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Using Treatment Process Data to Predict Maintained Smoking Abstinence

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Abstract

Objectives—To identify distinct subgroups of treatment responders and nonresponders to aid in the development of tailored smoking-cessation interventions for long-term maintenance using signal detection analysis (SDA).

Methods—The secondary analyses ($n = 301$) are based on data obtained in our randomized clinical trial designed to assess the efficacy of extended cognitive behavior therapy for cigarette smoking cessation. Model 1 included only pretreatment factors, demographic characteristics, and treatment assignment. Model 2 included all Model 1 variables, as well as clinical data measured during treatment.

Results—SDA was successfully able to identify smokers with varying probabilities of maintaining abstinence from end-of-treatment to 52-week follow-up; however, the inclusion of clinical data obtained over the course of treatment in Model 2 yielded very different partitioning parameters.

Conclusions—The findings from this study may enable researchers to target underlying factors that may interact to promote maintenance of long-term smoking behavior change.

Keywords

cigarette smoking; maintained abstinence; signal detection analysis

Smoking cessation treatment can produce short-term abstinence, but treatment effects lack durability.¹ Although several factors consistently predict short-term treatment response, far

less is known about variables that may influence long-term treatment outcome.² Indeed, the ability to achieve long-term smoking cessation may be influenced by different variables.³⁻⁵ A better understanding of the factors that govern long-term treatment response may lead to the development of more effective smoking cessation therapies.

Most analyses examine only linkages between pretreatment variables and smoking cessation treatment outcome. There is surprisingly little information on the extent to which clinical data gathered during treatment foretell long-term smoking cessation treatment response. Inasmuch as normal clinical practice proceeds by adjusting therapy in response to clinical data measured during treatment,⁶ it may be useful to identify both pretreatment factors and treatment process factors in the service of developing more effective interventions. Given the emerging interest in adaptive treatment research protocols based on patient's response to treatment,⁷ knowledge of the combination of factors that distinguish between successful and unsuccessful outcomes may be useful in determining when, and if, therapy needs to be adjusted.

In this paper, we used signal detection analysis (SDA) with a set of predictor variables to produce a series of and/or (Boolean) rules to identify subgroups of smokers in the sample who were more or less likely to achieve maintained smoking cessation through 52-week follow-up.⁸ Because we were interested in treatment effects on abstinence, we focused on maintained abstinence as the metric rather than follow-up point-prevalence abstinence, as it can be difficult to discern if cessation that occurs only during follow-up is attributable to treatment.

To our knowledge, 6 studies have employed SDA or similar methodology to partition smokers into subsamples with different treatment outcomes. In these studies, a variety of variables, primarily measured at baseline, were able to define subgroups with different rates of successful treatment response. These variables included age,^{9,10} gender,¹¹ self-efficacy,^{9,12} level of nicotine dependence,^{9,11,13,14} depression,^{9,14} BMI,^{11,14} pros of quitting,¹² perceived stress,¹² baseline cotinine levels,¹⁰ motivation to quit,¹¹ and craving.¹³ Although there was some consistency across studies, the variable that maximally discriminated successful versus less successful treatment response differed in all studies. This lack of consistency may be due, in part, to the inclusion of different subsets of variables and/or the use of different metrics to define treatment response.

The analysis presented here used data from a clinical trial designed to examine the effectiveness of extended cognitive behavioral therapy (CBT) in promoting longer-term smoking abstinence among adult smokers.¹⁵ Individual, in-office therapy sessions consisted of teaching self-regulatory skills to cope with smoking triggers, allowing the participant to rehearse modeled skills, and developing action plans to promote abstinence in self-identified risky situations. We evaluated 2 models in an effort to identify factors that might influence long-term treatment response. Model 1 evaluated factors measured at baseline to determine which pretreatment characteristics might distinguish treatment response and nonresponse. Model 2 evaluated both pretreatment factors and factors measured during the course of treatment to determine what combination of baseline and treatment process factors facilitate longer-term abstinence.

Methods

Randomized Controlled Trial Design

The original study was designed to examine the effectiveness of extended CBT in promoting long-term smoking cessation.¹⁵ Individuals were excluded from participating in the study for the following reasons: pregnancy, current lactation, epilepsy, bipolar disorder, schizophrenia, receipt of active treatment for or report of current depression or substance abuse, history of heart problems in the previous 6 months, head trauma leading to unconsciousness in the past year, history of severe head injury resulting in brain surgery or specific neurological problems, current use of bupropion or nicotine replacement therapy (NRT) or medication use that could interact with bupropion or NRT.

