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Using Interactive Web-Based Screening, Brief Intervention and Referral to Treatment in an Urban, Safety-Net HIV Clinic

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Abstract

—Substance use among PLHIV is high, and screening, brief intervention, and referral to treatment (SBIRT) is an evidence-based approach to addressing the issue. We examined the acceptability of a technology-based SBIRT program in an urban HIV clinic.

—An SBIRT intervention was programmed into the clinic's electronic personal health record. We examined: demographic, health, HIV, and substance use characteristics of participants who completed the web-based intervention compared to those who did not.

—Fewer than half of the 96 participants assigned to the web-based SBIRT completed it (n=39; 41%). Severity of tobacco and amphetamine use differed significantly between participants who did and did not complete the intervention (p=.03, .04 respectively).

—Participants with higher severity of tobacco and amphetamines were significantly more likely to utilize the web-based SBIRT. It is important for technology-based approaches to behavioral interventions in clinic take into consideration feasibility, client knowledge, and comfort using technology.

Keywords

Substance use screening; computer-based programs; brief interventions; HIV; SBIRT

INTRODUCTION

Alcohol and illicit drug use are common among HIV-infected patients (1) and are recognized co-factors of HIV transmission (2, 3). More serious substance use disorders (SUDs) among persons living with human immunodeficiency virus (PLHIV) are associated with high rates of HIV transmission risk behaviors (4) and low antiretroviral therapy (ART) adherence (5). Alcohol use is the most prevalent risk factor for poor HIV medication adherence and is associated with lower CD4 counts (6). Methamphetamine and other amphetamine type stimulant use is also a critical factor in HIV transmission (4).

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Screening, Brief Intervention, and Referral to Treatment (SBIRT) has emerged as an important model for identifying and addressing substance use problems in medical settings (7). Few HIV clinical settings, however, routinely assess patients for harmful substance use (8). Brief Intervention (BI) approaches are typically delivered on site, and individuals with more severe substance use problems are also given referrals to treatment. BI for patients, who are not actively seeking treatment for substance use, has strong support in the alcohol literature (9, 10) and some promising effects have been observed with respect to other forms of substance use (11–14). Although the evidence base supporting BI for substance use is still developing, studies have found that BIs can be effective in reducing heroin and cocaine use (12–14) as well as amphetamine use (14).

In the field of substance use identification, treatment and support, empirical evidence suggests that information and communication technologies (including interactive web and mobile technology tools) may increase access to evidence-based behavioral treatments and interventions. For example, electronic personal health records (ePHR) have demonstrated potential to improve quality of health care and patient outcomes associated with managing a chronic illness (15). Fostering patient use of technology for self-management of chronic diseases could result in decreased demand on clinicians in primary care environments. Several studies have shown the acceptability of utilizing ePHRs in HIV primary care clinics (16, 17). In these studies, young Caucasian men found the ePHR to be a useful tool in managing their HIV care, but the studies were not able to enroll a more diverse racial or gender sample. Investigators of another study found that substance use itself was not a barrier to completing online health related surveys through an ePHR in an urban HIV clinic sample (16). A computer-based SBIRT intervention could be a feasible method for addressing substance use in an HIV primary care clinic. Even if a computer-based SBIRT intervention demonstrates only modest efficacy for reducing substance abuse, the potential to reach a broad population of high-risk patients could translate to a substantial public health impact (18). SBIRT may help health care providers identify and help those with, or at risk of, substance-related harms. However, the most feasible modality for delivering SBIRT to safety-net patients in a busy, urban HIV primary care clinic is unknown. Internet-based information and communication technologies have the capacity to increase access to behavioral interventions and may provide a timesaving and innovative mode of delivery. As part of a larger trial, we explored the differences between those who completed versus did not complete the intervention, among those assigned to web-based SBIRT.

METHODS

The analysis presented here is part of a larger two-arm parallel-group randomized controlled trial that followed participants over six months (ClinicalTrials.gov study number NCT01300806) to assess standardized screening, brief intervention, and referral to treatment for substance use. The parent study aimed to determine the feasibility and acceptability of computer-administered SBIRT intervention compared to clinician administered SBIRT in an HIV primary care clinic with high rates of substance use.

