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Predictors of quit attempts among smokers enrolled in substance abuse treatment

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Abstract

Introduction—This study investigates factors predicting past year quit attempts among smokers enrolled in substance abuse treatment in New York State.

Methods—Data were drawn from two prior cross-sectional surveys conducted among clients treated in 10 randomly selected substance abuse treatment programs. Among 820 clients recruited, 542 self-identified as current smokers, and 485 provided information about their quit attempts. The main outcome was reporting a quit smoking attempt in the past year, dichotomized as quit attempters or non-quit attempters. Univariate and multivariate logistic regression analyses were performed to explore predictors of attempting to quit.

Results—Half of substance abuse clients in treatment programs reported a past year quit attempt. Quit attempters were more likely to be in a preparation and contemplation stage of change (preparation: OR = 2.68, 95% CI: 1.51-4.77; contemplation: OR = 2.96 95% CI: 1.61-5.42), reported more positive attitudes toward quitting (OR = 1.49; 95% CI: 1.11 - 1.99) and received more cessation services than non-quit attempters (OR = 1.21; 95% CI: 1.11-1.99).

Conclusions—Addressing patient attitudes about quitting smoking, having clinicians address smoking in the course of addiction treatment, and offering interventions to increase readiness to quit may contribute to increased quit attempts in smokers enrolled in addiction treatment programs.

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Contributions C Martinez and J Guydish conceptualized this study and led the manuscript. B Tajima and E Passalacqua conducted the fieldwork for the study. T Le executed the analysis, and participated in the data interpretation. All authors read and commented the final version of this manuscript.

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Keywords

Smoking; quit attempts; substance abuse; substance Abuse Treatment Centers

1. Introduction

Despite significant progress in reducing cigarette smoking in the general U.S. population, from 40% in 1964 to 19.0% in 2011 (Centers for Disease Control and Prevention [CDC], 2012; King, Dube, & Tynan, 2012; McGinnis & Foege, 1999; Okuyemi et al., 2013), smoking rates have remained high among persons with addictive disorders (CDC, 2013). Not all persons with addictive disorder enter treatment, but those who do enter treatment have very high smoking prevalence. Using epidemiologic data from the National Survey on Drug Use and Health (NSDUH), and for the period 2000-2009, smoking prevalence among persons who received any addiction treatment in the past year ranged from 67% to 69% (Guydish et al., 2011).

Persons with addictive disorders initiate smoking at a younger age, and are more likely to be heavy smokers, have higher nicotine dependence, and experience greater difficulty with quitting (Grant, Hasin, Chou, Stinson, & Dawson, 2004; Ward, Kedia, Webb, & Relyea, 2012). However, this population is interested in quitting smoking (Hughes & Kalman, 2006), and can quit successfully with intensive and specialized cessation interventions (Schroeder & Morris, 2010).

Consistent with high smoking prevalence among those in addiction treatment, Hurt et al. found that persons admitted to an inpatient alcohol treatment program were more likely to die from tobacco-related causes than from alcohol-related causes (Hurt et al., 1996). Similarly, a 20 year longitudinal follow-up study of patients enrolled in the California Civil Addict Program in the 1960s showed that smokers were four times more likely to die than non-smokers (Hser, Anglin, & Powers, 1993).

Approximately 4 million persons receive some form of addiction treatment annually (Substance Abuse and Mental Health Services Administration, 2009). Most addiction treatment occurs in the public sector, supported by federal and state funding (Olfson & Mechanic, 1996), and in treatment systems regulated at the state level. In recent years some states have experimented with tobacco control policies in their addiction treatment system, including the use of smoke-free grounds (Utah Department of Health, 2011; Drach, Morris, Cushing, Romoli, & Harris, 2012; Guydish et al., 2012). Smoke-free grounds, now implemented over half of U.S. hospital campuses (Williams, et al., 2009), may both deliver a positive health message and promote increased interest in quitting smoking (Rigotti et al., 2000; Rigotti, Munafo, & Stead, 2008). Previous studies have demonstrated that hospitalization in a smoke-free psychiatric hospital triggers smokers' quit attempts and increases expectancies about quitting and staying smoke-free (Ratschen, Britton, Doody, & McNeill, 2009; Shmueli, Fletcher, Hall, Hall, & Prochaska, 2008). Schroeder and Morris (2010) recommend addressing tobacco use in substance abuse and mental health populations by including the use of smoke-free treatment environments, tailored treatments, and supportive clinicians. Research suggests that patients who quit smoking also have better

drug abuse treatment outcomes (Lemon, Friedmann, & Stein, 2003; J. J. Prochaska, Delucchi, & Hall, 2004; Shoptaw et al., 2002; Zhao, Stockwell, & Macdonald, 2009).

