

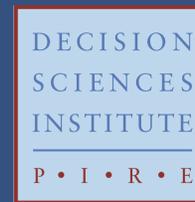
Predictors of Smoking Cessation Among Individuals Treated for Alcoholism: Findings from Project MATCH

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Abstract

More than 75% of individuals with alcohol use disorders are smokers and tend to smoke a pack of cigarettes or more daily. The combined use of both substances is more damaging to health than the use of either alone. There are clear benefits to quitting smoking for alcoholics in recovery, including improved health and better drinking outcomes, compared to those who do not quit smoking. Individual characteristics that are associated with smoking cessation among those with alcohol use disorders, however, are poorly understood. The purpose of this investigation was to examine demographic and clinical variables associated with stopping smoking during and after treatment for alcohol use disorders.

Method

Data were garnered from Project MATCH, a longitudinal prospective study of the efficacy of three behavioral treatments for alcohol use disorders, representing the largest such clinical trial to date. Timevarying covariate analyses were conducted to examine individual characteristics that prospectively predicted future smoking cessation over the course of 15 months. Predictors included self-efficacy, motivation, and depression, which were assessed at baseline, immediately following treatment (3 months), 9 months, and 15 months.

Results

Results showed that participants who showed greater self-efficacy around temptation to drink, as assessed by the Self-Efficacy Temptation Subscale, and who were farther along the Stages of Change ladder, as measured by the University of Rhode Island Change Assessment, were more likely to stop smoking. In addition, individuals who were less depressed, as measured by the Beck Depression Inventory, were more likely to quit.

Introduction

Individuals with alcohol use disorders smoke at higher rates than the general population.

- Also tend to be heavier smokers

Smokers are typically heavier drinkers than nonsmokers

- Many factors account for high rates of tobacco use
- And continued use during alcohol treatment.

Alcoholic smokers can successfully quit smoking using pharmacotherapy and behavioral treatment.

- Low one-year quit rates (0-12%)

Discrepant results regarding the impact of smoking cessation on alcohol relapse

- Clinical studies in which tobacco use was a targeted intervention showed that cessation did not hurt, and may have helped, drinking outcomes.

Clinical studies in which tobacco use was not a targeted intervention showed inconsistent results

- Naturalistic community studies showed that smoking was associated with increased substance use

Psychological and clinical factors associated with increased likelihood of smoking cessation

- Smokers in the general population

Smokers with alcohol use disorders in recovery

Self-Efficacy

Motivation

Depression

Self-Efficacy

Self-efficacy, in terms of perceived temptation to drink and confidence regarding not drinking, are strong predictors of drinking abstinence.

Also true for smoking

Little work has been conducted to determine if self-efficacy in one domain translates to another domain.

Motivation

Research results mixed and inconclusive

Some found positive correlations between quitting drinking and smoking

Some found negative associations

Discrepancies attributed to alcohol or drug use severity, type of treatment (inpatient vs. outpatient), and whether treatment for tobacco dependence was included

Additional studies warranted.

Depression

Compelling body of research reported depressed individuals:

- More likely to smoke
- Less likely to quit

Tend to experience greater withdrawal symptoms

- More likely to relapse to cigarette use than nondepressed persons

Nicotine shown to reduce negative affect

Reciprocal relationship between tobacco use and affective disorders

- Smoking increases the risk of depression

Depression among persons with alcohol use disorders associated with decreased likelihood of quitting smoking.

Purpose of this Study

Elucidate associations of certain instrumental variables that appear linked to the probability of smoking cessation during and after treatment for alcohol use disorders

Data from Project MATCH

Continuing Line of Programmatic Research

Goal to understand associations between smoking and drinking during and after treatment

Nonsmokers who initiated smoking (Friend & Pagano, 2004a)

Smokers who quit during the year following treatment (Friend & Pagano, 2004b)

Continuing smokers who reduce their cigarette consumption (Friend & Pagano, 2005)

Hypotheses

Alcohol abstinence self-efficacy, motivation, and depression independently related to smoking cessation.

Expected to be positively associated with increased likelihood of quitting smoking:

- Higher Alcohol Abstinence Confidence Self-Efficacy scores

- Lower Alcohol Abstinence Temptation Self-Efficacy scores

- Scores indicating that someone was farther along the Stages of Change ladder

- Lower BDI scores

Our Contribution to the Literature

Largest dataset of its kind (N=1,726)

Prospective data collection (every 90 days)

Novel statistical methods to examine outcome event patterns over time

- Time-varying covariate analysis.

