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Feasibility and preliminary efficacy of a web-based smoking cessation intervention for HIV-infected smokers: A randomized controlled trial

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Introduction

Persons living with HIV (PLWH) in the US smoke cigarettes at approximately triple the rate of the general adult population[1,2], and tobacco use has emerged as a leading killer in the highly active antiretroviral therapy (HAART) era. One recent study concluded that 61% of deaths in PLWH were directly attributable to smoking, and that smoking reduced longevity by an average of 12 years[3].

Smoking increases the risk of both opportunistic and “typical” infections in PLWH[4]. It is driving alarming rises in the incidences of cardiovascular disease, lung cancer, and head and neck cancers in this population[5,6]. It is also associated with inferior adherence to HAART and poorer quality of life[7,8].

The typical HIV-infected smoker is considered “complicated” from the standpoint of tobacco treatment because of very high rates of psychiatric and substance use comorbidities[9]. Such patients generally require intensive interventions in order to quit[10]. Notwithstanding the magnitude of this problem, the most effective approaches to tobacco treatment in PLWH remain unknown.

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Jonathan Shuter, MD: Overall supervision of design, execution, and write-up of the study

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The internet represents a promising mode of tobacco treatment delivery[11]. Meta-analytic data support the effectiveness of web-based interventions[12,13], although effect sizes are modest with one meta-analysis reporting an odds ratio for point prevalence abstinence of 1.14 [1.07–1.22] compared to controls and the other reporting Cohen's $d=0.12$ (0.20 is indicative of a small effect size). We have previously described the efficacy of an eight-session, seven-week, group therapy program targeting PLWH, entitled Positively Smoke Free (PSF)[14]. Using the input of HIV specialists, behavioral psychologists, graphic artists, software engineers, and PLWH smokers we distilled the content of the PSF curriculum into an eight session, seven week, individual (i.e. not group-based) web intervention, Positively Smoke Free on the Web (PSFW). Herein we describe the results of a randomized controlled trial assessing the feasibility and preliminary efficacy of PSFW for HIV-infected smokers.

Methods

Montefiore Medical Center's Center for Positive Living (CPL) delivers comprehensive HIV-care to over 2800 PLWH in the Bronx, New York.

Between March 2012 and April 2013 we recruited PLWH smokers who were interested in quitting and had access to a computer with internet into a randomized controlled trial of PSFW. Inclusion criteria were: (1) membership in the CPL clinic (2) confirmed HIV infection (3) an affirmative answer to "During the past 5 days, have you used any product containing nicotine including cigarettes, pipes, or cigars?"[15] (4) interest in quitting in the next six months. Exclusion criteria were (1) contraindication to nicotine replacement therapy (2) pregnancy (3) low literacy (score<15 on the Short Assessment of Health Literacy-Spanish and English scale)[16].

After consenting, eligible subjects were randomized by study staff 1:1 into two conditions using a random number table and an even/odd allocation strategy:

1. Standard care (control) consisted of brief (less than five minutes) advice to quit, a self-help brochure, and an offer of a prescription for a three month supply of nicotine patches (all study subjects had full insurance coverage for the patches).
2. PSFW (intervention) consisted of an offer of a prescription for a three month supply of nicotine patches and access to PSFW. Each PSFW subject received a unique access code. The website offered eight separate sessions and was available in English and Spanish. Sessions contained four to seven web-pages, and included interactive features. The text was written at a sixth grade level. Sessions were timed to permit access at approximately weekly intervals in order to parallel the timing of the original PSF program, e.g. Session 2 became available seven days after initial login to Session 1. Users were permitted unlimited access to both current and prior sessions. An illustrative web-page is featured in Figure 1. PSFW was guided by social cognitive theory[17], and its main goals were to educate, motivate, and increase self-efficacy to quit. In order to maximize usage of the website the software sent email and text (if subjects consented to text-messaging) reminders as each new session became available. Up to four electronic messages were sent for each new session. Subjects who failed to login to a session after the electronic

reminders were called by clinic staff to encourage website usage and to refer them to the study coordinator if there was difficulty accessing the website. Detailed time stamps of all website activity were maintained on the server.

