

Effectiveness of mHealth interventions to improve outcomes along the prevention of mother-to-child transmission of HIV cascade: Systematic review and meta-analysis

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Conclusions

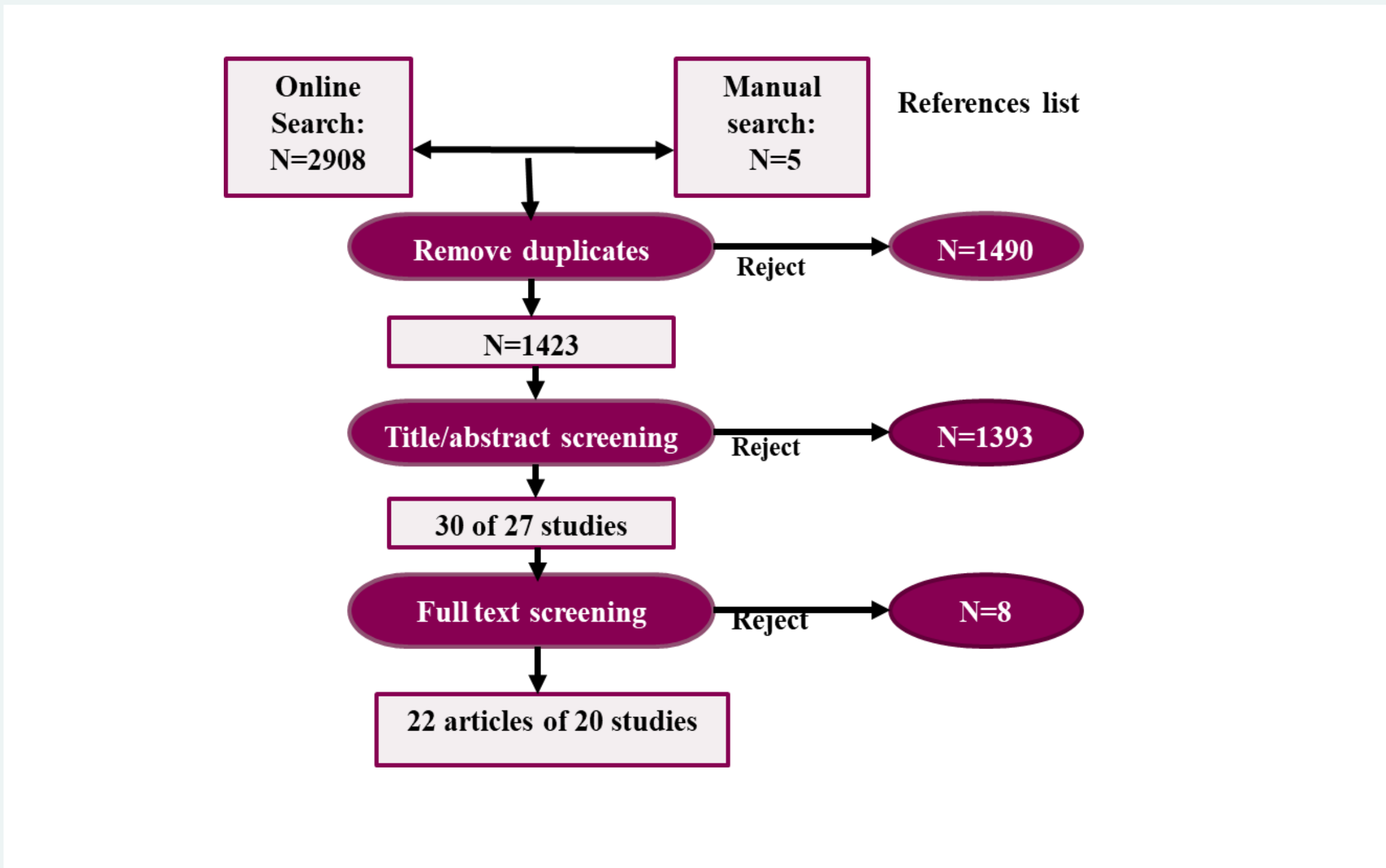
- mHealth improved short-term retention in care (RIC) and early infant diagnosis (EID) outcomes with moderate certainty of evidence.
- The greatest impact at six weeks postpartum coinciding with the first postnatal care visit.
- No mHealth effect was observed on long-term RIC or EID outcomes or other prevention of mother-to-child transmission of HIV (PMTCT) outcomes with low certainty level.

