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Positive Outcome Expectations and Tobacco Product Use Behaviors in Youth

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Abstract

Background—Outcome expectations are an important determinant of health behavior, according to Social Cognitive Theory; yet recent literature has not examined the relationship between outcome expectations and tobacco product use (e.g., use of cigarettes, cigars, hookah, e-cigarettes, or smokeless tobacco).

Objectives—This study examines if outcome expectations at baseline, among an adolescent cohort of never users of tobacco products, predicts tobacco product use (i.e., cigarettes, hookah, e-cigarette, cigar, or smokeless tobacco) or susceptibility to use at 6-month follow-up.

Methods—Data are from the first two waves of a Texas cohort study of urban middle school and high school students, which were collected in 2014–2015. Logistic regression analyses were used; these adjusted for socio-demographic variables. Analyses were limited to never users of any tobacco product at baseline ($n = 1999$, $N = 357,035$).

Results—Outcome expectations related to stress relief predicted ever use of (AOR: 4.21, 95% CI 1.84–9.60) and susceptibility (AOR: 2.97, 95% CI 1.01–8.70) to tobacco products. Additional outcome expectations (e.g., relaxation, concentration, slimness, etc.) were not associated with ever use or susceptibility.

Conclusions/Importance—This study extends the literature regarding outcome expectations among adolescents regarding tobacco products. It is important that interventions offer alternative solutions to stress relief that do not include tobacco products.

Keywords

Adolescence; adolescent health; social cognitive theory; smoking and tobacco use; tobacco control and policy

Background

Tobacco use remains a leading cause of premature death, and with the significant rise in noncigarette tobacco product use among youth (Singh et al., 2016), it is important to

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

understand the etiology of use. Health behavior theories, like Social Cognitive Theory (SCT) provide guidance on psychosocial factors that may be associated with tobacco product use. SCT posits that outcome expectations, defined as a belief that a behavior will lead to a certain outcome, may influence behavior (Bandura, 1986). Positive outcome expectations (sometimes referred to as expectancies) have been associated with susceptibility to cigarettes (Dalton, Sargent, Beach, Bernhardt, & Stevens, 1999), and have demonstrated mixed results with smoking behavior (Cohen, McCarthy, Brown, & Myers, 2002; Jøsendal & Aarø, 2012). Dalton et al. (1999) determined that each positive outcome expectation assessed was significantly associated with susceptibility to cigarette smoking. Regarding smoking behavior, Cohen et al. (2002) found in a longitudinal sample of young adults that positive outcome expectancies were associated with increased number of cigarettes per week. Lastly, in a sample of Norwegian students, only expectancies related to addictiveness significantly predicted cigarette smoking three years later (Jøsendal & Aarø, 2012).

Recent studies have not examined the relationship between outcome expectations and alternative tobacco products, such as e-cigarettes. However, one study of Hawaiian college students found that expectancies related to “affect regulation” (e.g., feeling less stressed) predicted susceptibility and use of e-cigarettes (Pokhrel, Little, Fagan, Muranaka, & Herzog, 2014). This study examines if positive outcome expectations about tobacco products at baseline predict ever use of or change in susceptibility to any tobacco product at 6-month follow-up among Texas adolescents.

Methods

Study design and participants

This study utilized data from two waves, approximately 6 months apart, of the Texas Adolescent Tobacco and Marketing Surveillance System (TATAMS). TATAMS surveyed 3907 6th, 8th, and 10th grade students in the 5 counties that surround the 4 largest metropolitan areas in Texas—Austin, Houston, San Antonio, and Dallas/Ft. Worth. At follow-up, 2488 completed the survey for a weighted response rate of 61%. After adjustment for non-response, both surveys represented $N = 461,069$ adolescents (Perez et al., 2017). Study protocols and procedures were approved by the University of Texas Health Science Center at Houston’s institutional review board.

At each wave, students were asked about their ever use of cigarettes, e-cigarettes, cigar products, hookah, and smokeless tobacco. Susceptibility was measured with three items: curiosity, peer influence, and intentions to use (Pierce, Distefan, Kaplan, & Gilpin, 2005). Composite measures were created for both ever use (ever use of any product versus never use) and susceptibility (susceptible to any product versus not susceptible).

Outcome expectations were assessed with five items on a 4-pt Likert scale, with the questions: “Howmuch do you agree or disagree with the following statements. I think using tobacco would (1) Help when I am feeling stressed, (2) Relax me, (3) Energize me, (4) Help me stay slim, (5) Helpme concentrate.” Those reporting “strongly agree” or “agree” were coded as endorsing the expectation.

Analyses were limited to baseline never tobacco product users who also completed the follow-up survey ($n = 1999$; $N = 357,035$). Analyses included sampling weights to account for the complex survey design, adjust for non-response, and to generalize back to the study population (Perez et al., 2017). Differences in descriptive statistics were assessed using chi-squared analyses. Logistic regression determined if outcome expectations at baseline predicted tobacco product use at follow-up. A second logistic regression determined if baseline outcome expectations predicted a change in susceptibility at follow-up. Each regression controlled for socio-demographic factors. Change in susceptibility was defined as students who were nonsusceptible never users at baseline who became susceptible at follow-up. Analyses were conducted in Stata 14.2 (College Station, TX).