Self-administered questionnaires containing the measures and outcomes listed in Table 1 were completed by all subjects at baseline, six-weeks, and three months post the recommended quit day. The primary cessation outcome was exhaled carbon monoxide (ECO) verified (i.e. ECO<10 parts per million) seven-day point-prevalence abstinence at the three month timepoint. Subjects received travel vouchers and a \$30 incentive for each study visit. Incentives were linked to visit completion and not to website usage or abstinence from cigarettes.

Dichotomous variables were analyzed using chi-square or Fisher's exact test. Comparisons of means were accomplished using Student's *t*-test or Mann-Whitney U-test. Correlation of two continuous variables was performed using Spearman's rank correlation. The feasibility endpoints mentioned above were continuous variables but their distributions violated normality assumptions. For multivariate analyses including these values as dependent variables, they were, therefore, dichotomized and subjected to logistic regression analyses. Since these endpoints were all logically and conceptually related, we included all covariates that were associated (i.e. $P<0.10$) with any of the feasibility variables in all of the logistic regression models. A backward, stepwise regression strategy was employed that retained only those covariates that demonstrated an association ($P<0.10$) with the dependent variable in the final model.

Psychobehavioral variables were measured repeatedly at each study visit. Changes in these variables were calculated by subtracting the Visit 1 score from the Visit 2 (i.e. the six-week visit) score with the goals of assessing the relationship between study condition assignment and change in score and evaluating the relationship of score change with the cessation outcome.

Sample size considerations

Based on the most comparable published study at the time that the project was designed, we estimated an increase in abstinence rates of 20.7% in PSFW subjects over controls[30]. Using this estimate the final sample size had a power of 0.88 to demonstrate a significant difference in the primary abstinence endpoint.

All aspects of the study were approved by the Montefiore Medical Center Institutional Review Board.

Results

A consort diagram representing the flow of subjects through the study protocol is presented in Figure 2. Of 178 study candidates, 138 enrolled. Reasons for non-enrollment are provided in Figure 2. Subjects who did not enroll were older than those who did, 49.7 ± 8.6 years vs. 45.6 ± 9.9 ($P=0.03$). There were no significant differences in gender, ethnicity, or racial distributions between enrollees and non-enrollees. Five (7.2%) of those in the PSFW

condition selected the Spanish version of the site. There were no significant differences in study outcomes between Spanish and English users.

Table 2 summarizes the baseline characteristics of individuals in the two study conditions. The groups were well-balanced without statistically significant differences in sociodemographic characteristics, tobacco use behaviors, or other baseline psychobehavioral measures. 134/138 (97.1%) subjects completed the study, including 68/69 (98.6%) in the PSFW condition. Two individuals died of causes unrelated to the study, and two were lost to follow-up.

Feasibility assessments

Adherence—PSFW subjects logged into a mean of 5.5 ± 2.9 of eight sessions. 46/69 (66.7%) visited six or more sessions. 28 (40.6%) visited all eight sessions and eight (11.6%) visited no sessions. The mean number of web pages visited was 26.2 ± 15.5 of 41. One-third of the cohort visited all 41 pages. 73.9% elected to receive text messages in addition to email reminders. The vast majority of users (94.2%) required live phone calls advising them that their next session was due. The mean number of phone calls per subject was 7.0 ± 4.3 (range 0—16). Only three subjects logged into all eight sessions without any phone calls.

Educational attainment of high school graduation was significantly associated with greater number of sessions logged into (6.0 vs 3.9 sessions; $P=0.04$), and there was a trend toward direct correlation between total number of sessions logged into and higher anxiety score (Spearman's $\rho=0.21$; $P=0.08$). Factors that were significantly associated with greater total number of web pages visited were educational attainment high school graduation (28.5 vs. 17.1 pages; $P=0.01$), higher decisional balance pro score (Spearman's $\rho=0.25$; $P=0.04$), and higher anxiety score (Spearman's $\rho=0.25$; $P=0.04$).