Introduction

- Almost 30% of 120,000 new annual HIV infections in children occur among pregnant and breastfeeding WLWH who initiated antiretroviral treatment (ART) but dropped out of care or did not achieve effective viral suppression.
- mHealth-based interventions have the potential to address these challenges and improve access to PMTCT interventions.
- Earlier mHealth studies had shown mixed results and most recent trials have reported null findings.

Aim

- To assess the effectiveness of mHealth interventions on maternal and infant outcomes along the PMTCT cascade.
- Primary outcomes: RIC and EID
- Secondary outcomes: Infant ART prophylaxis, exclusive breastfeeding (EBF), Maternal ART initiation, adherence and viral load outcomes.
- To assess whether mHealth effect was modulated by Option B+ policy implementation, presence of co-interventions, or interactive (2-way) intervention.



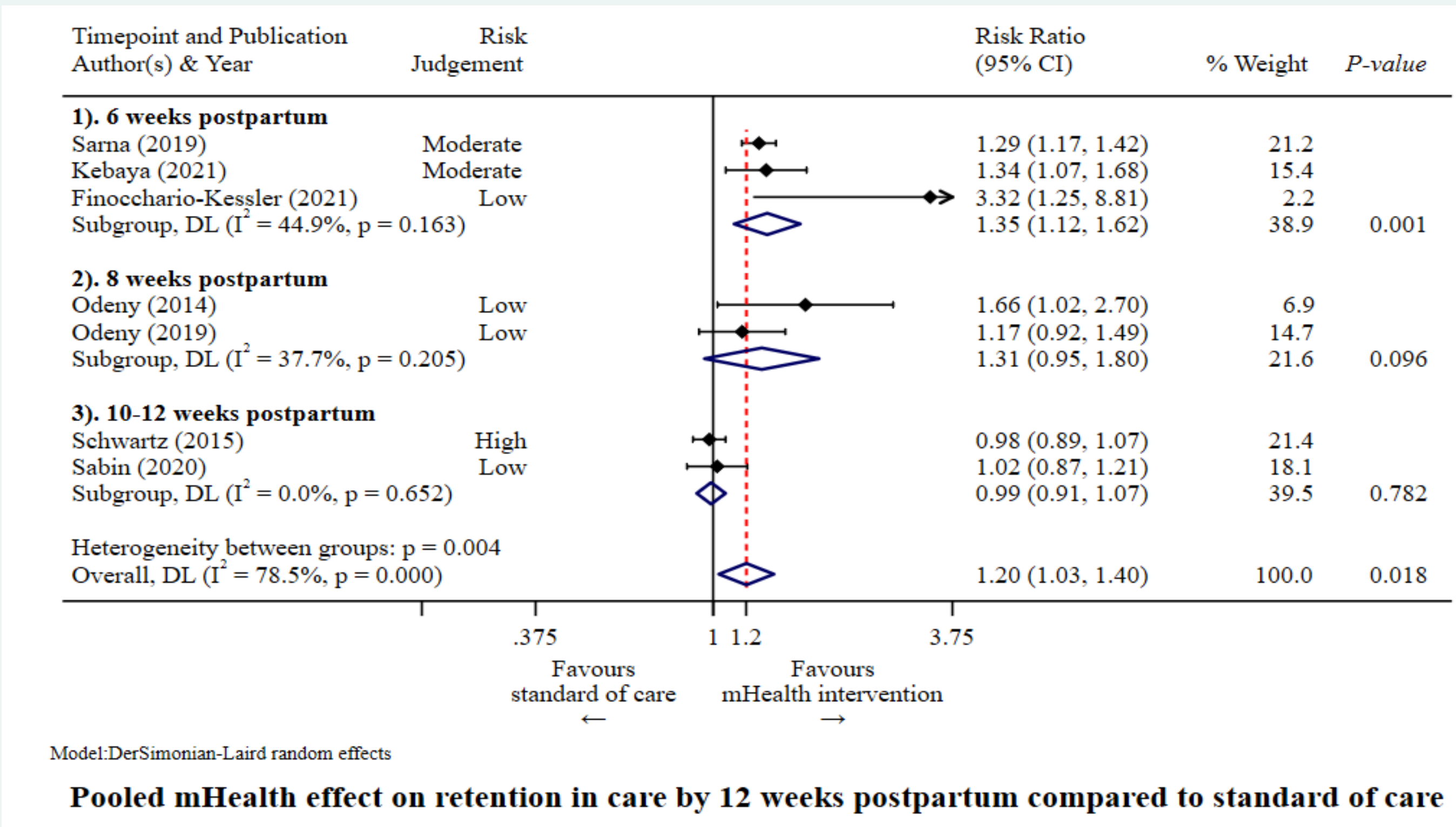
PRISMA flow chart

Literature search

- 5 electronic databases were searched using PICOTS criteria
- Population:** Pregnant or breastfeeding women living with HIV (WLWH)
- Intervention:** mHealth
- Control:** Standard of care (not receiving the intervention)
- Outcome:** Prevention of mother-to-child transmission of HIV (PMTCT) maternal and infant outcomes
- Time:** 2010-2025
- Study design:** Experimental studies including both RCTs and NRSIs
- 22 articles were eligible for inclusion

