

Perception of mHealth Intervention for Psychoeducational Support Among Nigerian Women Receiving Chemotherapy for Breast Cancer: A Qualitative Study

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Abstract

Background

Women diagnosed with BC receiving chemotherapy have reported various side effects, which adversely affect their psychological state. Evidence suggests that psychoeducational interventions (PEIs) delivered through mobile phones might effectively provide psychosocial support for this population. However, there is a lack of evidence on Nigerian women's perception of mHealth PEI, which prompted this study.

Method

A multi-centre exploratory qualitative study was conducted among women with BC who had completed chemotherapy at two tertiary hospitals in Nigeria. Face-to-face focus group interviews were conducted at the oncology clinics. Data were collected using a semi-structured interview guide until data saturation was reached. Data were analysed using thematic analysis.

Results

Thirty-two women were recruited, with seven focus group interviews conducted. The participants were between 22 and 75 years old and mostly diagnosed with Stage III BC. Four main themes emerged from the data analysis, including experiences of BC diagnosis and treatment phase, patients' needs during chemotherapy, coping with chemotherapy and perception of mHealth intervention for psychoeducational support. The participants found that mHealth intervention is acceptable, and the suggested contents include information on chemotherapy, how to deal with the fear of chemotherapy, nutritious diet locally available and information on exercise.

Conclusion

BC diagnosis was devastating, and psychological disturbances were experienced while receiving chemotherapy, but the participants perceived that mHealth intervention could provide psychological and informational support. This study will help design a culturally appropriate mHealth PEI for this population.

Introduction

Breast cancer (BC) has become the most common malignancy worldwide. In 2020, one in eight cancers worldwide were BCs [1, 2]. It is the most prevalent cause of cancer mortality in Africa [3]. Nigeria ranks second in BC incidence in Africa and first in mortality ratio with 124,815 new cases and 78,899 deaths in 2020 [4, 5].

Although chemotherapy remains one of the major treatment modalities for women with BC, various side effects have been found among women diagnosed with BC receiving chemotherapy, which adversely affects their psychological state [6, 7]. Similarly, educational needs have also been reported [8, 9].

However, psychoeducational interventions (PEIs), defined as activities that combine knowledge transfer with psychological activities like counselling [10], have been suggested as means to address this population's psychoeducational needs. A systematic review and meta-analysis of mHealth interventions along the BC trajectory found a medium effect size of PEIs on psychological issues like anxiety, depression, mood, and quality of life [11].

mHealth, defined as "health services delivered through mobile communication devices" [12], has been suggested as a medium to deliver PEIs because mobile phones have become ubiquitous [13]. In 2020, over three billion people worldwide had a smartphone, which is expected to grow by several hundred million years to come [14]. There were 187.9 million mobile connections in Nigeria in January 2021, covering 90% of the total population [15].

The usage of mHealth in addressing psychoeducational needs of women with BC receiving chemotherapy is becoming prominent. Previous studies suggest that mHealth interventions might help address certain psychological concerns like self-efficacy, symptom distress, quality of life, anxiety and depression [16–20]. However, none of the studies was conducted in Nigeria and Africa.

Although it has been observed that mHealth will be integrated into the care of oncology patients in Nigeria during the COVID-19 pandemic [21], the evidence to guide this integration is lacking. Similarly, the need for culturally appropriate, research-tested mHealth interventions in this population has been documented [22]. This highlights the need for a qualitative study to understand the perception of women diagnosed with BC receiving chemotherapy on the usage of mHealth interventions and the cultural elements that should be included in the intervention.

Hence, this study aims to explore: (1) the psychological and educational needs of Nigerian women receiving chemotherapy, (2) the acceptability of using mHealth intervention in addressing psychological and educational needs, (3) the facilitators and barriers, and (4) the cultural elements that should be included in the mHealth PEI.

Method

Design and sampling

This study is a multi-centre exploratory qualitative study using focus group interviews. A focus group interview was considered appropriate as it allows diverse insights among participants where the facilitator takes a peripheral role to guide the discussion [23, 24]. Purposive sampling technique was used to select 32 women diagnosed with BC receiving chemotherapy from the oncology clinics of two University Teaching hospitals in Nigeria. A total of seven sessions of focus group interviews were conducted until data saturation was reached.

The inclusion criteria were women aged 18 years and above; diagnosed with BC and completed chemotherapy within the past three months; attending the oncology clinic; could speak English and/or

Yoruba; and consented to join the study. Participants were excluded if they were cognitively impaired.

