Nicotine & Tobacco Research Volume 7, Number 2 (April 2005) 217–224

Taylor & Francis
Taylor & Francis Group

Acceptance of nicotine dependence treatment among currently depressed smokers

Nancy A. Haug, Sharon M. Hall, Judith J. Prochaska, Amy B. Rosen, Janice Y. Tsoh, Gary Humfleet, Kevin Delucchi, Joseph S. Rossi, Colleen A. Redding, Stuart Eisendrath

[Received 3 November 2003; accepted 16 October 2004]

This study reports on baseline characteristics associated with acceptance and refusal of available smoking treatment among currently depressed smokers in a psychiatric outpatient clinic who were enrolled in a larger clinical trial. The sample (N=154) was 68% female and 72% White, with a mean age of 41.4 years and average smoking rate of 17 cigarettes/day. All participants were assigned to a repeated contact experimental condition; received a stage-based expert system program to facilitate treatment acceptance; and were then offered smoking treatment, consisting of behavioral counseling, nicotine patch, and bupropion. Acceptors (n=53) were defined as those accepting behavioral counseling and pharmacological treatment at some point during the 18-month study, whereas refusers (n=101) received only the expert system. The number of days to treatment acceptance was significantly predicted by stage of change, with those in preparation entering treatment more quickly than contemplators or precontemplators. In a logistic regression, the variables most strongly associated with accepting treatment were current use of psychiatric medication and perceived success for quitting. Severity of depressive symptoms, duration of depression history, and history of recurrent depression were not related to treatment acceptance. Findings have implications for the psychiatric assessment and treatment of smokers in clinical settings. Psychiatric medication may play a significant role in smoking cessation treatment acceptance by currently depressed smokers.

Introduction

Cigarette smoking is increasingly concentrated in people with psychiatric conditions such as mood disorders, anxiety disorders, substance use disorders, schizophrenia, and other psychotic disorders (Lasser et al., 2000; Pomerleau, 1997). Many smokers suffer from major depressive disorder. A relationship has been established between smoking and negative affect, dysphoria, and depression in both population and clinical studies (Glassman, 1993; Pomerleau, 1997). Higher rates of depressive disorders are correlated with nicotine dependence severity (Breslau, Kilbey, & Andreski, 1991). Smokers with a history of depressive disorders may experience more severe withdrawal symptoms on quitting (Breslau, Kilbey, & Andreski, 1992; Covey, Glassman, & Stetner, 1990). Interestingly, a recent meta-analysis reported that lifetime history of major depression does not predict smoking cessation treatment failure (Hitsman, Borrelli, McChargue, Spring, & Niaura, 2003). Although individuals with mental illness are two times more likely to smoke than persons without mental illness, their quit rates are substantial. Lifetime quit rates for individuals with a history of major depressive disorder have been reported as high as 38% in nationally representative samples (Lasser et al., 2000).

Identifying characteristics of smokers who accept nicotine dependence treatment may contribute to the development and implementation of future smoking

Nancy A. Haug, Ph.D., Sharon M. Hall, Ph.D., Judith J. Prochaska, Ph.D., M.P.H., Amy B. Rosen, Psy.D., Janice Y. Tsoh, Ph.D., Gary Humfleet, Ph.D., Kevin Delucchi, Ph.D., Stuart Eisendrath, M.D., Department of Psychiatry, School of Medicine, University of California, San Francisco; Joseph S. Rossi, Ph.D., Colleen A. Redding, Ph.D., Cancer Prevention Research Center, University of Rhode Island, Kingston.

Correspondence: Nancy A. Haug, Ph.D., San Francisco General Hospital, 1001 Potrero Avenue, Suite 2100, Box 0852, San Francisco, CA 94110, USA. Tel: +1 (415)-206-3051; Fax: +1 (415)-206-5233; E-mail: nahaug@itsa.ucsf.edu

ISSN 1462-2203 print/ISSN 1469-994X online

DOI: 10.1080/14622200500055368

interventions for psychiatric populations. Typically, evaluation of smoking treatment focuses on outcomes among participants (Kviz, Crittenden, & Warnecke, 1992). However, the severity of depressive symptomatology may influence not only treatment outcome but also initial acceptance of smoking treatment. Seidner, Burling, Gaither, and Thomas (1996) stated that information about "treatment acceptors" and "treatment refusers" is needed to determine whether an intervention is reaching individuals at highest risk and meeting their specific needs.