In 2008, the New York Office of Alcoholism and Substance Abuse Service (OASAS) required all state-certified addiction treatment programs to implement tobacco-free grounds – banning the use of all kinds of tobacco products, including smokeless, in indoor and outdoor areas - and provide tobacco dependence intervention for clients on request (OASAS, 2008). Studies of this initiative have reported that tobacco-free OASAS policy has: 1) decreased client smoking (Guydish et al., 2012); 2) improved smoking-related attitudes and practices among staff and patients in some programs (Guydish et al., 2012); 3) decreased patients' previous resistances to tobacco-free policies (Brown, Nonnemaker, Federman, Farrelly, & Kipnis, 2012); 4) improved use of tobacco cessation-related intake procedures and use of recommended guidelines for treating tobacco dependence (Brown et al., 2012; Eby, Sparks, Evans, & Selzer, 2012; Eby & Laschober, 2013); and 5) linked the increase of smoking cessation interventions with clinician participation and organizational support (Eby, George, & Brown, 2013).

Our group conducted patient surveys in a random sample of New York State addiction treatment programs before and after the OASAS policy was implemented. We observed a small but significant decrease in smoking prevalence over time (69.4% to 62.8%, $p < .05$). Although the OASAS tobacco policy was associated with a reduction in smoking prevalence, it is clear that tobacco consumption among these patients is still high, even in the presence of favorable environments that provide tobacco-free grounds and access to tobacco-related services (Schroeder & Morris, 2010). The current study is a secondary analysis concerning quit attempts among smokers enrolled in New York State addiction treatment programs, comparing those who made at least one quit attempt in the past year with those who did not. Findings may inform efforts to increase the rate of quit attempts in this vulnerable population, where smoking prevalence is high and recalcitrant to change.

2. Methods

2.1. Design study

Data were drawn from two prior cross-sectional surveys conducted among clients enrolled in a random sample of 10 treatment programs (Guydish et al., 2012). The first survey was in 2008 before the OASAS tobacco-free regulation was implemented, and the second was one year later in 2009. The sample of participating programs included 3 outpatient, 2 methadone, and 5 residential programs. Research staff visited each program to conduct survey data collection with a convenience sample of clients. In residential programs, all clients present on the day of the site visit were invited to a meeting where a research team member completed consent procedures and distributed the survey. In outpatient clinics, a researcher was present to conduct data collection after group sessions, and in methadone clinics a researcher was present during morning dosing hours. Participation was voluntary and anonymous, and participants received a $20 gift card for completing the survey. Procedures for drawing the sample of programs and their representativeness of the treatment system, and procedures for participant recruitment and data collection were reported previously

(Guydish et al., 2012). Study procedures were approved by the University of California San Francisco institutional review board.

2.2. Inclusion criteria and sample size

A total of 820 clients were recruited, 409 in 2008 and 411 in 2009. The analysis reported here is focused on 542 self-identified current smokers, defined as those who endorsed the survey item responding “I currently smoke every day” or “some days”. Current smokers were asked: “how many times in the past year did you quit smoking voluntarily for at least 24 hours?”. We excluded 4 smokers who reported more than 50 quit attempts in the past year.

2.3. Variables

The *dependent variable* was whether the participant quit smoking in the past year, defined as voluntary smoking abstinence for at least 24 hours (Hughes & Callas, 2010). The exact wording of our question was: “How many times in the past year have you quit smoking voluntarily for at least 24 hours?” Respondents provided number of quit attempts in the past year, and we dichotomized the distribution to “non-past quit attempters” (did not make a quit attempt) and “past quit attempters” (did ≥ 1 quit attempts) (from this point on called “non-quit attempters” and “quit attempters”). Among the 542 smokers, 485 responded about their quit attempts in the past year, representing 89.5% of smokers in the sample. Those who did not answer the quit attempts question (n = 57) had similar tobacco consumption characteristics to those who answered it (n = 485). In addition, they had similar socio-demographic characteristics in regards age, sex, ethnicity, and race but were significantly less educated (57.9% had less than high school education, in comparison with 34.0% of those included in this study; p= .004).