- Allow accurate conclusions from complex, longitudinal data

- Recently begun to find application in alcohol treatment studies

Method

Data from Project MATCH

- Longitudinal study of efficacy of 3 behavior treatments for alcohol use disorders

N = 1,726 participants

- Only included participants who smoked at baseline and had data on predictor variables at first follow-up after treatment
- Final N = 1,193

- Assessed cigarette and alcohol consumption at baseline, 3 months (during treatment), and 6-, 9-, 12-, and 15-month follow-ups

- No smoking cessation treatment

Measures

Demographic and clinical characteristics

Tobacco use: Form 90-I

- Developed specifically for Project MATCH

- "Cigarettes per day in current period"

- 0=current nonsmoker

- All other scores=current smoker

Alcohol use: Percent days abstinent and drinks per drinking day

- Assessed using the Timeline Follow-Back (Sobell & Sobell, 1992; 1995)

Log-transformed variables

Alcohol relapse defined as consuming any drink during a given follow-up period.

Self-Efficacy

Alcohol Abstinence Self-Efficacy Scale (AASE) (Temptation and Confidence)

Based on Marlatt's cognitive-behavioral model of relapse

20-item self-report measure

Assesses Bandura's construct of self-efficacy applied to alcohol abstinence

5-point Likert scale ratings of vulnerability to drink (Temptation Subscale) and confidence to abstain (Confidence Subscale) across 20 high-risk situations

Collected at baseline, 3-, 9-, and 15-months

Motivation

University of Rhode Island Change Assessment (URICA)

Measures motivation for change

32-item self-report measure

4 subscales measuring the stages of change

- Precontemplation
- Contemplation

- Action
- Maintenance

- 5-point Likert scale

- Yields a second-order Readiness to Change score

- Collected at baseline and at the 3-months

Depression

Beck Depression Inventory

21-question multiple choice survey

One of most widely used instruments for measuring depression

4-point Likert-scale

Collected at baseline, 3-, 9-, and 15-months

Data Analysis

SAS version 8.0

PROC FREQ, PROC ANOVA, and PROC PHREG

ANOVA or chi-square analyses

- Evaluate demographic and clinical differences between groups

Proportional hazards regressions

Covariates

- Baseline level of predictors, drinking severity, cigarette consumption

- Lifetime history of smoking cessation

- Treatment arm

Two-tailed tests with p<.05

Proportional hazards regressions

Covariates

- Baseline level of alcohol severity

- Lifetime history of smoking cessation

- Treatment arm

Two-tailed tests; p<.05

Baseline Sample Characteristics

No significant differences between participants (N=1,193) and participants who were smoking at baseline but did not have complete data at the 3-month interview (N=52) on:

- Gender
- Race

- Age
- Education

- Lifetime weeks of tobacco use

- Percent days abstinent from alcohol use at baseline

- Drinks per drinking day at baseline

Mean age = 39.12 years

Mean education = 13.03 years

66% male; 81% non-Hispanic Whites

Mean drinks per drinking day = 17.69 (SD=11.23) Mean lifetime history of smoking = 2.96 years (SD=1.60)

Mean cigarette consumption in previous 90 days = 88 days

Mean daily consumption = 23.57 cigarettes (SD=14.93)

Results of Static Predictors

102 participants quit smoking during the study

67% in the 6 months following the end of treatment

Additional information detailed in Friend & Pagano, 2005a, 2005b

Most static baseline variables did not predict smoking cessation

Significantly associated with quitting smoking:

- Shorter history of tobacco use

- Older age

Results of Timevarying Predictors

Some hypotheses confirmed; others not

Variables associated with smoking cessation:

- Self-efficacy Temptation scores

- Individual Stage of Change Levels

- Action and Maintenance significant

- Precontemplation and Contemplation in expected direction

- Lower depression scores

Variables not associated

- Self-Efficacy Confidence scores

- Global URICA Readiness to Change score

Discussion

AASE

AASE results:

- Temptation self-efficacy correlated with smoking cessation

- Confidence self-efficacy was not

Consistent with Marlatt's model of relapse

Conceptualizes relapse with both cognitive and behavioral components

Assumes that strength of self-efficacy is a function the availability and accessibility of both emotional and behavioral skills necessary to cope with situations that represent vulnerability to drinking

The model asserts that the greater the individual's available repertoire of coping skills, the greater the strength of self-efficacy, and the lower the probability of relapse or drinking in a given situation.

Our findings appear to support the hypothesis that these two domains represent related but distinct constructs, since only one domain, temptation, was associated with smoking cessation in this population, whereas the other was not.

Results may be attributable to temptation residing in external stimuli

Confidence is based on internal self-assessment

Persons in recovery may perceive that they cannot control impulses to drink and to smoke.

In contrast, they may feel they can control such urges if external stimuli are minimized.

Stages of Change

Global index of readiness to change not predict smoking cessation

- Individual stages of change did in expected directions

A global score may have masked individual stage averages

Like self-efficacy, motivation for change in one domain appears to translate to motivation for change in a different domain

Depression

Depression associated with decreased likelihood of quitting smoking

Consistent with that found among smokers in the general population

Study Limitations

Conservative approach used to determine (no cigarettes vs. one or more cigarettes)

Relied on self-report only, without biochemical verification (other than a breathalyzer test for acute alcohol consumption) or collateral corroboration

Only single measure used to assess each construct

Clinical Implications

Interventions targeting alcohol use can affect other maladaptive behaviors, including cigarette use.

- Anticipate more dramatic results if target smoking directly

Strategies to increase behavioral skills to cope with smoking urges yield more beneficial results than increasing self-confidence around relapse

Interventions warranted that move a smoker father along the stages of change ladder

- Motivational treatments should be matched to a patient's current stage level

Given these individuals' increased vulnerability to cigarette use both because of their alcohol consumption and because of their depression, interventions that target depression are critical

Research Implications

Our previous work showed that quitting smoking or reducing cigarette consumption associated with better drinking outcomes

- Friend and Pagano, 2004; 2005a; 2005b

Current study builds our programmatic line of research that captures characteristics that may be amenable to interventions that can yield better health outcomes for this population of highly addicted smokers.

Interventions warranted that move a smoker father along the stages of change ladder

- Motivational treatments should be matched to a patient's current stage level

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Suggestions for Future Research

Determine if and when smoking cessation might be addressed in alcohol and drug treatment

Determine which clients might be interested Certain key smoker characteristics might be assessed to help determine who might best benefit

Determine if self-efficacy and/or motivation around quitting smoking are associated with better alcohol use outcomes

Examine how best to address smoking within the context of clinical, rather than research, settings to maximize generalizability

Table 1

Baseline Demographic and Clinical Characteristics

		Total 1193 (100%)
Gender	Male	909 (76%)
	Female	284 (24%)
Race	Caucasion	969 (81%)
	African-American	134 (11%)
	Other	90 (8%)
Marital Status	Married	370 (31%)
	Single	823 (69%)
Age (M, SD)		39.12 (10.27)
Education (M, SD)		13.03 (2.03)
Lifetime Tobacco use, years (M, SD)		2.96 (1.60)
Drinks per drinking day		17.69 (11.23)
Stages of Change (M, SD)	Precontemplation	13.19 (4.46)
	Contemplation	35.68 (3.63)
	Action	33.81 (4.06)
	Maintenance	30.31 (6.41)
Beck Depression Inventory (M,SD)		10.44 (8.37)
Self-Efficacy Temptation (M, SD)		2.92 (0.91)
Self-Efficacy Confidence (M, SD)		3.07 (0.91)

Table 2

Static and Time-Varying Predictors of Smoking Cessation

Variable	Parameter Estimate	Standard Error	Chi-Square	P>Chi Square	Hazard Ratio	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Static Variables, Baseline							
Age	0.04808	0.01170	16.8960	<.0001	1.049	1.025	1.074
Marital Status	-0.00817	0.06967	0.0138	0.9066	0.992	0.865	1.137
Gender	-0.36412	0.25981	1.9643	0.1611	0.695	0.418	1.156
Education	0.06151	0.05321	1.3366	0.2476	1.063	0.958	1.180
Treatment Arm	-0.07103	0.23538	0.0911	0.7628	0.931	0.587	1.477
Lifetime weeks of Tobacco Use	-0.00208	0.00022	89.1413	<.0001	0.998	0.997	0.998
Drinks per Drinking Day	-0.01081	0.01215					