnaire link. Participants were encouraged to share the survey within their networks, facilitating a snowball sampling effect. Direct recruitment also occurred through community-based interactions at locations frequented by Nigerian women, such as churches, mosques, community centres, university campuses, shopping malls, and other public spaces.

Before administering the questionnaire, the study's purpose was explained to each participant, and verbal consent was obtained. Participants were assured of the confidentiality of their responses and informed that participation was voluntary. The integration of digital and in-person recruitment methods ensured a diverse and representative sample, thereby enhancing the reliability and generalizability of the study's findings.

Data Analysis

The collected data were analysed using IBM SPSS Statistics Version 25.0. Descriptive statistics, including frequency distributions and percentage scores, were used to evaluate participants' knowledge and practice of breast self-examination (BSE). Participants' knowledge was assessed using eight key items covering awareness of BSE, sources of information, knowledge of breast cancer risk factors, signs and symptoms, treatment, appropriate timing of BSE, diagnostic methods, and the importance of BSE in early detection. Correct or appropriate responses were scored as 1 and incorrect or 'don't know' responses as 0, yielding a total score ranging from 0 to 8. Practice was assessed using five items relating to whether participants practiced BSE, frequency, age at initiation, appropriate timing, and position used during examination, with scores ranging from 0 to 5. For both domains, scores equal to or above 50% of the maximum attainable score were categorized as good knowledge/practice, while scores below 50% were classified as poor knowledge/practice, consistent with approaches used in similar studies.

To assess relationships between key study variables, inferential statistical analysis was conducted. Specifically, the Chi-square (χ^2) test was used to determine the association between sociodemographic factors and participants' knowledge and practice of BSE. A 0.05 level of significance ($p \leq 0.05$) was adopted to establish statistical significance, ensuring that observed associations were not due to random chance. This analytical approach provided both an overview of BSE awareness and practice among the study population and insights into potential factors influencing these behaviours.

Ethics Considerations

This study received ethical approval from the University of Sunderland Research Ethics Committee, Faculty of Health Sciences and Wellbeing, on 10th May 2023, with the application reference number 017011.

Prior to data collection, all participants were provided with a participant information sheet and consent form electronically or in person before completing the questionnaire. Written informed consent was obtained from all participants before their involvement in the study. In the online survey, participants indicated consent by electronically signing the consent section before accessing the questionnaire, whereas paper-based respondents signed a printed consent form.

RESULTS AND DISCUSSION

A total of 151 questionnaires were distributed, out of which 126 were fully completed and included in the final analysis, yielding a response rate of 83.4%. Table 1 presents the self-reported sociodemographic characteristics of participants. The largest age group was 31–40 years (41.27%), followed by those aged 21–30 years. The majority of participants were married (65.87%), while a smaller proportion were single, divorced, or widowed. Regarding educational background, most respondents (95.24%) had attained tertiary education, indicating a high level of formal education among participants. In terms of employment status, non-public sector workers accounted for 46.03% of the sample, while the remainder were engaged in public service or self-employment. Religious affiliation showed that Christianity was the predominant faith, with 88.89% of participants identifying as Christians, while the rest followed other religious beliefs. These demographic insights provide a foundational understanding of the participants' profiles, which may influence their knowledge and practice of breast self-examination (BSE).

Table 1: Sociodemographic Characteristics of Participants

Variable	Frequency (N)	Percentage (%)
Age (Years)		
21-30	47	37.30
31-40	52	41.27
41-50	23	18.25
51-60	3	2.38
61-70	1	0.79

Variable	Frequency (N)	Percentage (%)
Marital Status		
Single	43	34.13
Married	83	65.87
Education		
Primary	2	1.59
Secondary	4	3.17
Tertiary	120	95.24
Occupation		
Public Servant	45	35.71
Non-public Servant	58	46.03
Unemployed	23	18.25
Religion		
Islam	11	8.73
Christianity	112	88.89
Others	3	2.38