Independent variables included socio-demographics (age, gender, education), ethnicity /race (African American/Black, Caucasian/White, Hispanic, “Other ” including Asian, Native Hawaiian, Pacific Islander, Native American), current employment (yes/no), and primary drug of choice (alcohol, crack/cocaine, heroin/opiates, others). In addition, we explored smoking patterns by asking smoking days per week, number of cigarettes per day, first cigarette per day (within 5 minutes, 6-30 minutes; 31-60 minutes; after 60 minutes), cigarette most difficult to give up (the first in the morning, all others), smoking more during the morning, and for the assessment of motivation we used the readiness-to-change model (pre-contemplation, contemplation, preparation) to measure desire to quit (J. O. Prochaska, DiClemente, & Norcross, 1992). If they were in a relationship, we asked about partner’s smoking status (current smoker/non-smoker). These variables have been associated with quit attempts and smoking cessation in epidemiological studies (Broms, Silventoinen, Lahelma, Koskenvuo, & Kaprio, 2004; Lawrence, Hafekost, Hull, Mitrou, & Zubrick, 2013; van Loon, Tijhuis, Surtees, & Ormel, 2005).

We also measured clients’ smoking knowledge, attitudes, and clinician and program services received by using the Smoking Knowledge, Attitudes and Services scale (S-KAS) (Guydish, Tajima, Chan, Delucchi, & Ziedonis, 2011). The Knowledge scale was composed of five questions about the hazards of smoking and second-hand smoke, the awareness of resources

to help quit smoking, own skills to quit, and the need of clinician skills to provide help. The Attitude scale included seven items that asked about the willingness of clients in quitting and receiving help, the readiness to quit during the program and their concern about smoking. The four Clinician Service items asked how often the clinician had encourage the client to reduce or quit smoking, use Nicotine Replacement Therapy (NRT), or arrange an appointment to discuss quitting. Last, the seven Program Service items asked whether, in the current treatment program, they had received information, educational material, advice, referral, or medication to assist in quitting. The S-KAS scales have shown moderate to high internal consistency, with alphas ranging from 0.57 for the Knowledge scale to 0.82 for Clinical and Program Service scales (Guydish, Tajima et al., 2011), and have been used to assess impacts of program-level (Guydish, Ziedonis et al., 2012) and state policy interventions (Guydish, Tajima et al., 2011) to address smoking in addiction treatment.

2.4. Data analysis

The study groups (quit attempters/non-quit attempters) were compared on demographic variables, smoking measures, and four S-KAS dimensions using the chi-square test for categorical and t-test for continuous measures. Univariate logistic regression analyses were used to explore predictors of attempting to quit, including age, gender, ethnicity, race, education, employment, primary drug of choice, number of cigarettes per day, partner's smoking status, readiness to quit smoking, and the S-KAS knowledge, attitudes, clinician service and program service scales. Model terms that were statistically significant at the 0.10 level were entered into a multivariate logistic regression to evaluate independent predictors. Analyses were conducted using SAS version 9.3.

3. Results

For the 485 smokers, 221 (45.6%) had made a past year quit attempt and 264 (54.4%) had not. In comparison to non-quit attempters, quit attempters were older, more likely to be from Caucasian/White race and from Hispanic ethnicity, less likely to be from the "Other" race category (see Table 1).

We also assessed whether data collection before or after the New York policy implementation was associated with quit attempt v. non-quit attempt status, and whether the clinic where data were collected was associated with quit attempt v. non-quit attempt status (data not shown in Table 1). Data collection before or after policy implementation was not associated with quit attempt status (Chi Square ($n = 485$) = 0.94, $p = .332$). However, the clinic where data were collected was associated with quit attempt status (Chi Square ($n = 485$) = 15.39, $p = .081$), meeting criteria for inclusion ($p < .01$) in the multivariate model (data not shown in Table 1).

Compared to non-quit attempters, quit attempters were more likely to be in preparation or contemplation stages, reflecting greater readiness to quit smoking among those reporting past year quit attempts (Table 2). Quit attempters also reported smoking fewer days per week ($p= .010$) and fewer cigarettes per day.

Table 2 displays the difference among non-quit attempters and quit attempters for the four SKAS scales. Compared to non-quit attempters, those having made at least one quit attempt had higher mean attitude scores (3.4 v. 2.9), reflecting more positive attitudes toward quitting. Smokers having made at least one quit attempt also received a higher mean number of services from their clinician (2.6 v. 2.2). Table 2 also shows mean values for individual items within each scale however, to limit exposure to Type I error we did not test group differences for individual scale items.