Studies have shown favorable outcomes in treating smokers with a history of major depressive disorder using both pharmacological and behavioral methods (e.g., Hall et al., 1996, 1998). The study on which the present report is based was designed to integrate an innovative smoking cessation treatment within psychiatric care for currently depressed patients with cooccurring nicotine dependence. Although six sessions of behavioral counseling and 12 weeks of nicotine patch were offered to depressed patients at no cost, they had the option to refuse treatment and continue to participate in the trial. The purpose of the present study was to investigate characteristics associated with accepting and refusing available smoking cessation in depressed outpatients; treatment outcomes will be reported elsewhere.

Treatment acceptance was defined as setting a quit date with a counselor to begin behavioral counseling and pharmacological treatment. Our hypotheses were based on smoking cessation outcomes in the general population, linking treatment acceptance with treatment success, because no published reports exist on variables related to treatment acceptance in psychiatric groups. We hypothesized that treatment acceptors would be lighter smokers and have lower nicotine dependence than refusers. Regarding psychiatric severity, we posited that more severe depression and depressive symptoms would be associated with less treatment acceptance.

We used the transtheoretical model as a framework to investigate the relationship between readiness for change and treatment acceptance. Developed from theories of psychotherapy and research on self-change, the transtheoretical model comprises a comprehensive, integrated approach to the study of behavior change (DiClemente & Prochaska, 1998; Prochaska & DiClemente, 1983). The stages of change represent temporal and motivational aspects of behavior that assist us in understanding when particular shifts in attitudes, intentions, and behaviors occur. The processes of change are activities and experiences that individuals undertake when they attempt to modify problem behaviors. Our study used an expert system stage-based program to assist depressed smokers in moving forward on the stage continuum. We expected that individuals in earlier stages of change at baseline (e.g., precontemplators) would be less likely to accept treatment than those individuals in later stages (e.g., preparation) and that the time to treatment acceptance would be less for individuals in later stages. We also explored other variables related to readiness for change, including experiential and behavioral processes of change and thoughts about abstinence (e.g., perceived success for quitting, abstinence goals).

Method

Participants

Participants were 154 clinic-registered psychiatric outpatients who agreed to participate in a larger National Institute on Drug Abuse-funded smoking study. Men and women over age 18 years who (a) reported smoking at least 5 cigarettes/day in the past week, (b) were diagnosed as having a depressive disorder on the Primary Care Evaluation of Mental Disorders (PRIME-MD; Spitzer et al., 1994), and (c) enrolled in an outpatient psychiatric clinic in San Francisco were deemed eligible. Patients were excluded if they had an organic brain syndrome, bipolar disorder, or life-threatening illness; were non-English speaking; or were in treatment for nicotine dependence elsewhere.

Screener

The PRIME-MD (Spitzer et al., 1994) is a brief diagnostic screening tool with high reliability and validity in psychiatric settings (Kobak et al., 1997). The mood module assessed *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) (*DSM*-IV; American Psychiatric Association, 1994) mood disorders including major depressive disorder, dysthymia, major depressive disorder partial remission, minor depression, and bipolar disorder.

Measures

The Beck Depression Inventory–II (BDI-II; Beck, Steer, & Brown, 1996) is a widely used, 21-item measure of severity of depressive symptoms in the past 2 weeks. The Thought About Abstinence Scale (Hall, Havassy, & Wasserman, 1990) assessed participants' desire to quit smoking, expectancy of success with quitting, anticipated difficulty with remaining abstinent, and abstinence goal. The first three items were assessed with single-item 10-point visual analogue scales. Abstinence goal was dichotomized as goal of total lifetime abstinence (yes/no).

The Computerized Diagnostic Interview Schedule–IV (C-DIS-IV; Robins, Cottler, Bucholz, &

Compton, 1995) is a structured interview yielding *DSM*-IV diagnoses. The present study administered only the mood and nicotine dependence modules.

The demographic survey assessed participant age, gender, ethnicity, marital status, socioeconomic status, educational level, and employment status. The Fagerström Test for Nicotine Dependence (FTND; Payne, Smith, McCracken, McSherry, & Antony, 1994) is a six-item instrument measuring smoking behaviors indicative of physical dependence. The FTND is a revision of the widely used Fagerström Tolerance Questionnaire (FTQ; Fagerström, 1978) and has improved internal consistency over the FTQ and good construct validity (Chabrol, Niezborala, Chastan, Montastruc, & Mullet, 2003).

The medications questionnaire assessed prescribed psychiatric medication use. The Processes of Change Questionnaire (Prochaska, Velicer, DiClemente, & Fava, 1988) measured engagement in 10 strategies or mechanisms that help people move through the stages of change to modify smoking behavior. Two second-order factors, experiential and behavioral, also were calculated from these items.

