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## Harm Perceptions of Intermittent Tobacco Product Use Among U.S. Youth, 2016

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### Abstract

**Purpose**—To describe U.S. youth harm perceptions of intermittent tobacco use.

**Methods**—Using data from the 2016 National Youth Tobacco Survey of U.S. students in grades 6–12 (n=20,575), we examined prevalence and correlates of harm perceptions of tobacco product use on “some days but not every day” for four tobacco products. Associations between current (past 30-day) use and harm perceptions were assessed using multivariable regression.

**Results**—Perceiving that intermittent use causes ‘no’ or ‘little’ harm was 9.7% for cigarettes, 12.0% for smokeless tobacco, 18.7% for hookah, and 37.5% for e-cigarettes. Perceptions were associated with past 30-day use, and more than half of past 30-day non-cigarette users perceived intermittent use as causing ‘little’ or ‘no’ harm.

**Conclusions**—One in ten youth perceived intermittent cigarette smoking as causing ‘no’ or ‘little’ harm; this perception was higher among current users. Efforts are warranted to educate youth about the risks of tobacco product use.

### INTRODUCTION

The Surgeon General has concluded that use of products containing nicotine in any form among youth is unsafe.<sup>1–2</sup> Though a substantial proportion of U.S. youth are aware that tobacco use can be harmful,<sup>3</sup> nearly 4 million middle and high school students reported past 30-day use of at least one tobacco product in 2016.<sup>4</sup> One possible reason for this could be that they did not believe their particular use pattern was harmful; many youth use tobacco

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products intermittently rather than daily.<sup>5</sup> Among high school students who were current users in 2014, the proportion who used the product during 1–2 of the preceding 30 days was 52.0% for cigar smokers, 45.4% for e-cigarette users, 37.0% for cigarette smokers, and 26.6% for smokeless tobacco users.<sup>6</sup>

Research has documented the harmfulness of intermittent tobacco product use.<sup>2,3,6</sup> U.S. adolescent tobacco users who used a single tobacco product on 1–2 days during the previous month have reported symptoms of tobacco dependence, including strong cravings, irritability and restlessness when not using tobacco, strong desire to use the products, and wanting to use the products within 30 minutes of awakening.<sup>7</sup>

Few studies<sup>8–9</sup> have assessed whether youth perceive intermittent use of cigarettes to be harmful, and none have examined these harm perception beliefs for non-cigarette products. Accordingly, this study: (1) describes self-reported harm perceptions towards intermittent use of cigarettes, smokeless tobacco, hookah, and e-cigarettes among a nationally representative sample of U.S. students; and (2) assesses the association between these perceptions and tobacco use.

## METHODS

### Data

Data came from the 2016 National Youth Tobacco Survey (NYTS), a cross-sectional, school-based, self-administered pencil-and-paper questionnaire administered to U.S. public and private school students in grades 6–12. The 2016 NYTS employed a stratified, three-stage cluster sample design to produce a nationally representative sample of 20,675 students; the response rate was 71.6%.

### Measures

For each tobacco product separately, respondents were asked: “How much do you think people harm themselves when they [smoke cigarettes; use chewing tobacco, snuff, dip, or snus; use e-cigarettes; smoke tobacco in a hookah or waterpipe] some days but not every day?” Responses were: ‘no harm’, ‘little harm’, ‘some harm’, and ‘a lot of harm’.

### Analyses

For each tobacco product, weighted prevalence estimates and 95% confidence intervals for perceived levels of harm were generated overall and stratified by demographic and tobacco use characteristics, including sex, school level, race/ethnicity, number of days the tobacco product was used within the past 30 days, current (past 30-day) use of other tobacco products (i.e. cigars, cigarillos or little cigars; bidis; roll-your own; pipe tobacco; dissolvables), and household member tobacco product use. Adjusted prevalence ratios of the association between current tobacco use and harm perceptions for each primary tobacco product were calculated using multivariable logistic regression with predictive marginals, adjusting for all aforementioned factors except for frequency of use. Analyses were conducted in SAS-callable SUDAAN, version 9.3.