A total of 304 adult smokers (18-65 years of age; smoked at least 10 cigarettes per day or 3.5 packs per week) met criteria for entry into the study and received 8 weeks of CBT and nicotine patch therapy combined with 9 weeks of bupropion SR therapy (open-label treatment).¹⁵ Participants were randomly assigned to receive either an additional 12 weeks of CBT plus voicemail monitoring and telephone counseling (n = 154) or telephone-based general support only (n = 147); data from 3 participants were not included in the analysis because they inadvertently did not receive the treatment to which they were randomized. A quit date appointment was set for each participant 8 days after the baseline visit and 1 day after quitting smoking. In-office visits during open label were conducted during baseline, quit week, and weeks 1, 2, 4, and 6 (V0, VQ, V1, V2, V4, and V6, respectively). At the 20-week follow-up, those who received extended CBT produced a higher 7-day point prevalence abstinence rate (45%) compared to those who received telephone-based general support (29%); there was no statistically significant difference between the groups at the 52-week follow-up (31% versus 27%). The original study was approved by the Stanford University Administrative Panels on Human Subjects in Medical Research. Participants read and signed written consent forms during the initial office visit.

Predictor Variables

Demographics—The following demographic information was obtained during the initial screening: age, gender, ethnicity, education level, and marital status.

Treatment—Participants were randomly assigned to either the telephone support group or extended cognitive behavior therapy group at the baseline assessment.

Expired carbon monoxide—Carbon monoxide (CO) levels in parts per million (ppm) were measured using the Bedfont EC50 Smokerlyzer (<http://www.bedfont.com>). The current analysis uses the CO level measured at the baseline assessment (V0).

Cigarette consumption—Cigarette consumption was assessed at baseline (V0) through the question “On average, how many cigarettes do you smoke a day?”

Modified Fagerström Tolerance Questionnaire—This questionnaire (mFTQ) was administered at the initial screening and consists of 5 questions designed to assess tobacco dependence.¹⁶ The mFTQ is a modified version of the instrument first developed by

Fagerström¹⁷ as a self-report assessment of level of nicotine dependence. The modified questionnaire consists of the following 5 questions: “When you are in a place where smoking is forbidden, is it difficult for you not to smoke?” “Do you smoke more in the morning than during the rest of the day?” “Do you smoke even when you are so ill that you have to stay in bed most of the day?” “How deeply do you inhale?” “How soon after you wake up in the morning do you smoke your first cigarette?” Scores on the mFTQ range from a minimum of 5 to a maximum total of 25.

Craving and withdrawal symptoms—Craving was measured with the following 2 questions: “Have you felt cravings for a cigarette?” and “Have you felt strong urges to smoke?” A craving score was obtained by averaging the 2 items. If participants had not experienced the symptom, they circled 0. If participants reported experiencing the symptoms, they rated on a 6-point scale how upsetting these symptoms had been in the past 24 hours. Physiological and psychological withdrawal symptoms (nervousness, sleepiness, tense, frustration, restlessness, hunger, irritability, concentration problems, sleeping problems, anxiety) were also rated on the same scale (0-6) and were treated as a single scale score in the analyses. Craving and withdrawal symptoms were measured at VQ, V1, V2, V4, and V6.

Self-efficacy questionnaire—This questionnaire is adapted from Baer et al¹⁸ and consists of 21 questions that assessed confidence to resist an urge to smoke in various situations (labeled “situational self-efficacy”) and one question that assessed overall confidence in any situation (labeled “general self-efficacy”). Ratings were made from 0 to 10, with a higher number representing higher self-efficacy. Self-efficacy was assessed at V0, VQ, V1, V2, V4, and V6.

Depression symptoms—Depression symptoms were measured with the 20-item Center of Epidemiological Studies depression instrument (CES-D).¹⁹ Participants were asked to indicate the number of days (0 to 7) they felt or behaved in particular ways (ie, did not feel like eating or had a poor appetite; feel life had been a failure) during the past week. Depression symptoms were measured at V0, V2, and, V6.

