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## Use of Price Promotions Among U.S. Adults Who Use Electronic Vapor Products

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### Abstract

**Introduction**—Sales of electronic vapor products have increased in recent years. This increase in use may be related to manufacturer price promotions. This study assessed the use of price-related promotions among current electronic vapor product users.

**Methods**—Data from the 2015 and 2016 Summer Styles, an Internet survey of U.S. adults aged 18 years, were analyzed in 2017. Current electronic vapor product users ( $n=300$ ) were those who reported past 30-day electronic vapor product use. Price-related promotion use was defined as reported use of coupons, rebates, discount codes, or other special price-related promotions when purchasing electronic vapor products (e.g., electronic cigarettes [e-cigarettes], electronic hookah [e-hookah], or vape pens). Associations between price-related promotion use and sex, age, race/ethnicity, educational attainment, U.S. region, cigarette smoking status, electronic vapor product use frequency, place electronic vapor products were obtained, and survey year were assessed using multivariable logistic regression.

**Results**—Among current electronic vapor product users, 15.0% reported using price-related promotions. The adjusted odds of using price-related promotions was significantly higher among respondents who obtained electronic vapor products from a gas station, grocery or drug store, or the Internet (AOR=2.65, 95% CI=1.22, 5.74) versus anywhere else (i.e., mall kiosks, vape shop, friends/family) and among those who used electronic vapor products 15 days in the past 30 days (AOR=2.57, 95% CI=1.18, 5.56) versus 14 days.

**Conclusions**—Nearly one in seven current U.S. adult electronic vapor product users reported using price promotions during 2015–2016, and variations in price promotion use existed by electronic vapor product use frequency and where electronic vapor products were obtained. Continued monitoring of the use of price-related promotions could help inform public health policy, planning, and practice.

### INTRODUCTION

Electronic vapor products (EVPs), including e-cigarettes, are devices designed to deliver nicotine, flavorings, and other additives to users via an aerosol.<sup>1</sup> Since entering the U.S.

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market in 2007, EVP use increased considerably. Among U.S. adults, ever use and past 30-day use of e-cigarettes increased between 2010 and 2013 (3.3% to 8.5% and 1.0% to 2.6%, respectively).<sup>2</sup> In 2016, an estimated 15.4% of U.S. adults had ever used e-cigarettes, whereas 3.2% reported using the products every day or some days.<sup>3</sup> Corresponding increases were observed in sales of EVPs, with U.S. sales reaching an estimated \$4.10 billion in 2016, up from \$2.58 billion in 2014 (adjusted for 2016 dollars).<sup>4,5</sup>

The 2016 U.S. Surgeon General Report, “E-Cigarette Use Among Youth and Young Adults,” concluded that EVPs are marketed by promoting flavors and using a wide variety of media channels and approaches that have been used in the past for marketing conventional tobacco products.<sup>6</sup> Additionally, prices of EVPs are inversely related to sales volume; as prices have declined, sales have increased.<sup>6</sup> The use of price-related promotions for conventional cigarettes is well documented.<sup>7–13</sup> However, to date, no study has assessed the use of price-related promotions for EVPs. Therefore, this study examines prevalence and correlates of use of price-related promotions among U.S. adults who reported current EVP use during 2015–2016.

## METHODS

### Study Sample

Data came from the 2015 ( $n=4,127$ ) and 2016 ( $n=4,203$ ) Summer Styles surveys, national, consumer-based web panel surveys of U.S. adults aged 18 years conducted by Porter Novelli during June–July; response rates were 67% in 2015 and 68% in 2016. Styles respondents are drawn from the nationally representative KnowledgePanel<sup>®</sup>, which uses probability-based sampling to recruit online panelists, regardless of landline phone or Internet access.<sup>14,15</sup> Data are weighted to be nationally representative using Current Population Survey distributions.<sup>14,15</sup> This study involved the analysis of secondary, de-identified data; therefore, it did not undergo human subjects review.

### Measures

Current EVP users were respondents who reported using EVPs (e-cigarettes; e-hookahs, hookah pens, or vape pens; or some other electronic vapor product, such as e-cigars or e-pipes) at least once during the past 30 days.