## RESULTS

Nationally, the percentage of youth who perceived that intermittent tobacco use causes ‘no’ or ‘little’ harm among U.S. middle and high school students was 9.7% for cigarettes, 12.0% for smokeless tobacco, 18.7% for hookah, and 37.5% for e-cigarettes (Table 1). The highest proportion of students who reported ‘no’ harm was for e-cigarettes (9.8%), followed by hookah (5.3%), smokeless tobacco (3.9%), and cigarettes (3.7%).

Harm perceptions varied by demographics and tobacco product use behaviors (Table 1). ‘No’ and ‘little’ harm perceptions were generally more prevalent among current tobacco product users than non-users, regardless of the tobacco product assessed. Furthermore, the proportion of current tobacco product users who reported ‘no’ harm increased with higher frequencies of tobacco use. Approximately one-third of students who smoked cigarettes frequently (i.e., 20 or more of the past 30 days) perceived little or no harm in smoking some days, whereas the majority of students who used other products generally perceived ‘little’ or ‘no’ harm in using those products some days.

Compared to those who reported ‘a lot’ of harm, youth with lower harm perceptions of intermittent use were more likely to report current use (Table 2). This pattern was the most pronounced for e-cigarettes and hookah.

## DISCUSSION

These findings indicate that the majority of U.S. middle and high school students perceived ‘some’ or ‘a lot’ of harm towards intermittent use of cigarettes, smokeless tobacco, hookah, and e-cigarettes. However, many youth remain unaware of the harms of intermittent tobacco products use. For example, approximately 1 in 10 respondents believed intermittent cigarette smoking caused ‘little’ or ‘no’ harm. Furthermore, perceptions of ‘little’, ‘some’, and ‘no’ harm towards intermittent tobacco use were significantly associated with current use across all tobacco products assessed. Continued efforts to educate young people about the health consequences of even intermittent tobacco product use<sup>2</sup> could help further reduce misperceptions of harm.

A prior analysis found that nearly one-quarter of U.S. students in 2012 believed intermittent cigarette smoking caused ‘little’ or ‘no harm’.<sup>9</sup> In contrast, we found that approximately 10%, or 2.6 million youth, held these beliefs in 2016. This progress may be due, in part, to high-impact youth tobacco education campaigns.<sup>10</sup>

These findings are subject to limitations. First, findings may not be generalizable to all U.S. youth. Second, tobacco use was self-reported, which could introduce bias. Third, this study did not assess perceptions of all tobacco products (e.g. cigars). Last, the response scale included only four options; adding options might reduce the proportion of responses in the lower two categories. Nevertheless, this is the first study to describe harm perceptions towards the intermittent use of non-cigarette tobacco products among a nationally representative sample of U.S. middle and high school students.

Preventing tobacco use among youth is critical to decreasing overall tobacco use since most adult tobacco users first start before age 18 and nearly all adult smokers transition from occasional to daily use before young adulthood.<sup>1</sup> Given the variability in perceptions about tobacco product harms and the association between perceived harm and tobacco product use, these data have the potential to inform evidence-based interventions and tailored initiatives that can help reduce the use of all tobacco products among U.S. youth.

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### **Implications and Contribution**

This is the first study to assess U.S. youth harm perceptions of intermittent tobacco use across multiple tobacco products. These findings underscore the importance of public health efforts to educate youth about the harms of all forms of tobacco use, including intermittent use of both conventional and newer tobacco products.

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Prevalence and Correlates of Harm Perceptions<sup>a</sup> Towards Intermittent Tobacco Product Use among U.S. Youth – National Youth Tobacco Survey 2016

