The Use of Mobile Health Technology in Promoting Infant Vaccine Adherence – A Health Technology Assessment

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INTRODUCTION
Infant Mortality, Infections, and Vaccines
- Infant mortality rate (IMR) is one of the most important measures of child health and overall development in countries.
- Three out of 5 main causes listed by the World Health Organization (WHO) to be causing 72% of all childhood deaths in developing countries are infectious conditions: pneumonia, diarrhoea, measles, malaria, and meningitis.
- Most infectious diseases in children can be transmitted with full dose vaccination.
- However, the biggest challenge here, irrespective of resource availability to the individual or hospital, is follow-up.
- Almost all vaccines have a time schedule that needs to be adhered to for maximum efficacy.
- This scheduling can be a burden in low-resource settings where a travel to the nearest hospital means a forgone day’s wage, or the possible loss of a day by forgetting the appointment.

Role of Mobile Phone Technology
- Over the last decade, the global proliferation of mobile phones has reinstated the role of technology as a necessary tool to cater to emerging healthcare challenges and to shift the focus to better accessibility to and delivery of public healthcare facilities.
- Mobile phone technology can be an effective way to communicate immunization schedules to parents, thus improving vaccine adherence.
- There is a dearth of literature that performs a detailed analysis of the effect of mobile phones on infant vaccination coverage.
- This systematic review attempts to assess the efficacy of a mobile phone-based technology in delivering timely infant immunization reminders and ensuring compliance and follow-up rates.

OBJECTIVE
- To identify studies that implement a randomized controlled trial approach to establish the use of mobile health technology for vaccination reminders and neonatal health versus usual care.
- To ascertain the effectiveness of using a mobile phone-based technology to help with infant vaccine adherence as compared to usual care and to identify possible areas requiring new RCTs in the field of mobile health technologies in infant vaccination scheduling.

MATERIALS AND METHODS
- Studies were identified based on pre-specified criteria from two journals (BMJ and Lancet) and three databases (PUBMED, Google Scholar, and Cochrane).
- The articles were screened for PICO (Population, Intervention, Control, and Outcome) parameters.
- The shortlisted articles included the desired target population (infants and mothers), AND the methodological methodology was Randomized Controlled Trials (RCTs).
- Software used: Cochrane RevMan 5.0.
- Biases on account of protocols, selection and blending methods were taken into consideration.
- Risk ratios were analyzed for the review using a forest plot and bias graphs.

RESULTS
- Studies were published between 1996 and 2014.
- A total of 5999 participants (infants and mothers) were recorded for the intervention and control groups put together.
- Clinic-based interventions: 05; Province-based intervention: 01.
- Clinical studies provided: 05; Province-based intervention: 01.

RESULTS: Risk of Bias
- The included studies were of mixed methodological quality.
- Random sequence generation (selection bias)
- Allocation concealment (selection bias)
- Binding of participants and personnel (performance bias)
- Blinding of outcome assessment (detection bias)
- Incomplete outcome data (attrition bias)
- Selective reporting (reporting bias)

DISCUSSION
- A Cochrane review evaluating the benefits of telephone support for women during pregnancy and postpartum 6 weeks concluded that:
- There was a general reduction in depression scores, improved breastfeeding duration and increased overall satisfaction.
- Despite this, the evidence from RCTs was insufficient to recommend investment for routine telephone support.
- In contrast, the present review provides a favorable outcome of improved immunization schedule compliance rates with mobile-based support.
- Another trial reported in 2012 evaluating the effect of a test messaging intervention on influenza vaccination concluded that:
- Among children and adolescents in a low-income, urban population, the intervention (compared with usual care) was associated with an increased rate of influenza vaccination.
- However, the overall influenza vaccination rate remained low.

CONCLUSIONS
- The use of mobile technologies could marginally improve compliance in the intervention groups, even if they do not affect the overall immunization rates.
- Incorporating this scheme into an existing health system requires a small investment that could potentially result in sizeable gains in reducing infant and neonatal mortality and morbidity, particularly in resource-limited settings.

REFERENCES