Exploring Mobile Technology to Enhance Birth Outcomes in Rural Mozambique: Pilot Study Results

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ABSTRACT

Background: The global proliferation of mobile technology has generated a new tool to address public health challenges and shift the paradigm of health care access and delivery. The World Vision Organization currently has a Mobile Health Division that has developed Mobile Technologies for Health (mHealth). This platform bridges the practice of medicine with the practice of public health, through mobile technologies. This new field has emerged as a viable source to communicate health needs and collect community health data. It has been used to enhance healthcare information delivery to community health workers (CHW), researchers, patients and others, in real-time—and in the midst of rural, geographically-primitive areas.

Evaluation Methods and Results: Mobile phones were used to deliver a series of health education modules, in addition to data collection, CHW training, and a system to prompt emergency referrals. The pilot intervention design had 2 arms: with the mHealth intervention arm utilizing CHWs equipped with mobile phones and the comparison/control arm using CHWs without mobile phones. Surveys were administered at the end of the study to women in both groups to explore knowledge and awareness of dangers signs during pregnancy the postpartum period among study participants. Odds ratios, confidence intervals and p-values for each indicator were calculated and compared between groups.

A total of 188 women were recruited into the study, with 93 in the intervention arm and 95 controls. Mothers in the intervention arm were less likely to have knowledge of mothers on pregnancy and postpartum danger signs during after delivery when compared with mothers in the control group. The results above show, mothers who know at least 2 danger signs in pregnancy is significantly higher in the control area (68%, OR=0.4, p-value=0.009) than in the intervention group (51.6%). The higher proportion of school attendance history amongst mothers could have accounted for this difference.

The CHW’s reported that they were able to use the mobile phone templates with ease and that the recorded algorithms help them make decisions for women who report complications. They reported successful facility referrals for such women and were pleased that their referrals were given priority attention, once at the facility.

The survey had a total sample of 188, with 93 from the intervention area and 95 from the control area. There were similar numbers of boys and girls amongst children under 12 months of age, in both areas. It was found that more mothers in the control area had ever attended school and more mothers in the intervention group worked outside the home. Table 1 presents background characteristics of the participants.

Methodology

Information Management

CHW system organized and archived patient records while:

- Providing CHW training
- Reducing need for paper
- Serving as mechanism for emergency referrals

RESULTS

<table>
<thead>
<tr>
<th>Background Characteristics</th>
<th>Intervention Area</th>
<th>Control Area</th>
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<tr>
<td>Sex of children of mothers</td>
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<tr>
<td>Interv</td>
<td>Control</td>
<td></td>
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<tr>
<td>Boys</td>
<td>46.9 (42.5-51.3)</td>
<td>46.736 (41.7-51.7)</td>
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<tr>
<td>Girls</td>
<td>51.1 (45.8-56.4)</td>
<td>53.342 (48.5-58.9)</td>
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<tr>
<td>Mothers who had attended school</td>
<td>53.6 (40.6-62.1)</td>
<td>70.738 (63.8-72.2)</td>
</tr>
<tr>
<td>Mothers who work outside the home</td>
<td>67.7 (57.3-77.1)</td>
<td>58.146 (46.8-69.8)</td>
</tr>
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In the intervention arm, mothers who know at least 2 dangers signs in pregnancy was 51.6% compared to 68% in the control group, OR=0.4, p-value=0.009. The higher proportion of school attendance history amongst mothers could have accounted for this difference.

Human Resources

- CHWs (n=24) received 10 days of training on application and modules.
- CHW’s initiated home visits , recruited and enrolled participants from June 2011 through January, 2012 – continuing visits until birth event.
- CHWs were selected from intervention/control communities to enhance rapport with participants.

Training included:

- Pregnancy and postpartum modules
- Basic skills of mobile phone usage (power, text, data entry)
- Utilization of CommCare application
- Basic research enrollment

Module Content

Danger signs emphasized: bleeding, pain, fever, convulsions

Data Collection and Analysis

- Survey administered to gauge knowledge of mothers on pregnancy and postpartum danger signs at the end of study implementation phase
- Raw data collected in centralized database, STATA9 format
- Data cleaned and recorded for analysis.

CONCLUSIONS

The risks of maternal and infant mortality and pregnancy-related complications can be reduced by increasing access to quality prenatal care. World Vision’s mHealth intervention show promise as a feasible way to enhance knowledge among women of childbearing age in a rural, developing country. Further research and support to examine this platform is warranted.

REFERENCES


FUTURE DIRECTIONS/CONCLUSIONS

For future studies, taking more time to teach more basic phone operations uses could be effective for the CHW’s to have a better working knowledge of the cellular phone. Also, finding more efficient and accessible power sources will be important when using electricity-required devices for future studies.

The technologies that are the basis of mobile phones are becoming more powerful and cheaper. Projects that are currently under evaluation surrounding the incredible value and potential mobile phones/technology offers areas of the developing world in terms of promotion of enhanced maternal and personal health. Mobile health has the great potential to become a steady and viable resource in rural areas that lack the necessary health resources for their population.

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