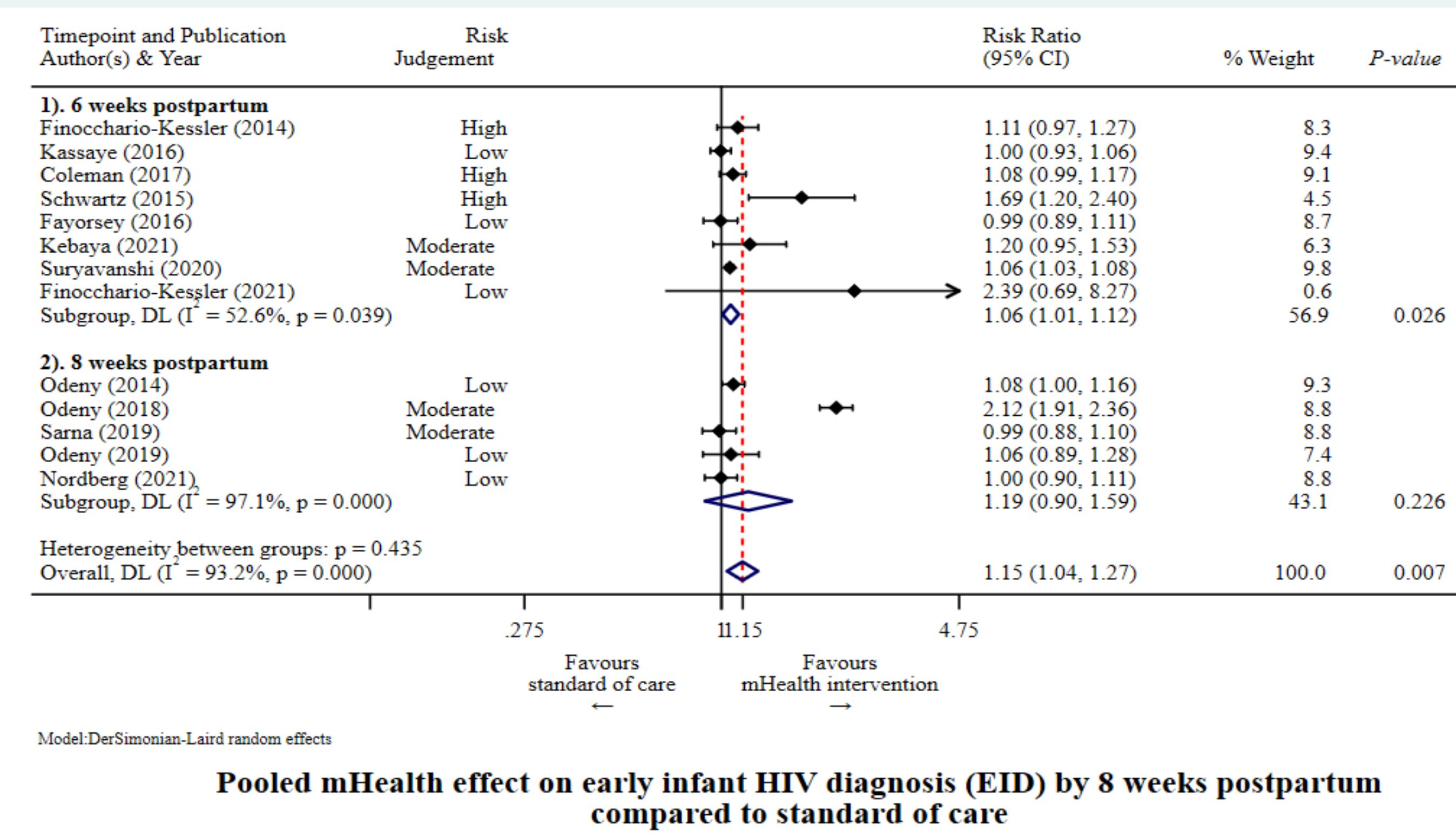
Results

- Random model pooled effect on RIC by 12 weeks and EID by 8 weeks postpartum favored mHealth. <50% of included studies in each meta-analysis were of low risk of bias.
- Egger's asymmetry test suggested no publication bias for both retention-in-care at 12 weeks and EID at 8 weeks postpartum ($p>0.05$).
- The effect size on both outcomes declined gradually over time in cumulative meta-analysis.
- In subgroup analysis, Option B+ policy and combined interactive Intervention and peer counsellor facilitated co-interventions added benefit to mHealth effect.



Model:DerSimonian-Laird random effects

Pooled mHealth effect on retention in care by 12 weeks postpartum compared to standard of care



Model:DerSimonian-Laird random effects

Pooled mHealth effect on early infant HIV diagnosis (EID) by 8 weeks postpartum compared to standard of care

Results table: Pooled effect by outcomes

Outcome (Postpartum follow-up)	Sample size, number and the design of studies	Certainty of evidence (GRADE)	Pooled effect (RR, 95% CI)
