

ASSOCIATIONS OF DAILY E-CIGARETTE USE AMONG ADOLESCENTS: ECOLOGICAL MOMENTARY ASSESSMENT

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OBJECTIVE

To conduct a pilot study to examine associations between daily exposure to e-cig marketing, e-cig use by adults, and e-cig use by peers and (a) adolescent e-cig use, (b) willingness to use e-cigs in high-risk situations, and (c) intentions to use e-cigs the next day.

METHODS

PARTICIPANTS

- 50 adolescents (ages 13-17) in Kentucky

- Past two-week e-cig users

- 40% Male

- 90% White

PROCEDURES

- 45-minute initial online survey

- 5-minute daily surveys at 4:00 p.m. for 14 days

INITIAL SURVEY MEASURES

- Demographics, age of initiation of e-cig and tobacco use, past year and past month e-cig, tobacco use and other substance use, and personal risk factors

DAILY EMA SURVEY MEASURES

- E-cig use

- Willingness to use e-cigs the next day

- Intentions to use e-cigs the next day

- Perceptions of exposure to tobacco and nicotine marketing near their neighborhood, near their school, in a magazine, online

- Reported exposure to peer e-cig use

- Reported exposure to adult e-cig use

ANALYSIS

- 640 observations from 50 adolescent participants

- Analyses comprised mixed effects multilevel logistic regression models to control for clustering of observations within participants over time



RESULTS

STUDY VARIABLES

- Any e-cig use was reported on 51% of the days, and intentions to use e-cigs the next day was reported on 47% of the days
- High level of willingness to use e-cigs (3.14 of 4.0)
- Youth were exposed to peer e-cig use on 63% of the days and to adult use on 29% of the days.
- Exposure to tobacco ads (1.20 of 4.0)

Variable	Percent	Mean (SD)	Range
Tobacco Use and Beliefs			
Any Daily E-Cig Use	51.4		
E-Cig Willingness ¹		3.14 (0.95)	1-4
E-Cig Intention (Next day)	46.6		
Exposure to E-Cig Marketing²			
Exposure to Adult E-Cig Use	29.1		
Exposure to Peer E-Cig Use	62.8		
Demographics			
Male	40.0		
White	90.3		
Age		16.2 (0.86)	14-17
Subjective SES ³		4.2 (1.44)	1-7

¹Mean of 3 willingness items ($\alpha = .98$)
²Count across 4 exposure to advertising items (yes-no)
³7-point SES scale from Poor (1) to Rich (7)

INDEPENDENT EFFECTS OF EXPOSURE VARIABLES

- Daily exposure to e-cig marketing and peer use were associated with increased odds of e-cig use the same day
- Daily exposure to e-cig marketing and peer use were associated with increased odds of intending to use e-cigs the next day
- Exposure to adult users was not significantly related to any of the outcomes

Exposure	E-Cig Use OR (95% CI)	Willingness OR (95% CI)	Intention OR (95% CI)
Model 1: E-Cig Marketing	1.35* (1.03, 1.78)	0.90 (0.59, 1.37)	1.44* (1.04, 1.99)
Model 2: Adult Users	1.78 (0.94, 3.36)	0.87 (0.33, 2.30)	2.04 (0.88, 4.77)
Model 3: Peer Users	10.04** (5.04, 19.97)	1.09 (0.46, 2.61)	4.52** (2.13, 9.61)

All models controlled for age, sex, race, and subjective SES
^{*} $p \leq .05$; ^{**} $p \leq .001$

UNIQUE EFFECTS OF EXPOSURE VARIABLES

- Daily exposure to peer e-cig use was associated with increased odds of using an e-cig daily and intending to use e-cigs the next day after controlling for exposure to marketing and adult users
- Daily exposure to marketing and to adult users were not significantly related to any of the outcomes after controlling for other exposures

Exposure	E-Cig Use OR (95% CI)	Willingness OR (95% CI)	Intention OR (95% CI)
E-Cig Marketing	1.04 (0.76, 1.42)	0.89 (0.57, 1.39)	1.18 (0.83, 1.68)
Adult Users	1.02 (0.49, 2.11)	0.87 (0.31, 2.43)	1.33 (0.53, 3.40)
Peer Users	9.77** (4.88, 20.00)	1.19 (0.47, 2.98)	3.91** (1.78, 8.58)

All models controlled for age, sex, race, and subjective SES
^{*} $p \leq .05$; ^{**} $p \leq .001$

Table 4. Multilevel Logistic Regressions to Assess Associations of Willingness and Intentions with Daily E-Cigarette Use

Exposure	OR (95% CI)	OR (95% CI)
E-Cig Willingness	4.73* (2.01, 11.10)	--
E-Cig Intention	--	15.62* (7.78, 30.53)

All models controlled for age, sex, race, and subjective SES
^{*} $p \leq .001$

WILLINGNESS AND INTENTION

- Willingness and Intention were both positively associated with e-cig use
- Intention was more strongly associated with daily e-cig use than willingness

CONCLUSIONS

- Results show a high daily prevalence of e-cig use among adolescents, as well as high levels of willingness to use and intentions to use the next day
- Adolescents reported high exposure to peer e-cig use; and results showed significant associations between exposure to peer use and daily e-cig use and intentions, even after controlling for other exposures
- Adolescents reported seeing one type of tobacco ad daily; and tobacco marketing exposure was associated with daily e-cig use and intentions among adolescents
- Exposure to adult e-cig use was not associated with any outcomes, although exposure to adult use was moderately high
- Both intention and willingness were positively associated with daily e-cig use
- This association was stronger for intention, suggesting it may be more important for understanding e-cig use in this population
- Additional research is needed to understand social and environmental influences, such as tobacco industry marketing, on youth susceptibility to tobacco use and dual use, especially among populations vulnerable to tobacco industry marketing
- Future research should examine the associations between various types of tobacco marketing exposure (actual and perceived) and the use of multiple tobacco products and transitions between products

CONFLICT OF INTEREST: None.

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