Data Collection Procedure

The second, third and fourth authors who were female registered nurses with a bachelor's degree conducted the interview. They were trained by the principal investigator before the data collection. An information sheet including detailed information about the study was provided to all participants, after which they were required to sign a written consent form. Demographic data were collected with a self-designed demographic datasheet.

The interview was conducted in a private, quiet room in the oncology clinic. One of the interviewers moderated the discussion as a facilitator while the other acted as an observer to handle logistics, take careful notes, and monitor recording equipment [25]. The facilitator utilised a semi-structured interview guide developed by the research team, which comprised open-ended questions based on literature review findings. Some of the questions asked include how they felt when they were diagnosed, how they coped with the diagnosis and treatment, their needs while receiving chemotherapy, experience with health professionals, and their perception of the mHealth app. The participants were seated in a circle. Each interview lasted around 60 to 90 minutes. All the interviews were audio-recorded.

Some measures were taken to ensure rigour during data collection and data analysis. Open-ended questions were utilized to ensure credibility. Dependability and transferability were ensured through audit trails. To ensure confirmability, the themes, participants' quotes, and interpretations were reviewed to confirm congruence and validate findings [26, 27].

Data analysis

Data were analysed using the QSR NVIVO 12 software programme. Verbatim transcription was conducted while listening to the recording. Thematic analysis method was used for data analysis [28]. This method has four phases: familiarising with the data, generating initial codes, searching for themes, reviewing themes, defining and naming the themes, and producing the report. The consolidated criteria for reporting qualitative research guidelines (COREQ) were adhered to in reporting this study (See Supplementary material).

Results

Demographics

Thirty-two women who had recently completed BC chemotherapy were interviewed. Majority were between ages 41-50 (34.4%). Most were married (62.5%), Christian (75%), had tertiary level education (68.8%) and monthly household income of USD120 (34.4%), and were diagnosed with stage III BC (34.4%). Socio-demographic data are presented in Table 1.

Table 1
Socio-demographic data of the participants (N=32)

Variable		Frequency	Percent
Age, mean (SD) 48± (12.78)			
Marital status	Single	5	15.6
	Married	21	62.5
	Separated	1	6.7
	Widowed	4	12.5
	Divorced	1	3.1
Ethnicity	Yoruba	16	50.0
	Igbo	12	37.5
	Hausa	1	3.1
	Edo	1	3.1
	Urhobo	1	3.1
	Igala	1	3.1
Religion	Christianity	24	75.0
	Islam	7	21.9
	Catholic	1	3.1
Level of education	No formal Education	2	6.3
	Primary	2	6.3
	Secondary	5	15.6
	Diploma	1	3.1
	Tertiary	22	68.8
Stage of breast cancer	Stage 1	7	21.9
	Stage 2	5	15.6
	Stage 3	11	34.4
	Stage 4	4	12.5
	I don't know	5	15.6

Variable		Frequency	Percent
Monthly household income	Less than 20,000NGN (50USD)	8	25.0
	21,000-50,000NGN (120USD)	11	34.4
	51,000-100,000NGN (245USD)	6	18.8
	101,000-150,000NGN (370USD)	2	6.3
	Above 150,000NGN	5	15.6

Themes

Four major themes emerged, including experiences of BC diagnosis and treatment phase, patients' needs during chemotherapy, coping with chemotherapy, and perception of mHealth intervention for psychoeducational support. These themes are further elaborated into various sub-themes (See Table 2).

Table 2
Themes and sub-themes generated from the interviews

Themes	Sub-themes
Experiences of breast cancer diagnosis and treatment phase	<ul style="list-style-type: none"> • Emotional turmoil with breast cancer diagnosis • Different experiences with the first cycle of chemotherapy • Psychological disturbances during chemotherapy
Patients' needs during chemotherapy	<ul style="list-style-type: none"> • Need for information from reliable sources • Need for psychological support and reassurance
Coping with chemotherapy	<ul style="list-style-type: none"> • Resources available for coping • Strategies adopted for illness adjustment
Perception of mHealth intervention for psychoeducational support	<ul style="list-style-type: none"> • Suggestions for the design of mHealth intervention • Incorporation of cultural elements • Facilitators for using mHealth intervention • Perceived barriers to using mHealth intervention • Acceptability and feasibility of the usage of mHealth intervention

Experiences Of Bc Diagnosis And Treatment Phase

The participants perceived diagnosis with BC as highly challenging. On receiving the diagnosis, some were confused, scared, and shocked. Participants' experiences in this regard are further discussed under three sub-themes.

i. Emotional turmoil with breast cancer diagnosis

Receiving the diagnosis was psychologically burdensome and shocking for the women. All of them were emotionally challenged after they received the diagnosis. It was clear that none of them was prepared for such an occurrence.