All variables achieving significance at $p \leq .10$ in univariate comparisons were entered into the multivariate regression model predicting whether or not a quit attempt was made in the past year. These predictors included age, ethnicity, race, smoking days per week, number of cigarettes per day, readiness to quit smoking (stage of change), and the S-KAS Attitudes and Clinician Service scales. Only significant logistic regressions from this model are shown in Table 3. Compared to pre-contemplation, smokers who were in preparation (OR = 2.68, 95% CI: 1.51 – 4.77) and contemplation stages (OR = 2.96; 95% CI: 1.61 - 5.42) presented higher odds of a quit attempt. In addition, smokers who reported more positive attitudes toward quitting (OR = 1.49, 95% CI: 1.11 – 1.99), and those who received more clinician services in support of quitting (OR = 1.21, 95% CI: 1.01 -1.46) had higher odds of a quit attempt.

4. Discussion

This study revealed that over 45% of OASAS substance abuse clients who smoke had a past year quit attempt. Compared to non-quit attempters, quit attempters were more likely to be older, Hispanic from “Other” race category, and were in a preparation and contemplation stage of change. They also reported more positive attitudes in regards to quitting, and received more counseling and tobacco cessation support from their clinicians and program services than non-quit attempters.

In 2008, approximately half of adult smokers made a quit attempt for at least 24 hours or more during the preceding 12 months (CDC, 2009). Our study reinforces the earlier observation, that although smokers addicted to other substances have a higher smoking prevalence and higher nicotine dependence, these persons are interested in quitting when they are in addiction treatment (Hughes & Kalman, 2006). McCarty et al. reported that 68-75% of methadone patients had tried to quit at least once in their lives (McCarthy, Collins, & Hser, 2002) and, Teater showed that 33% of women in addiction treatment had made a past year quit attempt (Teater & Hammond, 2010). Also consistent with previous research (Teater & Hammond, 2010), quit attempters were more ready to quit, and reported more favorable attitudes toward quitting than non-quit attempters.

Not reported previously, to our knowledge, is the finding that receiving tobacco-related services from clinicians was strongly and positively associated with past year quit attempts in this addiction treatment sample. Compared to non-quit attempters, quit attempters were more likely to be in a preparation or contemplation stage of change, reported more favorable attitudes toward quitting, and received more tobacco-related services from their clinician. Our findings show that even patients with high nicotine dependence, such as 42.7% (77/180)

of those that consume the first cigarette 5 minutes of waking, could have a past year quit attempt. One factor previously associated with quit attempts (1st cigarette of the morning) was not associated with quit attempts in this study. It is possible that this variable was affected for participants in residential treatment settings, where smoking is regulated by program activity schedules. However, in our analyses, neither time to first cigarette nor type of treatment program (residential, outpatient, methadone maintenance) were associated with quit attempt status.

This is of interest because tobacco cessation has been traditionally neglected in addiction treatment programs (J. J. Prochaska, Gill, & Hall, 2004; D. Ziedonis et al., 2008). Major implementation barriers include clinician beliefs that patients are not interested in tobacco cessation (Campbell, Wander, Stark, & Holbert, 1995), that tobacco cessation compromises treatment of other drug use (McIlvain & Bobo, 1999), clinicians' smoking status (D. M. Ziedonis, Guydish, Williams, Steinberg, & Foulds, 2006) and clinicians' lack of training in treating tobacco dependence (Richter, Hunt, Cupertino, Garrett, & Friedmann, 2012). However, multicomponent tobacco-free regulatory initiatives, such as that in the New York State addiction treatment system, can decrease patient resistance to tobacco-free policies (Brown et al., 2012; Eby et al., 2012; Eby & Laschober, 2013) and increase their readiness to quit. Our study adds to the scarce literature on quit attempts among persons in addiction treatment, and suggests that both clinician services and favorable patient attitudes toward quitting can increase quit attempts in this population.

Although a single quit attempt does not usually result in abstinence, on a population level having several quit attempts increases the chances of quitting (Zhu, 2013) and previous quit attempts increase the possibility of new ones (Vangeli, Stapleton, Smit, Borland, & West, 2011; Zhou et.al 2009). So, stimulating quit attempts can be an important and effective part of the cessation process. In our study, we have found that smokers enrolled in substance abuse treatments are able to start the "quit process" (Zhu, 2013) if they are exposed to favorable factors such as being in tobacco-free environments and having clinicians who encourage them to quit, use nicotine replacement therapy and, arrange follow-up appointments.

