

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 the 5 main causes listed by the World Health Organization (WHO) to be causing 70% of all childhood deaths in developing countries are infectious conditions: pneumonia, diarrhea, measles, malaria, and malnutrition¹
- Most infectious diseases in children can be tackled with full dose vaccination
- However, the biggest challenge here, irrespective of resource availability to the individual or household, 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 foregone day's wage, or the possible lapse of date 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 facilities²
- Mobile phone technology can be an effective way to communicate immunization schedules to parents, thus improving vaccine adherence³
- There is a dearth of literature that performs a detailed analysis of the effect of mobile phones on infant vaccine coverage³
- This systematic review attempts to assess the efficacy of a mobile phone technology in delivering timely infant immunization reminders and ensuring compliance and follow-up rates.

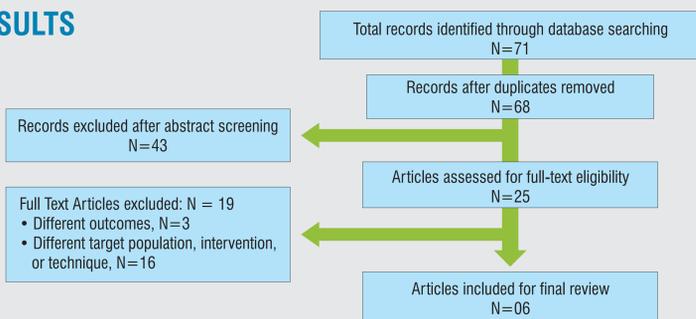
OBJECTIVE

- 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 mHealth (mobile health) technologies in infant vaccination scheduling.

MATERIALS AND METHODS

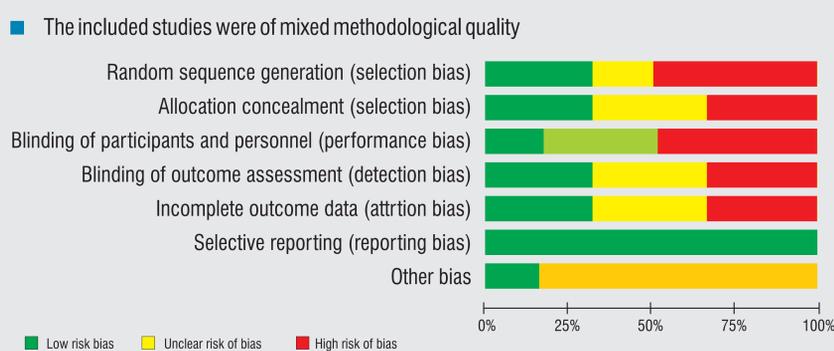
- Studies were identified based on pre-specified criteria from two journals (BMJ and Lancet) and three databases (PUBMED, Google Scholar and Cochrane).
- The articles were screened for PICO (Population, Intervention, Control and Outcome) parameters
- The shortlisted articles included the desired target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

RESULTS

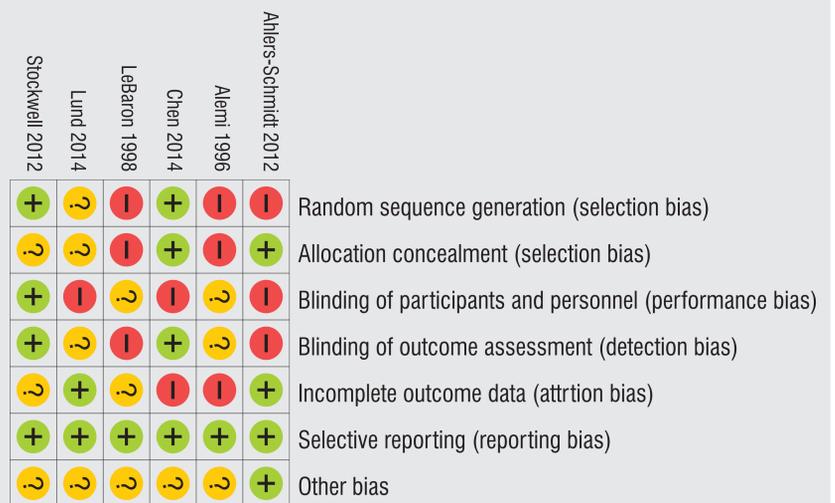


- Studies were published between 1996 and 2014
- A total of 5999 participants (infants and mothers) were recorded for the intervention and control groups put together
- Clinic-based interventions: 05; Province-based intervention: 01

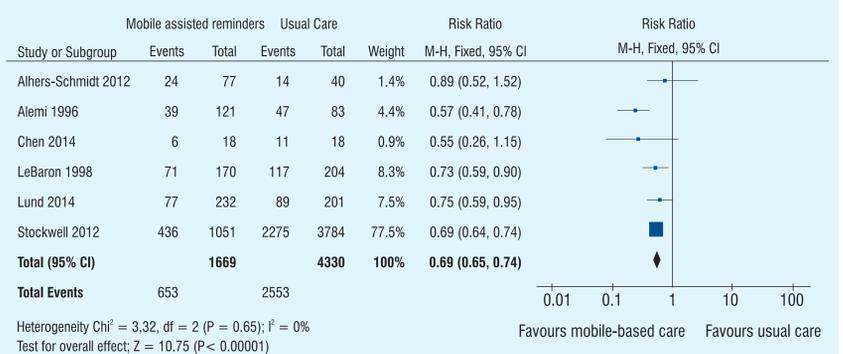
RESULTS: Risk of Bias



Results: Risk of Bias



RESULTS: Forest Plot



Interpretation:

- Risk Ratio is 0.69 (95% CI 0.65 to 0.74; p<0.00001)
- By using mobile phone as an intervention for infant vaccination compliance increases by 31% as compared to usual care
- The intervention (mHealth) is more effective compared to the control by a margin of 31%.

DISCUSSION

- A Cochrane review evaluating the benefits of telephone support for women during pregnancy and post-partum 6 weeks concluded that:⁴
 - 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 text messaging intervention on influenza vaccination concluded that:⁵
 - 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.
- Our review provides similar results in terms of effectiveness of mobile phone intervention on health outcomes

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

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