History of major depressive disorder (MDD)—A screen for current MDD and past history of MDD was administered at the baseline visit using the mood disorders portion of the Structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders* (SCID), fourth edition (DSM-IV).²⁰

Body Mass Index (BMI)—BMI was computed from the formula kg/m^2 . Height was measured at baseline (V0) using a wall-mounted stadiometer, and weight was measured on a Scale-Tronix 5600 electronic scale at both baseline (V0) and end of open-label treatment (V6).

Outcome Variable of Interest—Participants were considered to have maintained abstinence (labeled “maintained”) if they were abstinent at both end of open-label treatment (V6) and 52-week follow-up *and* reported no relapse between V6 and 52-week follow-up. Abstinence was defined as not smoking, even a puff, for the 7 consecutive days prior to

contact with study staff. This was verified by exhaled air carbon monoxide (CO) levels below 10 parts per million. Relapse was assessed at 20- and 52-week follow-ups by the following question: "Since you attempted to quit smoking, have you smoked 7 days in a row?" Date of relapse was assessed by the first day the participant smoked 7 days in a row. If a date of relapse was not reported after V6, the participant was considered a nonrelapser. Of the 301 participants, 23% met the criteria for maintained abstinence.

Data Analyses

Means and standard deviations for demographic and baseline characteristics by maintainers versus nonmaintainers of abstinence were computed. T-tests were computed to assess differences between maintainers versus nonmaintainers.

Recursive partitioning based on signal detection analysis (SDA) was performed using the QROC program (<http://www.stanford.edu/~yesavage/ROC.html>) developed by Kraemer.²¹ SDA is an exploratory analytic method that develops algorithms consisting of and/or decision rules to identify distinct subgroups of people that are mutually exclusive and maximally discriminated from each other. We chose to set the test to maximize efficiency, which places equal emphasis on false negatives and false positive results. Using these methods, tests are compared on their ability to discriminate dichotomous outcomes over a range of cut-points in order to find the particular cut-point that optimizes the criteria of interest (successful maintained abstinence).

Signal detection was chosen as the analytic method for several reasons. First, research has identified a host of predictors of short-term smoking cessation treatment response. In such cases, signal detection methodology is superior to general linear models because multicollinearity has very little effect on the results for SDA and the method more effectively allows for the full use of data available for each variable being evaluated, thus eliminating problems related to missing data in regression approaches.⁸ Second, the results of SDA provide data that are more clinically meaningful than those of regression analyses. Unlike logistic and multiple linear regression analyses that result in weighted averages that can be difficult for clinicians to interpret, SDA can define distinct subgroups of persons with differing rates of smoking cessation success. Clinician can use these algorithms to individualize treatment for patients to maximize the chances of successful long-term abstinence.

In the first signal detection model (Model 1), we included only demographic characteristics, treatment assignment, and baseline (V0) measures to determine what pretreatment variables differentiate smokers who did and did not maintain abstinence posttreatment and to replicate previous studies using the QROC program. Based on the findings of other signal detection models, the following variables were included in the initial analysis: demographics (age, gender, education level, marital status, ethnicity), treatment assignment, baseline BMI, baseline CO level, baseline cigarettes per day, cravings and withdrawal symptoms at quit week, baseline mFTQ, baseline situational and general self-efficacy, baseline CES-D scores, and baseline history of depression.

To determine what combinations of baseline and treatment process factors define subgroups of long-term treatment responders versus nonresponders, Model 2 included all the Model 1 variables, as well as scores at each data collection point for situational and general self-efficacy, CES-D, cravings, and withdrawal symptoms. We also computed changes over time on the following variables: situational and general self-efficacy (changes from V0 to each data collection point), CES-D (change from V0 to V2 and V6), both cravings and withdrawal symptoms (changes from V0 to each data collection point), and BMI (change from V0 to V6).

Results

Table 1 displays the means and standard deviations for demographic and baseline characteristics by maintainers versus nonmaintainers of abstinence. Those who did not successfully maintain abstinence had higher mFTQ scores, $t(298) = 3.5$, $P < .001$, and lower baseline BMI, $t(299) = -2.6$, $P < .01$, than did those who successfully maintained abstinence at the one-year follow-up. The groups did not differ significantly on any other demographic or baseline characteristics.

