Using Blended-learning Approach to Improve Education on Clinical Pathways for Breast Cancer Management in Nigeria: A Research Protocol

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ABSTRACT

Background: Breast cancer is the most common type of cancer affecting Nigerian women. Most Nigerian clinicians lack adequate skills and resources in screening, diagnosis, and managing women with breast cancer. The absence of locally sensitive clinical pathways (CPs) in most Nigerian hospitals, including those in Abia State, impacts patient outcomes. A blended learning (BL) approach has been used in other settings to improve the competence of clinicians. **Objective:** The objective of this study was to develop and evaluate a BL course that will train clinicians in Abia State on using established breast cancer management guidelines and to develop and implement CPs that are locally informed. Participants will also be taught clinical skills that will ensure the easy use of the CP, including clinical breast examination and breast biopsy. **Methods:** The target audience for this educational research includes primary care providers, specialists, resident doctors, and radiographers in Abia State. This audience is directly involved in the screening, diagnosis, and management of breast cancer. A sample size of 107 individuals is required to identify a large effect size. The course will be divided into five modules, which will run over 6-week period. The course will be evaluated using an objective-focused method, following a mixed-methods pre-and post-test design. Quantitative data will be analyzed using descriptive statistics, *t*-test, and ANOVA. Qualitative data will be transcribed and deductively analyzed to identify common themes. **Results:** The research is in the preliminary stage. Ethics approval has been obtained. Stakeholder meetings, content development, and participant recruitment are in progress. Findings will show how this course was developed and its anticipated impact. **Conclusion:** This innovative study would be the first application of BL approach in training clinicians on CPs. End-of-study knowledge translation method will be used to disseminate the finding.

Key words: Medical education, breast neoplasms, Nigeria, Distance education

BACKGROUND INFORMATION

The burden due to cancers is rising in Nigeria and other developing countries. Breast cancer is the second most common malignancy affecting Nigerian women and contributes the highest cancer-related mortality in this population.[1,2] Despite the rising prevalence of cancers in Nigeria, Nigerian health-care professionals have limited skills and resources to screen, diagnose, treat, and follow-up women with breast cancer.[2-4] The knowledge

gap in the management of various types of cancers in this region is further compounded by the lack of locally sensitive guidelines commonly referred to as "clinical pathways (CPs)."[4] Anecdotal evidence suggests that many institutions in Nigeria follow the cancer management guidelines proposed by the National Comprehensive Cancer Network (NCCN). Although the NCCN guidelines are mostly applicable to high-resource settings, they can be locally adapted through CPs to optimize cancer care.

CPs are evidence-based multidisciplinary care plans that outline the essential steps needed in the care of patients with a specific clinical problem (e.g., breast cancer). Essentially, CPs seek to link evidence to practice for specific health conditions, therefore, optimize patient outcomes, and maximize clinical efficiency.[5,6] They are used to translate universal clinical guidelines (e.g., NCCN breast cancer guidelines) into local protocols which inform clinical practice. Breast cancer CPs have been shown to reduce hospitalization, improve patient outcomes, reduce patient anxiety,[7] and improve overall patient satisfaction.[8] Although there has been no research conducted to evaluate the competence of Nigerian clinicians on the use of NCCN guidelines, evidence suggests that there is limited competence for cancer prevention, early diagnosis, and management.[2,9]

Blended learning (BL) has been shown to improve the competence of clinicians.[9] Following the tradition of self-directed learning in continuing medical education, BL involves the use of electronic and face-to-face classes to teach clinical concepts. This method has been found to be effective in several clinical areas including family medicine, orthopedics, and undergraduate medical education.[10] This research seeks to develop a training program to equip clinicians with the skills and competency to develop and implement CPs for breast cancer management in Abia State. We intend to develop a blended-learning course that will train clinicians in Abia State on the use of NCCN breast cancer guidelines and how to adapt the universal recommendations to local hospital contexts.

Goal and objectives
The overall goal of this project is to use BL approach to build the competence of clinicians in Abia State in managing breast cancer and to also use the NCCN guidelines as a foundational document to develop local CP for breast cancer management.

