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Mobile Phone Use for Health Information Access Among Pregnant Women

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Abstract

Pregnancy is a sensitive period in a woman's life which affect their health status. Pregnant women need health information to be able to take informed decisions about their health. The arrival of mobile phone has given birth to faster and easier access to up to date health related information. The aim of this study is to examine the extent of mobile phone use for health information access among pregnant women in Ekiti State, Nigeria. The study adopted the survey research design. Two hospitals were chosen using purposive sampling from each of the three senatorial districts in the state. Non probability sampling (convenient sampling) was used to select 768 pregnant women during their visits to antenatal clinics. A validated structured questionnaire was used to collect data. Data collected were analyzed using descriptive statistics. Findings revealed that the pregnant women in Ekiti State highly use mobile phone for health information access. The study recommended the need for health providers to further engage pregnant women by making health information available to them using mobile phone.

Keywords: *Ekiti State, Health information access, Mobile phone use, Pregnant women*

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Background to the Study

Pregnancy is a sensitive period in a woman's life and it exposes her and her unborn child to a lot of risk. These risks are as a result of altered physiological function of the body that affects the biochemistry and anatomy of the woman's body, which eventually affects their Quality of Life (QoL) (Lopes, Prochnow, & Piccinini, 2010). Pregnancy also alters the endocrine system and other organs in the body (Zou, Fan, Ma, Yue, Mao & Ma, 2009). The changes that occur in pregnancy can be physical, psychological or social which influence their quality of life.

The arrival of mobile phone has given birth to faster and easier access to up to date health related information. Mobile phones have become a crucial part of human life used in the area of personal communication globally. In this study, mobile phone use is defined as the application of mobile phone for accessing health information and for engaging in health communication by pregnant women. In recent years the penetration of mobile phones has evolved and helped to improve the search for information. Mobile phones can be used to browse the internet, provide social support, and used for communicating with health providers, families, and other pregnant women. Mobile phone has developed over the years that it cannot be referred to as just simple mobile communication tools. Smart phones are mobile phones with more computing power, high resolution camera and with global positioning systems (GPS).

In a nation with limited health resources, mobile phone can be used to empower patients by making needed information for taking informed decisions about their health available at due time. The fast growing wireless network gives room for information to reach people who have been separated by distance and lack of communication by implementing mobile phone application programs.

Literature has shown pregnant women receiving text messages on their mobile phones (Cormick, Rodgers, Gibbons, Buekens, Belizan & Althabe, 2012), communicating with community health workers, and using mobile phones (Huq, Azmi, Quaiyum and Hossain, 2014) to seek information online (Lima-Pereira, Bermúdez-Tamayo & Jasienska 2012). Mobile phones have been found useful in health communications with pregnant women showing interest in receiving routine health information via SMS (Kazi, Carmichael, Hapanna, Wangoo, Karanja, Wanyama, & Todd, 2017). SMS can be employed to reach the general population or be directed to a particular group of people, especially people at risk and living in areas with poor accessibility. Health information can be sent to people in form of mass broadcast using SMS. SMS can also be implemented to allow two-way communication between patients and health providers and thereby reducing delay in communication (Lund, Hemed, Nielsen, Said, Makungu, 2012). SMS is a useful tool for health education because of their relatively cheap rate and wide coverage. It reduces the barrier to communication. Literature has shown that sending routine SMS to pregnant women for health promotion will help them to adhere to healthy lifestyles during pregnancy (Soltani, Furness, Arden, McSeveny, Garland, Sustar, & Dearden, 2012). SMS can be used to provide help and motivations to pregnant women.

Studies have been conducted to examine people interest in using mobile phones for health related information. This was shown in a cross sectional quantitative study conducted by Kebede, Zeleke, Asemahagn, and Fritz, (2015) to assess patients' access to mobile phones and their willingness to receive short message service (SMS) or text message about medication reminders. It showed that access to mobile phones among the respondents was high and almost all the patients in the study were interested in receiving voice message or text message from the clinic. Eighty five percent of people who were interested in receiving text messages were ready to pay for the service. Furthermore, a study conducted by Balogun, Sekoni, Okafor, Odukoya, Ezeiru, Ogunnowo and Campbel (2012) in Lagos, Nigeria, examining mothers' access to information technology and their desire to receive SMS reminder for childhood immunization service used structured questionnaire for the interview and the study found out that almost all the respondents own a mobile phone and majority of them showed desire to receive SMS reminder through their mobile phone.

