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Short communication

Intentions to quit smoking among youth in substance abuse treatment

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ABSTRACT

Introduction: Smoking cessation interventions for adolescents in substance abuse treatment have shown promise. However, a better understanding of the correlates of substance use disordered (SUD) youths' intentions toward smoking cessation will help tailor cessation interventions to this population. The current study examined tobacco use, smoking-related self-efficacy, substance use and intentions to quit using alcohol and illicit drugs as correlates of intentions to quit smoking among youth in SUD treatment. **Methods:** Participants were 178 adolescents who were in inpatient ($n=90$) or outpatient ($n=88$) SUD treatment and had smoked at least once in the past 30 days. The sample was 44% female, 72% non-Hispanic Caucasian, with a mean age of 16.2 years ($SD=1.2$). Participants rated the likelihood that they would be nonsmokers in the next year (9-point scale).

Results: SUD youth intention to quit smoking averaged 4.9 out of 10 ($SD=3.2$), comparable to intention to quit drinking ($M=5.3, SD=3.6$), but lower than their intention to quit using drugs ($M=6.0, SD=3.4$). Teens' intentions to quit smoking were associated with nicotine dependence ($r=-.30, p<.01$) and smoking cessation related self-efficacy ($r=.36, p<.01$), but not with pretreatment substance use severity ($r=-.15$). Controlling for nicotine dependence, teens' intentions to quit smoking were positively related to smoking cessation self-efficacy ($pr=.26, p<.01$) and intention to quit using illicit drugs ($pr=.15, p<.05$), but unrelated to intention to quit drinking.

Discussion: Findings highlight the appropriateness of addressing adolescent tobacco use during SUD treatment, but emphasize the importance of assessing intention and other cognitions for each substance, as they may differ markedly.

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1. Introduction

Substance use disorders (SUDs) are associated with heavy cigarette smoking and tobacco dependence (Arria et al., 1995; Brown et al., 1996; Myers and MacPherson, 2004). Among teens with SUDs, heavier smoking is associated with greater use of other drugs and tends to occur more frequently concurrent with other substance use (Myers et al., 2007; Ramsey et al., 2005). Of particular concern, cigarette smoking increases the likelihood of long-term health problems and mortality among those who abuse other substances (Hurt et al., 1996). Intention to quit and self-efficacy for quitting are important mediators of teen tobacco (Myers et al., 2000; Woodruff et al., 2008; Zhu et al., 1999) and alcohol and drug (Kelly et al., 2000, 2002; Ramo et al., 2009) treatment outcomes. A greater understanding of factors associated with intentions to quit smoking can inform more efficacious tobacco cessation interventions for this at-risk population.

Motivational theories (Dweck, 1992) suggest that individuals receiving substance abuse treatment will have lower intentions to quit smoking if the perceived salience of smoking is high (as indicated by greater involvement). Consistent with this theory, previous research has found that among teens in SUD treatment, higher levels of pretreatment nicotine dependence are associated with lower intention to quit smoking (McDonald et al., 2000). In addition, for teens who received a smoking cessation intervention during a psychiatric hospitalization, 71% of whom had an SUD, increases in nicotine dependence over the subsequent year were associated with decreases in self-efficacy and intention to quit smoking (Strong et al., 2007). Additionally, greater confidence in quitting during treatment was related to increased readiness to quit smoking (Apodaca et al., 2007).

Emerging evidence suggests that tobacco-focused intervention delivered in the context of adolescent SUD treatment may serve to enhance alcohol and other drug use outcomes (Brown et al., 2009; Myers and Prochaska, 2008). Nonetheless, addressing tobacco use among individuals in substance abuse treatment has traditionally been challenging (Myers and Brown, 2005; Prochaska et al., 2004). A greater understanding of the factors associated with intention to

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Table 1
Demographic, cigarette, alcohol and drug use variables for inpatients, outpatients, and full sample.

