Missing Mums-to-be & Smartphone Technology: Addressing Antenatal Clinic DNAs with Novel Uses of a Mobile Application

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Introduction: A student-led initiative has developed a free smartphone application to be piloted at the Women’s & Children’s Hospital (WCH) within the Hull and East Yorkshire NHS Trust to improve attendance at antenatal clinics following consultation with the patient population and local clinicians. The application interfaces directly with local public transport service resources to aid geographical access to antenatal clinic in addition to providing appointment reminders, a pregnancy tracker and basic healthcare information.

Background: The Saving Mothers’ Lives report (1)
- 2006-2008: 32% of UK maternal deaths failed to regularly attend antenatal clinic appointments.
- Top three direct causes all associated with better health outcomes for mothers who regularly attend antenatal clinic appointments. Also holds true for indirect causes.
- Non-attenders at increased risk of low birth weight children, foetal death & neonatal death (5.46, 12.05 & 10.03; odds ratios compared to control, respectively) (2).
- Our review of antenatal clinic at the WCH identified an almost 6% Did Not Attend (DNA) rate: direct cost of around £54,000/annum to the trust (2). This does not include cost of increased mortality and morbidity.

Our team hypothesised that offering a free smartphone application (app) with appointment reminders and information could potentially improve attendance following extensive consultation with local clinicians & patients, building on the success of SMS-based services such as textbaby (3) by providing a more intuitive and user-friendly interface.

We carried out a survey amongst women admitted to labour ward to assess interest and viability of the project. We determined there was an 89% smartphone adoption rate amongst this population (n=91), with 84% stating that a smartphone app would be useful. 9% of the population indicated difficulties with attending clinic, and all of these women perceived the barrier to attendance to be geographical access. All in this category owned a smartphone and were receptive to the concept of an antenatal app.

Application:
The app developed has been for smartphones running Google Android, Apple iOS or Windows Phone operating systems using Recordset Solutions Ltd, a Yorkshire-based company specialising in bespoke software solutions (4). The screens shown here are taken from the prototype app and are subject to change. It is designed to be far more intuitive and attractive than SMS-based reminder and information services, encouraging further usage. Additional features for future development would include linking it to a secure online database held by the Trust to update appointment times remotely.

Schedule
The app can help the patient to keep track of their appointments. Appointment times can be entered directly into the app by the patient. Push notifications and text messages are used as reminders closer to the time of the appointment.

The rise in the “journey” overview grows with each appointment, with a new leaf for each appointment, and the rose slowly blossoming over the nine months. This graphical representation is intended to encourage a sense of progression and accomplishment with each appointment.

Travel
The app is able to offer public transport route planning from Travel South Yorkshire (5) by the app supplying GPS data from the smartphone obtained in real time on approval by the user. This experimental feature is subject to further consultation with Travel South Yorkshire and carries relevant disclaimers on its usage.

Information
The app offers information on a variety of antenatal topics. Information is tailored to the local population’s antenatal needs and maintained by healthcare professionals. Topics of interest to the Trust such as raising local breast-feeding rates can be focused upon using the app. Safety-netting on each page advises them to seek healthcare professionals if in any doubt.

Impact: By addressing the needs of the patient sub-population identified through our questionnaire (i.e. geographical access issues) and building on the success of SMS-based reminder services we hope to improve patient outcomes and decrease financial losses by improving attendance rates at antenatal clinic at the WCH, which would act as a surrogate measure of success. This project is a proof-of-concept experiment developed from a “grassroots” perspective. We hope to integrate this application or its concept into a suite of mobile applications currently being developed by the Hull & East Yorkshire NHS Trust. Upon its deployment we aim to audit its effectiveness in the clinical setting.

References: