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Five-year prospective prediction of self-initiated quitting of cigarette smoking of high-risk youth

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Abstract

This paper provides a 5-year replication-extension of a previous 1-year follow-up study of the same sample of southern California alternative high school youth. Demographic, behavioral, psychosocial, and emerging adult function predictors of adolescent self-initiated smoking cessation were investigated. Based on the first (1-year) prospective study and this follow-up, one may speculate that smoking cessation programs for adolescents should include counteraction of problem-prone attitudes, assistance with job aspirations and information about drug-free workplaces, motivation to quit strategies, and assistance with overcoming withdrawal symptoms.

Keywords

Self-initiated; Smoking; Cessation

1. Introduction

Approximately 75% of teenage regular smokers will smoke as adults (Sussman, 2002). Sadly, some physical damage from smoking begins in adolescence, and the fact that withdrawal symptoms are present even among youth who smoke on a daily basis or less provides ample evidence of the strain of quitting for many teenage smokers (Sussman, 2002; U.S. DHHS, 1994, 2000). Many adolescents who smoke regularly want to quit. Indeed, between 55% and 65% of smokers 12 to 18 years of age report having tried to stop. Identifying relevant variables to facilitate quit attempts has been considered important for some time but much needed research has not yet been completed. One means of examining variables associated with quit attempts is through prospective surveys of baseline smokers. Sussman (2002) examined an exhaustive selection of 17 prospective studies of self-initiated quitting. In general, the best predictors of quitting include lower pretest smoking and less experience with smoking, intending not to smoke in the future, living in a social milieu that is composed of fewer smokers (more non-smokers), belief that society should step in to place controls on smoking, perceiving smoking as negative behavior, and feeling relatively hopeful about life. In addition, participation in organized activities at school or elsewhere in the community has been found to be associated with higher quit rates later in life (Laoye, Creswell, & Stone, 1972). This may include settling down with a nonsmoker and beginning to take on a job (Sussman, 2002).

The present empirical study involves a longitudinal cohort of youth from 21 continuation high schools, one from each of 21 southern California school districts, who were administered both a baseline assessment and a follow-up assessment 5 years later. Continuation high schools enroll youth who have transferred out of the regular system due to academic or behavioral problems (e.g., lack of credits, drug use). This study provides a replication-extension of a previous 1-year follow-up study with this sample (Sussman, Dent, Severson, Burton, & Flay, 1998).

2. Methods

The baseline smokers varied from 14 to 19 years of age (mean age=16.8 years, S.D.=0.9). The sample was 59% male; 50% white, 37% Latino, 4% African American, 5% Asian, 2% Native American, and 2% other ethnicity; 50% lived with both parents; approximately 60% of youths' fathers and 60% of youths' mothers completed high school; modal occupations among the fathers were skilled or semiskilled labor (42%); among the mothers, unskilled labor or housework (32%). Alcohol, marijuana, and any hard drug use in the last month were reported by 77%, 69%, and 42% of the sample, respectively. At baseline, subjects were assessed in single classroom periods with a 20-page self-report questionnaire. Subjects completed the 5-year follow-up survey by telephone.

An 11-item rating scale was used to assess cigarette use (and other drug use). Only those subjects who had smoked cigarettes in the last 30 days at baseline were retained for analysis. At the 5-year follow-up, subjects were again asked about their current cigarette smoking. Generally, adult and adolescent smokers smoking less than one cigarette in the last month are classified as ex-smokers (Sussman, 2002; Sussman et al., 1998). Those who reported having smoked in the last 30 days at baseline but not at follow-up were classified as "quitters", and those who reported smoking at both time points were considered "nonquitters".

