m2Health Application, a Consumer Health Informatics Tool for Evidence-Based Self-Management Against Postpartum Infection

Mary O. Ejiwale1,2, Timothy Patrick2, Jake Luo2
1. Biomedical and Health Informatics, PhD Program; UWMilwaukee. 2. Department of Health Informatics and Administration, UWMilwaukee.

ABSTRACT

Maternal morbidity and mortality is a public health concern for both the developed and developing nations. At the global level, infection is the second leading cause of postpartum complications, and death surrounding childbirth, abortion or miscarriage. It persists permanently as the third cause of pregnancy-related death in the United States (Centers for Disease Control and Prevention [CDC], 2012, 2017). It is also the first leading cause of women’s death in the United Kingdom (Acosta et al., 2014). The occurrence of maternal sepsis is independent of the mode of delivery, natural or caesarean section, although, the latter has a higher predisposition.

SIGNIFICANCE OF THE PROBLEM

Pregnancy-related death takes the lives of over 600 women per year, (Centers for Disease Control and Prevention [CDC]. 2012), 99 % of such deaths take place in the developing countries (World Health Organization, [WHO]. 2016). At least, half of maternal deaths are of preventable causes, which include puerperal infection (Bingham, Strauss, & Coeytaux, 2011); (Shamshad, Shamsher, & Rauf, 2010). Every 90 seconds, a woman succumbs to needless death of this nature (American Public Health Association, 2011) (APHA), 2011). Additionally, Isabey, Poliquin, Schneider, & Morris (2015) assert that postpartum infection is cost-ineffective, as it accounts for one third of maternal re-admission, and emergency room visit after the initial discharge, with, Urinary Tract Infection (UTI), and surgical site infection (SSI) being the most reported childbirth-related sepsis (Bommarito, Fraser, & Olsen, 2015). Early detection and reporting are lifesaving strategies for this problem (WHO, 2016).

DATA SPEAKS!

Observation: Percentage of Maternal Death due to Infection Remains Unchanged

GOALS

The aim of this study is to:

❖ Introduce a novel approach to the prevention, early recognition and reporting of postpartum sepsis.
❖ Develop a consumer-centric mobile health application, called, “m2Health” (Maternal Mobile Health), that provides evidence-based self-care information to women of both the developed and developing nations.
❖ Enhance women’s health decision making power through the concept of self-monitoring, and self-management, so they become co-producers of postpartum quality outcome with their providers.
❖ Ultimately support the World Health Organization (WHO)’s global Safe Motherhood Initiative

METHODOLOGY

This is a cohort and prospective study. Fifty pregnant women would be recruited during their first antenatal care visit. The participants would be divided into experimental and control group. The control group would continue with the current antenatal and postpartum care protocol, practices and guidelines, while the experimental group uses the m2Health “app”, both also at the antenatal and postpartum period (after childbirth, abortion or miscarriage). Every participant in the latter group would be given one free digital body thermometer of the same brand for temperature measurement. The attending nurse would demonstrate how to measure, and record the values of three cardinal vital signs that are pertinent to maternal sepsis (temperature, respiration, and heart rate). The “app” includes the normal range of these measurements, and flags any aberrant, so, the patient can promptly seek medical intervention. This self-monitoring exercise continues till the end of the first six-weeks after pregnancy (puerperal phase). Other Evidence-based information related to nutrition during and after pregnancy, personal hygiene (hand, vulva and breast), and other self-care activities related go pregnancy and puerperium are also available through the “app”.

Extensive research proves the acceptance (Willcox et al., 2015) and effectiveness of patient-facing application as a medium for disseminating maternal health education (Zuravc, D., Talsunna, A. O., & Snow, R. W., 2012). Evidence also exists for supporting self-care as an efficient approach to promoting postpartum quality outcome (Jung ES, 2002); (Troy & Dalgas 2008). This m2Health application ameliorates the shortcomings of paper-based maternal health education(e.g. loss of material), breaks the barrier of location/ distance to tested-and-proven postpartum care information, making it readily available and accessible to women of both the developed and developing nations, enhances women’s health decision making power, and promotes safe motherhood at the global level. Additionally, this application supports the concept of self-monitoring by enabling women to measure and record their vital signs, know the normal range of values and promptly identify and report an aberrant.

Cardinal Signs and Symptoms of Puerperal Infection

Fever: Temperature >100.4°F (38.0°C ), rigors / chills, tachycardia (Heart rate >= 90bpm), respiration rate >20 breaths/min, pain / tenderness (Lower abdominal, breasts, episiotomy or surgical site) (Royal College of Obstetricians and Gynaecologists, 2012).

CONCLUSION

Postpartum infection turns tragic so quickly, early detection is the key. This formidable in-process work is an innovative strategy against this global health problem. m2Health application would save the cost associated with readmission due to puerperal sepsis, and it would save women’s lives throughout the world.

WHY AN “APP”? 

Paper-based Postpartum Health Information

Internet-based Postpartum Health Information

“Hard to narrow down internet-based postpartum health information. Wish there’s an "app" focusing on maternal sepsis” – Hypothetical postpartum woman.

FUNCTIONALITIES

m2Health "app” has dual phases of functionality:

Early Start Phase: This is the antenatal phase. The main goal of this phase is to prepare for a healthy postpartum outcome, through a “good” prenatal self-management. Users also get acquainted with the application, build self-confidence in navigating and interacting with the “app” before their pregnancy is over.

Latter Phase: The pregnancy is over (childbirth, abortion or miscarriage) at this stage. m2Health “app” users interact with the “app” for the first six-weeks after pregnancy, they perform active self-management and monitoring activities kicks in against clinical signs and symptoms of maternal sepsis etc. Both phases work towards the realisation of a healthy postpartum outcome.

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