



Short Communication

Associations with E-cigarette use among Asian American and Pacific Islander young adults in California

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ABSTRACT

With attention to the rapidly growing market of electronic nicotine delivery systems (ENDS/e-cigarettes) and the fastest growing US ethnic minority group, the current study explored associations between awareness, perceived risks, and use of ENDS among Asian American and Pacific Islander (AAPI) young adults.

AAPI young adults (ages 18–25) in California were recruited via social media, college classes, listservs for AAPI-serving non-profits, and snowball sampling to complete an anonymous survey between 2014 and 2015.

The sample (N = 501) was 57% women, 15% LGBTQIA; with a mean age of 21; 26% foreign-born; identifying as Filipino (29%), Chinese (24%), Vietnamese (14%), mixed-AAPI heritage (13%), or 21% other. Nearly half the sample (44%) reported ever ENDS use; 11% were current users. Current ENDS use was twofold greater for: Filipino and Vietnamese compared to Chinese respondents; men versus women; LGBTQIA-identified respondents; those vocationally trained; and employed. Awareness of ENDS from peers/friends was most common and was associated with ever though not current ENDS use. Most respondents perceived ENDS as harmful (62%); low compared to high risk perception was associated with a three-fold greater likelihood of ever use and six-fold greater likelihood of current use. Popular flavors were fruit (49%, e.g., lychee, taro) and candy/sweets (26%). Current users viewed ENDS as a healthier alternative or quit aid for conventional cigarettes (42%); recreation/social use (33%) also was common.

Findings indicate ENDS visibility among AAPI young adults in California with affinity for flavors and many engaging in trial and current use for harm reduction and recreational/social aims.

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1. Introduction

Electronic nicotine delivery systems (ENDS) are battery powered devices with a heating element used with liquid cartridges, often containing nicotine (Breland et al., 2014). Available in a wide range of flavors, many attractive to youth, e-cigarettes are now the most commonly used tobacco product among middle (5.3%) and high (16.0%) school students (Arrazola et al., 2015). In a national survey of 12 to 17 year olds, leading reasons for ENDS use were availability in appealing flavors (81.5%) and lower perceptions of harm relative to conventional cigarettes to self (79.1%) and others (78.1%) (Ambrose et al., 2015).

Differences in youth prevalence of ENDS use are seen by race/ethnicity: highest among nonHispanic Caucasians and lowest among African Americans with numbers too small to report for youth identifying as

Asian American and Pacific Islander (AAPI) (Arrazola et al., 2015). The only published study on ENDS use among AAPI youth was conducted with high school students in Hawai'i (Wills et al., 2015). ENDS ever use was more common among Filipinos (34%) and Native Hawaiians (42%) than Caucasians (23%) and Asian Americans (12%; Chinese, Japanese, and Korean). Among US adults, ENDS use has been lowest among those identifying as AAPI, with prevalence about half that of other ethnic/racial groups (Schoenborn and Gindi, 2015).

AAPI is the fastest growing ethnic group in the US, making up to 5.6% of the population nationally and 14.9% in California (Hoeffel et al., 2012). The three largest AAPI ethnic groups in California are Filipino, Chinese, and Vietnamese (United States Census Bureau, 2010). Given the expanding ENDS market and AAPI census, the current study aimed to characterize ENDS use and risk perceptions among AAPI young adults in California, a state recognized for early tobacco control legislation and declines in tobacco use, that has experienced growth in vape shops and other retail ENDS sales. Though recognizably dynamic and diverse, AAPI young adults, as a market segment generalization, tend to be tech-adoptive and responsive, comfortable with global brands, and socially connected in on- and off-line communities (Hargittai, 2010). An

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exploratory descriptive study, we examined ENDS awareness, ENDS use, and risk perceptions overall and by AAPI ethnic group, nativity status, age, education, employment status, gender, and sexual orientation. An understanding of ENDS use patterns and risk perceptions among AAPI young adults can inform regulatory needs and tailored health interventions.

2. Materials and methods

Participants were recruited for an anonymous online survey between 7/7/2014 and 4/24/2015 in person ($n = 163$) at Bay Area college classes and online ($n = 338$) via AAPI-targeted social media, email listservs for non-profits serving AAPI youth, and snowball sampling. Compensation was not provided. Inclusion criteria were California resident, 18–25 years old, identifying as AAPI. Stanford University IRB approved the study protocol. Assessed demographic characteristics included AAPI ethnic group (Chinese, Filipino, Vietnamese, multi-AAPI ethnic, other), nativity (US, foreign born), age, education level, employment status, gender, and LGBTQIA status (i.e., lesbian, gay, bisexual, transgender, queer, intersex, asexual). Measures of ENDS source of awareness (friends/peers, family, television, radio, print, online, social venues, point-of-sale retail, other), risk perceptions, ENDS use, and preferences are summarized in Table 1. With a median-split, age-group was examined as 18–20 versus 21–25, relevant to state policy efforts to raise the legal age for purchasing tobacco (and in some cases ENDS) to age 21, including in California and Hawai'i.

Chi-square tests were run to examine associations for nativity and AAPI ethnicity with ENDS awareness (analyzed yes/no for each source separately), ever and current ENDS use, and risk perceptions categorized as low (1–3), neutral (4), or high (5–7). A Bonferroni correction was applied for the two tests (i.e., ethnicity and nativity) by source of ENDS awareness with statistical significance for $p < 0.025$. Multivariate

logistic regressions tested predictors of ever and current ENDS use, controlling for AAPI ethnic group and nativity, age, education, employment status, gender, sexual orientation, sources of ENDS awareness, and risk perceptions.

