

Perspectives of Pregnant Women Regarding the Use of Mobile Phones for Antenatal Health Education: A Qualitative Study in Rural Southwestern Kenya

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Abstract

Introduction: Pregnant women face a myriad of challenges ranging from anxiety, myths and misconceptions concerning pregnancy, diet, and general antenatal care because of inadequate health education during the antenatal period. There are extensive studies on mobile phone use in primary care; however, only a few qualitative studies have been conducted to establish the usefulness of these devices in antenatal education. Therefore, this study aimed to explore pregnant women's views on mobile phone use in antenatal education.

Methods: This study utilised a qualitative study design. It was conducted in rural health facilities in southwestern Kenya. Focus group discussions were used to collect data which were analysed thematically using ATLAS.ti version 23.

Results: The overall theme that emerged from the study was “antenatal education is beneficial, and if provided via a preferred mode of mobile phone communication, can bridge the gap in antenatal education content.” The participants perceived antenatal education through mobile phones as beneficial and complementary to the information received during routine antenatal care. Most of the participants felt that antenatal education should be given through a preferred mode of mobile phone communication.

Conclusion: Mobile phones have the potential to improve the quality of antenatal education provided during pregnancy.

Keywords: antenatal care; antenatal education; mobile phone; mobile phone communication mode

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Background

Antenatal care provides an opportunity to communicate with and support women to enable a positive experience during pregnancy (World Health Organization 2016). Health promotion through education on nutrition, recognition of danger signs during pregnancy, and birth preparedness are essential components of antenatal care (McCauley et al. 2022). A systematic review and analysis of antenatal education showed that it reduces maternal stress and improves maternal self-efficacy during pregnancy (Hong et al. 2021). In addition, antenatal care knowledge improves the uptake of antenatal care services (Kpienbaareh et al. 2022; Riberu, Roga, and Paun 2023). A study conducted in Somalia, however, showed that despite attending antenatal care clinics, 50% of women may not receive key health information during pregnancy, such as danger signs (Ahmed, Nuh, and Hassan 2023).

Using mobile phones to support health education during pregnancy through text messages and voice calls has proven to be effective in improving antenatal care outcomes (Coleman et al. 2020a; Hussain, Smith, and Yee 2020; Rahman et al. 2022). A systematic review of the effect of mHealth in high income countries demonstrate that some mobile phone-based behaviour interventions are correlated with positive behaviours and health outcomes (Hussain, Smith, and Yee 2020). The authors noted that some interventions such as text messages and mobile phone web applications were associated with improved gestational weight gain and physical activity, although there was no significant improvement in smoking cessation among pregnant women. Studies conducted in Samoa (Wattersson, Castaneda, and Catalani 2020) and Nigeria (Coleman et al. 2020b) indicated that educational text messages improved antenatal care attendance. Similarly, a study conducted in four provinces of Afghanistan showed that women who received educational text messages and voice messages had improved maternal and child health knowledge (Lebrun et al. 2020).

In Kenya, mobile phones have been identified as a possible solution in empowering people on health matters (Republic of Kenya 2017). A randomised control trial conducted among a pastoralist community, for instance, revealed that health information given through mobile phone text messages improved antenatal care attendance (Muvengei, Karanja, and Wanzala 2021). Similar findings were reported by a randomised control trial conducted among rural women in Kenya to evaluate the effectiveness of short message service reminders in the utilisation of antenatal care services (Gitonga et al. 2021). However, Sowon, Maliwichi, and Chigona (2022) found that few qualitative studies have evaluated user perspectives of using mobile phones in antenatal care in Kenya. The few qualitative studies identified by them include a study reporting pregnant women's perception and acceptability of text messages in antenatal care and childhood immunisation (Kazi et al. 2017) and another assessing client experiences of a mobile phone counselling intervention to improve antiretroviral therapy among pregnant women (Okal et al. 2022). According to Sowon, Maliwichi,

and Chigona (2022), engaging stakeholders in designing culturally appropriate interventions is important.

It is evident from the literature that very few qualitative studies have been conducted on mobile phone use in antenatal care. In light of this, this study adopted a qualitative study design to establish the perspectives of pregnant women seeking services in Kisii rural health facilities regarding mobile phone use in antenatal care. Findings from this study could inform the future development of a mobile phone health education intervention with the aim of improving the quality of antenatal education. Moreover, the findings will contribute to policy development with regard to mHealth services in antenatal care in Kenya.

Methodology

Design

A qualitative, inductive, and descriptive research design was adopted to enable participants to express their views and perspectives on the use of mobile phones in the provision of antenatal education. An inductive approach was used to gain a holistic understanding of the use of mobile phones in antenatal care education (Kyngäs, Kääriäinen, and Elo 2020).