Socio-demographic factors included in the models were grade, gender, race/ethnicity, and SES. Grade was dichotomized into middle (6th and 8th) and high school (10th). For race/ethnicity, three categories were created: White/Other, African American, and Hispanic. SES was measured with the question (Gore, Aseltine, & Colten, 1992; Springer, Selwyn, & Kelder, 2006), “In terms of income, what best describes your family’s standard of living in the home where you live most of the time?” A variable was created, with participants who responded, “just getting by,” “nearly poor” or “poor” classified as low SES, and, “very well off” or “living comfortably” were classified as middle/high SES.

Results

Of the baseline never users, 3.6% ($n = 78$) reported using a tobacco product at 6-month follow-up. Of the 78 students reporting ever use, 63.2% tried e-cigarettes, 29.4% cigarettes, 19.3% a cigar product, 17.3% smokeless tobacco and 6.7% hookah. Among students who were nonsusceptible at baseline, 15.1% ($n = 171$) became susceptible at follow-up. Of the 171 who became susceptible, 56.1% became susceptible to e-cigarettes, 48.2% to cigarettes, 26.9% to cigar products, 25.8% to smokeless tobacco, and 44.4% to hookah.

Among nontobacco users at baseline, significantly more ever users at follow-up endorsed the outcome expectations that tobacco would help with stress and relaxation as compared to nonusers. Furthermore, significantly more ever users at follow-up endorsed any outcome expectation as compared to nonusers. Among nonsusceptible students at baseline, significantly more susceptible participants at follow-up endorsed the outcome expectation that tobacco would help with stress as compared to nonsusceptible participants (Table 1).

The odds of ever tobacco product use at follow-up were significantly higher among students who believed that tobacco would help with stress (AOR: 4.21, 95% CI 1.84–9.60) compared to those that did not believe this, after adjusting for sociodemographic factors. Similarly, the odds of ever tobacco product use at follow-up were significantly higher among students who endorsed any outcome expectation at baseline (AOR = 2.44, 95% CI = 1.13–5.26), after adjusting for sociodemographic factors. The odds of becoming susceptible to any tobacco product were significantly higher among students who believed that tobacco would help with stress (AOR: 2.97, 95% CI 1.01–8.70), compared to those who did not hold this belief, after adjusting for sociodemographic factors. Outcome expectations related to relaxation, energy, concentration, and slimness were not statistically significant for either outcome,

when adjusted for sociodemographic factors (Table 2). Bivariate analyses indicated there were significant differences between users and nonusers beliefs that tobacco use helped with relaxation; however, when adjusted for sociodemographic factors, this difference was no longer statistically significant.

Conclusions/Importance

This study is one of the first to examine the relationship between positive outcome expectations and the initiation of or change in susceptibility to various tobacco products, in youth. This study indicates that expectations related to stress relief are important to both the initiation of and susceptibility to tobacco products.

Previous research has explored the relationship between outcome expectations and cigarette smoking or susceptibility. Each study asks about different expectations, therefore, comparison across studies is difficult. Consistent with our findings, Dalton et al. (1999) found that the odds of being susceptible to cigarettes were 8.6 times higher for students who endorsed the expectancy regarding stress (Dalton et al., 1999). However, contrary to our findings, previous research has found an association between the outcome expectations relating to relaxation (Dalton et al., 1999) and slimness (Spruijt-Metz, Gallaher, Unger, & Johnson, 2005; Wahl, Turner, Mermelstein, & Flay, 2005) and smoking behaviors. In the one study on e-cigarette use and expectancies, expectancies under the factor “affect regulation” (e.g., feel less stressed,) were associated with current and lifetime e-cigarette use (Pokhrel et al., 2014). However, this study was among college students in Hawaii, not among adolescents. Taken together, expectations regarding tobacco’s ability to reduce stress appear important to youth.

While this study utilizes a longitudinal design, and includes a diversity of tobacco products, it is not without limitations. The outcome expectations questions are not product specific; therefore, it is not possible to elucidate the relationship between individual outcome expectations and products. This study is specific to Texas, and has limited generalizability. However, Texas is a unique state to study tobacco use because the tobacco industry is estimated to have spent more money marketing their products in Texas than any other state (Bach, 2016). Further, it has been estimated that nearly 1 in 10 kids in the U.S. live in Texas, making it an important state to study tobacco use (U.S. Census Bureau, 2016).

Future research would benefit by expanding on this study to examine the relationship between negative outcome expectations and the initiation of or susceptibility to these tobacco products. Further, examining the tobacco products separately would be beneficial to see if certain outcome expectations are more salient for different products. This current study indicates that positive outcome expectations regarding stress reduction are predictive of tobacco use. According to SCT, psychological determinants of behavior are both outcome expectations and self-efficacy. Additional research should focus on testing the theoretical framework of Social Cognitive Theory (SCT) to better understand the etiology of these alternative tobacco products.

