mPowering (Maternal Health In Ghana) MHIG

Introduction

According to Ghana's 2010 Millennium Goals Report, the high maternal mortality rate (MMR) is one of the country's greatest concerns. In 2013, Ghana ranked 36th out of 164 countries in terms of MMR with 380 maternal deaths per 100,000 live births (Bhutta, Chopra, Axelson, Berman, Boerma, Bryce, & de Francisco, 2010). Although there is recent progress in reducing the MMR, Ghana is not on track to meet Millennium Development Goal 5: "improving maternal health by reducing the MMR by 75 percent" (Bhutta et.al, 2010). One of the most effective ways to reduce maternal mortality is for expectant mothers to receive periodic ANC visits from health professionals while also having a professional birth attendant deliver their baby (Murray & Pearson, 2006). Among other things, periodic ANC visits can identify high-risk births and refer such cases to medical professionals for assisted deliveries (Murray & Pearson, 2006). In the rural areas of Northern Ghana, one of the major challenges is the difficulty of providing expectant mothers with information about proper antenatal care (ANC), dispelling myths, and making them aware of warning signs along with motivating them to be assisted by a professional birth attendant (Banchani & Tenkorang, 2014). It is difficult for expectant mothers, especially the hardest to reach and poor mothers, to access public healthcare facilities due to the long distances between the expectant mother's village and public health clinics, the poor condition of the roads, and unreliable public transportation

. However, with the rapid rate of mobile phone adoption, delivering learning opportunities in conjunction with mobile devices may be promising for many individuals in Ghana. In 2013, Ghana ranked number one on the continent in mobile cell broadband penetration (Ambient Insight, 2014). Thus, leaving room for mobile experiences that have the potential to educate individuals in their daily lives. Therefore, the integration of personal mobile devices and maternal health messaging for expectant mothers could benefit maternal health information access by informing mothers of ANC appointments and encourage delivering with a professional birth attendant.

In the Northern Region of Ghana among ten public hospitals/clinics, a Mobile Maternal Health Program has been implemented by a local NGO. The primary goal of the program is to decrease the number of maternal mortality rates among expectant mothers and increase ANC activity (External News, 2013). This program seeks to provide pregnant women with valuable information to think critically about being assisted by a professional birth attendant during childbirth (External News, 2013). One clinic, in particular, has been successful in signing up over 800 individuals for the program since 2013. While serving 42 entire communities in a rural area of the Northern region surround the location of this clinic. In general, the program is open to any expectant mother who has access to a mobile phone and would like to receive weekly voice or text messages regarding maternal health information. More specifically, the messages are coordinated with the expectant mother's delivery date while focusing on dietary options, prenatal reminders, vaccination reminders, exclusive breastfeeding explanations, etc (External News, 2013). Midwives promote the program during initial pre-natal check-ups at the facility. After the mothers are signed-up by the lead midwife, a mandatory orientation is facilitated. Although providing maternal health information to mothers is the primary focus of the program, equally

important is the development of a knowledge base about how to best provide the service to this population along with the addressing all of the critical elements needed for successful outcomes. Therefore, this project intends to evaluate various maternal health-related factors, including decisions regarding ANC and professional birth attendant delivery along with documented mortality and morbidity outcomes.

Research Questions

This study will aim to provide comprehensive data, from the expectant mothers regarding the following research question and sub-questions:

1. How do mobile messages impact expectant mothers maternal health activity?
    a. Are women who have decided to receive mobile maternal health messages during their pregnancy likely to retain in ANC?
    b. What are the perceived needs of mobile maternal health in their maternal care activities?

Specific Aims

- To determine considerations for mobile maternal messages being used to promote ANC.
- To define additional outcomes that impact ANC retention in care, such as the number of messages listened to, pregnancy conditions, socio-demographics, and pregnancy history.
- To determine the percentage of expectant mothers who retained in ANC that participated in the intervention.

Goal

This goal of this study is to evaluate how mobile messages impact expectant mothers who participated in a mobile maternal health messages intervention.

Brief description of proposed methodology

The selection of a pre-post evaluation study design is selected to compare health care activities within a local hospital before and after the mobile maternal health intervention. The purpose of the evaluation is to determine if the mobile maternal health messages impact the expectant mothers health care activity of those who participated in the project. Also qualitative feedback from expectant mothers will provide guidance as to what they believe were the strengths and weakness of the mobile maternal health messages.