Lee and Moon (2016) conducted a cross-sectional study exploring the use of mobile application among pregnant women in which 301 pregnant women participated. The study found out that more than half of mobile (smart) phone users in the study used at least one pregnancy app and found out that first time mothers use the applications more than people getting pregnant for the second time and women who have been using smart phone for a very long time are more likely to use the apps. They found out that applications related to pregnancy have become an important source of health information for pregnant women. However, the respondents raised the issue of apps' credibility as a major concern. They suggested that such applications should be managed by health care professionals. The study was conducted using survey method. A similar study conducted by Sat and Sozbir (2018) investigating how the use of mobile application and blogs influence pregnancy and the study involves 465 pregnant women. It was a descriptive study with data collected using a developed questionnaire. The study revealed that more than 40% of the women use at least one mobile apps and more than 80% of the women use pregnancy application and blogs to seek pregnancy information. The study also found out that pregnant women that use pregnancy blogs adapt better in pregnancy.

A study by Haryanti, Hastuti and Hanim (2017) was conducted to investigate how SMS had been used to overcome the problem of inadequate knowledge of pregnant women. The study was conducted using a qualitative design and document review. According to the study, the use of SMS helped women to seek timely care from mid wives or health care professionals. SMS equipped pregnant women with knowledge of the available antenatal services and encouraged them to go for antenatal care. Lau, Cassidy, Hacking, Brittain, Haricharan and Heap (2014) in their study tried to improve antenatal health education and awareness by using text messages to disseminate antenatal procedures and the study was a randomnised control study. The study found out a positive health related behavior among women in the intervention group which means sending regular SMS to pregnant women can be beneficial to them and useful for health promotion.

However, literature has shown people's interest in receiving health related information through their mobile phones (DeSouza, et al, 2014) and it has been found useful in health communication for facilitating decision making in maternal health (Ibembe, 2011). A study conducted by Hampshire, et al., (2015) used a story based approach to study how young people between 8 and 25 use mobile phone and they found out that many of the respondents use their mobile for digital social networking and for browsing the internet to seek health information. A study conducted by Pimmer, Brysiewicz, Linxen, Walters, Chipps, & Grohbel (2014) among Nurses undergoing advance training in midwifery found out that midwives in rural area used mobile phones to interact with online communities. The midwives also created a facebook group to consult with each other about patients' conditions and share specialized information. Furthermore, a study has also shown pregnant women interest in receiving health related information via SMS on their mobile phones and through email which can also be accessed with mobile phone (Cormick , Kim, Rodgers, Gibbons, Buekens, Belizan, Althabe, & 2012). Majority of the respondents in a study were interested in receiving health related information on their mobile phones (DeSouza, Rashmi, Vasanthi, Joseph, & Rodrigues, 2014).

The aim of this study was to

1. Find out the actual use of mobile phone for health information access among pregnant women in Ekiti State.
2. Find out the frequency of use of mobile phone for health information access among pregnant women in Ekiti State.
3. Find out the duration of use of mobile phone for health information access among pregnant women in Ekiti State.

Materials and Methods

The cross sectional study was conducted using a self reported questionnaires across all the three senatorial district in the Ekiti State, Nigeria. Ekiti State is one of the 36 states located in the southwest geo-political zone. It had a population of 2,398,957 based on the 2006 population census and was estimated to be 3,270,800 in 2016. Out of this, 1,183,470 (50.7%) were women (City population, 2016). Ekiti State has one tertiary health facility and twenty secondary health facilities, all of which formed the population for this study.

Eight hundred and ninety seven (897) Pregnant women were recruited using convenient sampling from six state government owned hospital in Ekiti State. Two hospitals were chosen using purposive sampling from each of the three senatorial districts in the state. Non probability sampling (convenient sampling) was used to select 897 (50%) pregnant women during their visits to antenatal clinics. Copies of structured questionnaire were distributed to the selected pregnant women attending antenatal clinic, who owned a mobile phone and can read and understand English language. The questionnaire was distributed for a period of one month during antenatal clinic. The participants were informed that their participation in the study was voluntary and their privacy would be protected. The participants responded to the questionnaires after providing informed consent to participate in the study. The pregnant women returned the questionnaires in sealed envelopes to ensure confidentiality of their information. The identity of participants was kept anonymous. 768 pregnant women

returned filled copy of questionnaire and was analysed using SPSS. The study was approved by the Babcock University research and ethics committee and Babcock University Research Committee (BUHREC) and Ekiti State Ministry of Health ethical committee.