3. Results

3.1. Sample description

Reflecting California's AAPI census, participants ($N = 501$) identified as Filipino (29%), Chinese (24%), Vietnamese (14%), mixed-AAPI heritage (13%), or other AAPI (21% – Asian Indian, Bangladeshi, Cambodian, Hmong, Lu Mien, Japanese, Korean, Laotian, Malaysian). Most respondents were born in the US (74%). Participants averaged 21 years of age ($SD = 2.2$); 57% were women and 39% men (4% non-reported); 15% identified as LGBTQIA. Educational level of the sample was high school degree or lower (33%), some college (28%), associate's or vocational degree (7%), and bachelor's or graduate degree (32%); most of the sample was in school currently (72%), while 23% were employed, and 5% were unemployed.

3.2. Source of ENDS awareness

Respondents reported learning about ENDS from: friends/peers (73%), family (19%), retail point-of-sale (33%), social venues (30%), and media sources (40% online, 36% television, 18% print, 11% radio). Awareness of ENDS from peers was greatest among Filipino (86%) and mixed-Asian (83%) respondents, moderate for Vietnamese (73%) respondents, and lowest for Chinese (65%) and other Asian-ethnic respondents (59%), $X^2 = 29.98$, $df = 4$, $p < .001$; and higher for those US-born versus foreign-born (78% vs. 22%, $p = .004$, $OR = 1.88$, 95% $CI = 1.22$ –2.89). Similarly, learning about ENDS from family was highest for Filipino (28%) and other Asian-ethnic respondents (22%), moderate for Vietnamese (14%) and those identifying as mixed-Asian (15%), and lowest for Chinese respondents (8%), $X^2 = 18.51$, $df = 4$, $p = .001$; and higher for those US-born versus foreign-born (84% vs. 16%, $p = .021$, $OR = 1.99$, 95% $CI 1.10$ –3.61). Awareness of ENDS from social venues was more common among mixed Asian ethnic (42%) and Filipino (37%) respondents, moderate for Vietnamese (33%) and other Asian ethnic (30%) respondents, and lowest among Chinese respondents (14%), $X^2 = 22.14$, $df = 4$, $p < .001$; and did not differ by nativity. Awareness of ENDS from point-of-sale retail and any media source (online, television, print or radio) did not differ by AAPI ethnic group or nativity.

3.3. Perceived risk of ENDS

Risk perception of ENDS use averaged 4.9 ($SD = 1.6$) on a 7-point scale, with 21% coded as low risk perception (1–3), 17% neutral (4), and 62% harmful (5–7) (Table 1). ENDS risk perceptions did not differ by AAPI ethnic group or nativity.

3.4. Ever and current ENDS use

Ever ENDS use was reported by 44% of the sample, with 11% reporting current use (Table 2). Ever ENDS use was twofold greater among Filipino and Vietnamese compared to Chinese respondents with no difference by nativity. Ever and current ENDS use was more common among men than women and among 21–25 compared to 18–20 year olds. Current ENDS use was twice as high among those identified as LGBTQIA versus not; for those with vocational training or an associate's degree versus high school only or college-educated; and for those employed versus unemployed or a student.

In a logistic regression model ($X^2 = 82.03$, $df = 19$, $p < .001$, $R^2 = .18$), ever ENDS use was greater among Vietnamese ($OR = 2.67$ 95% $CI 1.26$ –5.64) and Filipino ($OR = 2.61$, 95% $CI 1.38$ –4.94)

Table 1
ENDS Items, Response Options, and Frequency in an Anonymous Survey of Asian American and Pacific Islander Young Adults in California, 2014–2015.

1. ENDS Information Exposure: How did you hear about e-cigarettes? (select all that apply)						
Friends/Peers	73%	Online	40%	Television	36%	
Retail	33%	Social Venues	30%	Family	19%	
Radio	11%	Print/Magazine	18%	Other	3%	
2. ENDS Ever Use: Have you EVER used electronic cigarettes or other forms of Electronic Nicotine Delivery Systems (ENDS) such as vape pens or e-hookah?						
Yes	44%	No	56%			
3. ENDS Current Use: Do you currently use electronic cigarettes or other forms of Electronic Nicotine Delivery Systems (ENDS) such as vape pens or e-hookah?						
Yes	11%	No	89%			
4. Perceived Risk: What effect do you believe electronic nicotine delivery systems (e-cigarettes, e-hookah, vape pens) have on health? [Doesn't effect one's health = 1 to Bad for one's health = 7]						
Low risk (1–3) 21%		Neutral (4) 17%		Harmful (5–7) 62%		
1–2.2%	2–5.7%	3–13.3%	4–17.0%	5–22.7%	6–16.4%	7–22.7%
5. Flavor Preference: What is your regular flavor of e-cigarette/e-hookah/vape pen? ^{ab}						
Fruit	49%	Candy/Sweet	26%	Drinks	10%	
Menthol/Mint	8%	Tobacco	3%	No-flavor	4%	
6. Reasons for Use: What is/are your reason(s) for using e-cigarettes? ^a						
Quit-aid/healthier – “I used e-cigarette to quit smoking cigarettes and hookah.”						42%
Social – “Fun recreational activity to do. Enjoy doing it.”						33%
Stress – “Stress reliever.”						15%
High – “I enjoy the act of smoking, and enjoy the 'high'.”						10%
Flavor – “Enjoy the flavor.”						8%

^a These open-ended questions were asked of current users only and did not require responses. Of 56 current users, $n = 37$ responded to questions about flavor, $n = 39$ to questions about reasons for use.

^b Flavor responses were categorized based on the first listed flavor, coded as fruit; candy/sweet (e.g., custard, vanilla, dessert); drinks (e.g., “coca-cola”, coffee, milk, or “sex in the beach”); menthol/mint; tobacco; or no-flavor.

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