Engagement—The mean number of interactive clicks was 10.2 ± 8.6 (range 0—40), and the mean total time spent logged into the website was 59.8 ± 74.9 minutes (range 0—511). Factors that were significantly associated with greater number of interactive clicks were educational attainment high school graduation (11.2 vs. 6.1 clicks; $P=0.04$), risk for HIV other than same-sex sex (11.6 vs. 7.2; $P=0.05$), home as primary site of internet access (11.7 vs. 4.6; $P=0.008$), and higher anxiety score (Spearman's $\rho=0.28$; $P=0.02$). Factors that were significantly associated with greater total time logged into the site were older age (Spearman's $\rho=0.26$; $P=0.03$), risk for HIV other than same-sex sex (71.8 vs. 34.3 minutes; $P=0.05$), higher anxiety score (Spearman's $\rho=0.39$; $P=0.001$), and higher perceived stress score (Spearman's $\rho=0.26$; $P=0.03$). There were trends toward association of greater total time spent logged into the site with no reported alcohol consumption in the prior 30 days (77.6 vs. 40.4; $P=0.07$), home as primary site of internet access (61.0 vs. 31.2; $P=0.07$), and maximum educational attainment (Spearman's $\rho=0.21$; $P=0.09$).

Logistic regression analyses were performed to evaluate the association of relevant covariates with the four adherence and engagement endpoints. Variables showing association (i.e. $P<0.10$) with any of these endpoints on univariate analysis were entered into the models. None of them retained a significant association with logging into all eight sessions in the adjusted model. Table 3 summarizes the associations of these covariates with

visiting all 41 web pages, being in the upper 50th percentile of interactive clicks, or being in the upper 50th percentile of total time logged into the site. Factors that were associated with one or more of these feasibility outcomes, reflecting a higher degree of adherence to or engagement with the PSFW program, included educational attainment of at least high school graduation, higher anxiety score, lower perceived stress score, HIV risk behavior other than same-sex sex, and accessing the website at home.

Satisfaction—Over 78% of respondents indicated that the PSFW experience was positive in terms of being helpful, meeting expectations, leading to user satisfaction, and being personally relevant. 95.2% indicated that they would recommend PSFW to family or friends who were interested in quitting.

Efficacy

The biochemically-verified, seven-day, point-prevalence abstinence rate at the three month timepoint for the entire cohort was 7.2%. In the intent to treat analysis, 10.1% of the PSFW group quit vs. 4.3% in standard care ($P=0.33$, $OR=2.49$ [0.62–10.1]).

Additional analyses of the primary abstinence outcome were performed on the subjects in the PSFW condition. The increased quit rate in PSFW was restricted to those 28 subjects who logged into all eight sessions (17.9% quit rate) whereas those who logged into less than eight had a quit rate of 5%. The quit rate was 21.7% among those who visited all 41 web pages. There was a trend toward higher quit rates among women vs. men (11.7% vs. 2.7%, $P=0.08$). Women who logged into all eight sessions ($N=13$) and who visited all 41 web pages ($N=10$) had quit rates of 30.8% and 40% respectively. No other baseline characteristic was significantly associated with three-month abstinence. All measures of website usage were higher in subjects who quit, but the only one that approached statistical significance was number of interactive clicks (16.1 vs. 9.6 clicks, $P=0.06$). Overall satisfaction with PSFW was higher in those who were abstinent ($P=0.05$).

All subjects were offered a prescription for a three month supply of nicotine patches, while use of other cessation pharmacotherapies was discouraged. Seventy-six (55.1%) subjects accepted the prescription, although only 44 (31.9%) reported using NRT during the study. Ten (7.2%) reported using bupropion or varenicline during the study. Of the 51 who used any pharmacotherapy, 24 were in the PSFW condition and 27 were in standard care ($P=0.69$). Those who used pharmacotherapy did not differ from those who did not by age, gender, race, ethnicity, educational level, or baseline motivation to quit. There was no significant difference in the proportion who quit between those reporting the use of pharmacotherapy and those who did not (5.9% vs. 9.3%, $P=0.74$).