A total of 28 predictors were examined, as in the Sussman et al. (1998) 1-year prospective study. Also, five measures were added, to examine emerging adulthood function status correlates of having quit smoking, measured concurrently with the last wave of data collection. More specifically, four classes of baseline predictors were examined. The first class was demographic measures: binary-coded *ethnic comparisons*, *age*, *gender*, *socioeconomic status*, *living situation*, and *acculturation*. The second class of baseline predictors included measures related to current drug use: *current cigarette smoking*, *smoking intention*, *alcohol use*, *marijuana use*, *hard drug use*, and *addiction concern*. The third class of baseline predictors was perceived social variables: *friends' cigarette use*, *peer approval of drug use*, *prevalence estimates of peer smoking*, *family conflict*, and *fear of victimization*. The fourth class of baseline predictors included variables related to individual differences: *morality of drug use*, *sensation seeking*, *health as a value*, *perceived stress*, *depression*, and *program success expectancies*. Five measures were added at the 5-year follow-up. These included subjects' reports on whether or not they had graduated high school were employed, were married, were parents, and were homeowners (see Sussman & Dent, 2004; Sussman et al., 1998, for details on the measures).

To analyze the data, first an attrition analysis was completed. Next, a two-stage logistic regression analysis protocol was completed. The first set of models examined prediction of quit status from each univariate predictor, as reported in Table 1. The second stage of analysis examined prediction of quit status from all significant predictors from stage-2 models in the same simultaneous multivariable logistic regression model. To the extent that a variable's coefficient in this model differs from that of the previous models, the variable's influence must be indirect.

3. Results

The retained sample size for analysis was 303 baseline cigarette smokers that were follow-up 5 years later. This analysis consisted of 51% of those 593 baseline cigarette smokers that previously had been examined at baseline and again at a 1-year follow-up (Sussman et al., 1998). We compared the analysis subsample on baseline measures to those of the full measured baseline sample, using a series of single sample *t*-tests or calculation of an approximate confidence interval for proportions with large samples. There were no statistically significant differences of 28 tests.

Results of the first-stage model are shown in Table 1. To summarize the results found at the 5-year follow-up, regarding demographics, quitters were more likely to be Latino (49% versus 34%), were less likely to be White (38% versus 52%), were slightly older (means=17.00 and 16.72 years, S.D.=0.89 and 0.93), and were less acculturated (means=1.63 and 1.41, higher mean refers to being more likely to use a language other than English; S.D.=0.82 and 0.66). The two ethnicity results replicated those found at 1-year follow-up. However, acculturation and age also were now significant predictors (i.e., from baseline to the 5-year follow-up but not from baseline to the 1-year follow-up). Regarding drug use-related measures, quitters reported a lower level of cigarette smoking at baseline (means=39.59 versus 64.42, S.D.=37.62 and 36.06) and intention to smoke cigarettes in the future at baseline (means=3.92 versus 4.42, S.D.=1.29 and 1.06). The smoking level result replicated that of the 1-year data. However, now, intention was a significant predictor, whereas addiction concern was not. The converse relation of these two variables with quitting was found in the 1-year follow-up data.

None of the perceived social variables discriminated between quitters and non-quitters. In the 1-year data, friends use had been found to be a significant predictor of quitting. Among the individual difference measures, morality of drug use and program success expectancies predicted quitting, as in the 1-year follow-up data. Quitters reported more certainty that it was wrong to use drugs (means=2.41 versus 2.68, lower mean is higher value; S.D.=1.01 and 0.96), and quitters reported a higher mean level of confidence that topics learned from school programs that year would help prevent their future substance use (means=1.96 versus 2.19, lower mean is higher value; S.D.=0.59 and 0.60). Contrary to the 1-year follow-up data, health as a value and perceived stress failed to be significant predictors of quitting smoking at the 5-year follow-up. Finally, an examination of the emerging adulthood function status variables revealed that quitters were more likely to be holding down jobs (84% versus 68%). Hispanic ethnicity (or not), white ethnicity (or not), age, acculturation, current cigarette smoking, intentions to smoke in the future, morality of drug use, program success expectancy, and job status were retained from the second stage analysis and were entered into a final multivariable model. This model was significant (Wald Chi-square(9)=27.41, $p < 0.001$). The only significant effects were level of cigarette smoking (Wald Chi-square(1)=6.31, $p < 0.01$) and job status (Wald Chi-square(1)=5.53, $p < 0.02$).