	Inpatient (n = 90)	Outpatient (n = 88)	Full sample (n = 178)
Demographic variables			
Age: M (SD) [*]	16.0 (1.1)	16.5 (1.1)	16.2 (1.2)
Gender: % female [*]	58.9	28.9	43.9
Ethnicity: %white	75.6	68.9	72.2
Cigarette use variables			
Smoking days/mo: M (SD)	27.5 (5.9)	27.8 (5.3)	27.7 (5.6)
Cigarettes per day: M (SD) [*]	15.0 (11.1)	10.1 (8.1)	12.6 (10.0)
Nicotine dependence: M (SD) [*]	4.6 (2.0)	4.1 (1.8)	4.4 (1.9)
Alcohol/drug use variables			
Drug of choice (%)			
Alcohol	13.2	16.1	14.6
Marijuana	41.8	49.4	45.5
Methamphetamine	29.7	24.1	27.0
Other	15.4	10.2	13.0
Substance use disorder diagnosis (%)			
Alcohol	62.6	73.6	68.0
Marijuana	80.2	74.7	77.5
Methamphetamine [*]	50.5	31.0	41.0
Substance use severity score: M (SD) [*]	66.9 (12.5)	58.8 (19.1)	63.2 (16.3)
Number of drugs ever used: M (SD) [*]	4.1 (1.5)	3.4 (1.5)	3.8 (1.5)
Smoking cessation/cognitions			
Ever quit smoking (%)	60.0	63.3	61.7
Smoking self-efficacy: M (SD)	5.0 (3.4)	5.1 (3.3)	5.1 (3.3)
Intention to quit smoking: M (SD) [*]	4.4 (3.2)	5.4 (3.0)	4.9 (3.2)
Other substance cognitions			
Intention to quit drinking: M (SD)	5.2 (3.5)	5.4 (3.7)	5.3 (3.6)
Intention to quit using drugs: M (SD)	5.9 (3.5)	6.1 (3.2)	6.0 (3.4)

^{*} Chi-square of *F*-tests showed difference between inpatient and outpatient sample is significant at the $p < .05$ level.

quit smoking, including use of and intentions to quit alcohol and other drugs, can elucidate adolescents' interest in quitting in the context of substance abuse treatment, and guide efforts to tailor interventions to teens in SUD treatment.

The present study examined correlates of intention to quit smoking in the context of substance abuse treatment. Consistent with social learning theory and prior research with adolescent smokers, we expected that lower pretreatment nicotine dependence, less severe alcohol and other drug use involvement, and greater smoking-related self-efficacy would be associated with greater intention to quit smoking. Additionally, we examined whether greater intentions to quit alcohol and other drug use following treatment were independently associated with higher intention to quit smoking.

2. Methods

2.1. Participants

Participants were 178 adolescents (90 inpatient, 88 outpatient), drawn from three independent studies conducted in the greater San Diego, CA area (one inpatient, two outpatient; Kelly et al., 2000; Myers and Brown, 2005; Myers et al., 2000). The inpatient sample included 90 of 104 adolescents in a study of outcome following substance abuse treatment conducted from 1994 to 1999. Excluded were 10 subjects who had never smoked cigarettes and four missing data on motives. The outpatient sample consisted of all 35 participants in a smoking cessation treatment development study (conducted from 1996 to 1998) and 53–57 participants in a smoking cessation treatment outcome study (conducted from 1998 to 2001). Excluded were four participants who were missing data on alcohol and drug motivation.

All participants had ever smoked at least weekly and were current smokers (at least once in the past 30 days) at the time of baseline assessment. Informed consent was obtained separately from a parent/legal guardian for youth under 18 years of age. Table 1 reports demographic characteristics. Inpatient participants were slightly younger (16.0 vs. 16.5; $F = 6.12$, $p < .05$), and more likely to be female (58.9% vs. 28.9%; $\chi^2 = 16.09$, $p < .01$) than outpatient participants. Participants met DSM-III-R (American Psychiatric Association, 1987) diagnostic criteria for abuse or dependence on at least one substance (other than nicotine).

2.2. Procedure

Participants were recruited from inpatient and outpatient substance abuse treatment programs in the metropolitan San Diego area. All programs were based on the Minnesota Model, employing 12-step principles and recommending participation in 12-step support groups. Therapy included group, individual, and family modalities. Data analyzed in the present study were collected during the baseline interview for all subjects. At the time these data were collected, no local youth substance abuse treatment programs addressed tobacco use as part of their intervention.

2.3. Measures

Nicotine dependence was assessed with the 7-item modified Fagerstrom Tolerance Questionnaire for adolescents (mFTQ), for which adequate reliability and validity has been demonstrated (Prokhorov et al., 1996). The sum of the seven mFTQ items was used (range: 0–9).