Repeated measures

There was a trend noted for change in the self-efficacy negative affect subscale (which assesses self-predicted temptation to smoke in negative affect situations) with subjects assigned to PSFW demonstrating a larger increase in self-efficacy from the baseline to the six-week visit than controls ($P=0.09$). Subjects who were ultimately abstinent at three

months had significantly larger increases in total self-efficacy ($P=0.05$) and self-efficacy positive affect subscale ($P=0.02$) than those who were non-abstinent.

Study-arm contamination

Six (8.7%) subjects in the standard care condition reported knowing someone who used PSFW, discussing the contents of the website, or having familiarity with the “Three Me’s,” a central feature of PSFW specific to the website.

Discussion

Over half of smokers living with HIV have home computers with internet access[31,32], and multiple studies have demonstrated the effectiveness of web-based cessation interventions for various smoking populations[12,13]. There is a growing literature describing interventions delivered over mobile devices/smartphones for PLWH. There are fewer studies of treatments delivered via desktop or laptop computers, sometimes referred to as “computerized” interventions, for PLWH[33]. Meta-analytic data support the efficacy of web-based HIV-prevention for persons at risk for HIV[34], and there are several published studies of computerized interventions to promote medication adherence[33,35,36] and manage depression[37]. These studies reported high levels of engagement and satisfaction with their web-programs. The one published trial of web-based tobacco treatment for PLWH offered a five-session program but did not report feasibility or utilization outcomes. The efficacy of the program was difficult to interpret because of exceptionally high quit rates in all treatment conditions including 29% in the web-treatment arm and 24% among minimal-contact controls[38].

In this pilot trial of Positively Smoke Free on the Web, the feasibility outcomes suggest that the internet is a promising avenue of tobacco treatment delivery for PLWH. Two thirds of subjects logged into 6 sessions, and 40% logged into all eight. Only 35.6% and 6.8% of subjects achieved these levels of attendance to live PSF group sessions in our earlier study[14]. In both studies, preliminary efficacy analyses suggested that higher program completion rates were associated with increased cessation. Although PSFW was designed as a stand-alone intervention, with automated texts and e-mails to promote adherence, it is clear from our experience that these simple, non-interactive reminders were not sufficient to sustain program usage. Virtually all subjects required reminder phone calls, with an average of seven calls per user. Web-based health interventions have the capacity to deliver high-reach, low-cost, and anonymous treatments. However, our findings demonstrate that with a PLWH target population, an accurate representation of reach and cost may need to incorporate direct human contact or social interaction (e.g. with an online community) into the model. Although the reminder phone calls were very brief, were delivered by clinic support staff as part of their regular duties, and were explicitly not cessation counseling sessions, the necessity for the calls in almost all PSFW subjects does have implications for program feasibility and generalizability. Future research is needed to explore whether engagement with interventions such as PSFW can be enhanced with more interactive features or if the program is better suited as an adjunct to clinic care or live counseling, e.g. smokers’ quitline, than as a stand-alone treatment.

Even though all study participants demonstrated adequate literacy to utilize the site, those with higher educational attainment scored higher on multiple measures of adherence and engagement. The intervention is text-heavy, and it is possible that a website with less text and more graphics could have engaged those of lower educational attainment better. It is interesting that higher baseline anxiety levels were associated with higher levels of adherence and engagement. Anxiety is common in PLWH[39], and individuals with anxiety disorder smoke at higher rates[40]. There is also a complex interaction between anxiety and internet use. Anxiety, especially social anxiety, may fuel excessive internet use syndromes[41]. Internet use may, conversely, be anxiety-provoking[42]. Although we did not quantitate overall internet usage in our cohort, it is possible that high-level internet usage patterns by anxious subjects spilled over into higher levels of PSFW usage. It is significant that levels of engagement were higher in those who accessed the website at home. The home environment may be less prone to distractions and interruptions and more conducive to full attentiveness than other locales, may afford greater privacy, and may also allow for greater scheduling convenience and flexibility. Given these findings, it would be reasonable to encourage home usage of computerized health interventions for PLWH. The significance of various other sociobehavioral measures, e.g. age, sexual orientation, alcohol use, decisional balance, and perceived stress, and their relationships to website usage were less consistently observed but may be worthy of further study.