The smoking history and health questionnaire assessed the ages at which each participant first smoked a cigarette and became a regular smoker, total years of smoking, number of prior quit attempts, and the number of cigarettes smoked in the 24 hr prior to baseline assessment. The Smoking Stage of Change (DiClemente et al., 1991) short form was used to classify participants into one of the three preaction stages (precontemplation, contemplation, preparation) because all participants were current smokers. The precontemplation stage is identified by a lack of awareness that a problem exists and no intention to change behavior in the foreseeable future. In the contemplation stage, individuals are aware that a problem exists and seriously thinking about changing it but have not yet made a commitment to take action. People classified in the preparation stage are intending to take action within the future (typically the next 30 days) and have made some effort to modify behavior.

Procedure

Patients were recruited upon registering at the clinic or at subsequent visits by telephone, letters, flyers, and clinic staff over a 3-year period. Interested cigarette smokers also could self-refer into the study by completing a form and leaving it in a secure lockbox in the clinic waiting room. Patients were told they could participate whether or not they were ready to quit smoking. Patients also were told that the study involved free smoking treatment for some participants and that everyone would be paid for completing the research questionnaires.

After we obtained verbal assent, patients were screened briefly over the telephone regarding study inclusion and exclusion criteria and were administered the PRIME-MD. Patients who met criteria for a depressive disorder on the PRIME-MD were invited to the initial baseline interview at which written informed consent was obtained and the C-DIS-IV was administered. If patients were diagnosed as bipolar disorder on the C-DIS-IV, they were disqualified from the study. Assessments were conducted at baseline and at 3, 6, 12, and 18 months; however, the present analyses focused on baseline data. Participants were paid US$25 per assessment with a US$50 incentive for completing all assessments.

After completing the baseline assessment battery, participants were stratified based on nicotine dependence and stage of change and randomized immediately to either a standard brief contact condition (n=159) or a repeated contact innovative treatment condition (n=163). Patients randomized to the brief contact condition received standard educational materials on quitting smoking and a list of smoking cessation programs in the San Francisco Bay area during their initial visit. Patients randomized to the repeated contact condition met with a counselor and completed the expert system, as described below. The present study reports on only those participants assigned to the repeated contact innovative treatment condition who received smoking cessation counseling using an expert system designed to increase readiness to quit smoking (N=154). Nine participants from this group were excluded from the present analyses because they reported smoking fewer than 5 cigarettes/day and would not have been eligible to accept the nicotine replacement therapy. Figure 1 depicts the recruitment and eligibility process.

Expert system and Pathways to Change *manual.* Participants assigned to the repeated contact innovative treatment condition met with a counselor and received the expert system at intake (baseline) and at months 3, 6, and 12. The expert system generated an individualized report for each participant based on input of stage-related measures (Velicer & Prochaska, 1999) and was modified for use with depressed smokers. The baseline assessment used normative comparisons (i.e., comparing the individual's scores on each of the key transtheoretical model variables to the ''norms'' of those who have made progress in the program). In the follow-up reports, both normative and ipsative feedback were provided (i.e., comparisons were made to the person's previous scores).

The associated *Pathways to Change* self-help manual included information, self-help exercises,

