

Mobile phone text messages for improving adherence to antiretroviral therapy (ART): an individual patient data meta-analysis of randomized trials

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Outline

- Background
- Objectives
- Methods
- Results
- Strengths and limitations
- Conclusions

Background 1

- 30 million + people living with HIV worldwide
- Improved outcomes thanks to antiretroviral therapy (ART)
- ART only works if it is taken properly
- Otherwise:
 - ✓ Mortality
 - ✓ Morbidity
 - ✓ Transmissibility
 - ✓ Resistant strains
 - ✓ Health care costs

Background 2

- Text messaging as an adherence enhancing device
- Widespread use
- Cheap
- Trials and reviews demonstrating effect

Objectives

- Summarise the evidence from three trials
- Analyse the effect of the intervention in subgroups defined by: age, gender, level of education, duration on ART and type of message
- Examine the use of multiple statistical methods

Methods 1

- Individual patient data analysis of three trials
 - ✓ Lester et al (Kenya)
 - ✓ Pop-eleches et al (Kenya)
 - ✓ Mbuagbaw et al (Kenya)

Methods 2

- Lester et al:
 - ✓ multi-site two-arm trial of weekly interactive text messaging
- Pop-eleches et al:
 - ✓ single site five-arm trial of short daily, short weekly, long daily and short daily one-way text messages
- Mbuagbaw et al:
 - ✓ single site two-arm trial of weekly motivational text messaging
- **The first two trials showed significant improvement in adherence to ART while the latter did not.**

Methods 3

- Contact authors
- Request data
- Data recoding and verification
 - ✓ Uniform categories
- Data merging

Methods 4

- Baseline covariates
 - ✓ Descriptive statistics
- Primary analysis: outcome adherence >95%
 - ✓ Random effects mixed models

Methods 5

- Adjusted analysis:
 - ✓ Age, gender level of education, duration on ART
- Sensitivity analysis
 - ✓ Generalised Estimation Equation
 - ✓ Adherence >90%
 - ✓ Handling of missing data
 - ✓ Pooled estimates (aggregate meta-analysis)

Methods 6

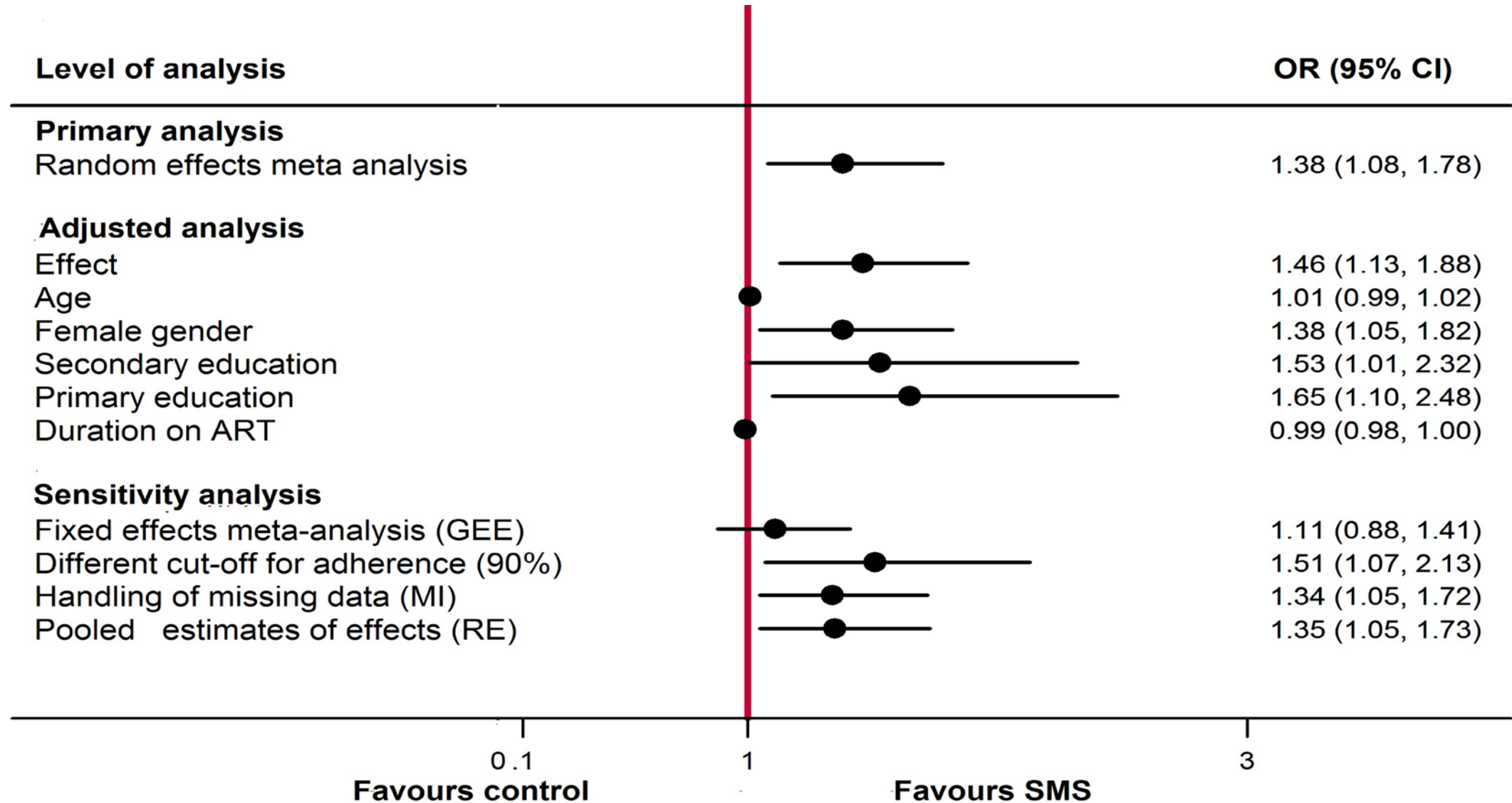
- Subgroup analysis
 - ✓ Age
 - ✓ Gender
 - ✓ Duration on ART
 - ✓ Type of message (Short, Long, Weekly Daily)
 - ✓ Interactive
 - ✓ Motivational

