Treatment outcomes amongst drug-susceptible TB persons using medication monitor and differentiated care approach in South Africa: results from a cluster randomised trial.

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BACKGROUND

- Challenges of implementing traditional directly observed therapy has been well documented
- WHO had recommended the use of digital adherence technologies (DAT) such as evriMED devices (medication monitors) to assist patient-centered adherence support
- First China trial looking at effectiveness of using medication monitors showed 45% improvement in adherence over standard of care
- Systematic review 2018, reported that evidence of the effect of digital technologies (Video Observed Therapy, medication monitors, sms) on improving TB outcomes remained limited
- There was limited data on the implementation of medication monitors in SA and on their effect on TB treatment outcomes.

METHODS

Study design: Pragmatic cluster randomised control trial
Study setting: 18 primary health clinics in 3 South African provinces with high number of identified TB cases and with varying prevalence of HIV infection
Study population: Adults and children with DS-TB receiving TB treatment at the participating clinics
Sample size: Approximately 2610: harmonic mean of 145 participants/cluster; % with <80% adherence in SoC arm is 30% → 90% power to detect a 40% reduction in poor adherence
Intervention clinics: Wisepill evriMED device with real-time monitoring and differentiated care
Standard of Care (SoC) clinics: Patients given silent monitors to measure drug intake

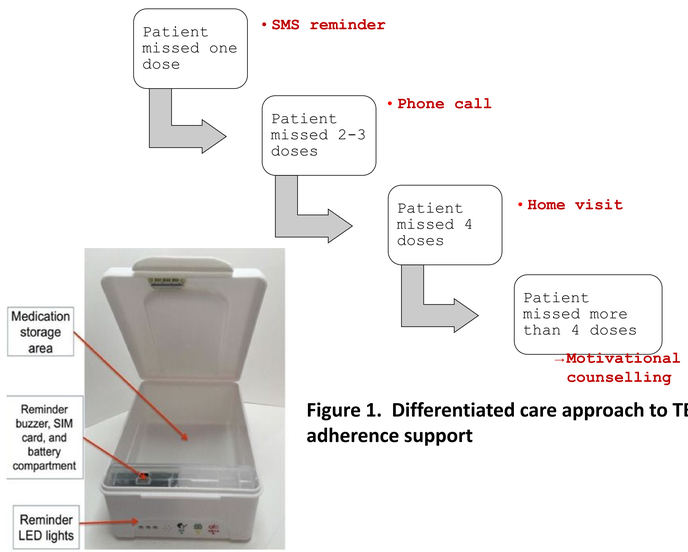


Figure 1. Differentiated care approach to TB adherence support

"Unfavourable" outcome did not differ by study arm. Subgroup analyses indicate some differences in females and Western Cape by study arm.Sensitivity analysis, including all those that died in follow up or including delayed treatment completion as "unfavourable" indicated no differences in outcomes by study arm.

DEFINITION OF OUTCOMES

Unfavourable composite outcome is defined as poor end of treatment outcome or treatment recurrence (by 18 months from treatment start):

Poor end of treatment outcome: Treatment failure, Lost to follow-up, Death, Treatment restart, MDR diagnosis >28days after diagnosis, Culture positive at 6 months

"Recurrence" defined as: among those with treatment outcome defined as success or completed treatment:

Self-report treatment restart or positive sputum at any follow-up visit to 18 months

All remaining participants will be coded as "**not assessable**". These include:

Transfer outs

Treatment outcome not documented (and no culture result at 6 months)

Treatment outcome defined as cure or completed treatment and lost to follow-up or died by 18 months

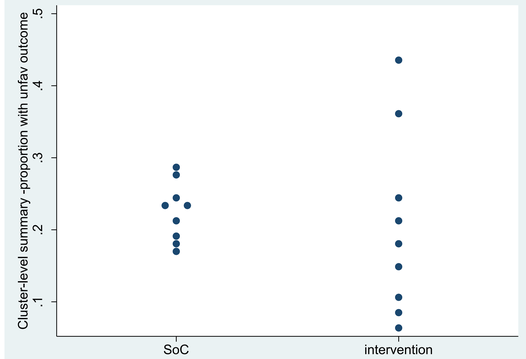
RESULTS

On 2727 participants enrolled, 2070 with defined outcome, 432 (20.9%) had unfavourable outcome

Table 1. Breakdown of unfavourable outcome by study arm

	Standard Of Care (n=974)		Intervention (n=1096)	
Unfavourable outcome	**216**		**216**	
poor end of treatment outcome	173	80.1%	176	81.5%
Treatment failure	30	13.9%	30	13.9%
Lost to Follow Up	81	37.5%	68	31.5%
Died	57	26.4%	72	33.3%
MDR	5	2.3%	6	2.8%
After end of treatment	43	19.9%	40	18.5%
Rif Resistant TB	1	0.5%	2	0.9%
Culture positive	25	11.6%	26	12.0%
Restarted treatment	17	7.9%	12	5.6%

Figure 2. Comparison of unfavourable outcomes by study arm



SoC	Intervention	Risk ratio (95% CI)*	P-value
22.3%	17.1%	0.78 (0.53-1.16)	0.21

* Intervention vs Standard of Care; Adjusted for age, sex, TB diagnosis, ethnic group, marital status, HIV/ART status and province

CONCLUSIONS

Although adherence was improved, there does not seem to be a difference in unfavourable outcome in persons with DS-TB in the intervention versus Standard of Care arms. Although these interventions are less likely to show an impact on clinical outcomes in routine settings, the effect on adherence is important and warrants continued use and evaluation of these technologies.

ADDITIONAL KEY INFORMATION

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Acknowledgements:

Department of Health, South Africa

Provincial Departments of Health, Gauteng, KwaZulu Natal and Western Cape

Health care workers and patients at facilities

Funders: Bill & Melinda Gates Foundation, Stop TB Partnership, South Africa Medicine Research Council