Model 1

The SDA began with the full sample ($N=301$) in which the maintained abstinence rate was 23%. At the first stage of testing, the mFTQ was identified as the optimally efficient test, $\chi^2 = 14.72$, $P < .001$, $OR = 2.9$; 95% CI: 1.7–4.9, and was used to divide the full sample into 2 subsamples. Those with baseline mFTQ scores <17 had a maintained abstinence rate of 32% at 52-week follow-up. By contrast, those with mFTQ scores ≥ 17 had a maintained abstinence rate of only 14% at 52-week follow-up.

mFTQ scores <17 —In the subsample of participants with mFTQ scores <17 , BMI was also associated with maintained abstinence and was the most efficient test to further divide this subsample, $\chi^2 = 14.65$, $P < .001$, $OR = 3.9$; 95% CI: 1.9–7.8. Participants with a BMI of ≥ 27.3 were more likely to have maintained abstinence at 52-week follow-up (48%) than were participants with a lower BMI (19%).

mFTQ scores <17 and BMI ≥ 27.3 —Among those in this subsample with BMI ≥ 27.3 , baseline CES-D score was an efficient test for further division of the subsample, $\chi^2 = 4.99$, $P < .05$, $OR = 3.1$; 95% CI: 1.1–8.4. Sixty-seven percent (67%) of participants in the subsample with a baseline CES-D score of <3 maintained abstinence at 52 weeks. In contrast, only 38% of those with scores ≥ 3 maintained abstinence at 52-week follow-up.

mFTQ scores <17 and BMI <27.3 —No further branching occurred.

mFTQ scores ≥ 17 —In the subsample with mFTQ scores ≥ 17 , BMI also was associated with maintained abstinence and was the most efficient test to further divide this subsample, $\chi^2 = 7.85$, $P < .01$, $OR = 4.9$; 95% CI: 1.5–9.9. Thus, participants with a BMI of >29.4 were more likely to maintain abstinence at 52 weeks (23%) than were those with lower BMI (7%). No further branching occurred for either of these subgroups.

Model 2

As in Model 1, the SDA began with the full sample (N=301) in which the maintained abstinence rate was 23%. At the first stage of testing, situational self-efficacy measured at Visit 6 (SE_6) was identified as the optimally efficient test, $\chi^2 = 12.16$, $P < .001$, $OR = 3.1$; 95% CI: 1.6–5.8, and was used to divide the full sample into 2 subsamples. Those with SE_6 scores ≥ 9.9 had a maintained abstinence rate of 43% at 52-week follow-up. By contrast, those with SE_6 scores < 9.9 had a maintained abstinence rate of only 21% at 52-week follow-up.

SE_6 scores ≥ 9.9 —In the subsample with SE_6 scores ≥ 9.9 , total withdrawal symptoms score at Visit 1 (WS_1) was associated with maintained abstinence and was the most efficient test to further divide this subsample, $\chi^2 = 10.81$, $P < .001$, $OR = 5.2$; 95% CI: 1.9–14.1. Thus, participants with a $WS_1 < 0.7$ were more likely to maintain abstinence at 52 weeks (63%) than were those with WS_1 scores ≥ 0.7 (21%).

SE_6 scores ≥ 9.9 and WS_1 scores < 0.7 —In this subsample of participants with $WS_1 < 0.7$, BMI was also associated with maintained abstinence and was the most efficient test to further divide this subsample, $\chi^2 = 5.27$, $P < .05$, $OR = 5.0$; 95% CI: 1.2–20.4. Participants with a BMI of ≥ 26.5 were more likely to maintain abstinence at 52-week follow-up (77%) than were those with a lower BMI (39%).

SE_6 scores ≥ 9.9 and WS_1 scores < 0.7 —There was no further branching for this subgroup.

SE_6 scores < 9.9 —In the subsample with SE_6 scores < 9.9 , change in craving score from quit week to end-of-treatment ($Crave_{q-6}$) was associated with maintained abstinence and was the most efficient test to further divide this subsample, $\chi^2 = 10.68$, $P < .01$, $OR = 3.6$; 95% CI: 1.7–7.9. Thus, participants with $Crave_{q-6} < -1.5$ were more likely to maintain abstinence at 52 weeks (36%) than were those with $Crave_{q-6}$ scores ≥ -1.5 (14%).

