Exposure and Engagement Drive Impact: Results from a Digital Health Trial with Rwandan Adolescents

1310

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BACKGROUND

- Digital interventions are a promising approach for improving health behaviors; however, low digital engagement can limit effectiveness.
- An intent-to-treat analysis found that CyberRwanda, a digital HIV and family planning platform, improved secondary outcomes including modern contraceptive method use among sexually active youth.[1]
- We examined how exposure and engagement with CyberRwanda affected its impact.

METHODS

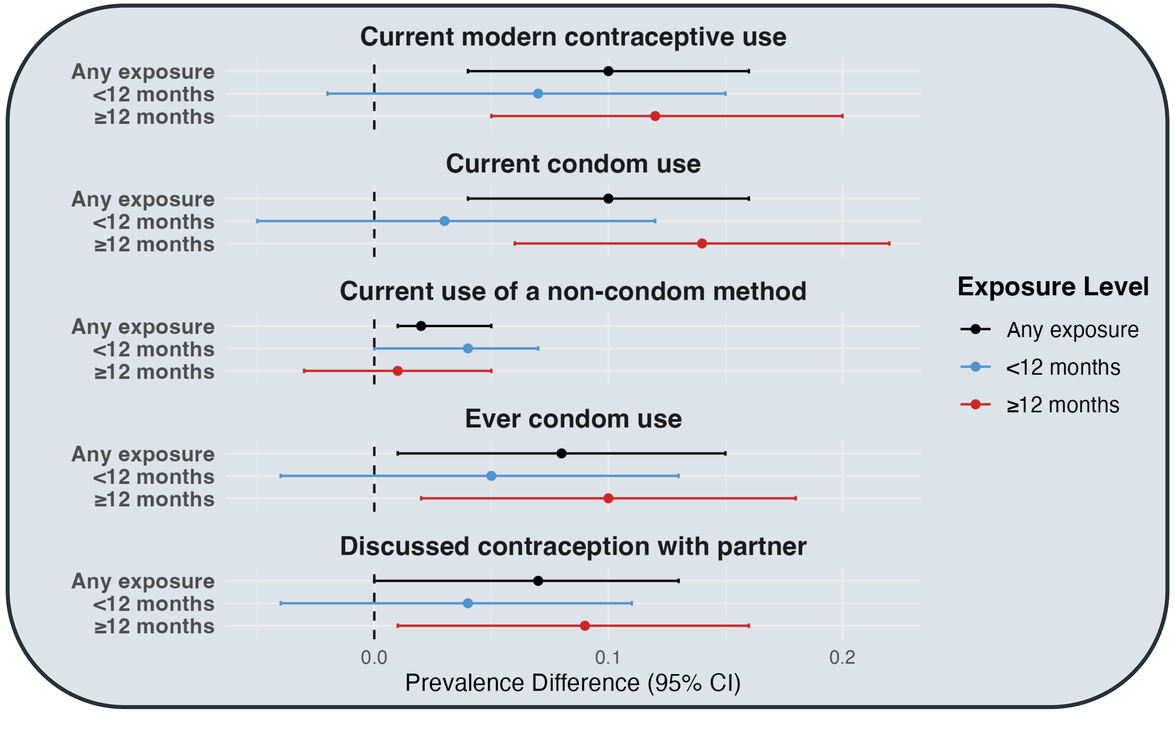
- **Study design:** 24-month cluster randomized trial; 60 schools across 8 Rwandan districts (n=6,078).[2]
- **Study population:** Secondary students ages 12–19.
- **Primary outcomes:**
  1. Current modern contraceptive use (all females)
  2. Initiation of childbearing (all females)
  3. Ever HIV testing (overall)
- **Secondary outcomes:** HIV and family planning knowledge, attitudes, self-efficacy, and behavior.
- **Analysis:** Prevalence ratios (PR) estimated using:
  1. Generalized linear mixed models to assess effects by exposure level (**per-protocol**: any exposure; **dose-response**: <12 months, ≥12 months).
  2. Instrumental variable models to assess **causal average complier effects (CACE)** of high frequency use and combined high frequency use + ≥12 months of exposure.

Table. CyberRwanda Exposure and Engagement

	CyberRwanda (n=3707)
Exposure	
Any exposure (≥1 month)	3394 (91.6%)
<12 months	1441 (38.9%)
≥12 months	2266 (61.1%)
Engagement	
High frequency use	1175 (31.7%)
Engagement + Exposure	
High frequency use + ≥12 months exposure	907 (24.5%)
Missing data: high frequency use (n=60), high frequency use + ≥12 months of exposure (n=60).	

Having ≥12 months of digital exposure was found to be a key driver of impact, underscoring the importance of sustained access to and engagement with digital health tools.

Figure. Per-protocol and Dose-response Effects of CyberRwanda (n=1,305 Sexually Active Participants)



RESULTS

- **Primary outcomes:** No impact observed regardless of exposure level or engagement.
- **Per-protocol:** Consistent with intent-to-treat results.
- **Dose-response:** In the ≥12-month exposure group, there were larger effects on all secondary outcomes that were significantly improved in the full sample; few effects were observed in the <12-month group.
- **CACE**: The largest effects were observed when combining high frequency engagement with ≥12 months of digital intervention exposure.
- **Sexually active subgroup:** Participants with high exposure and engagement had the most notable improvements on contraceptive use including:
  - Increased modern contraceptive use among ≥12-month exposure group vs. control. (**Figure**).
  - Increased modern contraceptive use by 40 percentage-points for high frequency users with ≥12 months of exposure vs. control.

CONCLUSIONS

- When adolescents have higher exposure to and/or engagement with CyberRwanda, the intervention has a greater potential for impact, including preventing HIV and unintended pregnancy among sexually active youth via improved condom use.
- Our findings underscore the need to prioritize sustained access to and engagement with digital health tools to maximize intervention effectiveness.

ACKNOWLEDGEMENTS

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REFERENCES

1. Hémono et al. 2024
2. Nolan et al. 2020

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