Alcohol and drug use severity was assessed using the *Personal Involvement Screen* from the *Personal Experiences Screening Questionnaire* (PIS; Henly and Winters, 1988), a 29-item measure of substance use severity and consequences (e.g., pre-occupation, psychological benefits of using, using across multiple situations, using socially/recreationally, loss of control), with responses ranging from 0 (“never”) to 3 (“often”). The measure has well-established validity (Winters et al., 1993). The PIS had good internal reliability (Chronbach's $\alpha = .93$) in the present sample. The sum of the 29-item PIS was used (range: 0–87).

Cigarette cessation cognitions included intention to quit smoking (“On a scale of 1–10, how likely is it that you will be a nonsmoker a year from now?”) and self-efficacy for quitting (“On a scale of 1–10, how confident are you that you could quit smoking for good?”), both assessed as part of the *Teen Smoking Questionnaire* (TSQ; Myers and MacPherson, 2004), a semi-structured interview composed of items from various existing smoking-related measures. The TSQ also assessed quantity (average cigarettes per smoking day) and frequency (average smoking days per month) of current smoking, and number of lifetime quit attempts.

Alcohol and drug use cognitions were measured using items assessing intentions to drink and use (“How likely is it that you will drink alcohol [use drugs] in the future?”) from the *Customary Drinking and Drug Use Record* (CDDR; Brown et al., 1998). Responses were scored on 10-point Likert scales. The two items were reverse coded for the present study to make them consistent with the variable assessing intention to not smoke.

Table 2

Results of hierarchical regression analyses predicting intention to quit smoking among teens in substance abuse treatment ($n = 178$).

Variable	B	SE B	B	pr	t
<i>Intention to quit smoking</i>					
Step 1					
Nicotine dependence	-.56	.12	-.33	-.33	-4.55**
Step 2					
Nicotine dependence	-.38	.13	-.22	-.21	-3.00**
Smoking self-efficacy	.26	.07	.27	.25	3.70**
Intention to quit drinking	.01	.07	.01	.01	0.18
Intention to quit using drugs	.15	.07	.16	.14	2.04*

Note: Model $R^2 = .11$ for Step 1 ($p < .01$); $\Delta R^2 = .09$ for Step 2 ($p < .01$).

* $p < .05$

** $p < .01$

3. Results

Smoking, other substance use, and substance use-related cognition variables are presented in Table 1. On average, youth smoked 28 days per month (range: 1–30; $SD = 5.6$), consumed 12.6 cigarettes per smoking day (range = 0–60; $SD = 10.0$), and had moderate levels of dependence ($FTQ = 4.4$; $SD = 1.9$). More than half of participants (62%) had made at least one lifetime smoking cessation attempt. Inpatients smoked significantly more cigarettes per day ($M: 15.0$ vs. 10.1 ; $p < .05$) and had significantly higher levels of nicotine dependence ($M: 4.6$ vs. 4.1 ; $p < .05$) than outpatients. Inpatients were significantly more likely to be dependent on methamphetamine (51% vs. 31%; $\chi^2 = 7.06$, $p < .01$) and had greater substance use severity overall ($M: 66.9$ vs. 58.8 , $p < .05$) than outpatients.

Adolescent ratings of intention to quit smoking did not differ significantly from ratings of intention to quit drinking ($M_d = -0.37$, $t = -1.1$, $p = .29$), but were significantly lower than intention to quit using drugs ($M_d = -1.06$, $t = -3.4$, $p < .01$).

3.1. Correlates of intentions to quit smoking

Zero-order correlations of intention to quit smoking were examined. As hypothesized, lower levels of nicotine dependence ($r = -.30$, $p < .01$), and higher smoking cessation self-efficacy ($r = .36$, $p < .01$) were associated with greater intention to quit smoking. Substance use severity was not significantly associated with intentions to quit smoking ($r = .15$, n.s.).

3.2. Relationship of intentions to quit alcohol and drugs with intention to quit smoking

Since smoking characteristics differed between inpatients and outpatients, we controlled for treatment modality (inpatient vs. outpatient) and level of nicotine dependence. We conducted a hierarchical regression, with treatment modality and nicotine dependence entered in the first step and hypothesized predictors of intention to quit smoking (smoking-related self-efficacy, substance use severity, intention to quit drinking, and intention to quit using drugs) entered in the second step.

