



## Adolescent health brief

## Access to Tobacco Among California High School Students: The Role of Family Members, Peers, and Retail Venues


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## A B S T R A C T

**Purpose:** The purpose of the study was to determine from whom and where adolescents obtained tobacco, including cigarettes, e-cigarettes, and hookah.

**Methods:** California adolescents (N = 772; 63.19% female; mean age = 16.13 years, SD = 1.61; 26.44% white, 22.12% Asian/Pacific Islander, 36.65% Hispanic, and 14.79% other) were surveyed about their access to different tobacco products.

**Results:** Adolescents were significantly more likely to obtain tobacco from friends (54.9%) than family members or direct purchasing ( $p < .001$ ). Smoke shops were the most common purchase location across products (44.3%), with adolescents significantly more likely to purchase hookah and e-cigarettes from smoke shops than gas stations, liquor stores, or drug stores ( $p < .02$ ).

**Conclusions:** The effective characterization of tobacco access patterns is critical to the development of comprehensive tobacco control. By demonstrating peers and smoke shops as the primary social and retail outlets, this study identifies targets for the optimization of regulation and messaging aimed at reducing adolescents' access to tobacco.

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**IMPLICATIONS AND CONTRIBUTION**

Adolescents' access to cigarettes has been well documented; however, less is known about access to other tobacco products including e-cigarettes and hookah. This study outlines access patterns across multiple products to inform a more precise approach to messaging, regulation, and enforcement aimed at reducing access to tobacco among adolescents.

Large-scale national studies in the United States have shown a decline in cigarette smoking prevalence among adolescents and young adults (AYAs) [1–5]. However, total tobacco product consumption has increased, largely due to the growing popularity of e-cigarettes and hookah [1–5]. Despite long-standing laws banning the sale of tobacco products to adolescents under

the age of 18 years, a 2015 study showed 66% of 10th graders identified cigarettes as “easy to obtain;” a notable decline from 91% in 1996 [4]. Coincident with the decline in perceived ease of obtaining cigarettes, recent research has shown that adolescents are increasingly identifying peers as the primary source of cigarettes [1,2,5].

Most research on where and how youth access tobacco has focused on cigarettes, leaving a paucity of data on how and where adolescents obtain e-cigarettes, hookah, pipe tobacco, chew/dip, and cigars. Efforts to understand adolescents' access across tobacco products and retail venues represent an important means to inform a more comprehensive approach to tobacco control regulation. This study examines AYAs' access to cigarettes, e-cigarettes, hookah, chew, cigars, and pipes, including from whom and where these products were obtained.

**Conflicts of Interest:** The authors have no conflicts of interest to disclose.

**Disclaimer:** The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or the Food and Drug Administration.

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**Methods**

*Participants*

Participants were recruited directly from 9th and 12th grade classrooms from 10 large and diverse California high schools to participate in an ongoing longitudinal study of tobacco access, perceptions, social norms, marketing, and tobacco use [6]. A total of 1,299 participants were enrolled and provided assent and parental consent (for those under age 18 years); 405 were disqualified due to missing information. A total of 772 participants (59.43%) completed the survey.

Participant demographics were as follows: N = 772; 63.19% female; mean age = 16.13 years, SD = 1.61; 26.44% white, 22.12% Asian/Pacific Islander, 36.65% Hispanic, and 14.79% other. Enrolled participants completed an online survey administered through Qualtrics (Qualtrics Labs; Provo, UT) to assess their tobacco product usage and access patterns. This study was approved by the Stanford University IRB.

*Measures*

Participants were asked whether they had ever used hookah, e-cigarettes, cigarettes, pipe tobacco, cigars, and chew/dip. Those who self-reported having ever used any of the tobacco products were asked from whom and where they obtained these products (Table 1).

*Data analysis*

Descriptive analyses were performed to determine product usage and purchasing patterns (Table 1), in total and separately by age group (under age 18 years; and 18 years and older). Logistic regression models using generalized estimating equations (GEE) to adjust for clustering by school were estimated and tested with Tukey–Kramer adjustment for multiple comparisons to compare access patterns (Table 2). Due to limited power, subgroup analyses comparing access patterns among early high school (aged 13–15 years) and late high school (aged 16–19 years) were limited to descriptive statistics (Table 1).

**Results**

The most common tobacco products used were hookah, e-cigarettes, and cigarettes, representing 32.7%, 28.7%, and 19.2% of total users, respectively (Table 1). For both minors and those over age 18 years, friends represented the main source of tobacco products (54.9%), with adolescents significantly more likely to obtain hookah, e-cigarettes, and cigarettes from a friend than any of the other sources addressed (Table 2).