There is an urgent need to develop effective, evidence-based tobacco treatments for PLWH smokers. Randomized controlled trials of established strategies such as motivational interviewing [43] and face-to-face intensive counseling [38,44] have failed to prove efficacious in PLWH. Individual cellphone counseling improved three month quit rates, but these gains were not sustained over longer-term follow-up [45,46]. We previously reported the preliminary efficacy of PSF group therapy for PLWH smokers[14], and a definitive trial of this intervention is ongoing.

In the present trial, the proportion of patients assigned to PSFW versus the control condition who achieved the conservative, intention-to-treat abstinence endpoint was 10.1% vs. 4.3%. Our pilot study was not powered to detect an effect of this size, but these cessation rates compare favorably with established web-based cessation programs designed for the general population[47,48]. In comparison, the three-month quit rate for the live, group therapy version of Positively Smoke Free was 19.2% in a prior study in the same clinic environment. This cessation rate was consistent with those seen in general population smokers receiving maximally intensive, in-person behavioral therapy[49]. In the current study, the fact that successful quitters were concentrated among those who used and were engaged in the website at the highest rates, rather than randomly distributed within the PSFW condition, suggests that the finding is not a statistical artifact. One could posit that the subjects who were highly motivated to quit used the website the most and quit at the highest rate. However, our analyses (not presented) did not demonstrate a correlation between motivation and website usage, arguing against the view that usage and engagement were surrogates for motivation to quit. The observation that website benefit appeared to be restricted to female users is worthy of additional study. Although we are not aware of gender differences in web-based intervention efficacy from prior trials, gender differences in smoking behaviors and health-motivated internet usage have previously been described[50,51]. The high cessation

rates among female high school graduates who completed all eight sessions, suggest that this may be a segment of the HIV-infected community which can derive particular benefit from full engagement in web-based tobacco treatment.

Of all the website usage data collected, only the number of interactive clicks approached a statistically significant association with the abstinence endpoint. Interactive clicking indicates engagement, and it also personalizes the website message insofar as many of the interactive choices address specific user characteristics. Measures to increase the attractiveness and quantity of interactive features, and measures that increase the personalization of the message may increase the engagement and efficacy of future web-based tobacco treatments.

Self-efficacy, i.e. one's perceived ability to resist smoking in tempting situations, is a critical determinant of successful cessation[21] and was a predictor of higher cessation rates in prior studies of tobacco treatment in PLWH[14,52,53]. Increasing self-efficacy is a central goal of PSFW. Although this trial was not powered to discern significant associations between self-efficacy and abstinence, the associations that we observed between changes in self-efficacy, study condition, and three-month abstinence reinforce the view that self-efficacy is an important mediator of treatment success.

Certain limitations of the study need to be acknowledged. The sample size was relatively small, and thus the trial may not have had the statistical power to detect important associations. Although the software did permit quantitation of time logged into the site, it is not possible to precisely quantitate the level of engagement of each user with the website. Finally, our data derives from a patient sample enrolled in a single, New York City HIV clinic. Although our population is typical of urban HIV clinic populations in the US, results derived from this study may not be generalizable to other settings and locations.