The objectives of this research are as follows:
1. To develop a BL course on the use of NCCN breast cancer management guidelines in Abia State.
2. To build competence of healthcare provi-ders in creating local CPs for breast cancer management in Abia State.
3. To evaluate the effect of the training program using established adult education quality metrics. This will help ensure the rigor of our research and reliability of

our findings. It will also help improve the program to be optimized for further use in similar clinical environments.

The questions to be answered by this research are as follows:
1. To what extent does a blended learning approach impact clinicians' perceived knowledge of breast cancer management?
2. To what extent does a blended learning approach impact clinicians' content knowledge (based on NCCN guidelines) of breast cancer management?
3. To what extent does a blended learning approach improve clinicians' competence in developing local clinical pathways for breast cancer management?
4. Do clinicians perceive blended learning as an effective strategy for training on breast cancer management?

Learner objectives
At the end of the course, learners will be able to:
• Diagnose and manage breast cancer using NCCN guidelines
• Develop locally appropriate CPs for breast cancer.

METHODS

Study participants
The target participants for this study include primary care providers (e.g., family physicians and general nurses), specialists (including radiologists and surgeons), residents, and radiographers working in Abia State. We will also extend the training to students of medicine, nursing, and radiography in the state.

These participants will be recruited through various professional organizations in Abia State, including Nigerian Medical Association, National Association of Nigerian Nurses and Midwives, the Association of General Private Medical Practitioners of Nigeria and their nursing counterparts, as well as primary health-care service providers in government health facilities. These professional organizations typically mobilize their members using social media/networking sites (e.g., Facebook® and WhatsApp®). The professional organizations will be requested to allocate continuous professional development points to this course, to attract participants. Interested individuals will be required to register online for the course at no charge. The course will also be made accessible to potential participants from neighboring states, such as Akwa Ibom State.

Course design
This will be a blended-learning course, having both electronic and face-to-face components. BL approach has been shown to be an effective learning method because it enhances student participation, provides more time for them to interact with course materials, and enables individuals to learn at their own pace. This method

has been found to be effective in several clinical areas including family medicine, orthopedics, and undergraduate medical education.[10] Our study will apply the self-directed learning theory of medical education.[11] This approach requires personal involvement of the learner, learning that is self-initiated and that comes from within, and learning that is evaluated by the learner.[11] It is usually focused on problem-solving, such as developing CPs.

The course will be divided into five modules, which will run over 6-week period. Module 1 will focus on a brief overview of the goals of the course and an introduction to breast cancer. Module 2 will focus on the early detection of breast cancer. This module will include discussions on breast self-examination, clinical breast examination, understanding ultrasound findings, and understanding mammography findings. In the third module, participants will be trained on breast cancer diagnosis using ultrasound-guided biopsy. This module will be delivered with experts in breast ultrasound imaging. Module 4 will introduce participants to the management of breast cancer based on the NCCN breast cancer guideline harmonized for Sub-Saharan Africa.[12] It will also feature some content on interprofessional collaboration. The final module will focus on CPs. Participants would be trained on developing CPs that can be applicable to their local setting.

For each module, participants will participate in an online course. Information will be presented with the use powerpoint slides, interactive videos, and games. The electronic component will be accessible using computers and mobile devices and will be developed using Moodle (Modular Object-Oriented Dynamic Learning Environment, Moodle Pty Ltd, Perth, Australia). This will require class interaction and reflective writing to demonstrate mastery of course materials. It is estimated that participants will require about 2 h to complete each online module. Each of the online modules will run for 1 week. Online modules will be hosted by Obong University, a Nigerian private higher education institution. To enhance the course experience, we will limit the class size for the online component to 40 individuals. This will make it more manageable for the course facilitators. We will have three different cohorts of the course. All the cohorts may run concurrently. Each cohort will be facilitated by an experienced clinician and assisted by another clinician. The cohort facilitator and assistant will moderate discussions and class activities.