Participants were recruited from the waiting room of San Francisco General Hospital's Positive Health Program (PHP) clinic, which provides primary medical care to more than

2,500 HIV-infected participants with 30,000 visits per year. Trained recruiters distributed study flyers during primary care clinic hours and obtained contact information from patients expressing interest in participation. Interested patients were screened for eligibility and enrolled if appropriate. Study eligibility criteria included: 18 years of age or older; confirmed HIV-positive serostatus; ability to provide informed consent and to be followed over a six-month period; receiving HIV care at the clinic; and ability to speak English or Spanish. All research and consent materials were available in both languages. Those who were interested and eligible provided written informed consent. All study protocols were reviewed and approved by the University of California, San Francisco (UCSF) Institutional Review Board and the clinical site. Participants received $35 for completing the study visit. Intervention participation was not reimbursed differentially.

Data Collection

Upon being enrolled in the study, each participant completed a self-administered survey booklet of various instruments. The instruments used in the current analysis include the following:

Demographics and Health—This instrument included questions about demographics, including: age, gender, race, education, employment status, income, health insurance, and whether they had children. HIV-related health questions included: year of HIV diagnosis; AIDS diagnosis; self-reported CD4 count and viral load; HIV transmission route; whether taking ARVs; and self-reported physical condition, psychological condition, and social support.

Adherence—Using the Adult AIDS Clinical Trials Group (AACTG) Medication Adherence 30-Day Visual Analog Scale (VAS), participants were asked to estimate how often they took their medications as prescribed in the past 30 days, on a scale ranging from 0% to 100% (19). VAS measures of past 30-day adherence have been found to correlate with other objective measures of adherence as well as viral load (20).

Depression—The Center for Epidemiology Studies Depression Scale (CES-D) is a 20-item likert-type scale that measures the level of depressive symptoms experienced over the past week (21). The total score ranges from 0 to 60, with a higher score indicating more depressive symptoms. We utilized the CES-D as a continuous measure (21).

Engagement with Healthcare Provider—This was assessed with a 13-item scale where participants were asked to rate their interactions with health care providers on a four-point scale with 1=always true and 4=never. Responses are summed to create a total score, with a possible range of 1–52. A low score indicates greater provider engagement. Cronbach's alpha reliability estimate was 0.96 (22).

Substance Use—Use of alcohol, tobacco and other substances was assessed with the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). The ASSIST (23) is a validated measure to screen for the presence of alcohol and other substance use disorders. For each substance, the ASSIST assesses frequency of use, cravings, impact of

use on key life domains, expressed concern from others, and failed quit attempts. The responses to these items are summed for each substance category (e.g. tobacco, amphetamines) to provide a continuous Specific Substance Involvement Score (SSIS). Using validated cut points for the SSIS, the ASSIST indexes low, moderate, or high risk for the presence of disordered patterns of use for each substance assessed. The validity of ASSIST was demonstrated in an international, multisite study of 1,047 patients, including 697 patients from primary health care settings (11).

The SBIRT Intervention

Following baseline data collection, participants were randomized via a blinded, computerized randomization program into two groups, a web-based or a clinician-administered intervention. Only data from the 96 patients who were assigned to the web-based intervention are included in this analysis.

The 96 participants were assigned to participate in a self-administered substance use screening and brief intervention (SBI) for substance use that was embedded into myHERO, the web-based personal health record linked with the clinic's electronic medical record. MyHERO was available in English and Spanish and patients could access the system from any internet-linked computer, including free computers at city libraries and hospitals. Study staff directed patients to complete the SBI on one of three clinic computer stations located in the waiting room and, if necessary, assisted patients in setting up electronic mail accounts and guided them through how to access the web-based patient portal in order to access the ePHR. Participants were also permitted to complete the SBI from a remote computer within one week of study enrollment if they preferred. We considered completion of the web-based intervention if patients logged on and completed SBI. The information technology staff supporting the electronic interface validated completion of the intervention.

For the screening component of the SBIRT intervention, we administered the ASSIST (11). The brief intervention was tailored to patients' substance dependence risk scores as determined by the ASSIST (11). Participants at no or low risk for a substance use disorder received positive feedback and behavior maintenance support (24). Participants assessed at moderate risk received an interactive web-based brief intervention and links to substance use websites and patient resources that had been pre-programmed into myHERO. Referral to treatment was engaged for high-risk scoring subjects; they were referred or encouraged to call the clinic's social worker trained in substance use counseling with the goal of referring the high-risk patient to specialty addiction treatment.