Setting

The study took place in rural health facilities in Kisii, a county in the southwestern part of Kenya, from March 2020 to May 2020. Kisii county is one of 47 counties in Kenya and consists of nine sub-counties, eight of which are in rural areas while one is an urban centre.

Participants

The target group was pregnant women seeking antenatal care services in sub-county rural health facilities. The pregnant women were approached individually and invited to participate in the study. The inclusion criteria were as follows: a) being between 16 and 28 weeks pregnant, b) having no comorbidities, c) willing to participate voluntarily, d) able to communicate in Swahili or English, and e) having a mobile phone.

Data Collection

Before the study began, a focus group discussion guide was developed based on a literature search to collect information from the participants. The guide contained open-ended questions which allowed participants to give their views on the topic. Examples of questions included: What is your opinion on the use of mobile phones to provide antenatal education? How can mobile phones be used to provide antenatal education? What aspects of antenatal care education would you like to receive via mobile phone?

The first author translated the research tool from English to Swahili and then back to English again to ensure confirmability of the information. A pilot study was conducted among a group of expectant mothers who did not participate in the actual study to determine the appropriateness of questions and where necessary, adjustments were made to ensure clarity to improve the credibility of the study (Kyngäs, Kääriäinen, and Elo 2020).

Purposive sampling was used to recruit participants into the focus group discussions. The discussions took an average of 60 to 80 minutes. The women were reimbursed with some money to take care of incidentals. Serial focus group discussions were conducted until data saturation was reached, that is, when no new information emerged.

The first author tape-recorded the interviews and moderated them while the other two authors observed the discussions. One trained research assistant took notes. The focus group discussions were conducted in Swahili. The research assistant was recruited from the local area and was selected based on her knowledge of the local language and Swahili. This was to enable her to translate any information that was not clear into the local language.

Data Analysis

Data from the focus groups were transcribed verbatim by the first author and research assistant. The transcripts were imported into ATLAS.ti version 23 for thematic analysis. The main theme, categories, and sub-categories were generated using an inductive approach. The following steps outlined by Mezmir (2020) were followed: 1) Familiarisation with the data. The authors read through the transcripts and listened to audio tapes. 2) Data reduction. The text was divided into meaningful units with words having similar meaning which were then condensed into shorter units (codes) but retaining the central meaning. 3) Data display. The codes were sorted into sub-categories and categories and the relationships displayed in ATLAS.ti version 23. 4) Report writing.

Trustworthiness

Lincoln and Guba's four trustworthiness dimensions—credibility, dependability, confirmability, and transferability—were taken into consideration to ensure the trustworthiness of the research process (Lincoln and Guba 1985, cited in Forero et al. 2018) as follows: Credibility was ensured by recruiting participants that were appropriate for the study and ensuring that data saturation was reached during data collection. Dependability was enhanced through the involvement of all the authors in the research process. Coding and identification of key concepts was agreed upon by all the authors. New issues emerging from the discussions were incorporated in subsequent focus group discussions. The categories and sub categories were discussed extensively with all the co-authors in the process of triangulation before a general theme was established to ensure confirmability of the research findings. Confirmability was further

enhanced through an iterative process of data analysis. Transferability was ensured through thick descriptions of the methodology that was used to enable the reader to get important information in understanding the findings and their attached meanings.

Ethical Considerations

This study was approved by the Kenyatta National Hospital/University of Nairobi Ethics and Research Committee, reference number KNH-ERC/A/335. Formal written approval was sought from the head of the health facilities where the focus group discussions were held. A consent explanation form was used to explain the purpose and nature of the study to the participants. The participants were assured that the information they provided would be private and confidential, that their participation was voluntary, and that they had a right to withdraw from participating if they so wished.

Results

Participants' Sociodemographic Characteristics

A total of four focus group discussions were held in four sub-county rural health facilities. A total of 28 women participated. The participants' ages ranged between 18 and 38 years while their gestational age at the time of the interview ranged between 18 weeks and 28 weeks. Most of the participants were married, had either two or three children, and had secondary school education (see Table 1).

Table 1: Participants' sociodemographic characteristics

Participant characteristics	Number
Age	
31–39 years	10
21–29 years	16
20 years and below	2
Marital status	
Married	26
Single	2
Widowed	0
Gestational age	
16–20 weeks	2
21–24 weeks	4
25–28 weeks	22
Level of education	
Tertiary	4
Secondary	22
Primary	2
None	0
Number of children	
More than 3	4
2 or 3 children	18

0 or 1 child

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Theme: Antenatal Education is Beneficial, and if Provided via a Preferred Mode of Mobile Phone Communication, Can Bridge the Gap in Antenatal Education Content

The overall theme that emerged from the study was “antenatal education is beneficial, and if provided via a preferred mode of mobile phone communication, can bridge the gap in antenatal education content.” This theme was arrived at from three categories and 14 sub-categories as presented in Table 2. While some participants had mixed feelings about using mobile phones for antenatal care education, there was a consensus that the education was helpful in various ways and could supplement the information they received during routine antenatal care. Additionally, the participants agreed that they would be willing to receive health education via mobile phone as long as it was provided through their preferred mode of communication.