SE_6 scores < 9.9 and $Crave_{q-6}$ scores < -1.5 —Among those in this subsample with $Crave_{q-6} < -1.5$, change in general self-efficacy ($genSE$) was an efficient test for further division of the subsample, $\chi^2 = 5.22$, $P < .05$, $OR = 3.8$; 95% CI: 1.2–12.4. Fifty-five percent (55%) of participants in the subsample with a change in $genSE \geq 2$ maintained abstinence at 52 weeks. In contrast, only 23% of those with scores < 2 maintained abstinence at week 52.

SE_6 scores < 9.9 and $Crave_{q-6}$ scores < -1.5 —Finally, among those in the subsample with $Crave_{q-6} < -1.5$, change in total withdrawal score between initial quit visit and Visit 1 (WS_{q-1}) was the most efficient test to further subdivide this subsample, $\chi^2 = 6.78$, $P < .01$, $OR = 5.1$; 95% CI: 1.5–17.3. Thirty-two percent (32%) of participants in the subsample with WS_{q-1} of < -0.5 maintained abstinence at 52 weeks. In contrast, only 11% of those with WS_{q-1} scores ≥ -0.5 maintained abstinence at week 52.

Discussion

The 2 models were able to identify factors that created algorithms for the partitioning of smokers into different subgroups based on their rates of maintained abstinence; however, the characteristics that identified the subgroups differed between models.

In Model 1, the subgroup of smokers with lower nicotine dependence scores (mFTQ <17), lower baseline CES-D scores (CES-D <3), and higher baseline BMI (>27.3) were the most likely to maintain abstinence over through 52-week follow-up (Figure 1, subgroup 5). Conversely, poor treatment response through week 52 was associated with higher mFTQ scores (>17) and baseline BMI of less than 29.4 (Figure 1, subgroup 1). Similar to Killen et al,¹³ the mFTQ, a measure of nicotine dependence, was the pretreatment variable that maximally distinguished response and nonresponse.

The inclusion of data collected over the course of treatment changed our results markedly. In fact, the mFTQ, which was identified as the optimally efficient test in Model 1, did not emerge as a distinguishing factor between subgroups in Model 2. In Model 2, the subgroup with the highest rate of maintained abstinence had almost 100% situational self-efficacy in their ability to resist an urge to smoke at end-of-treatment, reported few withdrawal symptoms the week after the quit date, and had higher pretreatment BMI (>26.5) (Figure 2, subgroup 7). In contrast, the group with the lowest rate of maintained abstinence (11%) had lower situational self-efficacy at end-of-treatment, less change in cravings over the course of treatment, and less change in withdrawal symptoms from quit week to the Visit 1 (Figure 2, subgroup 1). The majority of the participants were in the subgroups with lower success rates, with very few participants in the subgroup with the highest rate of maintained abstinence.

In Model 2, situational self-efficacy at end of treatment was the first optimal cut-point for distinguishing those who were more or less likely to maintain abstinence at 52-week follow-up. Self-efficacy has consistently been shown to be a strong predictor of treatment response.^{18,22-26} In a signal detection model using data from an in-hospital smoking cessation program, the most responsive subgroup to treatment was marked by 100% confidence to quit smoking at baseline.⁹ In the current study, both situational self-efficacy and general self-efficacy distinguished between subgroups, albeit at different points in the treatment process. In fact, those in the subgroup with the second-highest maintained abstinence rate (55%; Figure 2, subgroup 4) differed from the subgroup with the second-lowest rate of maintained abstinence (23%; Figure 2, subgroup 3) only in their changes in general self-efficacy early in treatment. These results suggest that enhancing both situational and general self-efficacy might increase the probability of successful long-term treatment outcome.

Craving and withdrawal symptom severity have long been regarded as important factors in nicotine dependence,^{27,28} but there is minimal direct evidence from clinical treatment studies to suggest that craving and/or withdrawal symptoms are good predictors of treatment outcome. In studies that have assessed these relationships, the scores for these symptoms often were obtained from a single occasion, usually were measured within 24 hours of the

quit attempt, and assessed shorter-term outcomes.^{29,30} In the current study, craving and withdrawal symptom severity at the initial quit week did not identify subgroups of treatment responders versus nonresponders in either model. Rather, it was the change, or lack thereof, in craving and withdrawal symptoms and/or post-quit week withdrawal severity that were important in defining subgroups with differing rates of maintained abstinence. These results suggest that frequent monitoring of withdrawal symptoms might prove clinically important for preventing post-treatment relapse.

