

Can mHealth improve recording of birth outcomes in LMICs?



Introduction

Documenting birth outcomes in LMICs can be challenging. Traditional paper-based systems have a short memory and are difficult to store, making it hard to access records for patient care at a later date or to monitor data trends.

With increasing mobile phone ownership in LMICs, use of mHealth in maternal health interventions is expanding. **However, it's not known whether mHealth is used to capture birth data, and whether this improves recording of birth outcomes.**

Objectives

- Identify what mobile technologies are being used to record birth outcomes at the time of delivery in LMICs
- Determine if recording birth outcomes with mHealth is feasible and acceptable
- Evaluate if mHealth improves recording of birth outcomes

Methodology

PRISMA guidelines for scoping reviews were followed. MEDLINE, CINAHL and Global Health were searched for papers where mHealth was used by midwives or birth attendants at the point of delivery in LMICs.

Two independent reviewers screened the papers using pre-determined inclusion and exclusion criteria. Data were extracted and a narrative synthesis conducted.

Results

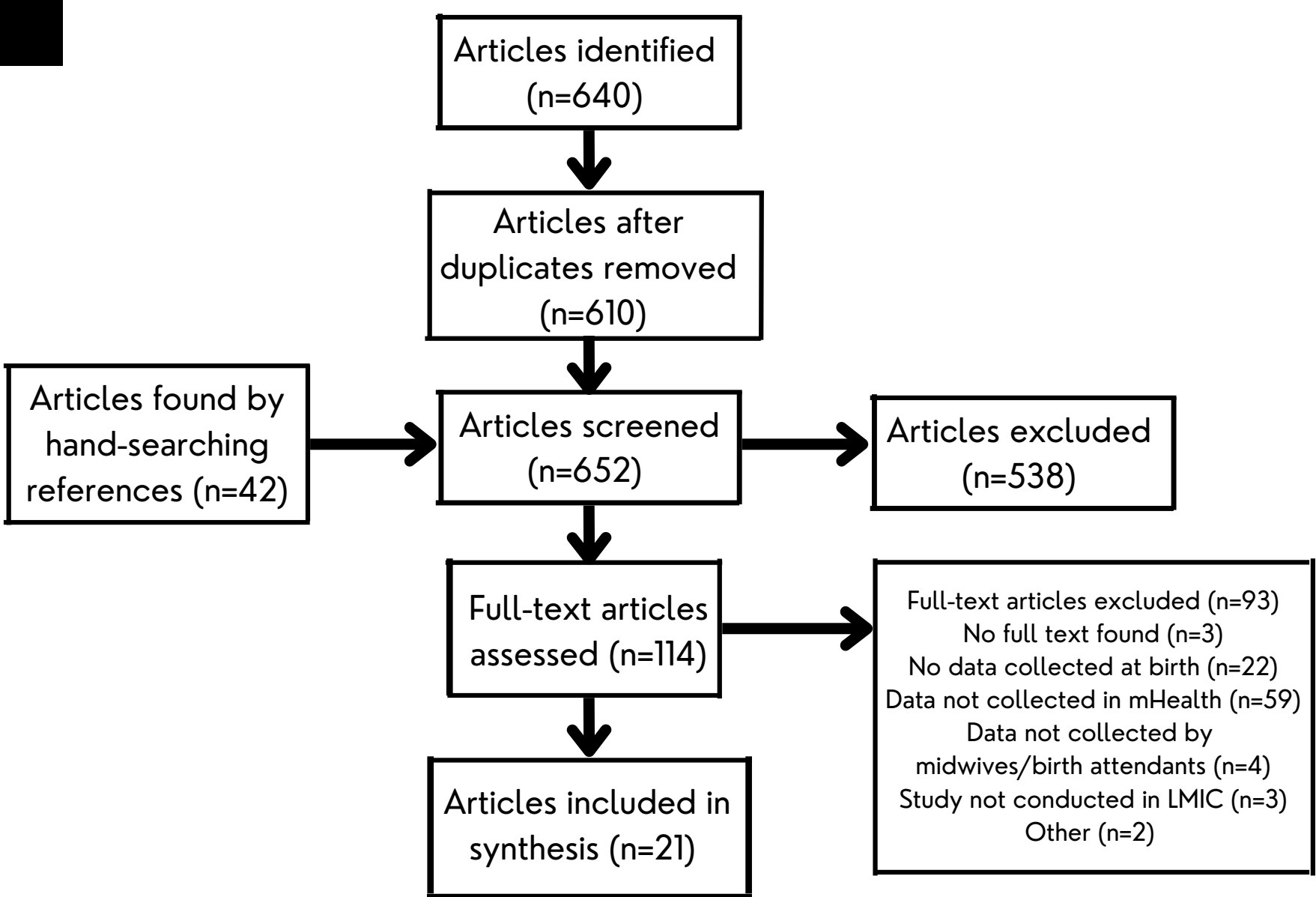


Figure 1: screening and selection of articles

	Platform	Intervention content	User feedback	Limitations
L	ePartogram	App with WHO partograph	Data entry simple Improved decision making	Concerns about time for data entry in high-volume sites
L	e-partograph	App with WHO partograph	Only 44% willing to use	Low willingness to use mobile partograph
L	mLabour	Partograph + labour ward management	Preferred tablet to paper Like automatic graphing	NS
L	prasavGraph	Partograph + digital records	NS	NS
L	ASMAN	Partograph, digital records + dashboard*	Easy + time efficient Improvement in recording data	Tablet + connectivity issues High workload prevented all fields being completed
O+C	PPH recording	SMS protocol to report PPH	NS	Poor network and power outages Lack of remuneration
O	Mobile delivery timer	Timer measuring time from birth to cry	70% found app beneficial 90% found easy to use	NS
O	Birth defect surveillance	App to document birth defects	NS	Doesn't capture births outside facilities
C	RapidSMS-MCH	SMS protocols for data collection	Technology well accepted Some wanting compensation for increased workload	High initial costs Lack of equipment to collect data
C	Data collection	App for medical records + dashboard	87% found forms helpful ALL preferred electronic to paper records	High cost phone airtime Increased error rates in electronic records v paper
C	Perinatal monitoring app	Record vital signs, medical record + dashboard	Easy to operate system Some staff unfamiliar with technology	Data corruption issues
