

BACKGROUND

- Maternal health remains a universal concern in developed and developing countries
- 94 % of maternal deaths occur in LMICs
- E-health solutions are considered revolutionary instruments in healthcare
- The use of technology in health has changed the outcomes of maternal care for the better

AIM

To analyze all digital interventions that improve maternal emergency delay

METHOD

- Three databases searched
- Primary evidence from 2014-2024
- Inclusion: pregnant women incorporated with e-intervention for maternal health

Identification of studies via databases and registers

Identification

Records identified from*:
PubMed (n = 353)
ScienceDirect (n = 858)
Scopus (n = 9320)

- Records removed *before screening*:
- Duplicate records removed (n = 276)
 - Records removed for inappropriate type of study (n = 8242)
 - Records removed for other reasons (not accessible, not in English) (n = 1966)

Screening

Records screened
(n = 47)

Reports sought for retrieval
(n = 33)

Records excluded**
(n = 14)

Reports not retrieved
(n = 5)

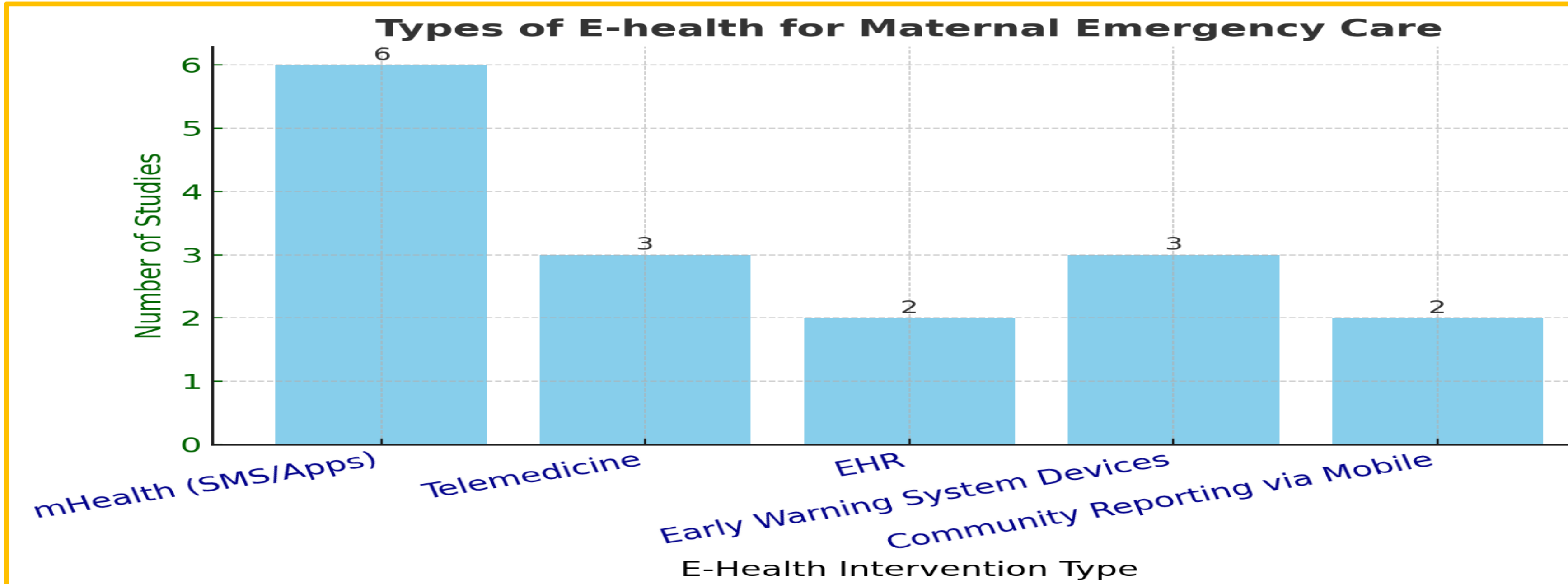
Included

Reports assessed for eligibility
(n = 28)

Studies included in review
(n = 16)

- Reports excluded:
- Not e-health intervention (n = 4)
 - Intervention targeted to healthcare worker (n = 3)
 - Wrong study design (n = 5)

RESULT



Three Delays Model:

- Decision to seek care
- Identifying and reaching a medical facility
- Adequate and Appropriate treatment

The identified e-health interventions address key components of the **Three Delays Model**.

- mHealth tools** (e.g., SMS reminders, mobile apps) primarily reduce the **first delay** by increasing maternal awareness, improving health literacy, and encouraging timely antenatal visits and facility-based deliveries
- Community-based mobile reporting** and **telemedicine** interventions support the **second delay**, particularly in remote or rural areas. They facilitate early risk identification and timely referral.
- Early Warning Systems** and **EHR-based predictive models** directly target the **third delay** by improving provider response time within facilities.

CONCLUSION

- Integration of digital intervention into maternal healthcare has the potential to mitigate delays in emergency situations and significantly improve maternal outcomes.
- mHealth tools, electronic health records, and early warning systems have enhanced early risk detection, referral efficiency, and emergency response, particularly in low-resource settings.
- Digital intervention should be contextually adapted, supported by policy, and integrated into national maternal health strategies in low- and middle-income countries.

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DISCUSSION

Digital interventions such as mHealth applications and electronic medical records (EMRs) have improved clinical decision-making, emergency management, and adherence to essential birth practices.

- This scoping review found that several interventions **address all three delays** in the maternal care pathway.
- Geographic variation** remains a key factor. Countries such as **Rwanda and Kenya** demonstrate effective national-level implementation of mHealth strategies to boost ANC coverage and emergency care response.
- These findings highlight that while digital tools can enhance readiness and response, the impact on mortality often depends on **health system capacity and referral efficiency**.