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PROSPERO International prospective register of systematic reviews

The effectiveness of mHealth interventions for maternal, newborn and child health in low and middle income countries: a systematic review and meta-analysis

Ulugbek Nurmatov, Claudia Pagliari, Siew Lee, Liz Grant, Bright Nwaru, Mome Mukherjee

Citation

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Review question(s)

What is the impact of interventions delivered via mobile information and communications technologies (mHealth) on:

• Maternal health during the antenatal, intranatal and postnatal periods

• Foetal, neonatal and infant health up to one year

• Child health up to the age of 5 years

• Utilisation of maternal and child health services

• Quality of maternal and child health services

Searches

• Published studies: We will search the Cochrane Library (Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Methodology Register), MEDLINE, EMBASE, CINAHL, PsycINFO, AMED, Global Health, TRIP, ISI Web of Science (Science and Social Science Index), WHO Global Health Library, IndMed, KoreaMed, POPLINE, NHS Health Technology Assessment Database. Search dates will be from 1990 to present. Our search terms are detailed in Appendix 1.

• References from published studies: The bibliographies of all eligible studies will be scrutinised to identify additional possible studies.

• Unpublished and in progress studies: Unpublished and ongoing work and research in progress by searching key Internet-based relevant databases – www.clinicaltrials.gov; www.controlledtrials.com; www.anzctr.org.au; http://www.who.int/ictrp/en/. In addition, to extend our search for published, unpublished and on-going studies, we will contact an international panel of experts in this field.

• Language: No language restrictions will be imposed; translations will be undertaken where necessary.

Link to search strategy

http://www.crd.york.ac.uk/PROSPEROFILES/8939_STRATEGY_20140214.pdf

Types of study to be included

The following study designs will be potentially eligible for inclusion:

• Randomised controlled trials (RCTs, quasi-RCTs, Controlled clinical Trials (CCTs)), controlled before-and-after studies, interrupted time series studies

• Cohort, case-control studies

Condition or domain being studied

Rates of maternal, newborn and child (MNCH) mortality and morbidity are vastly greater in low than in high income countries and represent a major source of global health inequity. A host of systemic, economic, geopolitical and sociocultural factors have been implicated. Mobile information and communication technologies hold potential to ameliorate several of these challenges by supporting coordinated and evidence-based care, facilitating community based health services and enabling citizens to access health information and support. mHealth has attracted considerable attention as a means of supporting maternal, newborn and child health in developing countries and research to assess the impacts of mHealth interventions is increasing. While a number of expert reviews have attempted to summarise this literature, there remains a need for a fully systematic review employing gold standard methods of evidence capture, critical appraisal and meta-analysis, in order to comprehensively map, quality assess and synthesise this body of knowledge.

Participants/ population

• Pregnant women

• Women in antenatal, intranatal and postnatal periods

• Newborns

• Children aged 0-5 years

Exclusion criteria

• Studies from developed countries

• expert opinion

• case studies, case series

• technical reports, reviews

Intervention(s), exposure(s)

Any intervention, delivered via mobile ICT, which is designed to support the maternal, newborn and child health at national, state, city, or community level in Low and Middle Income Countries.

Comparator(s)/ control

Usual care

Context

Any healthcare setting

Outcome(s)

Primary outcomes

• Primary outcomes: maternal mortality; maternal morbidity; newborn and child mortality; newborn and child morbidity

Secondary outcomes

• Secondary outcomes: number of planned antenatal and post natal visits; number of unscheduled care visits and emergency care; quality of life; quality of care (delivery by skilled birth attendants, appropriate use of evidence-based medical and obstetric interventions where available); self-efficacy; cost-effectiveness; immunisation cover and child developmental milestones.

Data extraction, (selection and coding)

Two authors will search the databases and screen titles and abstracts for potentially eligible studies. Disagreement will be resolved by consensus, or arbitration involving a third author where necessary. Full text articles will be retrieved for selected studies, and two authors will assess whether these meet the set inclusion criteria. Disagreement

will be resolved by discussion amongst reviewers, with referral to a third author if necessary. Reasons for exclusion of studies will be noted.

Two reviewers will independently extract data using customised data extraction forms. The following information will be extracted: author and year, country of origin, study design, healthcare setting, type of mHealth intervention (intended objective and technology used), range of specified outcome measures, maternal mortality and morbidity, newborn and child mortality and morbidity, emergency care, quality of life, quality of care (delivery by skilled birth attendants, appropriate use of evidence-based medical and obstetric interventions where available), immunisation rates, and cost-effectiveness of interventions. Key findings from each included study will be summarised and presented in summary tables.

Risk of bias (quality) assessment

We will assess and document the methodological quality of included RCTs, quasi-RCTs and CCTs following the Cochrane approach using the methods detailed in section eight of the Cochrane Handbook for Systematic Reviews of Interventions. For controlled before-after studies and interrupted time series studies will be assessed using the Cochrane Effectiveness and Practice Organisation of Care (EPOC) guidelines. For observational studies (cohort and case-control) we will use the Effective Public Health Practice Project (EPHPP). We propose to concentrate on using the following seven domain-based parameters to assess quality: adequate sequence generation, allocation concealment; blinding of participants and personnel, blinding of outcomes, incomplete outcome data addressed, free of selective reporting and free of other bias. We will grade each parameter of trial quality: A - low risk of bias; B - moderate risk of bias; C - high risk of bias and an overall assessment for each controlled trial using the same three criteria will be made. Reviewers will not be masked to study details. We will assess the agreement of reviewers on methodological quality assessment and resolve disagreements by discussion, with a third researcher brought in to arbitrate if needed.

Strategy for data synthesis

Based on our preliminary scoping work, we anticipate that we will identify a limited number of eligible trials with substantial heterogeneity so that meta-analysis will not be appropriate. In the (unlikely) event of identifying sufficient trials suitable for inclusion in a meta-analysis we will follow the standard procedures described in the Cochrane handbook.

Analysis of subgroups or subsets

None planned

Dissemination plans

We will share our findings with fellow investigators planning intervention studies, present abstracts at international conferences; disseminate findings within our professional spheres of influence. A paper will be published in a peer reviewed journal.

The review is being conducted on behalf of the World Health Organisation and the results will be cascaded through its maternal and child health programmes. We will disseminate the key messages through our online networks of health professionals and academics, including the University of Edinburgh's Global Health Academy, LinkedIn Global Health groups, and the Guidelines International Network (which produces evidence-based guidelines in different regions).

Contact details for further information

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Details of any existing review of the same topic by the same authors
N/A

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Stage of review at time of this submission	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	Yes	Yes
Risk of bias (quality) assessment	Yes	Yes
Data analysis	Yes	Yes

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