Table 2 presents the distribution of participants' knowledge and awareness regarding breast self-examination (BSE). The results indicate that a significant majority (88.10%) of respondents reported being aware of or have previously heard about BSE. Among those who were aware, the primary source of information was healthcare professionals, with 62.70% of participants stating that they received BSE-related information from health workers. In terms of breast cancer awareness, 68.25% of participants demonstrated knowledge of key risk factors associated with the disease. Additionally, 59.52% were aware that breast cancer is treatable, reflecting a moderate level of understanding regarding disease management. Regarding the practice of BSE, 70.63% of participants correctly identified the appropriate timing for performing the procedure, indicating a relatively strong awareness of best practices for early detection. However, slightly more than half (55.56%) understood breast cancer diagnosis, suggesting a need for further education on screening and diagnostic methods. Remarkably, 65.08% of respondents believed that breast self-examination should only be performed by females, highlighting a potential misconception that may limit broader awareness of breast cancer detection practices among men. This finding underscores the necessity for targeted public health education to address gender-related misconceptions and emphasize that breast cancer, though more prevalent in women, can also affect men.

Table 2: Knowledge and Awareness of Breast Self-Examination Among Adult Nigerian Women (18–65 Years) Living in Sunderland

Variable	Frequency (N)	Percentage (%)
Awareness of Breast Self-examination		
Yes	111	88.10
No	15	11.90
Sources of Breast Self-examination information		
Health Workers	79	62.70
Family Member	20	15.87
Book/Print Materials	15	11.90
Others	12	9.52
Have knowledge of risk factors of Breast Cancer		
Yes	86	68.25
No	40	31.75
Have Knowledge of Signs and Symptoms of Breast Cancer		
Yes	84	66.67
No	42	33.33
Have Awareness of Treatment of Breast Cancer		
Yes	75	59.52
No	51	40.48
Have Knowledge of Time to Conduct Breast Self-examination		
Yes	89	70.63
No	37	29.36
Have Knowledge of Diagnosis of Breast Cancer		
Yes	70	55.56
No	56	44
Who Should Perform Breast Self-examination?		
Males Only	–	–
Females Only	82	65.08
Both Males/Females	33	26.19

Variable	Frequency (N)	Percentage (%)
Don't Know	11	08.73
Breast Self-examination is important in early detection of Breast Cancer		
Important	90	71.43
Not Important	16	12.70
Don't Know	20	15.87

Table 3 presents the level of breast self-examination (BSE) practice among study participants. The majority (76.19%) reported practicing BSE, with 40.48% performing it weekly. Additionally, most participants believed that the appropriate age to start BSE is between 18–30 years (69.84%). Regarding the optimal timing for BSE, 43.65% identified a week after menstruation as the best period. Furthermore, 33.33% stated that conducting BSE in front of a mirror is the most appropriate position for self-examination.

Table 3: Practice of Breast Self-Examination Among Adult Nigerian Women (18–65 Years) Living in Sunderland

Variable	Frequency (N)	Percentage (%)
Do you practice breast self-examination?		
Yes	96	76.19
No	30	28.81
Frequency of practice of Breast self-examination		
Weekly	20	15.87
Monthly	51	40.48
Yearly	9	7.14
Don't know	46	36.51
Appropriate Age to practice Breast Self-examination		
18-30	88	69.84
31-40	29	23.02
41-50	6	4.76
51-60	3	2.38
61-70	0	0.00
Appropriate time to practice Breast Self-examination		
A week before menstruation	22	17.46
A week after menstruation	55	43.65
During menstruation	6	4.76
Don't know	43	34.13
Position to observe in doing breast self-examination		
While lying on the bed	23	18.25
Sitting	2	1.59
In front of the mirror	42	33.33
While having a bath	6	4.7
All of the above	53	42.06

Table 4 presents the chi-square analysis examining the relationship between the level of knowledge and practice of breast self-examination (BSE) among the study participants. The results indicate a statistically significant association between knowledge and practice of BSE in breast cancer prevention ($\chi^2 = 6.08$, df = 1, $p < 0.05$), suggesting that participants with better knowledge of BSE were more likely to practice breast self-examination.