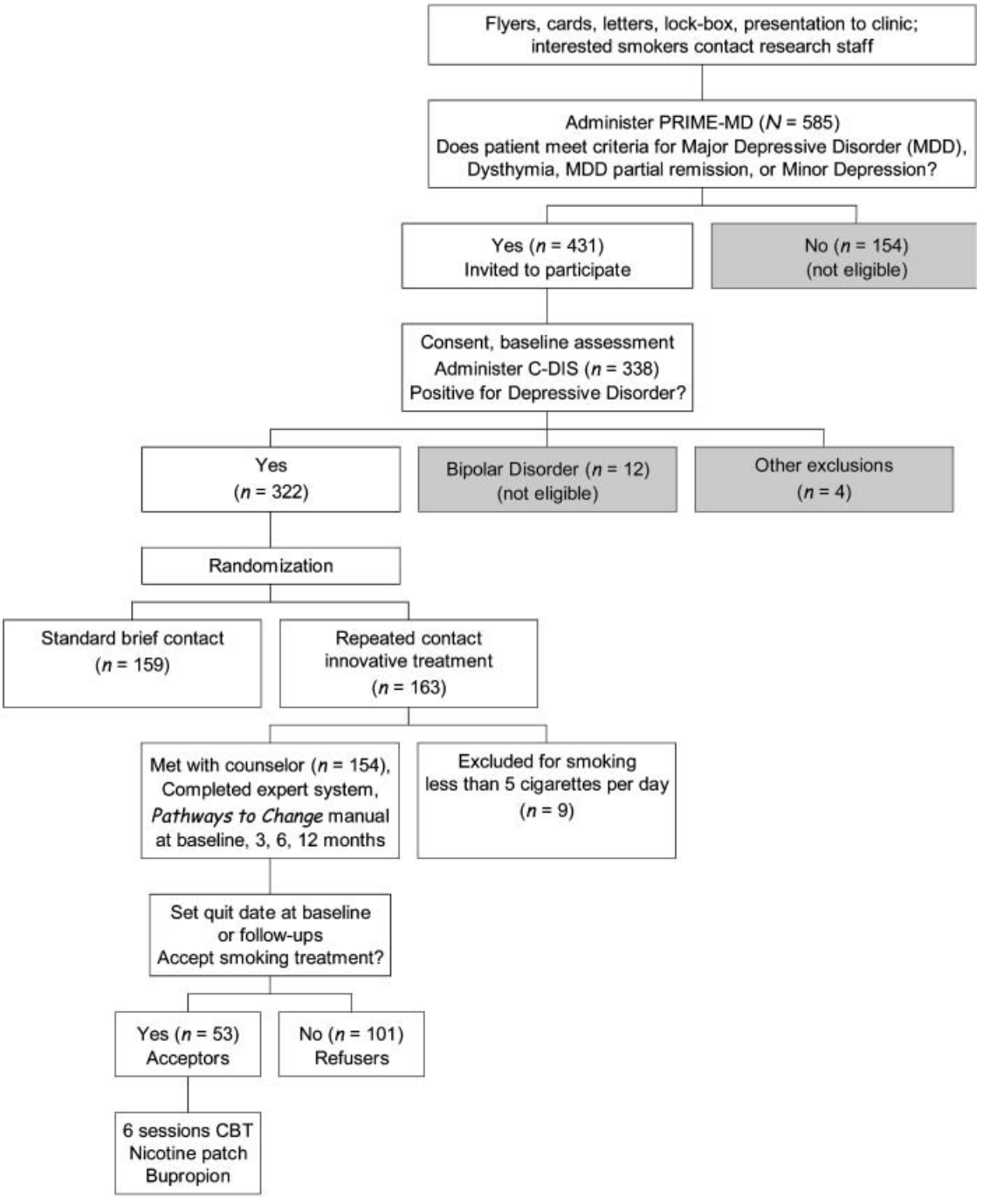

Figure 1. Recruitment and eligibility flow chart. CBT, cognitive-behavioral therapy; C-DIS, Computerized Diagnostic Interview Schedule; MDD, major depressive disorder; PRIME-MD, Primary Care Evaluation of Mental Disorders.

and assessments to assist participants in monitoring their progress in the program. The manual was targeted to individuals in each of the preaction stages of change (i.e., precontemplation, contemplation, preparation) to increase readiness to quit and included information for smokers who had quit but relapsed. At the end of the session, participants were encouraged by their counselor to set a goal ranging from learning more about their smoking behavior or health effects to setting a quit date. Those who elected to set a quit date were scheduled to begin smoking cessation treatment.

Treatment acceptance. Treatment acceptance was defined as setting a quit date with a counselor to begin behavioral counseling and pharmacological treatment. Participants had the opportunity to accept treatment at any time for up to 15 months. They could accept the treatment in-person at one of their appointments (intake or months 3, 6, or 12) or call

the research staff between appointments to begin cessation treatment. The active components of the smoking treatment are described below. Treatment refusers did not set a quit date with a counselor to begin smoking cessation treatment but were encouraged to continue participating in the study by attending their appointments to complete the expert system.

Behavioral counseling. When participants were ready, they set a quit date and began the six-session behavioral counseling treatment. The first session was scheduled 3 days before the quit date and the next session was scheduled for the day following the quit date. Subsequent sessions were held weekly and then biweekly over the next 8 weeks. The content of behavioral counseling included an emphasis on commitment to abstinence, development of a plan for quitting, and information on the risks of smoking and benefits of quitting. The intervention had a cognitive-behavioral orientation with mood management strategies, relaxation techniques, and social support skills training (Hall et al., 1998).

Nicotine replacement therapy. Nicoderm patches were made available for daily use during the first 10 weeks. Participants smoking more than 10 cigarettes/day were given 21-mg patches for the first 6 weeks, switched to 14-mg patches for weeks 7–8, and tapered to 7-mg patches for the final 2 weeks. Participants smoking fewer than 10 cigarettes/day were started with 14-mg patches for 6 weeks and switched to 7-mg patches.