Analysis

The aim of this analysis was to examine the characteristics of participants assigned to the computer-assisted SBIRT, and to identify differences between those who did complete the intervention and those who did not. We compared participants based on demographic, HIV, health, and substance use characteristics. Sample characteristics were analyzed using t-tests for continuous data and chi-square tests for categorical data. A p-value of less than or equal to 0.05 is considered statistically significant. Stata Version 11 software was used for data analysis.

RESULTS

Of the 96 participants who were randomized to the web-based SBIRT intervention, fewer than half, 39 (40.6%), completed the intervention (Table 1). (In contrast, 85% of those assigned to the clinician-based SBIRT intervention completed it. Although not presented here, there were no other differences between the randomized groups). The mean age of participants assigned to the web-based intervention was 45.4 years (SD=8.1). Of these, 64 (66.7%) were male and 22 (22.9%) were female; seven were male-to-female transgender individuals; one person identified as an additional category of gender; and one did not report a gender. For the purposes of this analysis, all transgender individuals are classified as women, who therefore make up 30.2% of the sample. Nearly half of participants (42.7%) were African American, and had a high school equivalent or greater education (46.3%). Almost two-thirds (64.6%) of the participants reported using tobacco in the past three months. The most common currently-used substances were tobacco (64.6%), alcohol (64.6%), cocaine (32.3%), amphetamines (36.5%) and non-prescribed sedatives (28.1%).

Women were somewhat more likely to complete the SBIRT intervention than were men (44.8% vs. 35.9%), but this difference was not statistically significant. A number of other differences were noted among groups but also were not statistically significant: among non-Hispanic White participants, 33.3% completed the intervention while 66.7% did not; among Hispanics, 40.0% completed the web-based SBIRT and 60% did not; those who completed the intervention had somewhat higher self-reported physical condition scores than those who did not (6.8 vs. 6.1); and among those who have ever had an AIDS diagnosis, only 39.5% completed the intervention while the rest did not.

The only statistically significant differences between those who completed the intervention and those who did not were found in participants' Specific Substance Involvement Scores (SSIS). Participants who did complete the web-based intervention had significantly higher tobacco SSIS scores (23.5 vs. 18.7, p=0.03) and amphetamine SSIS scores (14.6 vs. 8.1, p=0.04) than those who did not complete the intervention. SSIS scores for other substances showed no significant differences.

DISCUSSION

This study addressed the feasibility of utilizing an ePHR approach to screen for substance use within an urban safety net HIV clinic setting. It utilized a web-based Screening Brief Intervention and Referral to Treatment (SBIRT) embedded into an existing ePHR. Fewer than half of the participants randomized to the web-based SBIRT intervention arm completed the intervention. In addition, our results indicate that the two groups – those who did and did not complete the web-based intervention – were markedly similar in nearly all of the measured sociodemographic, HIV, and other health characteristics.

There were, however, significant differences noted among participants in terms of SSIS scores. Participants with higher SSIS scores for both tobacco and amphetamine use were significantly more likely to complete the web-based SBIRT intervention. This finding may indicate that participants whose substance use was more harmful were interested or

motivated to seek information or help for their tobacco or amphetamine use. Other studies have found that the use of ePHR can improve rates of preventive services in general medical populations (25), and our finding may indicate a similar interest in addressing or preventing harm related to substance use. Nevertheless, our study did not demonstrate similar use of ePHR among all current substance users in the sample and it is important to try and understand more about why that was these mixed results.

While technology-based approaches have been found feasible in other studies of substance use screening, referral and treatment (26), the findings from this study indicate that a web-based approach for substance use screening may not be feasible for patients in this urban, safety net clinic setting without some modification. Anecdotally, study participants did not indicate that using the computer for the intervention was not acceptable. Because we did not collect data about computer access or comfort using the computers as part of the study measures, it is not clear whether completing the web-based intervention visit was related to access to computers or internet, or a “digital divide”, defined as “the divide between those with access to new technologies and those without” (27). We sought to minimize these issues in two ways. First, access to computers and internet was facilitated by the availability of three Internet linked computers in the clinic waiting room where the study was conducted. Study staff also provided a list of places in the nearby area that offered public and free access to computers (e.g. public library). Second, we asked participants whether they felt comfortable using a computer or had experience using the computer. For those participants who reported that they did not, study assistants sat with each participant to walk her/him through setting up electronic mail (email) accounts and logging in to their ePHR during the study visit. Our study team did not keep timelogs of how much time was devoted to this project, but study documentation indicates that staff spent on average between 30–60 minutes helping participants through this process.