"I felt that the whole world was coming to an end. I cried and cried. I said, "God why, me..." (Participant 5).

"It was the saddest day of my life. It was even on my birthday. When people were calling telling me happy birthday, I was telling them it was a sad birthday" (Participant 1).

ii. Different experiences with the first cycle of chemotherapy

Many women felt that the first cycle of chemotherapy they had was more challenging than the other cycles they received.

"The first chemo...My God I almost ran mad. I was on admission. In fact, I could not stand. I thought I was gone. They said I passed out. I was hearing them from afar" (Participant 13).

"My first dose of chemo was not an easy one. It was easy to take it, but it was challenging to battle the side effects at home. It was as if another demon from hell was coming to dominate this body..." (Participant 8).

However, some participants opined that the first chemotherapy cycle was not challenging for them.

"The first chemo did not trouble me much. I was eating as I like; I just witnessed a little discomfort the first and second day" (Participant 25).

iii. Psychological disturbances during chemotherapy

Psychological concerns reported by the women include fear, anger, confusion and insomnia.

"My sister, you see, chemo will confuse you. When I started chemo, I was weighing 138kg. 1st Chemo took 13kg!" (Participant 9).

"...even to sleep on my bed, I become scared. Because it is as though once it is 12 midnight something strange was coming to possess my body..." (Participant 8).

"Sometimes I will be shouting at my children, I became very irritable and aggressive." (Participant 20).

Patients' Needs During Chemotherapy

While receiving chemotherapy, the needs of the women were majorly informational and psychological. Many of them got confusing information online and from friends and relatives. These needs were further elaborated in two subthemes.

i. Need for information from reliable sources

The participants' responses suggested that they did not have enough information before and during chemotherapy. They wished they had more information about diet, exercise and the mode of action of the chemotherapy.

"I didn't know they would cut off my breast after the injection; they didn't explain very well to me. Even for the chemotherapy, they did not explain well..." (Participant 10).

"The major informational need I had was on nutrition. Like when I want to go to the market, what should I buy and what should I not buy..." (Participant 13).

Although many of them resorted to seeking information online, some were scared as the information they got was misleading, confusing and inconsistent. While some found the information helpful, many of them found the information unreliable, which made them feel uncertain about their prognosis.

"Google will take you where you don't want to go. When I google, I was confused as I didn't see anybody to put me through..." (Participant 8).

"When I got the diagnosis, I said I was not going to go for chemotherapy. So, I tried different supplements. But they were not successful, so I came back to the hospital. But by then, I was between life and death" (Participant 9).

ii. Need for psychological support and reassurance

Although many of them reported that they had attended health talks on coping with the demands of chemotherapy before the commencement of their chemotherapy sessions, they felt they needed personal counselling sessions.

"Except for the weekly health talk, there was really no personal counselling. They just did a general health talk" (Participant 6).

"I think one thing is missing, counselling. How can people come here crying and they still go out of the hospital sad? There must be time for counselling" (Participant 4).

3. Coping With Chemotherapy

Although the participants perceived chemotherapy as highly challenging, coping resources were available, and some coping strategies were adopted for adjustment. This is further elaborated in two subthemes.

i. Resources available for coping

Coping resources identified by the participants can be categorised into family members, friends, BC survivors, health professionals and the church.

“My aunt was a huge support to me. She is 80 now. She is a BC survivor. I concluded that if she could survive it over 20 years ago when technology was not this advanced...what am I afraid of...” (Participant 13).

“My children all rallied around me. They have been giving much money, running into millions of naira.” (Participant 19)

“I just want to thank the nurses and the doctors here. They are very hardworking. Thank you for your love and care. The love, attention, care and support were really helpful” (Participant 25).

“My whole church was aware. Because of my financial state, I could not pay the hospital bills here so my whole church was supportive in terms of praying and raising money for me, especially the church women” (Participant 8).

Furthermore, many of them found smartphones to be a major source of support while receiving chemotherapy.

“Smartphone is like my doctor, consultant, and dietician. The phone is a teacher and even more than a doctor. Before you see a doctor, the phone has helped you to get an answer” (Participant 8).

