Technology preferences to enhance HIV and HCV care among patients with substance use disorders

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Abstract

We examined technology use patterns (e.g., mobile phone and computer ownership, text messaging, internet access) and preferences for adopting health information technologies to optimize office-based treatment for substance use disorders, HIV, and Hepatitis C virus (HCV) infection. Surveys were administered to patients enrolled in inpatient detoxification program in a publicly-funded tertiary referral center. Most reported mobile phone ownership (86%) and described high rates of mobile phone (3.3) and phone number (2.6) turnover in the preceding year. Internet access was reported on a daily (52%) or weekly basis (22%). Most participants were amenable to receiving text message-based informational content (i.e., medications, support groups, treatment programs) pertaining to substance use disorders (79%), HIV (50%), and HCV care (58%). Respondents reporting less than high school education and past year incarcerated elicited higher favorability in adopting smartphone apps to facilitate peer sharing of HIV-HCV related content. Results suggest high favorability for adopting health information technologies to enhance office-based treatment for substance use disorders, HIV, and HCV, particularly among vulnerable patient sub-groups.

Introduction

Barriers to coordination of care for substance use disorders (SUDs), HIV, and Hepatitis C infection (HCV) in primary care include limited real-time administrative and clinical support for tasks such as scheduling follow-up visits, medication dose management, and resolving adverse events.[1] However, health information technologies enhance the delivery of evidence-based interventions in real-time and promise to circumvent clinical and

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administrative barriers to care for populations with SUDs, HIV, and HCV in primary care.[2, 3] Patients with SUDs in primary care and outpatient addiction treatment settings have described high rates of mobile phone ownership, internet access, and acceptability of theoretically-informed mHealth interventions to address SUDs, HIV, and HCV.[4, 5] However, there is limited data characterizing patient preferences for technology based interventions to optimize the delivery of evidence-based content addressing SUDs, HIV, and HCV in inpatient or community settings.

We conducted a survey of inpatient detoxification patients to explore: 1) technology use patterns (e.g., mobile phone, computer ownership); and 2) preferences for adopting health information technologies (e.g., text messaging, smartphone applications) to enhance self-management and peer-driven approaches targeting addiction treatment, HIV, and HCV care.

Methods

Details regarding the study's design, participant characteristics, and site have been described previously.[5] Study staff recruited a convenience sample of adults (n=206) admitted to Bellevue Hospital's inpatient detoxification program for alcohol and/or opioid use disorder(s) between February and August 2015. The study was approved by the New York University Medical Center Institutional Review Board.

After obtaining informed consent, eligible participants completed a 34-item semi-structured survey based on prior studies conducted by the authors, the Pew Research Center, and a review of the literature.[4, 6–8] Survey domains consisted of: 1) demographic characteristics; 2) clinical characteristics; 3) healthcare utilization; 4) technology use patterns (i.e., smartphone applications, text messaging); 5) privacy concerns; and 6) preferences for adopting health information technologies to enhance addiction treatment and HIV-HCV care.[9] Descriptive statistics characterized the sample and their responses. Multivariate logistic regression models assessed the association between demographic and clinical characteristics and preferred technology use.

Results:

The study sample's demographic and clinical characteristics are representative of similar studies among this mostly adult male (91%), non-Caucasian (66.4%), Medicaid-insured (62%), and undomiciled (45%) sample in Bellevue Hospital.[5, 7] The mean age was 46.7 ($\pm$11.8). Participants self-reported unemployment (34%), receipt of SSI or SSD (21%), or public assistance (i.e., food stamps, welfare) (17%). Past year homelessness was common (64%) and fewer described incarceration in the preceding 12 months (21%).

Respondents were admitted for detoxification from alcohol (67.5%) and/or opioids (53%). Nearly half of individuals with opioid use disorder (n=57/109) reported injection drug use. Few participants (4%) were HIV positive. Among HCV positive respondents (18%), only one participant had received antiretroviral therapy. Furthermore, 12% of participants were never tested for HCV. Among respondents reporting mobile phone ownership (86%), most owned smartphones (66%, n=135). Annual turnover of mobile phones (3.3) and phone numbers (2.6) were attributed to phones being lost (63%), stolen (27%), or damaged (21%).