With respect to retail outlets, for those under age 18 years and older, smoke shops were the most common location of purchase, representing 44.3% of all respondents (Table 1). Participants were significantly more likely to obtain e-cigarettes and hookah from a “smoke shop” than any other retail outlet (Table 2). For all other products assessed, there was no significant difference in purchase patterns between intrapersonal sources or retail outlets.

**Discussion**

This study extends past research on AYAs’ access to cigarettes [7] to an examination of from whom and where they obtain

**Table 1** Participant product usage, and from whom and where they obtained these products, by age group

	Total N (%)		Hookah		E-cigarettes		Cigarettes		Cigars		Pipe tobacco		Chew or dip	
	<18	≥18	<18	≥18	<18	≥18	<18	≥18	<18	≥18	<18	≥18	<18	≥18
Product usage														
Ever used (N = 499)	321 (64.3)	178 (35.7)	107 (21.4)	56 (11.8)	94 (18.9)	49 (9.8)	65 (13.0)	31 (6.2)	29 (5.8)	18 (3.6)	18 (3.6)	13 (2.6)	8 (1.6)	11 (2.2)
From whom did you obtain the product the last time you used it? (N)														
Friend (N = 253)	173 (68.4)	80 (31.6)	66 (26.1)	31 (12.3)	49 (19.4)	16 (6.3)	32 (12.6)	13 (5.1)	13 (5.1)	9 (3.6)	9 (3.6)	8 (3.2)	4 (1.6)	3 (1.2)
Self (N = 89)	30 (33.7)	59 (66.3)	10 (11.2)	15 (16.9)	12 (13.5)	19 (21.3)	4 (4.5)	11 (12.4)	2 (2.2)	5 (5.6)	1 (1.1)	4 (4.5)	1 (1.1)	5 (5.6)
Family (N = 46)	34 (73.9)	12 (26.1)	16 (34.8)	6 (13.0)	12 (26.1)	3 (6.5)	1 (2.2)	4 (8.7)	4 (8.7)	2 (4.3)	1 (2.2)	0 (0)	0 (0)	0 (0)
Bummed (N = 42)	37 (88.1)	5 (11.9)	14 (33.3)	0 (0)	10 (23.8)	4 (9.5)	7 (16.7)	1 (2.4)	2 (4.8)	0 (0)	3 (7.1)	0 (0)	1 (2.4)	0 (0)
Took (N = 31)	22 (71.0)	9 (29.0)	1 (3.2)	1 (3.2)	5 (16.1)	3 (9.7)	13 (41.9)	3 (9.7)	1 (3.2)	1 (3.2)	1 (3.2)	0 (0)	1 (3.2)	1 (3.2)
From where did you obtain the product the last time you used it? (N)														
Smoke shop (N = 82)	34 (41.5)	48 (58.5)	15 (18.3)	19 (23.2)	15 (18.3)	16 (19.5)	2 (2.4)	2 (2.4)	2 (2.4)	7 (8.5)	0 (0)	4 (4.9)	0 (0)	0 (0)
Gas station (N = 34)	14 (41.2)	20 (58.9)	2 (5.9)	2 (5.9)	3 (8.8)	2 (5.9)	3 (8.8)	9 (26.5)	4 (11.8)	2 (5.9)	0 (0)	0 (0)	2 (5.9)	5 (14.7)
Liquor store (N = 30)	20 (66.7)	10 (33.3)	7 (23.3)	2 (6.7)	3 (10.0)	1 (3.3)	7 (23.3)	4 (13.3)	3 (10.0)	1 (3.3)	0 (0)	0 (0)	0 (0)	2 (6.7)
Drug store (N = 18)	14 (77.8)	4 (22.2)	2 (11.1)	1 (5.6)	4 (22.2)	1 (5.6)	4 (22.2)	1 (5.6)	2 (11.1)	0 (0)	1 (5.6)	1 (5.6)	1 (5.6)	0 (0)
Internet (N = 21)	15 (71.4)	6 (28.6)	6 (28.6)	1 (4.8)	8 (38.1)	5 (23.8)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4.8)	0 (0)	0 (0)	0 (0)

Note: Due to low response rate, the responses “a friend gave them to me” and “a friend bought them for me” were collapsed into the variable “obtained from a friend,” whereas “someone in my family bought them for me with my money” and “someone in my family gave them to me” were collapsed to “obtained from a family member.”

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