Participants using the web-based screening may also have felt uncomfortable with the idea of entering sensitive information into an internet-linked system, based on concerns about security information. And perhaps the public setting of the clinic waiting room contributed to the feasibility of implementing the web-based intervention.

Among those who did log on to the ePHR, some participants may not have been linked to the intervention because of a programming error, although we are not aware of such an issue. Despite working closely with the programming team that supported myHERO in order to develop the SBI portions of the interactive web-based program, and despite numerous tests with the program, we did not engage in rigorous beta testing, which may have resulted in some remaining programming issues. As with other novel approaches in clinical care implementation studies that identify training and technical assistance needs by patients are needed (28).

Age differences may also have affected participation rates. In this study, the mean age of participants was higher among those who did not complete the intervention. While this difference was not statistically significant, it may play a role in who utilizes technology for substance use behavioral interventions. A recent Pew Report on older adults’ usage of the Internet reported that 63% of older adults would require assistance in using the Internet (29).

Studies in the field of technology-based approaches that target substance use have promise. Technology-based interventions are more likely to demonstrate impact if they utilize effective informational technology and are developed with the patients who are the intended end-users of the technology, and whose input is taken into account as the technology refinement process is underway (26). While limited, there are a few studies that indicate technology-based interventions utilized in conjunction with other evidence based approaches to substance use demonstrate a positive outcome of treatment for substance use (30, 31)

Another limitation of the study was the convenience sampling of participants from the clinic waiting room; thus, our sample may not represent the mix of patients seen at the PHP clinic. The most current patient demographic data for the clinic showed that 84.0% of participants were male, nearly half (48.3%) were Caucasian, 24.4% African American and 22.6% Latino/a, which differs somewhat from our sample. To our knowledge there are few studies that assess patient characteristics of using ePHR in HIV care. In those studies which have been done the findings indicate that younger Caucasian populations utilized ePHR. This may have been one of the challenges in our study because our population was less than 40% Caucasian which may explain the low use among participants although in other studies looking at racial differences in using technology.

CONCLUSION

An interactive, internet-based SBIRT intervention embedded in the ePHR of patients at an urban, safety net HIV primary care clinic was not a successful delivery modality in this randomized trial. Fewer than half of the participants assigned to the web-based arm completed the web-based intervention. Despite these results, technology-based approaches for substance use are building evidence as an important tool for addressing substance use. In addition, research regarding the use of ePHR as a tool for chronic disease management such as HIV is growing. For example, several studies have examined use of ePHR for diabetes, cardiovascular disease and asthma (15, 28). In these studies patient use of ePHR was related to increased control of biological markers related to disease management. Results from the current study, however, highlight the importance for technology-based approaches to take into consideration accessibility, client knowledge, and comfort with using technology for people living with HIV who are also substance user.

These study findings highlight a need for caution as we look to technology as a tool to address substance use screening in HIV clinic settings. Future studies implementing use of technology in an HIV primary care clinic setting should utilize a more robust methodology to assess feasibility.

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Table 1

Characteristics of Participants Who Did and Did Not Complete the Web-Based Screening, Brief Intervention, and Referral to Treatment

	Overall (n = 96)	Completed SBI (n = 39)	Did not complete SBI (n = 57)	p-value
Demographic Characteristics				
Age (mean)	45.4 (±8.1)	43.9 (±7.1)	46.3 (±8.6)	0.17
Gender				
Male	64 (66.7%)	23 (59.0%)	41 (71.9%)	0.08
Female	29 (30.2%)	13 (33.3%)	16 (28.1%)	
Other	3 (3.1%)	3 (7.7%)	0 (0.0%)	
Race / Ethnicity				
Asian / Pacific Islander	2 (2.1%)	1 (2.6%)	1 (1.8%)	0.53
African American / Black	41 (42.7%)	20 (52.6%)	21 (36.8%)	
Hispanic / Latino	15 (15.6%)	6 (15.8%)	9 (15.8%)	
Native American Indian	2 (2.1%)	0 (0.0%)	2 (3.5%)	
Non-Hispanic White	30 (31.3%)	10 (26.3%)	20 (35.1%)	
Other	5 (5.2%)	1 (2.6%)	4 (7.0%)	
Education level				
11th grade or less	21 (21.9%)	9 (23.7%)	12 (21.1%)	0.30
High school or GED	44 (45.8%)	19 (50.0%)	25 (43.9%)	
Associate degree / 2 yrs college	20 (20.8%)	8 (21.1%)	12 (21.1%)	
College (BA or BS)	9 (9.4%)	1 (2.6%)	8 (14.0%)	
Master's Degree	1 (1.0%)	1 (2.6%)	0 (0.0%)	
Work for pay (yes)	16 (16.7%)	7 (18.0%)	9 (16.4%)	0.84
Adequacy of income				
Totally inadequate	23 (24.0%)	7 (18.4%)	16 (28.1%)	0.18
Barely adequate	55 (57.3%)	21 (55.3%)	34 (59.7%)	
Enough	17 (17.7%)	10 (26.3%)	7 (12.3%)	
Have health insurance (yes)	78 (81.3)	31 (79.5%)	47 (82.5%)	0.71
Have children (yes)	34 (35.4%)	17 (43.6%)	17 (30.4%)	0.19
HIV Characteristics				
Year diagnosed with HIV (mean)	1999 (±7.1)	1998 (7.4)	1999 (6.9)	0.96
Ever had an AIDS diagnosis (yes)	38 (39.6%)	15 (41.7%)	23 (42.6%)	0.93
Undetectable viral load (yes)	50 (72.5%)	23 (74.2%)	27 (71.1%)	0.81