Finally, in the current analyses, having a higher, compared to lower, pretreatment BMI was a significant predictor of maintained abstinence for specific subgroups in both Model 1 and Model 2. This finding that higher BMI was predictive of smoking cessation is not unique to this study, albeit somewhat contrary to conventional wisdom that weight gain is associated with smoking relapse. In Killen et al's study¹⁴ using signal detection modeling, substantial weight gain was associated with less relapse among a subgroup that experienced increased depression symptoms during treatment. Similarly, Hall and colleagues³¹ found that greater weight gain during the first 6 months of abstinence predicted continued abstinence. Swan et al¹¹ reported baseline BMI as a significant factor that distinguished between subgroups; however, they found that those with higher baseline BMI were more likely to relapse. They attributed this finding to inadequate nicotine replacement among those who were heavier, as this subgroup was only identified in the model including smokers using 14 mg patches, not those using 21 mg patches. Future studies should continue to examine the role that BMI, both pretreatment and change over time, plays in smoking cessation.

This study represents one of the first attempts to include both pretreatment and treatment process variables in signal detection analyses to identify the combination of factors that influence successful maintained abstinence. Both SDA models identified groups of nonresponders who might be targeted to increase their success in cessation; however, the inclusion of clinical data collected during treatment in Model 2 yielded very different partitioning parameters. Targeting subgroups based on treatment process data could aid in tailoring intervention programs over the course of therapy, as well as provide valuable information on those who might benefit from extended treatment to increase their chances of long-term success.

It should be noted that the participants in the current study were receiving both CBT and pharmacotherapy, with half receiving extended CBT sessions. Although treatment assignment was not a significant predictor in identifying subgroups with differing rates of treatment response, it is unknown if the results of this study will generalize to other treatment modalities. Further, the majority of the participants were white (82%), limiting our ability to determine if these findings would be similar for populations with different demographic features. If it is determined that these subgroups are reproduced, they can be targeted for intervention development to determine if changes in these factors can increase the successful maintenance of long-term abstinence.

In conclusion, SDA was able to successfully identify subgroups of smokers with varying probabilities of maintaining long-term abstinence based on both pretreatment factors and clinical data measured during treatment. The results of Model 2 suggest that process

measures may be more influential than pretreatment factors in predicting long-term treatment outcome. Given the emerging interest in adaptive treatment strategy (ATS) research, which tailors treatment research protocols based on patient's response to treatment,⁷ SDA is a promising method for delineating which treatment process factors best predict treatment response. Although the results from our analyses do not permit the conclusion that adjustments in treatment based on the factors identified in Model 2 will, in fact, increase longer-term maintained abstinence for nonresponders, we hope to test the model in a future ATS study design.

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Figure 1. Evaluation of an Optimally Efficient Algorithm to Predict Maintained Smoking Abstinence Using Pretreatment Factors

Notes.

* $P < .05$, ** $P < .01$, *** $P < .001$.

Figure 2. Evaluation of an Optimally Efficient Algorithm to Predict Maintained Smoking Abstinence Using Pretreatment and Treatment Process Factors

Notes.

The decreased number of participants at subsequent stages of testing is due to missing data.

*P<.05, **P<.01, ***P<.001.

Table 1
Means and Standard Deviations for Demographic and Baseline Characteristics by
Successful Maintained Abstainers Versus Unsuccessful Maintained Abstainers (N = 301)

	Did Not Maintain Abstinence (n = 233)	Maintained Abstinence (n = 68)
Gender		
Male	135 (58%)	45 (66%)
Female	98 (42%)	23 (34%)
% Married	117 (50%)	32 (47%)
% Minority	43 (19%)	9 (13%)
History of depression	23 (10%)	8 (12%)
Age	45.4 (10.8)	47.7 (9.4)
Education (years)	14.1 (2.3)	14.2 (2.3)
mFTQ^{a,b}	16.9 (3.6)	15.1 (3.7)
Baseline # of cigarettes/day	20.5 (7.7)	18.8 (6.5)
Baseline CES-D^c	7.0 (6.9)	6.0 (6.6)
Baseline BMI^{d,e}	27.5 (5.5)	29.6 (6.1)

Note.

^a mFTQ = modified Fagerström Tolerance Questionnaire

^b _t (298) = 3.5, P<.0001

^c CES-D = Center of Epidemiological Studies-Depression Instrument

^d BMI = Body mass index

^e _t (299) = -2.6, P<.01