In this pilot study of Positively Smoke Free on the Web, we explored the feasibility and preliminary efficacy of a web-based tobacco treatment program targeting PLWH smokers who were motivated to quit and had internet access. The feasibility data were encouraging, showing relatively high rates of adherence and engagement. With a reminder protocol consisting of live phone calls, emails, and texts, session completion rates far surpassed those observed for an in-person version of the program described in a previous publication[14]. Educational attainment of at least high school graduation, higher anxiety score, and home as primary location of website access were consistently associated with higher levels of website usage and engagement. Abstinence rates in the PSFW condition were more than double those in the control condition, and were particularly high among female high school graduates who visited all of the program's web pages. These findings suggest that web-based tobacco treatment, especially if supported by an effective adherence protocol, is a feasible strategy for PLWH smokers, and preliminary abstinence data suggest that such treatment may increase quit rates.

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POSITIVELY SMOKE FREE
You work hard to build up your health... don't let it go up in smoke!

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Choose a Session

session 1
session 2
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Welcome to Positively Smoke Free!

You have made a very big decision. You have decided to quit smoking. And we are here to help you prepare for your quit date in 4 weeks. As members of the Positively Smoke Free team, it is our pleasure to provide you with a program that is **specially designed for people living with HIV who smoke**. We know that there are many pressures out there and that quitting smoking won't be easy. We want to be here for you, and to help you succeed in getting cigarettes out of your life for good.

To help you succeed, **Positively Smoke Free** will focus on the specific issues you face as someone who is living with HIV. You will be provided with 8 sessions designed specially for you. **And, don't forget to read the right side of the page!** It includes quotes, facts, and lots of interesting information that will help you quit smoking.

Know Your Strengths

Your experience living with HIV has probably taught you some lessons that will help you through the quitting process:

- **People living with HIV are the champions of changing behavior** to protect their health and the health of their loved ones. Safer sex behaviors and using clean needles are two clear examples.
- Many people living with HIV/AIDS have learned to rely on their spiritual faith to get them through hard times. **Your faith during**

POSITIVITY!

The beginning is always today.
—Mary Wollstonecraft

The 3 Me's

Everyone has internal voices that help them make decisions. What are yours saying right now about joining this program?

Little Me. "This program is boring. Let's go do something fun instead."

Adult Me. "You're doing a great job taking care of your HIV. Your next biggest health problem is that you smoke. You're going to need a lot of help to quit, and this program looks like it's designed just for you. And, it's free!"

Critical Me. "There you go, trying to quit again. What a waste of time. You know you're going to fail, so why even try?"

Figure 1.

A representative web-page from Positively Smoke Free on the Web.

Note: PSF=Positively Smoke Free; PSFW=Positively Smoke Free on the Web; NRT=nicotine replacement therapy.

*Subjects who were lost to follow-up were considered non-abstinent in the primary analyses.

Figure 2.
Flow of study subjects.

Table 1

Study measures and outcomes.

Description	Measure	Ref.
Sociodemographic /medical information	Self-report and medical record	NA
Tobacco use and knowledge	CDC-QIT	15
Other substance use	NIH/NIAID Baseline Substance Use Report	18
Nicotine addiction	Modified Fagerstrom Tolerance Questionnaire	19
Motivation to quit	Modified Abrams & Biener Readiness to Quit Ladder	20
Self-efficacy	Self-efficacy/Temptations Scale	21
Decisional balance	Smoking Decisional Balance Short Form	22
Social support	Interpersonal Support Evaluation List	23
Loneliness	UCLA Loneliness Scale	24
Depression	Center for Epidemiologic Studies Depression Scale	25
Anxiety	General Anxiety Disorder-7	26
Perceived stress	Perceived Stress Scale – 4 Item	27
Study Outcomes		
Adherence	# of sessions logged into; #web pages visited	NA
Engagement	# of interactive clicks; # total minutes logged in;	NA
Satisfaction*	Satisfaction survey designed by study team	NA
Study contamination**	Questionnaire designed by study team	NA
Abstinence (by history)	Seven-day point-prevalence abstinence at 3 months	28
Abstinence (biochemical)	Exhaled carbon monoxide<10 parts per million***	29

Note: NA=not applicable, CDC-QIT=Centers for Disease Control-Question Inventory on Tobacco, NIH/NIAID=National Institutes of Health/ National Institute of Allergy and Infectious Diseases, UCLA=University of California, Los Angeles

* PSFW subjects only

** Standard care subjects only

*** Measured using the Bedfont piCO+ Smokerlyzer (Bedfont Scientific Ltd., Kent, UK) according to manufacturer's instructions.