The self-administered questionnaire included questions on socio-demographic characteristics, and measuring actual mobile phone use, frequency of mobile phone use and duration of mobile phone use and for health information and communication. Respondents were asked about the use of mobile phone to communicate with health providers, family of friend, receive text messages, access information online and access pregnancy apps. They were assessed on a 4 point likert scale. The options that were used to measure the actual use were: 4 = Very high use, 3 = High use, 2 = Low use and 1 = Very low use. Frequency was measured using the following options: 4 = always, 3 = very often, 2 = rarely and 1 = never. Duration of mobile phone use was measured using the following options: 4 = very long time, 3 = long time, 2 = short time, and 1 = very short time.

Data analysis

Descriptive statistics like frequency distribution, mean and percentages was used in analyzing actual mobile phone use, frequency and duration of mobile phone use. This was coded and entered into the international business management (IBM) statistical package for social sciences (SPSS) version 20.

Results

The respondents for this study were pregnant women. The basic socio-demographic characteristics investigated include age, number of pregnancy, occupation, highest educational qualification and marital status.

Table 1: Respondents' Socio-demographic Characteristics

Parameters	**Classification**	**Frequency**	**Percentage %**
Age	Less than 20 years	126	16.4
	21 years to 30 years	419	54.6
	31 years to 40 years	191	24.9
	>40 years	32	4.2
	Total	**768**	**100.0**
Number of pregnancy	One	187	24.3
	Two	237	30.9
	Three	233	30.3
	More than three	111	14.5
	Total	**768**	**100.0**
Occupation	Civil Servant	186	24.2
	Private organization employed	255	33.2
	Self employed	241	31.4
	Unemployed	86	11.2
	Total	**768**	**100.0**
Highest educational qualification	Primary school	80	10.4
	SSCE	258	33.6
	Bsc/ HND	370	48.2
	Msc	30	3.9
	Ph.D	30	3.9
	Total	**768**	**100.0**
Marital status	Single	138	18.0
	Married	585	76.2
	Widowed	26	3.4
	Divorced/Separated	19	2.5
	Total	**768**	**100.0**

About 80% of pregnant women were between 20 and 40 years with most of them (54.6%) belonging to the age group 21-30 years. About 16.0% of the women were less than 20 years. About a quarter of the respondents had had only one pregnancy, 30.9% had had two, and another 30.3% had had three while about 15% had more than three pregnancies. One quarter of the respondents were civil servants, 33.2% worked with private organizations and 31.4% were self employed. Almost half (48.2%) of the respondents were graduates. This is followed by those who were secondary school certificate (SSCE) holders (33.6%). About 8% had higher degrees. Three out of every four of the pregnant women were married as expected. Unexpectedly, however, almost twenty percent (18.0%) were single which shows that there will be lack of support from their spouse.

This shows that most of the participants are married women who have at least one pregnancy experience. Most of them have been educated to at least a secondary school certificate level and only few of them are unemployed. Therefore, they are expected to be literate and conversant with the use of mobile phones.

Table 2: Actual Mobile Phone use Among Pregnant Women in Ekiti State

S/N	Items I use my mobile phone to:	Very high use	High use	Low use	Very Low use	MEAN($\bar{x}$)	Remarks
1	Communicate with family or friends about my health	107 (13.9%)	427 (55.6%)	196 (25.5%)	38 (4.9%)	2.79	High use
2	Communicate with my health providers about my health	128 (16.7%)	378 (49.2%)	203 (26.4%)	59 (7.7%)	2.75	High use
3	Search for health information online	94 (12.2%)	405 (52.7%)	233 (30.3%)	36 (4.7%)	2.73	High use
4	Receive text messages on health information	82 (10.7%)	411 (53.5%)	411 (53.5%)	52 (6.8%)	2.68	High use
5	Access pregnancy applications	98 (12.8%)	355 (46.2%)	267 (34.8%)	48 (6.2%)	2.65	High use

Average Mean Score = 2.72
Decision Rule: Very high use = 3.50 – 4.0, High use = 2.50 – 3.49, Low use= 1.50 – 2.49, Very Low use= 1.00 – 1.49.
Source: Researcher's Field Survey, 2018

The result shows that pregnant women in Ekiti State had a high use of mobile phone for accessing health information ($\bar{x}$ = 2.72). Pregnant women in Ekiti State highly used their mobile phones to communicate with family or friends ($\bar{x}$ = 2.79), communicate with their health providers about their health ($\bar{x}$ = 2.75), search for health information online ($\bar{x}$ = 2.73). They also highly used their mobile phones to receive text messages on health information ($\bar{x}$ = 2.68) and access pregnancy applications ($\bar{x}$ = 2.65).