Results 1

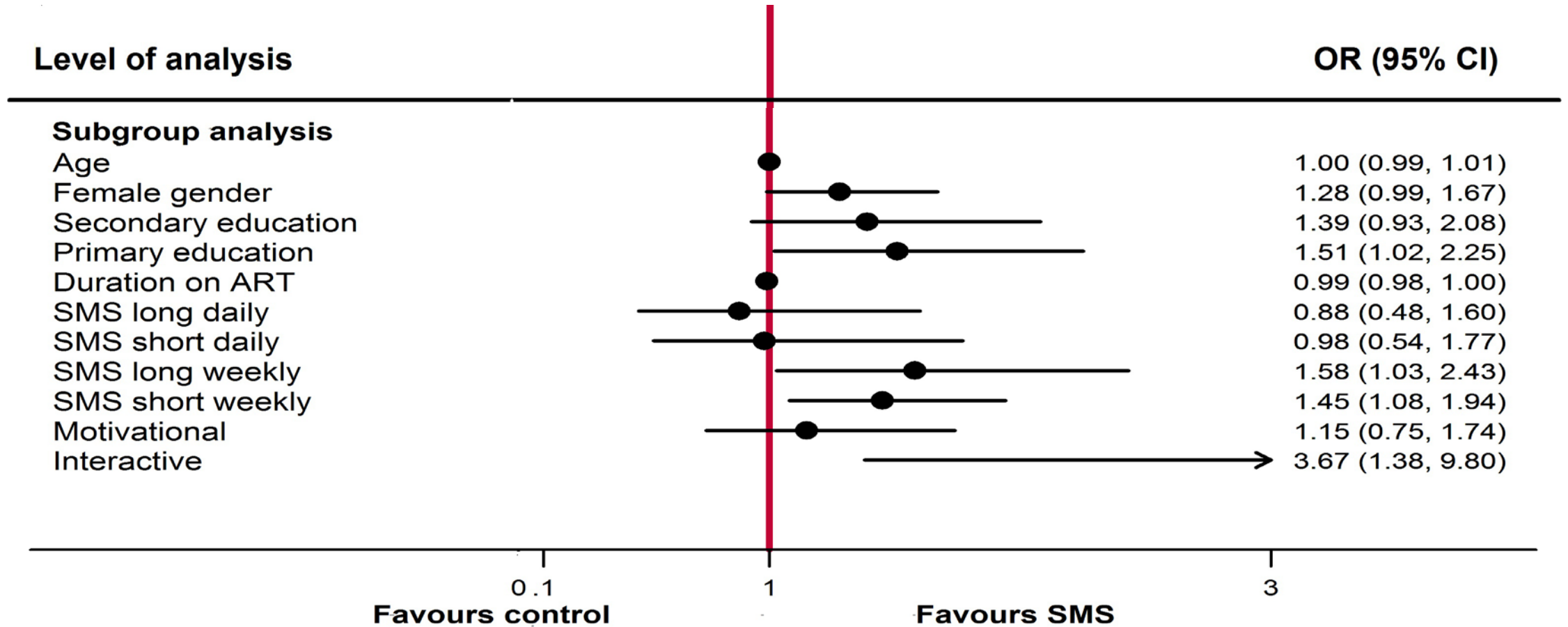
	Control arm (n=663)	SMS arm (n= 503)	Total (n=1166)
Categorical variables	n (%)	n (%)	n (%)
Number of participants			
Lester et al	265 (22.7)	273 (23.4)	538 (46.1)
Pop-Eleches et al	139 (11.9)	289 (24.8)	428 (36.7)
Mbuagbaw et al	99 (8.5)	101 (8.7)	200 (17.2)
Gender*			
Male	159 (32.7)	207 (33.2)	366 (33.0)
Level of education*			
Primary	164 (33.7)	227 (36.4)	391 (35.3)
Secondary or higher	252 (51.9)	275 (44.1)	572 (47.5%)
Continuous variables	Mean (SD)	Mean (SD)	Mean (SD)
Duration on ART (months)#	5.99 (16.00)	5.73 (15.342)	5.84 (15.626)
Age (years)&	37.19 (9.192)	37.33 (9.476)	37.27 (9.348)

SD: standard deviation; ART: antiretroviral therapy; *57 missing; &63 missing; #11 missing;

Results 2



Results 3



Results 4

Secondary outcomes	OR (95% CI)	p-value
Mortality	0.87 (0.52, 1.43)	0.591
Lost to follow-up	0.87 (0.63, 1.19)	0.387
Transfers	1.40 (0.56, 1.48)	0.463
Withdrawals	2.55 (0.67, 9.71)	0.170

Limitations

- Different interventions
- No viral load data
- Only African studies

Strengths

- Individual patient data
- Robust statistical methods
- Focus on Africa

Conclusion

- Test messaging:
 - ✓ Significant effect on adherence to ART
- Recommendation:
 - ✓ Interactive weekly text messaging especially in clients with at least a primary level of education.
- Further research:
 - ✓ Cost-effectiveness
 - ✓ Approaches to scaling up

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