Table 2

Baseline characteristics of the study cohort.

Characteristic	Control condition (N=69 [*])	Intervention condition (N=69 [*])	P
Age	45.9±10.0	45.4±9.9	0.76
Gender			
Male	43 (62.3%)	33 (47.8%)	0.23
Female	25 (36.2%)	35 (50.7%)	
Transgender	1 (1.4%)	1 (1.4%)	
Ethnicity			
Latino	29 (44.6%)	33 (48.5%)	0.65
Non-Latino	36 (55.4%)	35 (51.5%)	
Race			
Black/African American	41 (74.5%)	42 (77.8%)	0.42
White	13 (23.6%)	9 (16.7%)	
American Indian or Alaskan native	1 (1.8%)	3 (5.6%)	
Marital status			
Married/living with partner	15 (23.4%)	19 (28.4%)	0.52
Single	49 (76.6%)	48 (71.6%)	
Housing status			
Stable	62 (89.9%)	62 (89.9%)	1.00
Transitional	6 (8.7%)	6 (8.7%)	
Homeless	1 (1.4%)	1 (1.4%)	
Employment status			
Unemployed/disabled	59 (85.5%)	59 (85.5%)	1.00
Part-time employment	4 (5.8%)	4 (5.8%)	
Full-time employment	6 (8.7%)	6 (8.7%)	
HIV risk behavior			
Heterosexual contact	29 (43.3%)	32 (46.4%)	0.45
Same sex contact	18 (26.9%)	22 (31.9%)	
Injection drug use	6 (9.0%)	7 (10.1%)	
Transfusion	2 (3.0%)	3 (4.3%)	
Other/unknown	12 (17.9%)	5 (7.2%)	
Most recent CD4+ count (cells/ul)	578±367	595±339	0.78
Most recent HIV-1 viral load<40 copies/ul	46 (66.7%)	43 (62.3%)	0.59
Daily cigarette consumption	11.5±8.5	10.2±7.4	0.35
Nicotine dependence score ^{**}	4.9±2.3	4.8±2.1	0.97
Motivation to quit ^{***}	5.9±1.6	6.1±1.5	0.39

* Response totals do not equal the cohort size for all items because of incomplete reporting

** As measured using the Modified Fagerstrom Tolerance Questionnaire [19]

*** As measured using the Abrams and Biener Readiness to Quit Ladder [20]

Table 3
Multivariate logistic regression analyses of factors associated with adherence to and engagement with PSFW.*

	Visited all web-pages		More interactive clicks		More time spent logged into site	
	OR _{adj} (95% CI)	P	OR _{adj} (95% CI)	P	OR _{adj} (95% CI)	P
Anxiety score	1.15 (1.01–1.31)	0.03	NS	NS	1.17 (1.04–1.31)	0.01
Perceived stress score	0.78 (0.61–1.00)	0.05	NS	NS	NS	NS
High school graduation	4.29 (0.81–22.7)	0.09	4.08 (1.02–16.4)	0.05	NS	NS
Same-sex sex	NS	NS	0.26 (0.08–0.83)	0.02	0.32 (0.10–1.01)	0.05
Accessed website at home	NS	NS	3.93 (0.87–17.7)	0.08	NS	NS

Note: OR_{adj}=adjusted odds ratio, 95% CI=95% confidence interval, NS=not significant

* All models included age, decisional balance pro score, anxiety score, perceived stress score, high school graduation, same-sex sex, home use of PSFW, and any alcohol use in the past 30 days as potential covariates prior to the backward stepwise removal of variables.