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SHORT COMMENTARY IJPPH

Mobile Application Can Be an Effective Tool for Reduction of Maternal Mortality

Md. Jahid Hasan[1], Md. Sahariar Hossain[1], S.M. Yasir Arafat[2,3], Gazi Md. Rezaul Karim[4], Zuhayer Ahmed[5], Mahbuba Shabnam Mafi[1]

[1]Dhaka Medical College & Hospital

[2]Department of Psychiatry, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

[3]Department of Public Health, ASA University Bangladesh

[4]UNFPA, Bangladesh Office

[5]Surveillance Medical Officer, Bangladesh Country Office for Bangladesh, WHO

Introduction

Bangladesh is one of the countries that achieve the primary target of Millennium Development Goal (MDG) 5 by 2015 but still it must go a far way to reduce mortality and morbidity ratio in minimum level (Arafat 2016; Arafat 2016; El Arifeen et al. 2014). Maternal mortality & morbidity can be reduced markedly by proper monitoring of labor that calls for the detection of any complication during labor and necessary actions to be taken at the earliest possible time (WHO 2003; WHO 2000). The Paper Partograph advocated by the WHO to monitor labor could play a pivotal role here (Levin et al 2011). Lack of Graphical skills, understaffing, many versions of Partograph (Magon, 2011), poor record keeping, chance of retrospective documentation, lack of distance monitoring and overall negative attitude towards paper Partograph are identified barriers of using paper Partograph tools (Ollerhead & Osrin, 2014) especially in low and middle income countries(LMICs). Considering these barriers at hand we aimed to develop a tool to monitor stages of labor which will be easier to use and available at hand. So, we took this opportunity to program an innovative mobile application which is an easier, efficient and cost effective tool for monitoring labor. It can be considered as an alternative to paper Partograph.

The Life Curve Mobile Application

Life Curve Mobile Application is a user-friendly android mobile application by which any health professional including midwives & nurses can monitor the labor very easily and efficiently.
It has five functional segments:

Details of the Mother: The settings interface makes it possible to enter of mother comprising name of the mother, her age, contact number, previous obstetric history (if any), significant history of allergy, identification number along with the name & contact number of the concerned Physician or distance monitor.