Bupropion. Patients were considered for 12 weeks of bupropion sustained-release treatment if they failed nicotine patch therapy. The smoking cessation counselor consulted with physicians to assist in the decision-making process for patients interested in using bupropion.

Data analysis

Smoking treatment acceptors were compared with refusers on baseline sociodemographic variables, smoking history, nicotine dependence, treatment goals, psychiatric characteristics (e.g., severity of depression), and readiness-for-change variables using an uncorrected significance level of .05. A logistic regression model was estimated and tested predicting treatment acceptance from variables related to acceptance status at a p value less than .10 in univariate tests. This is a screening method balancing the need to reduce the candidate list against the need to not overlook potentially predictive measures (Hosmer & Lemeshow, 1989). We explored the number of days to treatment acceptance by baseline stage of change using a one-way analysis of variance. In addition to the test statistics, we computed measures of effect size using Cohen's (1988) estimates: d for the standardized difference between means and h for the standardized difference between proportions using the arcsin transformation.

Results

Preliminary analyses

Participant characteristics. Participants were predominantly female (68%), middle-aged (M=41.4 years, SD=12.3), White (72%), well educated (83% some college or higher), employed (53% full-time), and heterosexual (77%), with 48% single/never married, 27% divorced/separated/widowed, and 25% married or living with a partner.

Participants smoked an average of 17.0 cigarettes/day (SD=9.8) and had a mean FTND score of 4.1 (SD=2.4). The sample started smoking regularly at age 18.0 years (SD=6.2), had smoked for an average of 23.4 years (SD=12.6), and had a mean of 5.0 lifetime quit attempts (SD=10.2). Some 65% met *DSM*-IV criteria for nicotine dependence, and 44% met criteria for nicotine withdrawal on the C-DIS-IV. Stages of change for quitting smoking were as follows: Precontemplation (20%), contemplation (54%), and preparation (26%).

All participants met criteria for a current depressive disorder on the PRIME-MD (i.e., major depressive disorder, dysthymia, minor depression). A total of 94% met *DSM*-IV criteria for major depressive disorder on the C-DIS-IV; of those, 53% had recurrent episodes. The mean BDI-II score at baseline for the sample was 20.8 (SD=11.7), and 21% scored in the severe range (>30). The average time from index episode of depression was 16.7 years (SD=13.2) not including periods of symptom remission. Psychiatric medication was currently prescribed to 77% of participants; 53% were taking one medication, 25% were taking two medications, and 22% were taking three or more medications. The types of psychiatric medications included selective serotonin reuptake inhibitors (SSRIs; 53%), bupropion sustained-release (20%), and others (e.g., trazodone, gabapentin, and venlafaxine extended-release).

Treatment acceptance. Some 34% (n=53) of the sample accepted behavioral and pharmacological smoking cessation treatment. Among treatment acceptors, the median number of days to treatment acceptance was 56 days. Acceptors and refusers did not differ on age, gender, ethnicity, education, or marital status.

Primary hypotheses

Smoking variables. Acceptors and refusers did not different statistically on age of smoking initiation, lifetime quit attempts, cigarettes per day, FTND scores, or *DSM*-IV nicotine dependence.

Psychiatric characteristics. The two groups were significantly different on current use of prescribed psychiatric medication such that acceptors were more likely than refusers to be taking psychiatric medication (85% vs. 68% respectively; $\chi^2(1)=4.98$, $p<.02$, Cohen's $h=0.41$). No differences were found between acceptors and refusers on taking SSRIs (yes/no) or bupropion sustained-release (yes/no). No other differences in psychiatric characteristics (e.g., BDI-II continuous scores, BDI-II severity categories, major depressive disorder single vs. recurrent episode, duration of depressive condition) were observed between treatment acceptors and refusers.

Readiness for change. Treatment acceptors were more likely to be in the preparation stage of change (33% vs. 22%, respectively; $h=0.25$) and less likely to be in the precontemplation stage of change for quitting smoking (8% vs. 27%, respectively; $h=0.52$), compared with refusers, $\chi^2(2)=8.10$, $p<.02$. Among treatment acceptors, the number of days from baseline to treatment acceptance was significantly predicted by baseline stage of change, $F(2)=2.99$, $p<.05$ (Figure 2).