Table 2: Description of sub-categories, categories, and themes

Sub-categories	Categories	Theme
<ul style="list-style-type: none"> • Alleviates anxiety • Mothers feel free • Create trusting relationship between mothers and healthcare workers • Reminders to attend clinic and take medications • Good for better decision making • Dispel myths and misconceptions 	<ul style="list-style-type: none"> • Benefits 	<ul style="list-style-type: none"> • Antenatal education is beneficial, and if provided via a preferred mode of mobile phone communication, can bridge the gap in antenatal education content.
<ul style="list-style-type: none"> • Text messages • Phone calls • Text message reminders 	<ul style="list-style-type: none"> • Preferred mode of mobile phone communication 	
<ul style="list-style-type: none"> • Danger signs • Diet • Exercise • Self-care • Preparation for birth 	<ul style="list-style-type: none"> • Gap in antenatal education content 	

Category 1: Benefits of Mobile Phone Antenatal Care Education

The study’s findings suggest that mobile phone-based antenatal education can provide several benefits to pregnant women. The participants expressed varied opinions, with some stating that the use of mobile phones for antenatal education would help them make informed decisions about their health in a timely manner. Many of the participants believed that mobile phone antenatal education could provide them with advice on

topics such as self-care, danger signs during pregnancy, and nutrition. Additionally, some participants saw mobile phone education as a crucial tool in establishing a trusting relationship between pregnant women and healthcare providers. These are some of the participants' reflections:

I believe that receiving health education through our mobile phones can be very beneficial. For instance, we can learn about the right diet and exercise that will help us make informed decisions. In addition, we can get guidance on preparing for childbirth by purchasing essential items. (FGD 2 P3)

You can also get advice on what to do if one feels tired all the time. If there is a problem, one can get an answer from the nurse when she calls to teach us. (FGD 3 P1)

I think that reaching out to us via phone calls or text messages can help reinforce what was learned at the clinic and also provide additional information that was not covered. (FGD P 7)

Some women perceived that mobile phone calls would alleviate anxiety associated with the pregnancy condition while others felt that education through mobile phones would make them feel free to discuss issues relating to their condition. These are some of the participants' views:

When the nurse calls to provide health education, it can be an opportunity for mothers to ask questions that they may not have had a chance to ask at the clinic. There are many concerns and myths surrounding food and what not to do during pregnancy, and sometimes the limited time and long queues at the clinic can prevent mothers from asking all their questions. Therefore, speaking to a nurse over the phone can be a convenient and helpful way to get the information they need. (FGD 4 P1)

Being called by a nurse will make one feel cared for and creates a good relationship. ... I think it will enable me to trust her and I can share my concerns freely. (FGD 1 P2)

Generally, most of the participants felt that health education provided via mobile phones is beneficial and would complement what they are taught during routine antenatal care; therefore, they would be willing to receive health messages via mobile phones. One of the participants stated:

I am willing to receive health messages on my phone as it is an opportunity for me to learn more. (FGD 4 P2)

Category 2: Preferred Mode of Mobile Phone Communication

There were diverse opinions on which mode of communication would be useful. Most of the participants underscored the importance of using phone calls while others felt that they might forget to read text messages. Some participants emphasised that text

messages were good for reminding them to attend clinic and to take medicine, as the following excerpts illustrate.

I don't like reading, so calling is a better option as it allows me to ask questions and get clarification. (FGD 2 P7)

As for text messages Sometimes I may postpone reading messages until later. Sometimes I may forget to read them altogether. (FGD 3 P2)

I agree that messages are good but they should not be too long. (FGD 1 P1)

Text reminders ... these are also good. Many of us forget the date to return to the clinic. These can be useful especially if one is called a day before the clinic date. (FGD 2 P6)

Category 3: Gap in Antenatal Education Content

The participants thought that they should receive health information on various topics such as self-care during pregnancy, pregnancy danger signs, preparing for birth, and diet and exercise. In addition, they emphasised that they needed knowledge regarding myths and misconceptions surrounding pregnancy. Some of the participants expressed themselves as follows:

We need to learn about diet, exercise, identifying complications, and monitoring the baby's well-being. (FGD 3 P2)

Getting information on warning signs during pregnancy and receiving education on proper nutrition and self-care is important. (FGD 2 P3)