Results of this study indicate that prevention programs, including counter-marketing campaigns and school-based curricula, may be able to offer alternative solutions to stress relief that do not involve a tobacco product. Prevention programs should target these self-evaluative outcome expectations to have the largest impact on health behaviors.

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Table 1

Percent of students endorsing outcome expectations at baseline, by ever use and susceptibility status at follow-up.^a

Nonsusceptible ^a at baseline (n = 1180/N = 209,958)						
	Overall ^b	Nonsusceptible at follow-up	Susceptible at follow-up	F-value	p-Value	
	% (95% CI)	% (95% CI)	% (95% CI)			
Outcome						
Expectations						
Stress	3.18(2.07,4.86)	2.52(1.42,4.43)	6.95 (3.30,14.06)	4.75	0.03	
Relax	3.71 (2.47,5.55)	3.15 (1.84,5.33)	6.97 (3.29,14.16)	2.73	0.10	
Energize	2.19 (1.23,3.87)	1.98(0.98,3.97)	3.37 (1.07,10.1)	0.59	0.45	
Slim	3.00 (1.69,5.29)	2.79 (1.39, 5.51)	4.23 (1.59,10.79)	0.47	0.50	
Concentrate	1.83 (0.82,4.03)	1.70 (0.64,4.45)	2.58 (0.63, 9.97)	0.22	0.64	
Endorse any	5.38 (3.77,7.63)	5.03 (3.24,7.74)	7.35 (3.60,14.43)	0.71	0.40	
Nontobacco users at baseline (n = 1999/N = 357,035)						
	Overall ^b	Never user at follow-up	Ever user at follow-up	F-value,	p-value	
	% (95% CI)	% (95% CI)	% (95% CI)			
Outcome						
Expectations						
Stress	6.79 (5.51, 8.34)	6.14 (4.84,7.75)	24.13(13.35,39.64)	18.36	<0.001	
Relax	8.43 (6.82,10.38)	7.96 (6.28,10.04)	21.04 (10.90,36.72)	7.43	0.008	
Energize	3.57(2.64,4.81)	3.50 (2.53, 4.83)	5.47 (1.92,14.61)	0.29	0.44	
Slim	3.91 (2.80,5.44)	3.99 (2.83,5.58)	1.78 (0.56,5.50)	1.85	0.18	
Concentrate	2.69(1.68,4.30)	2.53(1.66,3.86)	7.11 (1.43,28.76)	2.23	0.14	
Endorse any	10.98(9.21,13.04)	10.45 (8.66,12.55)	25.33 (14.36, 40.71)	9.01	0.004	

CI = confidence interval.

Includes 6th, 8th, 10th graders from 5 counties surrounding the 4 largest cities in Texas (Austin, Dallas/Ft. Worth, Houston, San Antonio). "n" represents the sample size; "N" represents the population from which this sample was drawn. Weighted percentages are shown in the Table.

^aSusceptibility was measured by 3 items: "Have you ever been curious about smoking/using..."; "Do you think you will use any of the following products in the next 12 months?"; "If one of your close friends were to offer you one of the following products, would you use it?". Respondents who answered "not at all curious" and "definitely not" to each question were coded as "nonsusceptible."

^bSample size varies due to differences in missing data.

Table 2

Adjusted odds ratio for predicting tobacco product use at follow-up ($n = 1999$, $N = 357,035$) or change in tobacco product susceptibility based on endorsement of outcome expectations at baseline ($n = 1,180$, $N = 209,958$).

	AOR* for tobacco product susceptibility at follow-up, (95% CI)	AOR* for tobacco product use at follow-up, (95% CI)
Outcome expectation		
Help when I'm feeling stressed	2.97 (1.01, 8.70)	4.21 (1.84, 9.60)
Relax me	2.33 (0.77, 7.03)	2.46 (0.99, 6.09)
Help me concentrate	1.63 (0.25, 10.76)	2.47 (0.54, 11.25)
Energize me	1.73 (0.38, 7.92)	1.34 (0.36, 4.97)
Help me stay slim	1.47 (0.37, 5.80)	0.34 (0.09, 1.26)
Endorse any outcome expectation	1.47 (0.51, 4.19)	2.44 (1.13, 5.26)
Outcome expectations as continuous	1.24 (0.89, 1.73)	1.29 (0.99, 1.67)

Includes 6th, 8th, 10th graders from 5 counties surrounding the 4 largest cities in Texas (Austin, Dallas/Ft. Worth, Houston, San Antonio). "n" represents the sample size; "N" represents the population from which this sample was drawn. Weighted AORs are shown in the Table.

* adjusted for sex (male, female), race/ethnicity (White/Other, Black non-Hispanic, Hispanic), grade (middle school: 6th and 8th grade; high school: 10th grade), and SES status (LowSES: "just getting by", "nearly poor", or "poor"; Middle/High SES: "very well off" or "living comfortably").

Bolded AOR indicate statistical significance ($p < 0.05$).