

Digital Strategy to improve PrEP adherence among MSM: A Stepped-wedge Randomized Trial in China

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BACKGROUND

- Digital Health intervention is promising for encouraging behavior change.
- We conducted a stepped-wedge trial (SWT) to evaluate the efficacy of co-created digital PrEP adherence intervention to facilitate adherence among Chinese MSM PrEP users.

METHODS

- The SWT is nested in a PrEP demonstration trial in Guangzhou and Wuhan, China (NCT04754139).
- MSM in Wuhan and Guangzhou were recruited by online ads, clinic flyers, and community referrals to a PrEP demonstration trial. MSM were prescribed TDF/TFC as oral PrEP and could opt for daily or on-demand regimens.
- Behavioral survey data were collected at baseline and quarterly follow-ups over 12 months (M3, M6, M9, M12).
- Per-protocol analysis and generalized linear mixed-effects model were conducted in Stata 15.0.

Intervention development:

- 1 Before the trial:** Open call to solicit ideas of digital PrEP adherence messages
 - 2 During the trial:** 19 trial participants joined the co-creation group
 - 3 Co-creation:** Online and off-line sessions to iteratively develop digital messages for PrEP adherence
- The co-created messages were sent to participants every other week through WeChat (a mobile chat app).

- Intervention messages were co-created through open calls and three co-creation rounds, including short videos, images, and infographics.

RESULTS (July 2021 to September 2024)

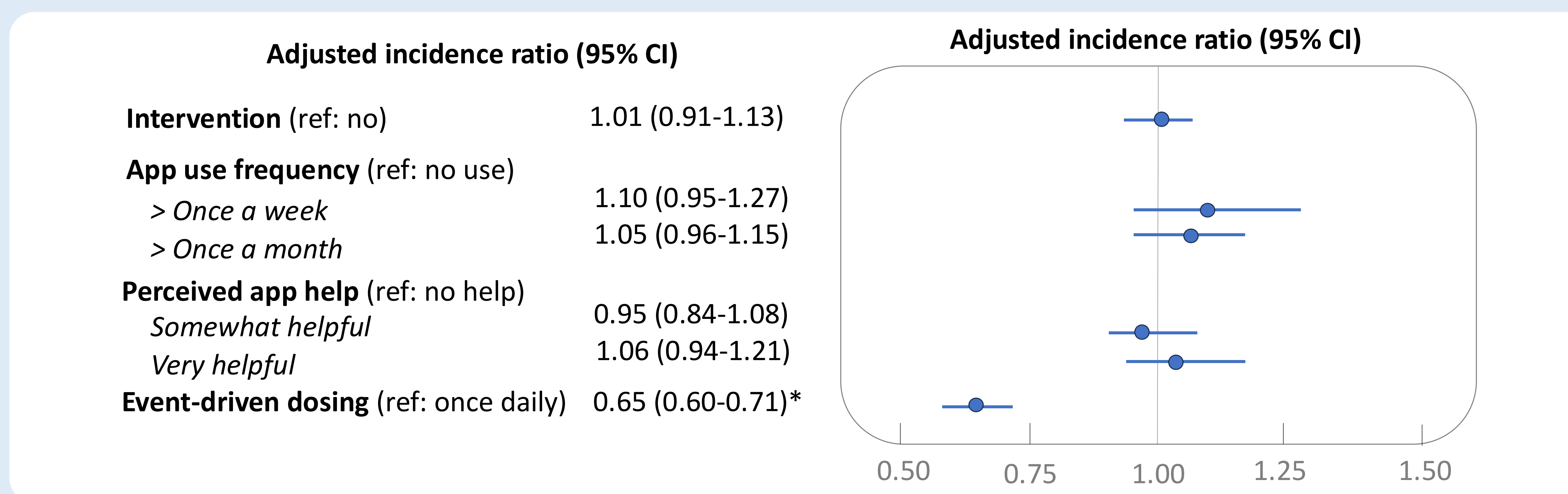
- 1,134 MSM started oral PrEP, with a median age of 29.1(SD=5.9).
- 1,089 MSM enrolled the SWT trial. A total of 7 people were diagnosed of HIV.
- 388 (34.2%) lost to follow-up before the trial ended; no difference across SWT clusters.
- About half of the participants opted for on-demand PrEP (the “2+1+1” strategy).
- From M3-M12, about 75% reported optimal adherence (daily users: 6-7 pills/week; on-demand users: full compliance with the 2-1-1 dosing scheme per sex event within 30 days; people not having sex considered as adherent), with a non-significant secular trend of declining adherence over time.
- The digital intervention did not significantly improve adherence levels (aOR=1.20, 95% C.I.= 0.88-1.63)

Table 1. Percentages of participants reporting optimal PrEP adherence across clusters over time

SWT cluster (baseline N)	M3 (n=906)	M6 (n=827)	M9 (n=759)	M12 (n=710)
Cluster A (n=247)	77.7%	80.7%	72.9%	75.2%
Cluster B (n=284)	77.1%	81.0%	77.3%	73.9%
Cluster C (n=278)	77.7%	73.6%	77.5%	78.0%
Cluster D (n=280)	80.8%	78.5%	74.9%	75.8%
ALL (n=1089)	78.4%	78.4%	75.8%	75.8%



Figure 1. Adjusted Odds Ratio for predictors of optimal PrEP adherence – results from GLMM



CONCLUSIONS

- MSM using once-daily oral regimen are more likely to report optimal medication adherence.
- Exposure to the digital co-created message, or higher frequency of using the intervention app, or higher perceived help from the intervention app did not significantly improve medication adherence.
- Co-created digital PrEP adherence intervention with Chinese MSM has the potential to improve PrEP adherence.
- Message-based intervention may have limited impact on improving adherence behaviors.
- Further research is needed to analyze the relationship between behavior outcomes and the extent of actual intervention exposure (i.e. reviewing the message).
- Our findings of varied adherence performance among individuals highlight the need for future research into differentiated PrEP interventions.

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