Living in the villages, we are often given conflicting advice about what to do and what not to do during pregnancy. It can be difficult to know what is correct and what is not. I believe that education can help us to make informed decisions and understand what is best for ourselves and our babies. (FGD 2 P2)

Discussion

The overarching theme from this study was “antenatal education is beneficial, and if provided via a preferred mode of mobile phone communication, can bridge the gap in antenatal education content.” The participants, predominantly multiparous and possessing at least a secondary-school education, exhibited a positive attitude towards mobile phone-based antenatal education, probably because their prior experience with pregnancy coupled with a degree of literacy influenced their perception of antenatal care education. Furthermore, these multiparous women were already well-versed with the healthcare system and had the perception that the antenatal education provided was inadequate. Their familiarity with mobile phones and their role in communication, including health information dissemination, likely contributed to their acceptance of mobile phone-based antenatal education.

The findings revealed that the participants perceived health messages via mobile phones as helpful in passing useful information regarding various topics in pregnancy. These findings are comparable to those of a cross-sectional study carried out in Afghanistan to determine the perceptions of women towards mobile phone use in maternal health. The study indicated that mobile phones were viewed as useful in making appointments, counselling, and disseminating health-related information (Yamin et al. 2018). The current study's findings are similar to those of a study performed in southwestern Uganda on the efficacy of text messages in improving maternity services whereby antenatal messages enabled pregnant women to comprehend antenatal care and skilled care benefits (Atukunda et al. 2023). Furthermore, the Ugandan study showed that the participants were able to make informed decisions and share the information with their partners who in turn made a commitment to support them. The current study reports a similar finding whereby the participants stated that antenatal education provided via mobile phones could help them make better decisions regarding their pregnancy.

Many pregnant women experience anxiety because they lack knowledge and are uncertain about what to expect. This study found that anxiety could be alleviated when the participants are followed up and given health education via mobile phones. Moreover, this indicates that antenatal education via mobile phone creates a trusting relationship between a pregnant woman and the healthcare system. Similarly, a study on text message support for diabetes and education among pregnant women indicated that this approach helped create a sense of connection between the women and their healthcare providers (Yee et al. 2020). The researchers reported that women who received such text messages experienced reduced stress levels, maintained a more optimistic outlook, and had better self-efficacy.

While some women in this study preferred text messages and text reminders as a form of communication, others affirmed that mobile phone calls were a better form of communication. An iterative development study conducted in southwestern Uganda corroborates these findings that text messages are preferred and enable women to make better decisions concerning their health (Atukunda et al. 2021). In the present study, the participants believed that messages could easily be forgotten if they were postponed to be read later. This finding contradicts a South African study which found that text messages were a more effective and cost-efficient way of communication among mothers (Coleman 2020b). Similarly, a randomised control trial conducted in Uganda also supported the preference for text and voice messages because of their relevance and engagement (Atukunda et al. 2023).

The participants in the current study felt that they did not have enough time to receive all the health information they needed during normal clinic hours, and that follow-up via mobile phone antenatal education would bridge this gap. Similar findings have been reported by Atukunda et al. (2023), who showed that text messages provided the participants with complementary education support. The current study found that the participants desired to receive messages on danger signs during pregnancy, diet,

exercise, self-care, and preparation for birth. A qualitative study on mothers' experiences of mHealth in Nigeria also showed that women were happy to receive text messages that helped them understand various challenges and aspects of pregnancy such as backaches, fatigue, and other minor and major discomforts (Olajubu, Fajemilehin, and Olajubu 2022). Additionally, the study reported that information on diet and maintaining adequate rest and exercise were key issues that women pointed out as part of antenatal education. Comparable findings are seen in a study conducted in Afghanistan, where women preferred to be taught nutrition (Yamin et al. 2018).

Strengths and Limitations

The strengths of this study are: 1) All the authors and the research assistant had the necessary knowledge and skills to conduct qualitative research; 2) the trustworthiness of the research process was ensured by following Lincoln and Guba's four dimension criteria (Lincoln and Guba 1984, cited in Forero et al. 2018). However, given that this study was conducted in only four sub-county rural health facilities in Kisii County, it is possible that the views of these women may not be generalisable to other areas.

Conclusion and Recommendations

The present study underscores the potential benefits of mobile phone-based antenatal education in bridging the gap in antenatal care. First, the participants believed that antenatal education provided via mobile phone is essential for the well-being of the mother, as it helps to alleviate anxiety and enables them to make informed decisions. Second, the participants felt that health information delivered via mobile phones could supplement the education they received during routine antenatal care. Third, the participants suggested that mobile phone education should be tailored to individual preferences and needs. This study demonstrates that mobile phones can be used to provide pregnant women with antenatal care knowledge, which can ultimately improve maternal and neonatal health. In the future, the development of mobile health education interventions in antenatal care should consider individual differences.

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