Popular mobile phone features included text messaging (96%), web browsers (81%), camera (79%), and video (64%). Internet access was reported on a daily (52%) or weekly basis (22%).[5]

Although some respondents utilized the internet to retrieve information related to their recovery (31%) (e.g., 12 step group meetings, detoxification and outpatient treatment programs, medication assisted treatments), no interviewees queried for content concerning HIV or HCV treatment. Text messages remained the most popular platform to facilitate communication pertaining to SUDs (79%), HIV (50%), and HCV (58%) (**see** Table 1). Privacy concerns pertaining to electronic communication with healthcare providers was common (51%) and included discomfort with terms such as "HIV" (33%), "hepatitis" (28%), and "treatment" (8%).

Demographic characteristics and technology use preferences

Black respondents were significantly more likely to request the delivery of HIV (54% versus 32%; X^2=12.65, p=0.005) and HCV related content (e.g., prevention, treatment) (52% versus 38%; X^2=8.20 p=0.04) via phone calls. Younger participants (i.e., 18–29 years old) were more likely than older respondents ($\geq$50) to query websites offering HIV prevention and treatment information (41% versus 13%; X^2=11.39, p=0.003) and HCV related content (41% versus 18%; X^2=7.15, p=0.028), and share HIV or HCV relevant information to other actively using peers (29% versus 10%; X^2=6.44, p=0.040).

High school completion was associated with reduced interest in receiving HIV content during in-person clinic visits with their healthcare provider (43% versus 60%; X^2=4.56, p=0.033) and HCV content via phone calls when compared to respondents without high school completion (38% versus 58%; X^2=6.09 p=0.01). Respondents reporting less than high school education elicited more interest in adopting smartphone apps to facilitate peer sharing of HIV-HCV related content compared to individuals with a high school education (20% versus 7.53%; X^2=5.47, p=0.019).

Incarceration status in the preceding 12 months was associated with increased interest in receiving HIV (50% versus 40%; X^2=6.80, p=0.033) and HCV prevention and treatment information via telephone calls (52% versus 41%; X^2=7.09, p=0.029), and HCV related content via smartphone apps compared to no criminal justice involvement (30% vs 13%; X^2=6.63, p=0.036). Lastly, unstable housing was associated with increased interest in using websites to access HIV related content (34% doubled-up versus 12% stably housed; X^2=9.74 p=0.02) and HCV content (36% doubled-up versus 14% stably housed; X^2=8.40 p=0.03).

Discussion

Overall, our findings suggest high acceptability for telephone and text message (TM) interventions to enhance HIV-HCV care and are aligned with prior studies describing the popularity of TM interventions versus smartphone applications to enhance self-management among participants with SUDs in specialty addiction settings and primary care.[4, 7, 8]. Importantly, participants self-reporting recent homelessness, incarceration, and less than a

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high school education elicited higher favorability towards adopting health information technologies and underscores the potential to reduce disparities for vulnerable populations with SUDs, HIV, and HCV.

The generalizability of our findings is limited by the small sample size and setting. There is also a relative paucity of information exploring participatory user design strategies for technologies addressing SUDs, HIV, and HCV care among vulnerable populations over time. Future studies should also consider provider- and systems-level factors influencing integration of emerging health information technologies addressing SUDs and related comorbidities in resource constrained healthcare, criminal justice, and community settings (e.g., homeless shelters, high schools).

Acknowledgments

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Table 1.

Technology preferences for HIV-HCV care among inpatient detoxification program patients (N=206)

Medical management domains	In-clinic or in-person %(n)	Phone call % (n)	Text messaging % (n)	Email %(n)	Web-based intervention %(n)	Smartphone app % (n)	Online forum %(n)	Social media %(n)
Medication reminders	63 (31%)	55 (27%)	45 (22%)	7 (3%)	11 (5%)	8 (4%)	3 (1%)	3 (1%)
Appointment reminders	31 (15%)	81 (39%)	73 (35%)	8 (4%)	2 (1%)	5 (2%)	0 (0%)	1 (0%)
Abstinence	90 (44%)	46 (22%)	32 (16%)	11 (5%)	6 (3%)	5 (2%)	3 (1%)	4 (2%)
HIV prevention or self-management	73 (35%)	36 (17%)	32 (16%)	15 (7%)	9 (4%)	6 (3%)	2 (1%)	2 (1%)
HCV prevention or self-management	73 (35%)	37 (18%)	31 (15%)	12 (6%)	9 (4%)	4 (2%)	5 (2%)	3 (1%)
Sharing HIV/HCV prevention or self-management strategies among peers	85 (41%)	47 (23%)	30 (15%)	13 (6%)	7 (3%)	4 (2%)	3 (1%)	6 (3%)