Primary outcomes			
EID by 8 weeks	7056 (10 RCTs, 3 NRSIs)	⊕⊕⊕○ Moderate	1.15 (1.04 to 1.27)
Retention-in-care by 12 weeks	3752 (6 RCTs 1 NRSIs)	⊕⊕⊕○ Moderate	1.20 (1.03 to 1.40)
Secondary outcomes			
Infant ART prophylaxis adherence by 12 weeks	1235 (3 RCTs)	⊕⊕○○ Low	1.02 (0.90 to 1.17)
EBF by 6 months	1745 (4 RCTs)	⊕⊕○○ Low	1.06 (0.92 to 1.21)
Maternal ART adherence by 24 months	2990 (4 RCTs)	⊕⊕○○ Low	1.01 (0.98 to 1.04)
Maternal ART uptake by delivery	1714 (4 RCTs)	⊕⊕○○ Low	0.98 (0.94 to 1.03)
Maternal viral suppression 6-12 months	757 (2 RCTs)	⊕⊕⊕⊕ High	1.05 (0.97 to 1.14)

EID=early infant diagnosis, RCT= Randomized trials, NRSIs= non-randomized studies, ART= antiretroviral, EBF=Exclusive breastfeeding

Policy implications

mHealth intervention are effective strategies for RIC and EID in the immediate postpartum period. Further research to optimize mHealth for long-term PMTCT outcomes is needed.



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