Nonetheless, we observed that 55.5% of smokers enrolled in addiction treatment programs did not report a quit attempt during the last year. Although we are not able to establish the causal mechanism between low predisposition to change (pre-contemplation stage) and lower scores in attitudes and clinical and programs services compared with quit attempters, this association must be taken into account as a predictor of quitting among this population. Our results suggest that treatment programs can promote quit attempts by addressing patient attitudes toward quitting, and by providing tobacco-related services. Interventions designed to move patients along the stage of change continuum may also help initiate quit attempts. Contrary to concerns that quitting smoking increases relapse to other drug use, research suggests that patients who quit smoking have better outcomes for other drug use as well (Lemon, Friedmann, & Stein, 2003; J. J. Prochaska, Delucchi, & Hall, 2004; Shoptaw et al., 2002; Zhao, Stockwell, & Macdonald, 2009).

4.1. Limitations

This was a secondary analysis of survey data, where the survey was not specifically designed to explore factors associated with quit attempts. However, a number of variables shown in the literature to affect quit attempts were present in the data. A small number of clinics (n=10) were included in the study, however the clinics were randomly selected from all eligible New York State programs, and patient characteristics in these programs were found to be similar to those in the population from which the sample was drawn (Guydish et al., 2012). Quit attempt data were missing for about 10% of smokers, and exclusion of these respondents could lead to a non-response bias. Missing data came from smokers more likely to be less educated. Previous studies have shown that non-response bias is a frequent problem in substance use surveys, with low response rates among persons with less education who do not understand the survey as well as those with higher education (Zhao et al., 2009). While we had quit attempt responses from 90% of smokers in the sample, it is possible that the resulting data overestimate the proportion of quit attempters. It is possible that participants may under-report smoking status or over-report quit attempts because our question requires recall of quit attempts during the past year. This is a commonly used time period for quit attempts (Hughes & Callas, 2010), although some authors ask for quit attempts during the past 3 months (Zhou et al., 2009). The 66% smoking prevalence reported in this sample is consistent with smoking rates among persons receiving any addiction treatment in the past year (Guydish et al., 2011), and the proportion reporting past year quit attempts is consistent with reference to population data (CDC, 2009). Last, these data were collected in New York State, at a time when all addiction treatment programs were mandated to implement tobacco-free grounds and to provide cessation services on request (Guydish et al., 2012), and findings may be related to a strong and statewide tobacco policy that is not found in all states.

5. Conclusion

Half of substance abuse smokers enrolled in treatment programs had a past year quit attempt and started a voluntary quit process when exposed to favorable factors. Because a quit attempt is the precedent of sustainable abstinence and ultimately of smoking cessation, programs and clinicians should address this issue in the course of an addiction treatment. Our findings reveal environmental and behavioral predictors that trigger quit attempts among substance abuse smokers such as: be in advanced stages of change, have higher attitudes in quitting, and receive more cessation services. Therefore, substance abuse programs and clinicians should: 1) launch educational and training programs to increase clinicians' knowledge and attitudes in smoking cessation interventions, 2) design motivational campaigns directed toward increasing quit attempts, and 3) request leadership and managerial support to implement comprehensive tobacco-free policies in substance abuse programs. Significant gains in public health can be achieved by increasing quit attempts among persons in addiction treatment, a vulnerable population where tobacco use, and the associated health and economic costs, remain highly prevalent.

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Highlights

- This study explores quit attempts among smokers in addiction treatment from New York State, the only U.S state that required all certified addiction treatment programs to implement tobacco-free grounds and provide tobacco dependence intervention for clients on request.
- Half of smokers in addiction treatment reported at least one past-year quit attempt. This finding confirms that persons in addiction treatment are as interested in quitting as smokers from the general population.
- This study adds to the scarce literature on quit attempts among persons in addiction treatment, and suggests that both clinician services and favorable patient attitudes toward quitting can increase quit attempts in this population.