Exploratory hypotheses

Thoughts about abstinence. Treatment acceptors were more likely than refusers to report a goal of lifetime abstinence from smoking (47% vs. 30%, respectively), $\chi^2(1)=4.62$, $p<.05$, $h=0.35$. Treatment acceptors rated themselves significantly higher than refusers on desire to quit ($M=7.26$, $SD=2.47$, vs. $M=6.09$, $SD=3.06$, respectively), $t(152)=2.58$, $p<.02$, Cohen's $d=0.41$, 95% $CI=0.09$–0.72; and perceived success for quitting ($M=6.36$, $SD=2.74$, vs. $M=4.70$, $SD=2.91$, respectively), $t(152)=3.42$, $p<.02$, $d=0.58$, 95% $CI=0.02$–0.91. However, on perceived difficulty for quitting and remaining abstinent, the groups did not differ. The statistical power of these analyses was sufficient to detect effects as small as $d=0.48$ as significant at $p=.05$ (two-tailed).

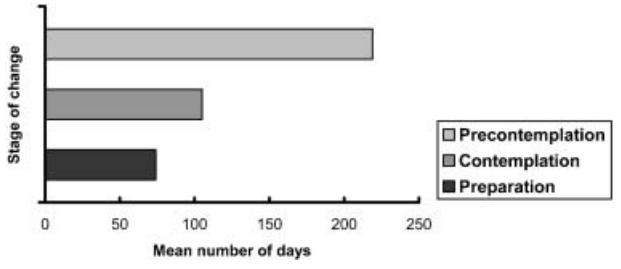

Figure 2. Baseline stage by days to treatment acceptance ($n=53$).

Table 1. Summary of logistic regression model predicting treatment acceptance ($N=154$)

Predictor	Odds ratio (95% confidence interval)
Abstinence goal	1.23 (0.54–2.78)
Psychiatric medication	3.22 (1.23–8.45)**
Behavioral processes of change	0.99 (0.82–1.19)
Experiential processes of change	1.04 (0.89–1.23)
Major depressive disorder (recurrent)	1.14 (0.94–1.39)
Perceived success for quitting	1.17 (1.01–1.37)**
Previous quit attempts	0.95 (0.90–1.01)*
Stage of change	1.75 (0.92–3.32)*
(Constant)	0.03**

Note. $\chi^2(8)=27.73$, $p<.001$; Nagelkerke $R^2=.23$.
*$p<.10$; **$p<.05$.

Processes of change. Acceptors rated their use of both experiential and behavioral processes of change as higher than refusers. Specifically, the experiential processes of social liberation ($M=15.47$, $SD=2.86$, vs. $M=14.30$, $SD=3.72$, respectively), $t(152)=2.18$, $p<.05$, $d=0.34$, 95% $CI=0.03$–0.65, and self-re-evaluation ($M=13.66$, $SD=3.48$, vs. $M=12.15$, $SD=4.45$, respectively), $t(152)=2.32$, $p<.05$, $d=0.36$, 95% $CI=0.05$–0.68; and the behavioral processes of helping relationships ($M=11.87$, $SD=3.27$, vs. $M=10.59$, $SD=3.47$, respectively), $t(152)=2.21$, $p<.05$, $d=0.38$, 95% $CI=0.04$–0.71, and self liberation ($M=12.23$, $SD=3.97$, vs. $M=10.68$, $SD=4.16$, respectively), $t(152)=2.22$, $p<.05$, $d=0.38$, 95% $CI=0.04$–0.71, were higher at baseline among treatment acceptors compared with refusers.

Logistic regression. The logistic regression model predicting treatment acceptance showed two statistically significant predictors: higher perceived success for quitting smoking and current use of psychiatric medication (Table 1). The odds of accepting treatment were more than three times higher for patients taking psychiatric medication compared with those not taking such medication. The model correctly classified 71% of the sample.

Discussion

The present study examined specific characteristics of psychiatric outpatients with depressive disorders who either accepted or refused available smoking cessation treatment. Treatment acceptors were more likely than treatment refusers to have smoking abstinence

as a future goal. Acceptors also were farther along in the stages of change and reported greater perceived desire and expectancy for success with quitting smoking, compared with treatment refusers.

Our results are consistent with those reported in a study of low-income women given the opportunity to participate in smoking treatment; the only significant predictors of treatment acceptance were intention to quit and self-efficacy (Pohl, Martinelli, & Antonakos, 1998). Kviz et al. (1992) reported that nonparticipants in a community-based smoking intervention were less confident about their ability to quit smoking compared with those who participated. They suggest that self-efficacy should be enhanced during a preparation phase to change smokers' perceptions of their smoking behavior and the process of quitting. The present study is one of the first to assess perceived success for quitting (a proxy variable for self-efficacy) in a sample of psychiatric outpatients. The finding that a cognitive process operative in other smoking populations is also a determinant of smoking treatment acceptance in this special population is noteworthy.