Table 3: Frequency of mobile phone use among pregnant women in Ekiti State

S/N	Items **How often do you use your mobile to:**	Always	Often	Rarely	Never	MEAN($\bar{x}$)	Remarks
1	Communicate with family or friends about your health	252 (32.8%)	235 (30.6%)	184 (24.0%)	97 (12.6%)	2.84	Often
2	Search for health information online	240 (31.2%)	232 (30.2%)	180 (23.4%)	116 (15.1%)	2.78	Often
3	Communicate with your health providers about your health	225 (29.3%)	242 (31.5%)	198 (25.8%)	103 (13.4%)	2.77	Often
4	Access pregnancy applications	215 (28.0%)	234 (30.5%)	195 (25.4)	124 (16.1%)	2.70	Often
5	Receive text messages on health information	221 (28.8%)	214 (27.9%)	200 (26.0%)	133 (17.3%)	2.68	Often

Average Mean Score = 2.75
Decision Rule: Always = 3.50 – 4.0, Often = 2.50 – 3.49, Rarely = 1.50 – 2.49, Never = 1.00 – 1.49
Source: Researcher's Field Survey, 2018

Findings shows that pregnant women in Ekiti State often used their mobile phone ($\bar{x}$ = 2.75). They often used the mobile phones to communicate with family and friends about their health ($\bar{x}$ = 2.84). They also often used it to search for health information online ($\bar{x}$ = 2.78), and to communicate with their health providers ($\bar{x}$ = 2.77). They often used the mobile phone to access pregnancy applications ($\bar{x}$ = 2.70) and to receive text messages ($\bar{x}$ = 2.68)

Table 4: Duration of Mobile Phone use among Pregnant Women in Ekiti State

S/N	Items How long have you been using your mobile phone to:	Very long time	Long time	Short time	Very Short time	MEAN($\bar{x}$)	Remarks
1	Communicate with your health providers about your health?	225 (29.3%)	237 (30.9%)	183 (23.8%)	123 (16.0%)	2.73	Long time
2	Search for health information online?	180 (23.4%)	267 (34.8%)	196 (25.5%)	125 (16.3%)	2.65	Long time
3	Receive text messages on health information?	175 (22.8%)	262 (34.1%)	189 (24.6%)	142 (18.5%)	2.61	Long time
4	Communicate with family or friends about your health?	169 (22.0%)	247 (32.2%)	182 (23.7%)	170 (22.1%)	2.54	Long time
5	Access pregnancy applications?	134 (17.4%)	292 (38.0%)	200 (26.0%)	142 (18.5%)	2.54	Long time

Average Mean Score = 2.61
Decision Rule: Very long time = 3.50 – 4.0, Long time = 2.50 – 3.49, Short time = 1.50 – 2.49, Very short time = 1.00 – 1.49
Source: Researcher's Field Survey, 2018

The result shows that pregnant women had been using their mobile phones for a long time ($\bar{x}$ = 2.61). They have been using them for a long time to communicate with their health providers ($\bar{x}$ = 2.73), to search for health information online ($\bar{x}$ = 2.65), receive text messages on health information ($\bar{x}$ = 2.61), to communicate with family or friends about their health and to access pregnancy applications (x= 2.54).

In the overall, pregnant women often use their mobile phones, they have been using them for a long time and there is high use in engaging their health providers, families and friends about their health on mobile phones and also receiving text messages and using mobile phones to access pregnancy applications. They employ voice and text message functions on their mobile phones for health communication. They use the internet options and pregnancy applications to access health information on their mobile phones.

Table 5.

S/N	Items **Challenges of mobile phones use and health information literacy.**	Yes	No
1	Lack of finances	456 (59.4%)	312 (40.6%)
2	Lack of information and communication technology (ICT) literacy skill	408 (53.1%)	360 (46.9%)
3	Lack of electricity to recharge the battery	426 (55.5%)	342 (44.5%)
4	Low network connectivity	377 (49.1%)	391 (50.9%)
5	Lack of time	325 (42.3%)	443 (57.7%)

Table shows that 456(59.4%) respondents agreed that they lack finance and 312(40.6%) disagreed. The table also shows that 408(53.1%) also agreed that they lack information and communication technology (ICT) literacy skill, 360(46.9%) indicated disagreed. It is also shown on the table that 426(55.5%) respondents agreed that there is lack of electricity to recharge the battery, 342(44.5%) disagreed. The table further shows that 377(49.1%) respondents agreed that there is low network connectivity, 391(50.9%) disagreed. As regards lack of time, 325(42.3%) agreed while 443(57.7%) disagreed.