Table 1

Demographic characteristics among smokers by quit attempt status

	Non-quit attempters (N=264)	Quit attempters (N=221)	Overall (N=485)	P-value[1]
Age, mean (SD)	38.7 (10.84)	41.2 (11.33)	39.8 (11.13)	**0.014**
Gender, No. (%)				0.756
Female	103 (39.5%)	83 (38.1%)	186 (38.8%)	
Male	158 (60.5%)	135 (61.9%)	293 (61.2%)	
Education, No. (%)				0.177
Less than HS	88 (33.5%)	76 (34.7%)	164 (34.0%)	
High school/GED	96 (36.5%)	73 (33.3%)	169 (35.0%)	
Some college/tech	51 (19.4%)	56 (25.6%)	107 (22.2%)	
College degree/diploma	28 (10.6%)	14 (6.4%)	42 (8.7%)	
Race/Ethnicity, No. (%)				**0.031**
African American/Black	84 (31.8%)	64 (29.0%)	148 (30.5%)	
Caucasian/White	112 (42.4%)	74 (33.5%)	186 (38.4%)	
Hispanic	53 (20.1%)	69 (31.2%)	122 (25.2%)	
Other[2]	15 (5.7%)	14 (6.3%)	29 (6.0%)	
Current employed, No. (%)				0.298
No	229 (87.4%)	185 (84.1%)	414 (85.9%)	
Yes	33 (12.6%)	35 (15.9%)	68 (14.1%)	
Primary of drug use, No. (%)				0.991
Alcohol	46 (18.0%)	36 (17.5%)	82 (17.8%)	
Crack/Cocaine	60 (23.5%)	47 (22.8%)	107 (23.2%)	
Heroin/Opiates	120 (47.1%)	98 (47.6%)	218 (47.3%)	
Other[3]	29 (11.4%)	25 (12.1%)	54 (11.7%)	

[1] p values from t-test for continuous variables and chi square test for categorical variables.

[2] Includes Asian, Native Hawaiian/Pacific Islander, Native American/Alaskan, mixed race, and other.

[3] Includes marijuana, methadone, hallucinogens, other prescription drugs, and prescription opiates.

Table 2

Smoking characteristics among smokers by quit attempt status

	Non-quit attempters (N=264)	Quit attempters (N=221)	Overall (N=485)	P-value[1]
Age started smoking, mean (SD)	15.6 (5.08)	16.1 (5.39)	15.8 (5.22)	0.366
Smoking days/week, mean (SD)	6.8 (0.69)	6.6 (1.16)	6.7 (0.94)	**0.010**
Cigarettes/smoking day, mean (SD)	14.5 (9.60)	12.9 (9.19)	13.8 (9.44)	0.074
1st cigarette after waking, No. (%)				0.187
Within 5 minutes	103 (39.9%)	77 (35.2%)	180 (37.7%)	
6-30 minutes	100 (38.8%)	85 (38.8%)	185 (38.8%)	
31-60 minutes	21 (8.1%)	31 (14.2%)	52 (10.9%)	
After 60 minutes	34 (13.2%)	26 (11.9%)	60 (12.6%)	
Cigarette hates giving up, No. (%)				0.621
1st one in the morning	161 (63.4%)	141 (65.6%)	302 (64.4%)	
All others	93 (36.6%)	74 (34.3%)	167 (35.6%)	
Smoking more in 1st hour, No. (%)	112 (43.2%)	108 (49.3%)	220 (46.0%)	0.185
Stage of change, No. (%)				**<.001**
Preparation	68 (26.3%)	92 (42.4%)	160 (33.6%)	
Contemplation	58 (22.4%)	79 (36.4%)	137 (28.8%)	
Pre-contemplation	133 (51.4%)	46 (21.2%)	179 (37.6%)	
Partner smoking, No. (%)	58 (22.2%)	47 (21.5%)	105 (21.9%)	0.917
Smoking, Knowledge, Attitudes and Services, mean (SD)				
Knowledge scale	3.6 (0.71)	3.7 (0.77)	3.7 (0.74)	0.310
Attitudes scale	2.9 (0.86)	3.4 (0.74)	3.1 (0.84)	**<.001**
Clinician services scale	2.2 (1.08)	2.6 (1.16)	2.4 (1.13)	**0.001**
Program services scale	3.2 (1.27)	3.3 (1.27)	3.2 (1.27)	0.141

[1] p values from t-test for continuous variables and chi square test for categorical variables.

Table 3

Multiple logistic regression predicting quit attempt status (N = 485)

	Odds Ratio Estimates [1]		P-value
	OR	95%CI	
Stages of change			<0.001
Pre-contemplation	1		
Preparation	2.68	1.51 – 4.77	
Contemplation	2.96	1.61 – 5.42	
Cigarettes/smoking day	0.97	0.95-1.00	0.042
Attitudes	1.49	1.11 - 1.99	0.034
Clinician services	1.21	1.01 - 1.46	0.006

[1] Model was built from all significant variables from univariate analysis (at p value ≤0.10) including Age, Ethnicity/ Race, Clinics, Number of smoking days/week, Number of cigarettes on smoking day, Serious thinking of quitting, Attitudes, and Clinician services. Only significant factors are presented in the table.