Moderate support for the transtheoretical model was found in this study of depressed smokers. As hypothesized, participants farther along on the stages of change continuum at baseline were more likely to accept treatment, whereas participants in precontemplation at baseline were more likely to refuse. Furthermore, time to acceptance of treatment was associated with stage of change, and treatment acceptance was found to occur more quickly among participants farther along the stage continuum. Although the experiential and behavioral processes-of-change variables were significant in the univariate comparisons, they did not contribute independently to the multivariate logistic regression model.

Acceptors were significantly more likely than refusers to be taking psychiatric medication for their depression. One possible explanation for this finding is that previous treatment for depression or successful experience with psychiatric treatment could have contributed to their acceptance of smoking treatment. Psychiatric medication may play a significant role in one's ability to accept smoking treatment (e.g., increasing self-efficacy) and to follow through with the treatment program. The participants who had not been on medications previously (23%) may be a group less comfortable in accepting treatment of any sort, and especially treatment that involves medication, which was offered in the current trial. Also, the psychiatric medication (antidepressants) may have played a more purely biological role in facilitating treatment acceptance. The severity of depressive symptomatology as measured by BDI-II scores and depression history at baseline was unrelated to treatment acceptance; however, the power to test these differences may not have been adequate.

Interestingly, smoking treatment acceptance was not related to gender, age, education, or other sociodemographic characteristics in this sample. In addition, smoking variables (i.e., nicotine dependence, smoking history) were not significantly associated with treatment acceptance. For depressed outpatients interested in treatment and confident about quitting, high nicotine dependence is not necessarily a barrier to accepting smoking treatment right away. The intensity of the intervention (behavioral counseling plus pharmacological methods) also may have affected acceptance of smoking treatment, although we are unable to test this speculation because participants were not offered an alternative. Study findings may be influenced by sample homogeneity (e.g., high education) or by sampling bias (e.g., low FTND score).

The present study has limited generalizability to low-income or racially or ethnically diverse groups and to populations with severe psychiatric illness. In addition, Seidner et al. (1996) suggest that the availability of a smoking intervention could generate demand characteristics that affect participants' self-report and their decision about the best time to quit smoking. Moreover, the present paper does not discuss active participation or attendance in treatment by acceptors.

The expert system and *Pathways to Change* program may have assisted in moving smokers in all stages to ultimately accepting treatment. One-third of depressed smokers accepted additional smoking treatment offered to them at no cost. Methods to improve treatment acceptance and participation by this group may be beneficial. We recommend that depressed smokers receiving outpatient psychiatric treatment be evaluated for psychiatric medication as well as for smoking cessation treatment. Linking treatment acceptance to longer-term smoking outcomes may offer more information about the characteristics of treatment acceptors and the factors contributing to successful participation in a smoking treatment program.

Acknowledgments

This research was supported by National Institute on Drug Abuse grant DA09253 (San Francisco Treatment Research Center). An earlier version of this manuscript was presented at the 2004 Society for Research on Nicotine and Tobacco annual meeting. The authors thank research assistant Tania Lihatsh and research counselor Jesse Cardozo for their efforts on the project.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders*. 4th ed. Washington, DC: Author.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *BDI-II manual*. San Antonio, TX: The Psychological Corporation.

Breslau, N., Kilbey, M. M., & Andreski, P. (1991). Nicotine dependence, major depression and anxiety in young adults. *Archives of General Psychiatry*, *48*, 1069–1074.

Breslau, N., Kilbey, M. M., & Andreski, P. (1992). Nicotine withdrawal symptoms and psychiatric disorders: Findings from an epidemiologic study of young adults. *American Journal of Psychiatry*, *149*, 464–469.

Chabrol, H., Niezborala, M., Chastan, E., Montastruc, J. L., & Mullet, E. (2003). A study of the psychometric properties of the Fagerström Test for Nicotine Dependence. *Addictive Behaviors*, *28*, 1441–1445.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum.

Covey, L. S., Glassman, A. H., & Stetner, F. (1990). Depression and depressive symptoms in smoking cessation. *Comprehensive Psychiatry*, *31*, 350–354.

DiClemente, C. C., & Prochaska, J. O. (1998). Toward a comprehensive transtheoretical model of change: Stages of change and addictive behaviors. In: W. Miller, & N. Heather (Eds.), *Treating addictive behaviors* (2nd ed.; pp. 3–24). New York: Plenum.