Table 4: Chi-Square Analysis of Knowledge and Practice of Breast Self-Examination in Breast Cancer Prevention

Variable	Yes	No	Total	$x^2 = \frac{(0-E)^2}{E}$
Knowledge of Breast Self-examination	111 (103.5) 0.54	15 (22.5) 2.50	126	3.04
Practice of Breast Self-examination	96 (103.5) 0.54	30 (22.5) 2.50	126	3.04
Total	207	45	252	6.08

df = 1, Chi-Square Calculated = 6.08, Chi-Square Critical = 3.84

Discussion

This study revealed a high level of knowledge regarding breast self-examination (BSE) as a preventive measure for breast cancer among adult Nigerian women (18–65 years) residing in Sunderland. Most participants were aware of BSE, with healthcare professionals serving as the primary source of information, followed by family members and other informal sources. Furthermore, participants demonstrated substantial knowledge of breast cancer risk factors, signs and symptoms, appropriate timing for conducting BSE, treatment options, and diagnostic procedures. Most respondents recognized the importance of BSE in the early detection of breast cancer. These findings align with previous studies conducted in India (Gore et al., 2022), , Ethiopia (Dinegde et al., 2020), Ghana

(Dadzi and Adam, 2019), and Nigeria (Ohaeri and Aderigbigbe, 2019), all of which reported moderate to high levels of awareness and knowledge of BSE. However, lower levels of awareness were reported among female adolescents in Bangladesh (Sarker et al., 2022) and India (Pooja et al., 2022).

The high level of BSE knowledge among the study participants suggests that healthcare professionals play a crucial role in disseminating health-related information. Supporting this assertion, Pooja et al. (2022) reported that over 51.7% of their study participants cited healthcare personnel as their primary source of BSE information. Conversely, Dinegde et al. (2022) found that mass media was the predominant source of information for nearly 52% of their study participants, highlighting the influence of media in public health education.

Similarly, the findings of this study indicated a high level of BSE practice among the participants, with most women reporting that they conducted BSE monthly. The majority of respondents identified the appropriate age range for initiating BSE as 18–30 years and acknowledged that the ideal time for performing BSE is one week after menstruation. These findings suggest that increased awareness correlates with higher levels of BSE practice. Supporting this, Sarker et al. (2022) reported a significant positive correlation between breast cancer knowledge scores and BSE practice scores ($r = 0.54$, $p < 0.001$). The study further identified key barriers to BSE practice, including lack of knowledge, absence of symptoms, and feelings of discomfort or embarrassment. However, some studies have reported a paradoxical trend of high knowledge but low BSE practice, as observed by Muhammed Sani and Labaran Yan (2018), Ohaeri and Aderigbigbe (2019), and Gore et al. (2022).

The present study further established that age was a determining factor in BSE practice. The findings align with those of Dinegde et al. (2020) and Dadzi and Adam (2019), who reported an inverse relationship between age and BSE practice, indicating that older women were less likely to engage in regular BSE. This pattern may be attributed to declining health-seeking behaviors and lower risk perception among older individuals.

Several studies have underscored the necessity of educating women on how and when to perform BSE to facilitate early detection of breast cancer. Trisina et al. (2022) identified knowledge as the most significant factor influencing BSE practice ($p = 0.001$; OR = 6.500), followed by exposure to BSE-related information ($p = 0.003$; OR = 3.185). Their study further highlighted that a significant proportion of breast cancer patients in Bali were diagnosed at an advanced stage, with women aged 40–50 years being the most affected. This underscores the importance of early breast cancer screening interventions.

CONCLUSION

The findings of this study emphasize the critical role of knowledge in influencing BSE practice among adult Nigerian women in Sunderland. A statistically significant association was observed between knowledge and practice of breast self-examination, indicating that women with better knowledge were more likely to engage in regular self-examination. Healthcare professionals were the predominant source of information, underscoring their central role in breast cancer education. Continued culturally appropriate health education focusing on the correct timing and techniques of BSE may further improve adherence and support early detection of breast cancer.

Limitations

Several limitations should be considered when interpreting these findings. First, the use of self-administered questionnaires introduces the potential for recall and social desirability bias, as participants may have overestimated their knowledge or reported favorable BSE practices. Second, despite efforts to achieve a representative sample, non-response bias may have influenced the results, as respondents could differ in key characteristics from non-respondents. Third, the study's focus on a specific geographic area (Sunderland) and a relatively small, targeted sample (126 Nigerian women) may limit the generalizability of the findings to other UK regions or diaspora communities. Finally, the cross-sectional design captures data at a single point in time, precluding the establishment of causal relationships between BSE knowledge and practice, despite the observed statistically significant association.

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