Among current EVP users, the use of price-related promotions was defined as answering *yes* to the question, *In the past 30 days, did you use coupons, rebates, discount codes, or any other special price-related promotions when you bought electronic vapor products, such as electronic cigarettes (e-cigarette), electronic hookah (e-hookah), or vape pens?*

Assessed covariates included: sex, age (18–35 years, ≥36 years), race/ethnicity (non-Hispanic white, other race/ethnicity), education (high school or less, some college or more), U.S. Census region (South versus Non-South [Northeast, Midwest, West]), cigarette smoking status (current, non-current [former and never smokers]), place where EVPs were last obtained (gas station, convenience store, grocery store, drug store, or Internet versus anywhere else [e.g., vape shops, mall kiosks, family or friends]), number of days of EVP use

during the past 30 days ( 14 days, 15 days), and survey year (2015, 2016). Categories were condensed to ensure the statistical stability of estimates.

### Statistical Analysis

The analytic sample included 300 current EVP users, which excluded 18 respondents (5.7%) for which data were missing on price-related promotion use, cigarette smoking status, place EVPs were obtained, and number of days of EVP use. Point estimates and 95% CI of price-related EVP promotion use were computed overall and by covariates. Differences between groups were assessed using the Student's *t*-test. Additionally, multivariable logistic regression was used to examine factors associated with price-related promotion use. All analyses were weighted to account for sample design and nonresponse.<sup>14,15</sup> All analyses were conducted in 2017 using Stata, version 14.

## RESULTS

Among the 2015 and 2016 overall sample, 4.0% (95% CI=3.4, 4.5) of respondents were current EVP users (Table 1). Among current EVP users (*n*=300), 15.0% (95% CI=10.3, 19.7) reported using price-related promotions. Price-related promotion use was significantly higher (*p*<0.05) among current EVP users who last obtained EVPs from a gas station, convenience store, grocery store, drug store, or the Internet (24.4%, 95% CI=13.8, 35.0) than those who purchased or obtained EVPs from other places (10.6%, 95% CI=6.1, 15.2). Price-related promotion use was also significantly higher among those who used EVPs 15 days in the past 30 days (20.3%, 95% CI=12.4, 28.3) than those who used EVPs 14 days (10.3%, 95% CI=4.9, 15.6).

Following multivariable adjustment, the odds of using price-related promotions among current EVP users were higher among those who last obtained EVPs from a gas station, convenience store, grocery store, drug store, or the Internet (AOR=2.65, 95% CI=1.22, 5.74) than those who purchased or obtained EVPs from other places. Odds were also higher among those who used EVPs 15 days in the past 30 days (AOR=2.57, 95% CI=1.18, 5.56) than those who used EVPs 14 days. There were no differences in price promotion use by sex, age, race/ethnicity, education, U.S. region, cigarette smoking status, or survey year.

## DISCUSSION

This study found that nearly one in seven current adult EVP users reported using price-related promotions to purchase EVPs in 2015–2016, with some variations in price-related promotion use observed across groups. Use of price-related promotions was higher among users who consume EVPs more often. This finding is consistent with the literature on conventional cigarettes, which shows that smokers who purchase cigarettes more frequently are more likely to identify avenues to make it less expensive.<sup>10–13</sup> Use of price-related promotions was also higher among EVP users who obtained the products from a gas station, convenience store, grocery store, drug store, or the Internet. This is consistent with patterns of cigarette sales<sup>10–13</sup> and with retail scanner data documenting prominent increases in e-cigarette sales in recent years in convenience stores.<sup>16</sup> By contrast, no variation in price-

related promotion use was observed across other assessed groups, including cigarette smoking status.

Monitoring trends in EVP use and related behaviors, including the use of price-related promotions, is important to inform public health policy, planning, and practice.<sup>6</sup> Although EVP use has the potential to benefit non-pregnant adult smokers if used as a complete substitute for conventional cigarettes and other combustible tobacco products,<sup>17</sup> price promotions could harm public health if they lead to prolonged use of tobacco products among adult smokers instead of complete cessation or contribute to youth experimentation and use of EVPs.<sup>6</sup> It is well documented that as the price of conventional cigarettes increases, consumption decreases.<sup>17–19</sup> Moreover, EVPs are being advertised and promoted using many of the same approaches that were previously used to promote conventional cigarette smoking among young people.<sup>6</sup> Therefore, further research is critical regarding the extent that price-related promotions influence EVP use, particularly among youth and young adults. It also is important to explore whether price promotions incentivize adult smokers, who otherwise would have quit, to use EVPs and maintain their addiction to nicotine.

