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Digital Health Interventions for Breast Cancer Awareness Among Younger Nigerian Women: A Participatory Breast Health Literacy Study

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Abstract

Background

Breast cancer is the most common cancer among Nigerian women, accounting for nearly one-quarter of new cases and a significant proportion of cancer deaths (8,10,28). Rising incidence is linked to lifestyle changes, urbanization, and improved detection, yet late-stage presentation remains prevalent, with over 70% diagnosed at stage III or IV (30). Awareness and screening uptake are low, hindered by stigma and socio-cultural barriers (3,4,13,14). Younger women under 40 are largely excluded from national cancer control strategies (24).

Methods

A participatory digital literacy intervention was created with six women aged 25–40. Inquiry groups and interviews guided co-creation of a culturally relevant website.

Data were analyzed thematically, focusing on awareness, and usability.

Results

Three themes emerged. First, stigma reduction: participants described the platform as a safe space to challenge myths (3,4). Second, improved awareness: women reported greater understanding of risk factors and screening importance (2,13,14). Third, digital usability: navigation was straightforward, but barriers such as data cost and internet access were noted (6,9).

Conclusion

This study demonstrates feasibility of participatory digital literacy interventions for younger Nigerian .The findings highlight opportunities for integrating digital literacy into primary care and community outreach (16,17,24). Scaling such approaches could advance equity in breast cancer prevention and early diagnosis.

Health Promotion Statement

Breast cancer remains a leading cause of mortality among Nigerian women, with late diagnosis and limited awareness contributing to poor outcomes. This project demonstrates that digital health literacy interventions can empower women aged 25–40 by providing accessible, culturally relevant information through an interactive website. By promoting early detection, encouraging screening, and dispelling stigma, e-health platforms foster informed decision-making and community engagement. The participatory approach ensures relevance and sustainability, while bridging the digital divide. Health promotion through tailored online resources offers a scalable model to improve awareness, reduce mortality, and strengthen public health outcomes in Nigeria.

Introduction

Breast cancer accounts for nearly one-quarter of new cancer cases among Nigerian women (8). Rising incidence is linked to lifestyle changes, urbanization, and improved detection (28). Risk factors include genetic predisposition (7, 31), reproductive history (29), and lifestyle factors such as obesity (2). Late-stage diagnosis remains common, with over 70% presenting at stage III or IV (30). Awareness and screening uptake are low, hindered by stigma and socio-cultural barriers (3, 4, 13, 14). Current policy frameworks, including the NSCCP 2023–2027 (24), aim to improve prevention and early detection, but younger women remain underrepresented. This study explores a participatory digital literacy intervention to address these gaps.

Literature Review on Breast Cancer in Nigeria

This literature review examines the current state of breast cancer in Nigeria, focusing on epidemiology, risk factors, diagnosis, treatment, the challenges faced in managing the disease and current efforts to improve breast cancer awareness and screening.

Epidemiology

Breast cancer is the most common cancer among Nigerian women, accounting for 22.7% of all new cancer cases and 16.4% of cancer deaths (8). The incidence rate of breast cancer in Nigeria has been steadily increasing, attributed to a combination of lifestyle changes, urbanization, and improved cancer detection (28). According to the Global Cancer Observatory, the age-standardized incidence rate of breast cancer in Nigeria is 38.7 per 100,000 women, with a mortality rate of 17.8 per 100,000 (10).

Risk Factors

Several risk factors contribute to the high incidence of breast cancer in Nigeria. These include genetic predisposition, reproductive factors, and lifestyle choices. BRCA1 and BRCA2 mutations have been identified as significant genetic risk factors for breast cancer among Nigerian women (31). Reproductive factors, such as early menarche, late menopause, nulliparity, and late age at first childbirth, are also associated with increased breast cancer risk (29). Additionally, lifestyle factors such as obesity, alcohol consumption, and physical inactivity have been linked to higher breast cancer risk (2).

Diagnosis

Late-stage diagnosis is a critical issue in the management of breast cancer in Nigeria. Many women present with advanced disease due to a lack of awareness, limited access to healthcare facilities, and socio-cultural barriers (13). Over 70% of Nigerian women diagnosed with breast cancer were at stage III or IV at the time of diagnosis (30). The use of mammography, crucial for early detection, is limited due to its high cost and lack of widespread availability (6). Socio-cultural factors such as stigma and myths about cancer also hinder effective breast cancer management (3).

Methods

Six women aged 25–40 were recruited via snowball sampling to participate in inquiry groups and interviews (see appendix). Participants co-created a digital literacy platform on breast cancer awareness. Data were analyzed thematically, focusing on stigma, awareness, and usability. Ethical approval was obtained, and informed consent was secured.