“My phone was my top companion. Apart from God and my phone... Anything I don't understand, I will just press it there and will get the answer” (Participant 10).

ii. Strategies adopted for adjusting to the illness

The strategies adopted for coping include positive thinking, prayer, online information and exercise.

“Determination, courage, being positive in everything, that was what pushed me through...” (Participant 10).

“With prayers, I was able to cope. And I believed God was able to support...” (Participant 26).

“The exercise helps me to eat more. Sometimes, bad thoughts will enter during the night, to sleep will become an issue. After these exercises, I also find it easier to fall asleep” (Participant 17).

"I didn't know what to eat or what to do. I now went to check online. The kind of food I should be taking. I was like whao! Is that the secret? That was how I pushed through" (Participant 8).

4. Perception Of Mhealth Intervention For Psychoeducational Support

The participants offered various suggestions that should guide the design of such an intervention. Their thoughts are captured in the following five subthemes:

i. Suggestions for the design of mHealth intervention

The participants suggested that mHealth intervention could be delivered through a mobile application (app), and the contents should include what to expect during chemotherapy, how chemotherapy works, how to manage the side effects of chemotherapy, and information on diet.

"First thing is information about chemo. Many are afraid of chemo. But if they can put out the information, it will take the fear away. Also, there should be info about how chemo works and how to manage the side effects" (Participant 15).

"They should give information about the first stage of chemo, the second stage. They should break it down" (Participant 16).

"...what can I eat, what are the things I need to run away from. The app should also have information about exercise" (Participant 17).

The intervention features suggested by the participants include the availability of offline features, involvement of BC survivors, privacy, timely response from nurses and user-friendliness.

"If it is possible, they can do it in such a way that participants can access some messages or functions offline. Also, the app should be user-friendly, and nurses must also respond on time. There should also be feedback" (Participant 4).

"...you have to bring survivors in. If a nurse is a survivor, that can be fine. It takes a survivor to relate with what we are passing through" (Participant 8).

"Privacy is paramount. An app like Facebook is not allowed. An app like WhatsApp looks good. It should be confidential to avoid stigma" (Participant 20).

They also reported on the suitability of nurses for delivering such interventions.

"I believe nurses should be able to help us with the application. Maybe because we spend more time with them, so they answer our questions more..."

ii. Incorporation of cultural elements

Some cultural elements identified during the discussion are the inclusion of food available in the local context and the availability of translation features into the three major local Nigerian languages, and information on how to balance spirituality and orthodox medicine.

"...there are many fruits and vegetables that they mention online that we don't have around here. So, if an app with local content can be built, it will go a very long way. (Participant 7).

"There should be room for translation- Yoruba, Igbo and Hausa. Over 20 years ago, my sister-in-law died of BC. I saw her breast decaying and she did not go to the hospital but was praying. People should come to the hospital. This is a cultural issue" (Participant 4).

iii. Facilitators for using mHealth intervention

Facilitators for the usage of mHealth intervention include the availability of smartphones, regular internet subscriptions and literacy. Almost all of them had a smartphone, and they have been using it to seek information online.

"I am a regular user of my phone, so there will not be any barrier. I speak English well, and I subscribe well to the internet" (Participant 1).

"...if there is an app that can bridge the communication between patients and nurses, it will encourage the patients that at least somebody is going through the journey with them" (Participant 3).

iv. Perceived barriers to using mHealth intervention

The participants identified three major barriers: illiteracy, non-expertise in using the app, and the cost of downloading the app. The two illiterate participants suggested that their children could teach them how to use the app.

"If it does not have you paying a subscription fee to be part, that will be very fine. For me, I won't download the app if it is not free. I prefer to be using my chrome and going on Google" (Participant 32).

"I have it, but I am not literate. For the application, my children can put me through on how to go about it" (Participant 14).

v. Acceptability and feasibility of the usage of mHealth intervention

All the participants opined that the intervention is feasible and would be acceptable. Also, they declared that they were willing to be part of the intervention when it is launched.

"This is a welcome development. We will not have to be rushing to the hospital every time for complaints that can be easily handled on the phone" (Participant 30).

For me, if such an app had existed before I started chemotherapy, I would have surely used it..."

(Participant 4).

"This intervention will go a long way. I don't think there will be many barriers, so far the app is beneficial, people will use it" (Participant 15).

Discussion

The psychological burden found among participants in our study was similar to the experiences of Nigerian women from a previous study [9]. It was observed that most of the women found the first cycle of chemotherapy more challenging compared to the previous cycles. This was supported by a study that found a significant increase in anxiety among this population after their first cycle of chemotherapy [29]. This calls for psychological support for this population when receiving chemotherapy.