Details of the labor: Includes all essential parameters of

*Corresponding author: Md.Jahid Hasan, Email: dr.jahid61@gmail.com

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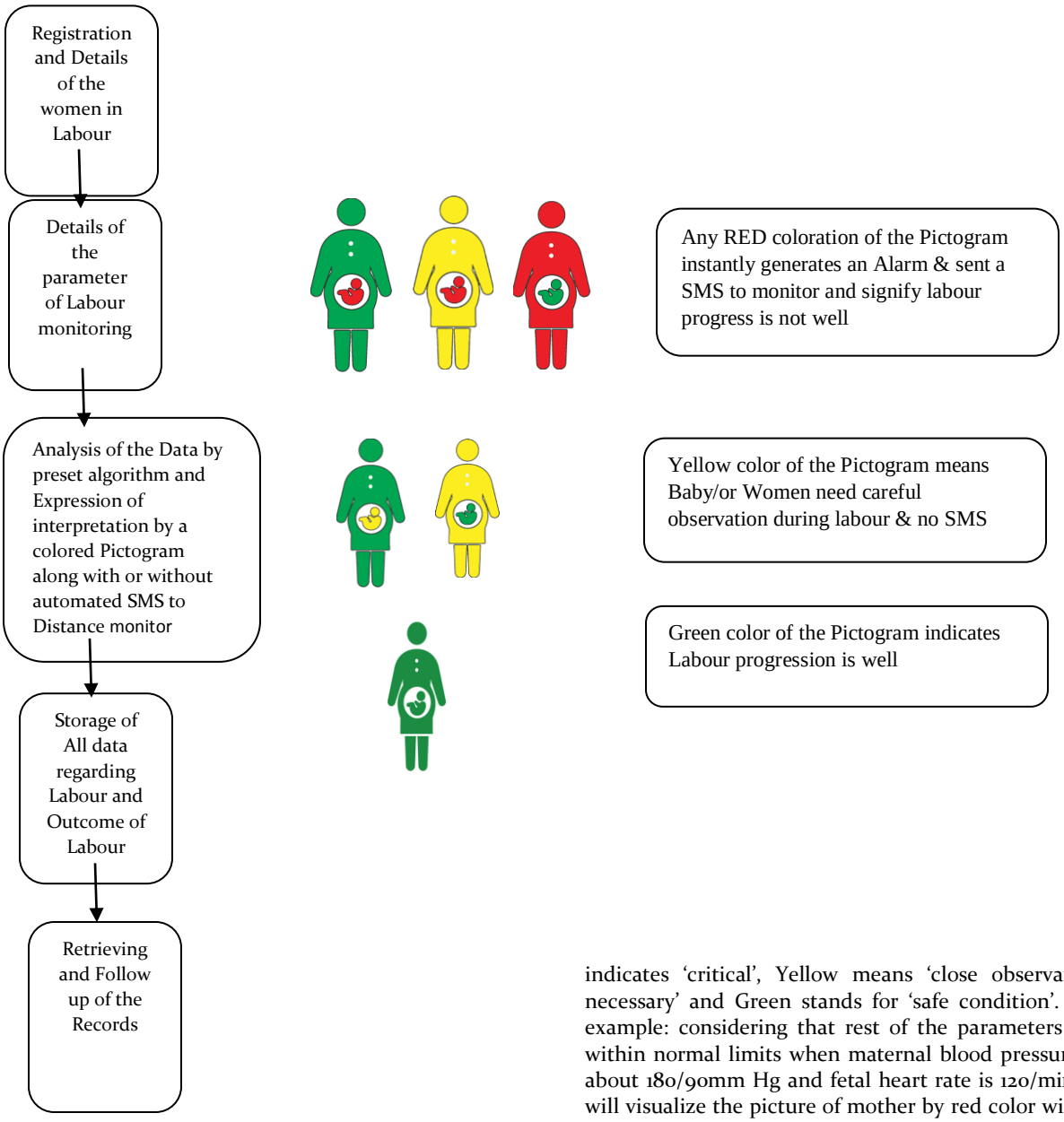
labor monitoring: Fetal & Maternal heart rate, Blood pressure, Temperature, Cervical dilatation, Fetal head descent & Number of uterine contraction in 10 minutes.

Figure 1: Working Scheme of Life Curve Mobile Application



Analysis of the Values: When health care providers input the value of labor monitoring parameters this application will analyze the values by an algorithmic method and visualize a color pictogram (Fetus within a Mother's womb) depicting current state of both mother and baby according to the values. This pictogram demonstrates the condition of mother and baby by three colors: Red, Yellow and Green. Here Red indicates 'critical', Yellow means 'close observation necessary' and Green stands for 'safe condition'. For example: considering that rest of the parameters are within normal limits when maternal blood pressure is about 180/90mm Hg and fetal heart rate is 120/min, it will visualize the picture of mother by red color with a green color baby. Insertion of values of cervical dilation every 4 hours and rest of the values in half hour intervals will generate an automated graph like the existing paper Partograph.

Alarm System: Instantaneous generation and transfer of text message to concerned physicians or distance monitor when any parameter is out of range ensures the accountability and alertness of the physician as

well as opens scope for distance monitoring. Beeping alarm system also alert the attending nurse and peers of the mother.

Data Storage

All the values entered in the application are recorded with network provided time. There is no chance of deletion of the values, messages or pictograms minimizing the need of retrograde use of the application. Moreover, outcome of the labor including normal delivery, caesarian section, still birth or distant referral or others can be stored in the application by touching 'Stop Notify' option. This stored information will provide a scope for research regarding outcome of labor or others, which is an additional benefit of the application.

Data and Software Availability

Full data and materials are available in Corresponding author. Moreover, as this is the first innovation and this data are not used by any other sources and not shared for any other purpose.

•Project name: Life Curve Mobile Application
•Operating system(s): e.g. Android
•Programming language: e.g. Java
•Other requirements: e.g. Java 1.3.1 or higher
•License: Not Published yet
•Any restrictions to use by non-academics: No

Conclusion

Rapid advances in mobile technologies and applications as well as users creating a new opportunity for the integration of mobile applications into existing Health services to support and alleviate existing barriers to achieve universal health coverage. Despite usefulness of Paper Partograph, "Life Curve Mobile Application" made a new horizon of health system to integrate mobile technology into the health system to protect the rights of mothers, ensures more and effective care especially in low resource settings. As innovative tools the usefulness and effectiveness of these tools can be evaluated further.

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