In the 6th week, there will be a face-to-face workshop to summarize the previous five modules and provide simulated, collaborative experience in developing CPs. We will also provide an opportunity for participants to practice clinical breast examination and breast ultrasound on community volunteers and to demonstrate how they could apply the new CP in the management of suspected cases. For instance, we will invite the community to participate in free breast cancer screening, using clinical breast examination and ultrasonography. Participants who discover suspicious lesions will be required to demonstrate how they will obtain a breast biopsy and follow-up those cases using the local developed CP. A breast cancer survivor will also be part of the faculty for the face-to-face workshop, to share practical experience on dealing with the disease in the absence of CPs. This will help to emphasize the urgency and the justification for driving the change in practice.

This module will be structured such that each cohort described above will have a dedicated period for hands-on (practical) component. For instance, we will dedicate a continuous 2-week period for the face-to-face workshop, where each cohort will have a 3-day hands-on, face-to-face period. Following the completion of the 6th module by all cohorts, about 12 participants (selected from all the cohorts) will be engaged in a 3-day, hands-on, multidisciplinary exercise to propose CPs for breast cancer management in the state. These individuals are expected to be selected from the most active set of participants in the general course. They will form the expert panel for developing cancer CPs in Abia State. Furthermore, this module will involve the evaluation of learning and course delivery, using standardized metrics. Figure 1 shows the structure of the training, with each cohort starting at different times to enhance class management.

Course evaluation

This course will be evaluated using the objective-focused method, following a mixed-methods pre-and post-test design. Participants will report their baseline assessment of knowledge for breast cancer, guidelines, and CPs using a pre-test. At the end of the course, they will provide a post-test evaluation showing a degree of achieving learning objectives and satisfaction with the course. For this research, the pre-test will be deployed as an online survey, which must be completed by participants before accessing course materials.

	Module 1	Module 2	Module 3	Module 4	Module 5	Workshop
Cohort 1						
Cohort 2						
Cohort 3						

Figure 1: Class management schedule

The post-test will also be deployed as an online survey, which must be completed before obtaining a course participation certificate. In addition to the pre- and post-test, participants will be required to evaluate each module based on content, delivery, and learning achieved.

Course evaluation questions will be adapted from existing resources that were developed and validated by Moattari *et al.*[13] In addition to the post-test (survey), about 12 participants (representing 10% of sample size, $n = 120$) will be randomly selected to participate in post-course focus group discussion to show what worked and how. Data will be analyzed using descriptive statistics, *t*-test, and analysis of variance to demonstrate baseline assessment and change in assessment at the completion of the course. Qualitative data will be transcribed and analyzed to identify common themes, using appropriate software. Results will show how the BL approach worked. Essentially, the quantitative data (pre-/post-tests) will describe the change in self-reported competence among the study sample, while the rich qualitative findings (focus groups) will illuminate the course experience. It is expected that over 70% of participants will report improved competence regarding breast cancer CPs after taking the course. 3 months after the conclusion of the course, we will survey the participants to understand what they have done with the knowledge. The metrics involved in this final survey will include but not limited to: Number of patients examined; number of patients biopsied; number of referrals to specialists; outcome for those patients, as well as feedback from the patients on the way they were managed.

Quantitative data will be analyzed using descriptive statistics, *t*-test, and analysis of variance to demonstrate baseline assessment and change in assessment at the completion of the course. Qualitative data will be transcribed and inductively analyzed to identify common themes.

Ethical consideration
Ethical approval has been obtained from Abia State Ministry of Health and the Research Ethics Committee at Obong University. This research will not collect personal health information, outside of the study instrument. All potential participants will be informed of their right to withdraw from the study before joining the course.

Although individuals who participate in the focus group discussion may not remain anonymous, pseudonyms will be assigned to protect their identity. We will ensure high ethical standards, including respect for human dignity, respect for free and informed consent, respect for vulnerable persons, respect for privacy and confidentiality, respect for justice and inclusiveness, and balancing harms and benefits by minimizing harm and maximizing benefits.

RESULTS

This project is in its early stage of execution. The research group has met and identified project stakeholders. There are ongoing meetings with the stakeholders. It is expected that the course will be held within the next 8 months. Outcome from course evaluation will be reported in due course.

CONCLUSION

This innovative study would be the first application of BL approach in training clinicians on CPs. It has the potential to improve the present scenario of cancer control in Abia State and beyond. Full data on the study will be made available on completion of the study.

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