

Formative qualitative response of MSM with substance use to digital pills for PrEP adherence

Peter R. Chai^{1,2}, Georgia Goodman^{1,3}, Edward W. Boyer^{1,2}, Kenneth H. Mayer^{1,4}, Rochelle K. Rosen^{5,6}, Conall O’Cleirigh^{1,3}

¹The Fenway Institute, Fenway Health, Boston MA, ²Department of Emergency Medicine, Brigham and Women’s Hospital, Boston MA, ³Department of Psychiatry, Massachusetts General Hospital / Harvard Medical School, Boston MA,

⁴Department of Infectious Diseases, Beth Israel Deaconess Medical Center / Harvard Medical School, Boston MA, ⁵The Centers for Behavioral and Preventive Medicine, The Miriam Hospital, Providence RI,

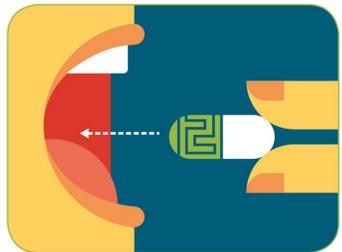
⁶Department of Behavioral and Social Sciences, Brown University School of Public Health, Providence RI

Introduction

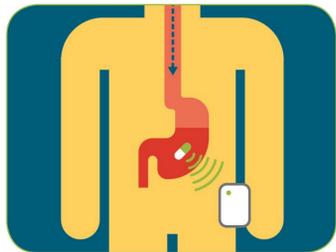
- Digital pills provide real-time verification of medication ingestion events and can be used to monitor adherence.
- Digitized pre-exposure prophylaxis (PrEP) may allow for detection of suboptimal adherence and improve delivery of adherence interventions.

Objectives

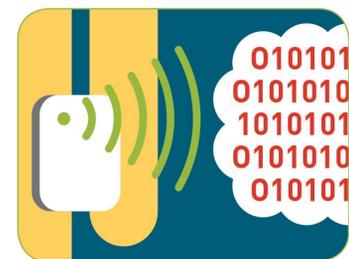
- To understand technology optimization factors using semi-structured individual interviews ($N = 15$) with men who have sex with men (MSM) self-reporting substance use other than alcohol.



1 The digital pill is ingested.



2 The pill is activated in the stomach and transmits a radio-frequency signal to a hip-worn device.



3 The device collects and transmits ingestion data to a cloud-based server driving an interface.



4 The interface then displays ingestion data to clinicians and patients.

Methods

- These data represent preliminary analyses of 15 in-depth interviews conducted with MSM prior to deployment of digital PrEP.
- **Participants** were 15 HIV-negative MSM, ages 18+, on or qualifying for PrEP, who self-reported non-alcohol substance use in the past 6 months.
- **Individual, semi-structured interviews** explored digital pill technology; adherence reporting; privacy; technology acceptance; and willingness to use and interact with the technology to reinforce adherence and address influencers of adherence.
- **Quantitative assessments** covered demographics, medical history, PrEP use, substance use history, and sexual activity.
- **Statistical analyses** included descriptives and applied thematic analysis of transcribed interviews.

Quantitative Results ($N = 15$)

	Mean (SD)	
Age (in years)	36 (11.8)	
Sexual partners in past 3 months	8.9 (14.9)	
	n (%)	
Race	White	10 (66.7)
	Mixed race	4 (26.7)
	Unknown	1 (6.7)
Ethnicity	Hispanic or Latino	5 (33.3)
	Not Hispanic or Latino	10 (66.7)
Education	Some college / college graduate	6 (40)
	Some graduate school	3 (20)
	Graduate / professional	6 (40)
Sexual orientation	Homosexual	12 (80)
	Bisexual	3 (20)
On PrEP	Yes	12 (80)
	No	3 (20)
Missed doses in past week	Yes	4 (26.7)
	No	11 (73.3)
Substances used	Alcohol	12 (80)
	Marijuana	9 (60)
	Sedatives	3 (20)
	Hallucinogens	1 (6.7)
	Other (e.g., poppers)	10 (66.7)

Qualitative Results

- **Theme 1:** Digital pill viewed as acceptable.

“I’d feel like a pioneer. I’d be up for it. I’d be open to it. It’s interesting.” – 23 y/o participant

- **Theme 2:** Digital pills as enhancing PrEP adherence and engagement in care.

“If you do this as instructed, you know 100 percent when you took it, and so there wouldn’t be any question about it.” – 23 y/o participant

“How cool would it be to be able to create a seamless interaction between patient, PCP, other care providers, and family? ... That’d be such a relief for many people, giving them peace of mind that someone is actually taking that medication.” – 59 y/o participant

- **Theme 3:** Willingness to share personal adherence data with physicians.

“I think it’s cool, or interesting, that the PCP or clinician... could reach out and be like, ‘Hey. I see that you’ve missed a couple dosages. What’s going on?’ ... That can be an alert for the provider.” – 31 y/o participant

Qualitative Results (cont.)

- **Theme 4:** Mixed views around sharing data with others, including potential sexual partners.

“I would like to believe we live in a world in which someone’s not lying. If someone says that they’re on PrEP, that they are on PrEP. You don’t have to have someone show their own personal data to prove that.” – 25 y/o participant

“It’s fostering a lot of trust between those two individuals. Then it’s like I’m not hiding anything... When you show the data, it’s like you’re all clear.” – 27 y/o participant

- **Theme 5:** Potential barriers to digital pill use: technological issues, lack of access, substance use, trust/privacy concerns, stigma.

“Is there some sort of GPS tracker? Is this some way to... put something in the bodies of all gay people? ... It almost sounds paranoid to a point, but there, obviously, are those questions.” – 24 y/o participant

“Where would people get this? Who’s giving it out? I think access is the most important thing.” – 31 y/o participant

- **Theme 6:** Desire for customizability across digital pill system, including privacy settings, data sharing, and frequency, timing, and content of messages.

“I think it would be really important to have that conversation before the patient... starts the program to be able to say, ‘I really only need one reminder a day,’ or ‘Please don’t contact me unless I forget to take a dose.’” – 29 y/o participant

Conclusions

- Digital pills to measure PrEP adherence were viewed as acceptable by MSM who use substances.
- Individuals are willing to share real-time adherence data primarily with clinicians, and are willing to engage with text messages and adherence data from digital pills.
- Issues around technology, privacy, and stigma may be potential barriers to use of digital pills.

Acknowledgements

- Support comes from Gilead ISR 17-10189 (Chai) and K23DA044874 (Chai).
- IDCap digital pill system developed by etectRx, Gainesville, FL.