We found inadequate psychological preparation before chemotherapy. This might have contributed to the emotional turmoil associated with the treatment. Inadequate preparation before chemotherapy was also found in a study among Zambian women receiving chemotherapy for BC [30]. This highlights the need for adequate psychological preparation before and during chemotherapy. Furthermore, inadequate information was also found among our participants before the commencement of chemotherapy. Diet, exercise, mode of action of chemotherapy, managing side effects, and dealing with the fear of chemotherapy were areas of need found. These areas are similar to the information needs found in this population findings from previous studies [31, 32]. Inadequate information before chemotherapy was also found in previous studies conducted in Nigeria [9] and Ghana [33], where the women receiving chemotherapy did not know much about the treatment.

To fill the knowledge gap found among our respondents, many of them resorted to seeking information from online sources using their mobile phones. Various studies have reported that online information-seeking behaviour is common among women diagnosed with breast cancer [34, 35]. Many of them have unanswered questions and sometimes find information from health professionals within 15-20 minutes of clinic consultation overwhelming and not very clear [36]. This highlights the need to deliver simplified online health information.

To deal with the side effects and psychological issues associated with chemotherapy, some coping resources were utilised, including support from family members which was also reported in another study [37]. Also, many of them found support from BC survivors helpful. This aligned with a study conducted in Thailand where women receiving chemotherapy for BC found support from those who had completed the treatment [38]. Furthermore, many of the participants reported that the church was beneficial. Religious coping was also reported by a study among African American women [39].

All our respondents perceived that a proposed mHealth intervention would be suitable to meet their psychological and educational needs while receiving chemotherapy. This is in line with a study where the participants perceived a mobile app as effective for psychoeducational support [22]. Our respondents

also agreed that nurses would be suitable to deliver the intervention. This supports a systematic review that reported that nurses are suitable providers of PEIs as their interventions have been found to improve health outcomes among cancer patients [40]. The suggested contents to be included in intervention include management of side effects information on the mode of action of chemotherapy, locally available diet, dealing with psychological concerns, and exercise. These are similar to the suggested components of previous mHealth interventions used among this population [41–44]. However, areas that were covered by other interventions in previous studies which were not suggested by the participants, such as self-esteem, body image, sleep management, self-care, discussion forum [42, 43], could be considered when designing further interventions.

Some cultural elements suggested to be considered when designing this intervention include locally available diet, a balance between spirituality and orthodox medicine and translation into the major Nigerian languages. These are similar to the cultural elements highlighted by another study [45]. Similarly, other suggested features like privacy, timely response from nurses and user-friendliness could be considered when designing future interventions.

Conclusion

This study has highlighted the acceptability of a mHealth PEI in supporting Nigerian women diagnosed with BC receiving chemotherapy. The suggested features and cultural elements documented in the study should be considered subsequently while designing such an intervention.

Relevance To Clinical Practice

This study will provide evidence on the factors to be considered when designing mHealth PEI for this population. It is hoped that this will help integrate mHealth into this care of women receiving chemotherapy for BC, thus addressing their psychological and educational needs, hence improving their experiences while undergoing treatment.

Declarations

Author contribution: Oluwadamilare Akingbade: Conceptualisation; methodology; data collection, data analysis; writing, original draft preparation; writing, review, and editing; and approval of manuscript for publication.

Victoria Adediran: Data collection; ethics approval from study setting; review; and approval of manuscript for publication.

Elizabeth Somoye: Data collection; ethics approval from study setting; review; and approval of manuscript for publication.

Adetutu Sefinat Alade: Data collection; ethics approval from study setting; review; and approval of manuscript for publication.

Ka Ming Chow: Conceptualisation; methodology; original draft preparation; writing, review and editing; validation of formal analysis; supervision; and approval of manuscript for publication.

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Code availability: Not applicable.

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Ethics approval: This study was conducted in line with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Survey and Behavioral Ethics Committee of the Chinese University of Hong Kong (SBRE-20-776) and from the Research and Ethics Committee of the Lagos State University Teaching Hospital, Nigeria (LREC/06/10/1660) and Lagos University Teaching Hospital (ADM/DCST/HREC/APP/4420).

Consent to participate: The participants received a research information sheet to help them understand key information about the research and the provided consent form. Verbal and written consent informed consent was obtained from each participant included in the study.

Consent for publication: Not applicable.

Conflict of interest: The authors declare no competing interests.

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