4. Discussion

Being Latino, not being White, older age, relatively lower intention to smoke in the future, lower attitudinal tolerance for drug use, a lower level of acculturation, and lower expectations of school treatment program success in combating drug use failed to add to the prediction of quit rates beyond that supplied by smoking behavior and job status. These seven predictors, significant in the first-stage models, may be of interest to cessation program development due to possible indirect effects on quitting. The final model converges with previous teen–young adult prospective studies on several findings. First, those youth that reported relatively light cigarette smoking at baseline were more likely to quit use in

young adulthood. This is the most consistent effect observed across studies (Sussman, 2002). Heavier smokers may be more likely to suffer withdrawal symptoms (e.g., appetite changes, sleep difficulties, irritability). Discomfort during cessation attempts is relatively likely among regular cigarette smokers and is likely to be negatively associated with cessation success. Second, those youth who obtain a conventional adult life role were working and were relatively likely to quit cigarette smoking. This “settling down” concept asserts that, as young adults take on responsibilities for others, they will tend to act in ways that will not interfere with their ability to perform these new roles (Chen & Kandel, 1998). On the other hand, marriage and parental status was not associated with quitting. Maybe, quitting smoking was a function of workplace smoke-free legislation in California; smokers may have decided to quit rather than smoke outdoors at work. Other research is needed to contrast such “settling down” versus policy explanations.

Acknowledgments

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References

- Chen K, Kandel DB. Predictors of cessation of marijuana use: An event history analysis. *Drug and Alcohol Dependence*. 1998; 50:109–121. [PubMed: 9649962]
- Laoye JA, Creswell W, Stone EB. A cohort of 12,205 secondary school smokers. *Journal of School Health*. 1972; 42:47–52. [PubMed: 4480909]
- Sussman S. Effects of sixty-six adolescent tobacco use cessation trials and seventeen prospective studies of self-initiated quitting. *Tobacco Induced Diseases*. 2002; 1:35–81. [PubMed: 19570247]
- Sussman S, Dent CW. Five-year prospective prediction of marijuana use cessation among youth at continuation high schools. *Addictive Behaviors*. 2004; 29:1237–1243. [PubMed: 15236829]
- Sussman S, Dent CW, Severson HH, Burton D, Flay BR. Self-initiated quitting among adolescent smokers. *Preventive Medicine*. 1998; 27:A19–A28. [PubMed: 9808814]
- U.S. Department of Health and Human Services. Preventing tobacco use among young people: A report of the surgeon general. Rockville, MD: Public Health Service; 1994.
- U.S. Department of Health and Human Services. Reducing tobacco use: A report of the surgeon general. Atlanta, GA: Office on Smoking and Health; 2000.

Table 1

Project TND self-initiated quitting results: 5-year results

Measure	Wald Chi-square
Demographics	
Ethnicity	
Latinos	4.81 *
Whites	4.19 *
African Americans	0.03
Asians	0.02
Native Americans	0.09
"Others"	0.02
Age	4.32 *
Gender	0.03
Socioeconomic status	0.56
Live with both parents	1.72
Acculturation	4.67 *
Drug use	
Baseline smoking	19.69 ***
Smoking intention	9.01 **
Alcohol use	1.80
Marijuana use	0.12
Hard drug use	1.55
Addiction concern	0.09
Perceived social variables	
Friends' cigarette use	0.28
Peer approval of drug use	0.62
Prevalence estimates of peer smoking	0.82
Family conflict	1.23
Fear of victimization	0.52
Individual difference variables	
Morality of drug use	3.51 ^a
Sensation seeking	1.03
Health as a value	0.11
Perceived stress	0.05
Depression	0.05
Program success expectancies	6.70 **
Emerging adulthood variables	
High school graduate	0.60
Employment status	5.25 *
Marital status	0.37
Parental status	0.19

Measure	Wald Chi-square
House ownership status	0.25

^a
 $p < 0.06$,

*
 $p < 0.05$,

**
 $p < 0.01$,

 $p < 0.001$.