The item was considered a serious challenge when at least 40% of the respondent considered it a challenge. This implies that lack of finances, lack of information and communication technology (ICT) literacy skill, lack of electricity to recharge the battery, low network connectivity and lack of time are the challenges of mobile phone use among pregnant women in Ekiti State.

Discussion of Findings

The findings of this study showed that pregnant women in Ekiti State highly used their mobile phone to engage their health providers, families and friends about their health and they have been doing it often for a long time. According to Fleming, et al. (2014) pregnant women usually obtain pregnancy-related information from others like medical doctors, midwives, friends, or relatives and electronic media such as the internet. Pregnant women in this study employed the voice and text message function on their mobile phones for health communication and it is consistent with a study where respondents showed interest in receiving health related information through their mobile phones (DeSouza, et al, 2014). Also, a study conducted by Balogun, et al. (2012) showed that mothers in their study were willing to receive text messages on their mobile phones. Pregnant women in this study also searched for health information on the internet using their mobile phones and a study by Lagan, et al. (2010) showed that about half of the respondents went to the internet to seek more information about their health due to dissatisfaction about information given by

healthcare professional and lack of enough time to discuss about their health with them. Furthermore, pregnant women in this study used pregnancy applications to access health information on their mobile phone and this is consistent with a study by Lee and Moon (2016) that revealed that more than half of mobile phone users used at least one pregnancy applications and found out that first time mothers use the applications more than people getting pregnant for the second time. However, the percentage of people getting pregnant for the first time in this study was less than one quarter of the respondents. A study by Sat and Sozbir (2018) revealed that more than 80% of the women had used pregnancy application to seek health information.

This study revealed that pregnant women communicated more frequently with their family and friends than their health care providers, with health provider coming as third. According to J-F et al (2014), mobile phones are often used for socialization and to be in contacts with friends and the fundamental use of mobile phone is for communication and to connect with friends, peers and colleagues. Information seeking research also showed that people delight in the use of social support group or interpersonal sources of information (Case, 2007). Therefore many people seeking health related information often turn to friends and families first before visiting health care professional as the last resort. Furthermore, Fredriksen et al (2016) revealed that pregnant women preferred information provided by other pregnant women to information provided by health care professionals. Also, people consider access first before considering issues of quality when seeking diverse information about health (Johnson & Case, 2012). After using mobile phones to communicate with family and friends, pregnant women searched the internet using their mobile phones frequently. A study conducted by Sinclair, et al (2018) revealed that the internet is commonly accessed for information related to pregnancy. Also, another study showed that out of 97% of women who sought for health information during pregnancy, 13% of them used the internet as the only source of information (Lagan, et al, 2010). Literature has shown that pregnant women are likely to seek health information many times during pregnancy especially before meeting their healthcare professionals (Gao et al, 2013). Pregnant women also accessed pregnancy applications frequently on their mobile phones than receiving text messages on health information. Lee and Moon (2016) revealed that more than half of mobile (smart) phone users in the study used at least one pregnancy applications.

However, the duration of mobile phone use to communicate with health providers was longer than the duration of mobile phone use to communicate with family and friends, to access pregnancy application, to search the internet and receive text messages on health information. This could be because people could only afford to buy smart phones which can be used to access applications and search the internet recently. Also, maybe recently people feel they can get the health information they need from family and friends and not only from health providers. Also, Health care providers are seen as the trusted experts when it comes to pregnancy-related information seeking, and they are 'unbiased' in their judgment and opinion (Leap, et al, 2010; Garnweidner, et al, 2013) and before access to modern technology health providers have been the only major source of information. Pregnant women use mobile phones for these purposes in this order: to communicate with family and friends, to communicate with health providers, to search for health information online, to receive text messages and to access pregnancy applications.

This study revealed that lack of finances, lack of information and communication technology (ICT) literacy skill, lack of electricity to recharge the battery, low network connectivity and lack of time were the challenges of mobile phone use among pregnant women in Ekiti State. Earlier studies showed lack of electricity, costs and network problem were challenges to mobile phone use j(Mechael, et al, 2010; van Velthoven et al., 2013; van Velthoven, et al, 2015).

Conclusion

Building upon the findings of this research, the study concluded pregnant women used their mobile phone to communicate with their healthcare providers, families and friends about their health. They received text messages on health information, accessed internet and pregnancy applications on their mobile phones. The study recommended the need for health providers to further provide comprehensive education for pregnant women on the use of mobile phone to search for the specific type of information that will improve health.

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