	Overall (n = 96)	Completed SBI (n = 39)	Did not complete SBI (n = 57)	p-value
CD4 Count (self-reported)	575.5 (±348.2)	629.8 (±399.5)	541.9 (±312.7)	0.32
Taking HIV meds (yes)	82 (85.4%)	35 (89.7%)	47 (82.5%)	0.32
30-day self-report adherence rate (mean)	83.0 (±23.0)	80.1 (±28.6)	85.1 (±17.9)	0.32
Other Health Characteristics				
Type of health care providers				
Nurse practitioner	26 (27.1%)	12 (30.8%)	14 (25.5%)	0.57
Physician	68 (70.8%)	27 (69.2%)	41 (74.6%)	
Engagement with health care provider	17.8 (±7.8)	18.1 (±8.4)	17.7 (±7.4)	0.82
Physical condition (mean) (1–10)	6.4 (±2.0)	6.8 (±1.9)	6.1 (±2.0)	0.08
Psychological condition (mean) (1–10)	6.3 (±2.2)	6.2 (±2.1)	6.4 (±2.3)	0.72
Social support (mean) (1–10)	6.5 (±2.7)	6.7 (±2.4)	6.4 (±3.0)	0.57
CESD depression (mean)	23.9 (±11.4)	23.0 (±12.0)	24.5 (±11.0)	0.53
Substance Use				
Ever use of substances (yes)				
Tobacco	82 (85.4%)	33 (89.2%)	49 (87.5%)	0.81
Alcohol	88 (91.7%)	36 (94.7%)	52 (94.6%)	1.00
Cocaine	77 (80.2%)	33 (86.8%)	44 (80.0)	0.39
Amphetamines	60 (62.5%)	27 (71.1%)	33 (60.0%)	0.27
Sedatives	44 (45.8%)	19 (50.0%)	25 (45.5%)	0.67
Opioids	41 (42.7%)	16 (42.1%)	25 (45.5%)	0.75
Substance use in past 3 months (yes)				
Tobacco	62 (64.6%)	25 (67.6%)	37 (68.5%)	0.92
Alcohol	62 (64.6%)	24 (63.2%)	38 (69.1%)	0.55
Cocaine	31 (32.3%)	13 (34.2%)	18 (34.0%)	0.98
Amphetamines	35 (36.5%)	16 (43.2%)	19 (35.2%)	0.44
Sedatives	27 (28.1%)	12 (31.6%)	15 (30.0%)	0.87
Opioids	20 (20.8%)	6 (15.8%)	14 (26.9%)	0.21
Specific Substance Involvement Score (SSIS)				
Tobacco	20.5 (±8.8)	23.5 (±5.7)	18.7 (±9.8)	0.03
Alcohol	14.5 (±11.3)	14.4 (±11.3)	14.6 (±11.4)	0.93
Cocaine	11.8 (±11.6)	13.6 (±11.8)	10.5 (±11.4)	0.32
Amphetamines	10.7 (±12.4)	14.6 (±13.6)	8.1 (±11.0)	0.04
Sedatives	5.8 (±8.7)	7.1 (±9.2)	4.9 (±8.3)	0.34
Opioids	5.5 (±10.0)	7.6 (±11.6)	3.9 (±8.6)	0.16