During May 2014, the student researcher, local hospital stakeholders, and NGO consulted on a plan to provide and support an evaluation regarding the intervention. This approach consists of two phases. The first phase includes quantitative data that will be collected first by using a baseline survey to extract anonymous hospital records regarding ANC activity and noted complications during pregnancies during the years (2009-2012) prior from the start year (2013) of the intervention. Next, a post-survey with identical questions as the baseline survey will be used to extract anonymous hospital records regarding ANC activity and complications during pregnancies during the years (2013-2016) of the intervention. Afterward, local community members will issue surveys by using purposive sampling from the individuals who participated in the intervention. Lastly, from the participants who completed the surveys, individuals' records will be collected regarding the mobile messaging data. The goal of the first phase is to identify potential influences that the messages have on expectant mothers that impact their health activity behavior changes. Once the participants have selected to complete the survey, they will be purposively selected for the second phase. The second phase will include a qualitative approach. The collection of data through individual semi-structured interviews will be used to assist with

the explanation of why certain outcomes were present in the records and surveys. By using this approach, it is hoped that the quantitative data outcomes will contribute to the understanding of the research problem. Therefore, the qualitative data will be used to explain the statistical results by deeply exploring participants' views. The results of the two phases integrate during the discussion of the outcomes of the entire study.

Data sources

The study takes place within one community that deploys the mobile maternal health messages intervention operated by a local NGO. Therefore the criteria for participants will included: (a) expectant mothers who live in Northern Ghana and are registered to the selected local hospital, (b) expectant mothers that are over the age of 18 who have ownership or borrow a cell phone, (c) expectant mothers who have participated in the mobile maternal health intervention for a minimum of 6 months in, (d) expectant mothers who have received maternal health sms or voice messages via mobile cellular phone for a minimum of 6 months, (e) expectant mothers who are willing to share views of the messaging and their maternal health activities during pregnancy. Although in Ghana, English is the official language, "Dagbani" is one of the main local dialects in the Northern Region. The study welcomes all individuals who fit the above criteria and speak either language. The research will include community health key informants and quality control officers who currently serve as community experts and will be knowledgeable about the research study. They are also a liaison between the local community and the local NGO. For the purpose of this research study, the key informants will serve as translators as well as the extension to the community for Erica Bass-Flimmons (PI) in situations where she needs the assistance of understanding cultural norms. The quality control officers will serve as individuals that will assist in overseeing the collection of data and monitoring the extraction of records. Some of the participants may not have completed primary education and, therefore, are non-literate, whereas others who had completed primary level of education would be considered literate. There will be no restrictions on levels of education for individuals to participate. Therefore, the readability of the consent form will be taken into account. Given the nature of the study, including mothers who are expecting between the ages of 13-17 may be a sensitive issue, e.g., if their parents do not know, and they are expecting, then we would have to ask for their permission for them to be in the study.

The study's sampling methods will include purposively sampling selected from the hospital records from those individuals who participated in the mobile maternal health project. The key informants will be used to obtain individuals for both qualitative and quantitative methods. The sampling size for the survey research is approximately 220 samples with the ultimate goal of achieving 200 responses. The 200 responses come from the 80% usability of participation based on profit parameter, 90% response rate, and 10% returned incomplete. The completion of hundred surveys affords a 95% CI with a sampling error of 5%.

This study will utilize three techniques for data collection: (a) collection of records (b) surveys and (c) semi-structured one-on-one interviews. For both quantitative and qualitative approaches, the data-collection period will approximately last for four weeks. Sequentially, the data collection process will include the collection of data records first followed by survey data and lastly interview data.

Regarding the pre-data set, the collection of records from the local hospital of 200 anonymous records will initially occur to receive baseline records (2009-2012) of health care activity regarding ANC activity and noted complications. Key informants will employ this method when