C	Hayat	App for medical records + dashboard	Improved worker efficiency Some frustrated as unable edit data	Workers needed to travel long distances to upload data
C	Maternal referral system	Communicate maternity referrals to hospital	NS	Bugs in application
L = labour monitoring O = specific outcomes C = community use				
NS - not specified in paper *dashboard - records and reports for local health bureaux to view				

Table 1: mHealth platforms, feedback and limitations

Analysis

640 records were screened, 21 of which met criteria. 15 different mHealth tools were identified, with studies carried out in 12 countries across Asia, South Africa and South America.

Six technologies were described by more than one paper, with four these studies being conducted in the same setting as the first published paper. Most papers were reporting early phase development and pilot work; three studies were preclinical and only one study reported results of a randomised control trial.

Thematic analysis identified six themes (figure 2). Three were roles for technologies: labour monitoring, recording of a specific birth outcome and tools for use in the community. The other three were what papers were mainly concerned with: attitudes of health workers to digital technologies, comparison of paper and digital data collection and sustainability, interoperability and infrastructure for mHealth.



Figure 2: themes identified

Studies found birth outcomes could be successfully recorded using mHealth tools, by both health professionals in facilities and by lay workers in the community. In all but one of the studies, digital data collection was preferred to paper methods, but in three studies workers were concerned about the time taken to complete the electronic forms.

However, there was little consideration of the infrastructure required for mHealth, and network connectivity and issues with hardware was discussed by some. Only four papers reported capability to communicate with pre-existing health information systems, and just one had been scaled up for widespread use.

Conclusion

- Several mHealth technologies are capable** of recording birth outcomes in the delivery room, but **none are specifically designed** for this purpose.
- Whilst mHealth was **well accepted**, few of the tools in use have adequate reporting of interoperability and sustainability, and research **studies were often of low-quality**.
- More consideration of sustainability and interoperability** with existing health systems is required, as well as **evaluation of technologies** to determine if they improve recording of birth outcomes.