### Limitations

This study is subject to at least four limitations. First, the Summer Styles is a web-based survey, which may limit generalizability compared with population-based surveys. Second, measures of EVP use data were self-reported, which could result in misclassification. Third, the sample size was limited, which prevented more detailed analysis of subgroup differences and could have influenced the statistical significance of the assessed outcomes. Finally, Summer Styles does not collect information on EVP product type, price promotion type, or price paid by the user; future research into potential variations in price promotion use by these factors is warranted.

### CONCLUSIONS

This is the first study to report on the use of price-related promotions for purchasing EVPs. The current findings that nearly one in seven current adult EVP users reported the use of price-related promotions, and that variations in promotion use exist, reinforce the importance of continued monitoring of patterns of EVP price-related promotions.

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**Table 1**Use of Price-Related Promotions Among Current Adult EVP Users, U.S., 2015–2016 Summer Styles<sup>a,b</sup>

Characteristics	n (%)	Use of price promotions	
		% (95% CI)	AOR (95% CI) <sup>c</sup>
Overall	300	15.0 (10.3, 19.7)	—
Sex			
Male	147 (49.0)	17.1 (9.9, 24.3)	ref
Female	153 (51.0)	12.4 (6.7, 18.1)	0.76 (0.37, 1.58)
Age			
36 years	199 (66.3)	14.1 (8.3, 19.9)	ref
18–35 years	101 (33.7)	15.9 (8.3, 23.6)	1.19 (0.57, 2.50)
Race/ethnicity			
Other race/ethnicity	78 (26.0)	16.3 (6.9, 25.7)	ref
White, non-Hispanic	222 (74.0)	14.5 (9.0, 19.9)	0.69 (0.30, 1.56)
Education			
Some college or more	147 (49.0)	13.8 (7.4, 20.1)	ref
High school or less	153 (51.0)	15.8 (9.2, 22.5)	1.04 (0.48, 2.23)
U.S. Census region <sup>d</sup>			
Non-South	184 (61.3)	16.0 (9.3, 22.6)	ref
South	116 (38.7)	13.6 (7.2, 20.1)	0.80 (0.38, 1.69)
Cigarette smoking <sup>e</sup>			
Non-smoker	129 (43.0)	13.8 (6.8, 20.9)	ref
Current smoker	171 (57.0)	15.9 (9.5, 22.3)	1.23 (0.57, 2.64)
Place EVPs were obtained			
Anywhere else <sup>f</sup>	194 (64.7)	10.6 (6.1, 15.2)	ref
Gas station, convenience store, grocery store, drug store, Internet	106 (35.3)	<b>24.4 (13.8, 35.0)</b>	<b>2.65 (1.22, 5.74)</b>
Days of EVP use during the past 30 days			
14	152 (50.7)	10.3 (4.9, 15.6)	ref
15	148 (49.3)	<b>20.3 (12.4, 28.3)</b>	<b>2.57 (1.18, 5.56)</b>
Survey year			
2015	188 (62.7)	12.3 (7.0, 17.6)	ref
2016	112 (37.3)	19.5 (10.6, 28.5)	1.49 (0.72, 3.09)

Note: Boldface indicates statistical significance ( $p < 0.05$ ). The  $p$ -values of the AORs were calculated from a multivariable logistic regression. The  $p$ -values for comparing differences in prevalence (%) were calculated using Student's  $t$ -test.

<sup>a</sup>EVP users were defined as respondents aged 18 years who used EVPs (e-cigarettes; e-hookahs, hookah pens, or vape pens; or some other electronic vapor product, such as e-cigars or e-pipes) in the past 30 days.

<sup>b</sup>Among current EVP users, the use of price-related promotions was defined as answering yes to the question: "In the past 30 days, did you use coupons, rebates, discount codes, or any other special price-related promotions when you bought electronic vapor products, such as electronic cigarettes (e-cigarette), electronic hookah (e-hookah), or vape pens?"

<sup>c</sup>AORs were obtained using logistic regression model adjusted for all covariates listed in the table.

<sup>d</sup>South: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Non-South: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

<sup>e</sup>Current cigarette smokers are defined as respondents who smoked  $\geq 100$  cigarettes in their lifetime and reported smoking “everyday” or “some days” at the time of the survey. Nonsmokers include both former smokers and never smokers. Former cigarette smokers are defined as respondents who smoked  $\geq 100$  cigarettes in their lifetime and reported smoking “not at all” at the time of the survey. Never cigarette smokers are defined as respondents who reported “no” to smoking  $\geq 100$  cigarettes in their lifetime.

<sup>f</sup>Included vape shops, mall kiosks, family, friends, other places, and multiple places.

EVP, electronic vapor product.