Results

Three key themes emerged:Stigma reduction: Participants reported that open dialogue and culturally sensitive content helped challenge misconceptions. Several noted that the platform provided a “safe space” to discuss breast health without fear of judgment (3, 4).

Improved awareness: Women described increased understanding of risk factors, symptoms, and the importance of early screening. The interactive design and visual aids were highlighted as particularly effective in communicating complex information (2, 13, 14).Digital usability: Participants found the website easy to navigate, though cost of data and inconsistent internet access were cited as barriers. Feedback emphasized the need for mobile-friendly formats and offline accessibility (6, 9).

Discussion

This study demonstrates the feasibility of participatory digital literacy interventions in addressing inequities in breast cancer awareness among younger Nigerian women, a group historically underrepresented in the National Strategic Cancer Control Plan (24). By involving participants directly in design, the project enhanced cultural relevance and trust, aligning with broader goals of national cancer control.

The findings also highlight how social determinants of health—health literacy, and digital access—shape health behaviors (3, 6, 13, 14). However, there were some limitations in the study. The use of snowball sampling introduced selection bias, favoring women already digitally literate or health-aware (2, 28). Integrating digital literacy platforms into primary care and community outreach could help reduce inequities in cancer outcomes, provided interventions are scaled equitably and supported by efforts to address economic barriers to screening and treatment (16, 17, 25, 26).

Future Research Directions

Mixed-methods evaluation: Larger studies combining qualitative and quantitative measures to assess awareness and screening uptake.

Longitudinal outcomes: Track sustained impact on stigma reduction, screening behavior, and early detection over time.

Equity analysis: Examine differences by socioeconomic status, rural vs. urban residence, and digital access.

Policy translation: Test integration of digital literacy platforms into Nigeria's NSCCP and primary care systems.

Conclusion

This project offers a proof-of-concept for participatory digital literacy interventions in cancer control. By engaging younger Nigerian women in co-creation, the study demonstrated feasibility and cultural relevance, addressing gaps in awareness and stigma. The findings provide exploratory insights into how digital health can complement existing systems (6, 9, 31). Future research should employ larger, mixed-methods designs to assess long-term outcomes and scalability. Ultimately, integrating digital literacy into primary care and community outreach could advance equity in breast cancer prevention and early detection (16, 17, 24).

Policy Implications

Equity in cancer control: Digital literacy interventions can help close awareness gaps among younger women, a group underrepresented in Nigeria's current NSCCP (24).

Integration into primary care: Embedding participatory digital platforms within community health services could improve early detection and reduce late-stage diagnoses (13, 14, 25).

Scalable innovation: Mobile-based approaches offer cost-effective, scalable solutions that complement existing policy frameworks (6, 9, 31).

Future research translation: Evidence from pilot interventions should inform revisions of the NSCCP to ensure inclusion of younger women and address socio-economic barriers to screening (16, 17, 25, 26).

Declarations

Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Competing Interests Statement

The author declares that they have no competing interests

Patient and Public Involvement Statement

Women aged 25–40 were actively involved in the design and conduct of this study. Participants co-created the digital literacy platform through inquiry groups and interviews, shaping its content, usability, and cultural relevance. Their feedback directly informed the intervention's features, including emphasis on stigma reduction, awareness of risk factors, and mobile-friendly design. Participants also reviewed preliminary findings and validated interpretations to ensure accuracy and resonance with lived experiences. This participatory approach ensured that the research was grounded in community priorities and responsive to the needs of younger Nigerian women.

Data Availability Statement

The qualitative data generated from inquiry group discussions and interviews are not publicly available due to privacy and ethical restrictions. Anonymized excerpts and aggregated insights supporting the findings are available from the corresponding author upon reasonable request. The data generated from the inquiry group discussions are not publicly available. Anonymized excerpts and insights supporting the findings are available on reasonable request from the author.

Ethics Approval and Consent to participate

This research was approved by Lancaster University, United Kingdom as part of a postgraduate study program.

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and its subsequent amendments. All participants were provided with an information sheet detailing the purpose, procedures, and significance of the study. Informed consent was obtained electronically via Google Forms, with participants affirming their voluntary agreement by selecting "Yes, I agree." Confidentiality and anonymity were strictly maintained, and all data were securely stored in compliance with the Data Protection Act.

Consent for Publication

All participants provided informed consent for the use of anonymized quotes and insights in publications arising from this study. No identifying information has been included, and confidentiality was strictly maintained. Consent was obtained in accordance with the ethical principles of the Declaration of Helsinki.

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Author Contribution

Study design,data collection,analysis and interpretation,drafting and revising of manuscript was done by Uchenna Ndu.

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Supplementary Files

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- interview.docx