Intention to quit smoking was independently predicted by nicotine dependence ($pr = -.17$, $p < .05$), smoking self-efficacy ($pr = .27$, $p < .01$) and intention to quit using drugs ($pr = .16$, $p < .05$), but not treatment setting ($pr = .12$, n.s.), substance use severity ($pr = -.02$, n.s.) or intention to quit drinking ($pr = -.01$, n.s.). Since there were no significant relationships between treatment setting or substance use severity and intention to quit smoking, we re-ran the regression excluding these variables (see Table 2). Cognitive variables were significantly associated with intention to quit smoking after accounting for nicotine dependence ($\Delta R^2 = .09$, $p < .01$). Smok-

ing self-efficacy ($pr = .25$, $p < .01$) and intention to quit using drugs ($pr = .14$, $p < .05$) each independently predicted intention to quit smoking.

4. Discussion

This study examined correlates of intention to quit smoking among adolescents in SUD treatment. As hypothesized, lower nicotine dependence and greater smoking self-efficacy were associated with greater intention to quit smoking. Controlling for nicotine dependence, smoking-related self-efficacy and intention to quit using drugs were associated with intention to quit smoking.

Our findings confirm that adolescents in substance abuse treatment who hold greater belief in their ability to succeed in quitting smoking are more motivated to attempt cessation. Teens, particularly those with high levels of nicotine dependence, may benefit from training in effective coping skills and a menu of options as techniques to increase self-efficacy and therefore intention to quit smoking (Myers and Brown, 2005). This is consistent with the 2008 Clinical Practice Guidelines which highlights the value of urging adolescent smokers to quit and the efficacy of counselling as an intervention for teen smokers (Fiore et al., 2008). Further, matching smoking cessation treatment strategies to adolescents' readiness to quit, an efficacious approach with non-SUD teens (Hollis et al., 2005), may help increase self-efficacy and intentions to quit smoking for teens in SUD treatment.

Consistent with findings in the adult literature, substance use severity was not significantly associated with intentions to quit smoking. Adults in SUD treatment express strong interest in quitting smoking across levels of pretreatment substance involvement (Irving et al., 1994; Kozlowski et al., 1989; Sees and Clark, 1993). As such, substance abuse treatment may be a particularly important time to intervene with adolescent smokers, regardless of substance involvement severity.

Adolescents' level of reported intentions to quit smoking was similar to intentions to quit drinking but significantly lower than their intention to quit using illicit drugs. The findings contrast somewhat with previous findings that teens in SUD treatment reported less readiness to quit smoking compared to alcohol or drugs (McDonald et al., 2000). There was a modest but significant positive association between intention to quit smoking and intention to quit using drugs, suggesting that teens more motivated to quit using drugs may also be more open to receiving a smoking cessation intervention than their peers. When evaluating and implementing smoking cessation interventions in SUD treatment settings, providers should assess intentions to quit using all substances of abuse and help clients to recognize the relationship between smoking and other drug use.

Several limitations of the present study must be considered when interpreting the results. First, data were based on participant self-report and is subject to recall bias. Second, these data were collected primarily during the 1990s, the extent to which these findings apply in the present is unknown. However, recent studies report similar rates of smoking in substance abusing samples, increasing our confidence in the relevance of the present findings (Chun et al., 2007). In addition, although our participants were drawn from a single metropolitan area, the sample was heterogeneous and appears representative of adolescent smokers in SUD treatment. Other variables that may influence smoking and other substance use cognitions should be included in future studies with substance abusing adolescents. Finally, the present investigation was limited by its cross-sectional design. Prospective studies are needed to better characterize the influence of smoking-related cognitions on smoking cessation outcomes in this population.

The present study demonstrates that one of the major moderating variables in smoking cessation outcomes (intention to quit) is related to the extent of tobacco use and confidence in quitting, and to some extent the desire to quit use of other substances. These data provide added support for the utility of addressing adolescent tobacco use in the course of SUD treatment and the importance of directly addressing the relationship between thoughts about smoking and thoughts about alcohol and other drugs.

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Contributors

Dr. Myers designed the studies and wrote the protocol. Dr. Ramo completed the first draft of the manuscript, including all parts, and Drs. Prochaska and Myers reviewed and revised subsequent drafts of the manuscript. All authors contributed to and have approved the final manuscript.

Conflict of interest

All three authors declare that they have no conflict of interest.

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