DiClemente, C. C., Prochaska, J. O., Fairhurst, S. K., Velicer, W. F., Velasquez, M. M., & Rossi, J. S. (1991). The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*, *59*, 295–304.

Fagerström, K. O. (1978). Measuring degree of physical dependence to tobacco smoking with reference to individualization of treatment. *Addictive Behaviors*, *3*, 235–241.

Glassman, A. H. (1993). Cigarette smoking: Implications for psychiatric illness. *American Journal of Psychiatry*, *150*, 546–553.

Hall, S. M., Havassy, B. E., & Wasserman, D. A. (1990). Commitment to abstinence and acute stress in relapse to alcohol, opiates, and nicotine. *Journal of Consulting and Clinical Psychology*, *58*, 175–181.

Hall, S. M., Munoz, R. F., Reus, V. I., Sees, K. L., Duncan, C., Humfleet, G. L., & Hartz, D. (1996). Mood management and nicotine gum in smoking treatment: A therapeutic contact and placebo controlled study. *Journal of Consulting and Clinical Psychology*, *64*, 1003–1009.

Hall, S. M., Reus, V. I., Munoz, R. F., Sees, K. L., Humfleet, G., Hartz, D. T., Fredrick, S., & Triffleman, E. (1998). Nortriptyline and cognitive-behavioral therapy in the treatment of cigarette smoking. *Archives of General Psychiatry*, *55*, 683–690.

Hitsman, B., Borrelli, B., McChargue, D. E., Spring, B., & Niaura, R. (2003). History of depression and smoking cessation outcome: A meta-analysis. *Journal of Consulting and Clinical Psychology*, *71*, 657–663.

Hosmer, D. W., & Lemeshow, S. (1989). *Applied logistic regression*. New York: Wiley.

Kobak, K. A., Taylor, L. V., Dotti, S. L., Greist, J. H., Jefferson, J. W., Burroughs, D., Mantle, J. M., Katzelnick, D. J., Norton, R., Henk, H. J., & Serlin, R. (1997). A computer-administered telephone interview to identify mental disorders. *The Journal of the American Medical Association*, *278*, 905–910.

Kviz, F. J., Crittenden, K. S., & Warnecke, R. B. (1992). Factors associated with nonparticipation among registrants for a self-help, community-based smoking cessation intervention. *Addictive Behaviors*, *17*, 533–542.

Lasser, K., Boyd, J. W., Woolhandler, S., Himmerstein, D. U., McCormick, D., & Bor, D. H. (2000). Smoking and mental illness: A population-based prevalence study. *The Journal of the American Medical Association*, *284*, 2606–2610.

Payne, T. J., Smith, P. O., McCracken, L. M., McSherry, W. C., & Antony, M. M. (1994). Assessing nicotine dependence: A comparison of the Fagerström Tolerance Questionnaire (FTQ) with the Fagerström Test for Nicotine Dependence (FTND) in a clinical sample. *Addictive Behaviors*, *19*, 307–317.

Pohl, J. M., Martinelli, A., & Antonakos, C. (1998). Predictors of participation in a smoking cessation intervention group among low-income women. *Addictive Behaviors*, *23*, 699–704.

Pomerleau, C. S. (1997). Co-factors for smoking and evolutionary psychobiology. *Addiction*, *92*, 397–408.

Prochaska, J., & DiClemente, C. (1983). Stages and process of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology*, *51*, 390–395.

Prochaska, J. O., Velicer, W. F., DiClemente, C. C., & Fava, J. (1988). Measuring processes of change: Applications to the cessation of smoking. *Journal of Consulting and Clinical Psychology*, *56*, 520–528.

Robins, L. N., Cottler, L., Bucholz, K., & Compton, W. (1995). *Diagnostic interview schedule for DSM-IV (DIS-IV)*. St. Louis, MO: Department of Psychiatry, Washington University School of Medicine.

Seidner, A. L., Burling, T. A., Gaither, D. E., & Thomas, R. G. (1996). Substance-dependent inpatients who accept smoking treatment. *Journal of Substance Abuse*, *8*, 33–44.

Spitzer, R. L., Williams, J. B. W., Kroenke, K., Linzer, M., deGruy, F. V. I., Hahn, S. R., Brody, D., & Johnson, J. G. (1994). Utility of a new procedure for diagnosing mental disorders in primary care. The PRIME-MD 1000 study. *The Journal of the American Medical Association*, *272*, 1749–1756.

Velicer, W. F., & Prochaska, J. O. (1999). An expert system intervention for smoking cessation, *Patient Education and Counseling*, *36*, 119–129.