entering the data into a survey form. The post-data set collection of 200 anonymous records will include participants that involved in the mobile maternal health messaging intervention.
Within the postpartum ward, two weeks before the initiation of the study, the purpose and the procedure of the study is explained to all women. To verify past recipients of the intervention, of the individuals who agree to participate in the study their phone numbers are reviewed and must match up with the records of the participants who were involved in the intervention located in the hospital. To greater examine the record analysis; this study will employ surveys to participants. The local communities will serve as the location for the distribution of surveys to community members. The survey will take no longer than 30 minutes. The local NGO or hospital has the authority to modify the instrument where appropriate. By using this method, a cooperative and friendly rapport with participants might be established which can afford me low response bias and more control over the response situations.
The third method of data collection will include the examination the mobile messaging records from the participants. Reviews of the number of messages viewed, length, date, and time will be observed. The selection of messaging data will come from a selection pool of those who participated in the survey.
The final method of data collection will include a qualitative data collection of 30-minute one-on-one semi-structured interviews. The participants will come from the respondent's pool that participated in the survey and mobile messaging records analysis. The interviews will include 16 participants. By having multiple interviews, one can describe and expand the understanding of the phenomenon while presenting multiple perspectives. The interviews will be audio-recorded and organized for analysis.
One week before the study, a mock procedure will be conducted to ensure that all materials are user-friendly and lend to providing the assessed information. After changes, a member of the research team will post an advance announcement to invite individuals to participant in the study. A copy of the consent form will be given out after the oral explanation/translation of the study is given. Participants can then verify that all points outlined in the consent form were covered with the assistance of the key informant if needed. The participants will orally agree to their voluntary participation and sign their signature on the consent form.

Technology employed

Six local key informants within the community will collect the data. None of the key informants will have any previous experience of data collection, but will all have mobile tablets and are proficient in the use of chat messaging. Training for the data collection protocol will take place for all of the community key informants over a two-day period with two quality control officers who work closely with the NGO. Training will consist of using the using the WHO guide (2009) for training community health workers. The training will consist of using interactive methods of role-plays, demonstrations and practice sessions to develop communication and data collection skills and practice. Training will consist of a general orientation to using the mobile tablet and its data collection software, accessing the surveys, interview questions and standard care of the device. The training also includes information on troubleshooting and how to deal with technical difficulties that might arise with the devices.
The study will employ the Open Data Kit (ODK) software, which is a free and open-source set of tools that help manage mobile data collection solutions. The software developer will design a custom form that key informant community members can employ. The software is available offline, and no network coverage is necessary. However, Completed data is automatically

uploaded to an excel file. If there is no mobile network coverage, completed surveys are stored securely until a signal is found at which time completed surveys are will be uploaded.

The anticipated results of the project

An anticipated result of the mPowering MHIG is the integrated approach of evidence-based maternal health interventions in a single setting. It may conclude that integrated interventions at the community level might contribute to a reduction in adverse pregnancy outcomes. Furthermore, a result of mPowering MHIG provides social support and information about early and ongoing prenatal care that is set out to reduce mortality and morbidity to expectant mothers in rural communities in Northern Ghana through community outreach. Being that the key informant community health members are trusted members of the target community who provide personal education, referrals to health and social services and social support. They also support for systems of changes and connect their communities to outside resources. By investing in basic training, support, and action of the community-supported intervention, mPowering MHIG creates sustainable community resource personnel to effect change from within communities. Using the web-based interface and real-time monitoring of community health workers output will also detect an instance of data fabrication.

How the study results will impact healthcare delivery

Evaluation and analysis reports are essential to the sustainability of mhealth; they inform the general public about funding support along with the effects of the pilot specifically related to the objectives of the program (Traxler & Kukulska-Hulme,2005).This study will increase the growing body of literature that has validated the efficacy of mobile voice and text-based health interventions to 1) enhance health literacy and 2) discover related health outcomes. The results from this project aim to change health care delivery for disadvantaged populations by pioneering the effort of employing mobile text and voice messages and improving access to critical health information.

References

Ambient Insight | International Mobile Learning Research. (2014). Ambient Insight | International Mobile Learning Research. Retrieved February 21, 2014, from http://www.ambientinsight.com/Reports/MobileLearning.aspx#section5

Banchani, Emmanuel, & Tenkorang, Eric Y. (2014). Implementation challenges of maternal health care in Ghana: The case of health care providers in the Tamale Metropolis. *BMC health services research, 14*(1), 7.

Bhutta, Z. A., Chopra, M., Axelson, H., Berman, P., Boerma, T., Bryce, J., ... & de Francisco, A. (2010). Countdown to 2015 decade report (2000–10): taking stock of maternal, newborn, and child survival. *The Lancet*, *375*(9730), 2032-2044.

External News| Savana Signatures. (2013). Retrieved January 3, 2014 from http://savsign.org/external-savsign-news/

Murray, S. F., & Pearson, S. C. (2006). Maternity Referral Systems in Developing Countries: Current knowledge and future research needs. *Social Science & Medicine*, *62*(9), 2205-2215.

Traxler, J., & Kukulska-Hulme, A. (2005). Evaluating mobile learning: Reflections on current practice.