Table 1

Characteristic	n (unweighted)	Weighted % (95% CI)			
		No Harm	Little Harm	Some Harm	A Lot of Harm
<b>CIGARETTES</b>					
<b>Overall</b>	20009	3.7 (3.1–4.3)	6.0 (5.5–6.6)	32.9 (31.7, 34.2)	57.4 (56.2, 58.5)
<b>Sex</b>					
Male	9876	2.5 (2.0–3.0)	5.4 (4.7–6.3)	33 (31.6–34.4)	59.1 (57.6–60.6)
Female	10016	4.9 (4.1–5.8)	6.6 (6.0–7.3)	32.9 (31.3–34.5)	55.6 (54.1–57.1)
<b>Race/Ethnicity</b>					
White, non-Hispanic	8836	2 (1.6–2.5)	5.9 (5.3–6.6)	35.4 (33.6–37.2)	56.7 (55.1–58.4)
Black, non-Hispanic	3096	6 (4.9–7.4)	6.2 (5.2–7.2)	26.3 (24.2–28.5)	61.5 (58.9–64.1)
Hispanic	5571	5.6 (4.6–6.8)	6.6 (5.4–8.0)	31.9 (30.2–33.6)	56 (54.5–57.4)
Other, non-Hispanic	1629	4.6 (3.0–6.9)	4.7 (3.6–6.0)	31.8 (28.9–34.9)	58.9 (55.5–58.9)
<b>School Level</b>					
Middle School	9340	3.4 (2.7–4.2)	5.5 (4.8–6.2)	32 (30.2–33.7)	59.2 (57.5–60.8)
High School	10587	3.9 (3.1–4.8)	6.4 (5.7–7.2)	33.6 (32.0–35.3)	56 (54.4–57.6)
<b>Number of days smoked cigarettes within past 30 days</b>					
0 days	18703	3 (2.5–3.6)	5.1 (4.7–5.6)	32.7 (31.5–33.9)	59.2 (58.1–60.3)
1–5 days	452	7.9 (5.0–12.1)	22.8 (18.3–28.0)	38.7 (32.7–45.0)	30.7 (25.3–36.7)
6–19 days	194	8.7 (4.9–15.1)	21.4 (15.1–29.4)	47.2 (38.8–55.8)	22.7 (17.2–29.4)
20–30 days	267	21.5 (15.5–29.1)	13.6 (8.9–20.1)	33.1 (24.4–43.2)	31.8 (24.7–39.8)
<b>Other (past 30-day) Tobacco Product Use<sup>b</sup></b>					
Yes	2512	8.7 (6.9–10.9)	13.9 (12.0–16.0)	34.7 (31.7–37.8)	42.7 (39.9–45.6)
No	17466	2.9 (2.5–3.5)	4.8 (4.4–5.2)	32.6 (31.4–33.9)	59.6 (58.4–60.8)
<b>Any Tobacco Use by Others in Household<sup>c</sup></b>					
Yes	7043	4.6 (3.8–5.5)	8.0 (7.1–8.9)	34.6 (33.0–36.2)	52.9 (51.1–54.6)
No	12046	2.9 (2.3–3.5)	4.8 (4.2–5.5)	32.2 (30.7–33.8)	60.1 (58.6–61.6)

**SMOKELESS TOBACCO (Chewing, Snuff, Dip, Snus)**

Characteristic	n (unweighted)	Weighted % (95% CI)			
		No Harm	Little Harm	Some Harm	A Lot of Harm
<b>Overall</b>	19981	3.9 (3.3–4.5)	8.1 (7.4–8.8)	34.4 (33.1–35.7)	53.7 (52.3–55.1)
<b>Sex</b>					
Male	9871	2.4 (1.9–3.0)	6.3 (5.6–7.2)	34.4 (33.0–35.9)	56.8 (55.3–58.3)
Female	9993	5.3 (4.6–6.3)	9.8 (8.9–10.8)	34.4 (32.7–36.1)	50.5 (48.7–52.3)
<b>Race/Ethnicity</b>					
White, non-Hispanic	8825	2.7 (2.2–3.3)	8.9 (8.0–9.8)	37.6 (35.9–39.4)	50.8 (48.9–52.7)
Black, non-Hispanic	3091	5.2 (4.2–6.5)	6.3 (5.2–7.6)	27.6 (24.7–30.7)	60.9 (57.6–64.0)
Hispanic	5560	5.3 (4.3–6.4)	7.7 (6.8–8.8)	32.1 (30.8–33.5)	54.9 (53.4–56.4)
Other, non-Hispanic	1627	3.8 (2.3–6.1)	6.5 (5.0–8.5)	31.2 (28.0–34.5)	58.5 (54.5–62.3)
<b>School Level</b>					
Middle School	9325	3.5 (2.7–4.4)	7.7 (6.8–8.8)	33.4 (31.5–35.3)	55.5 (53.1–57.8)
High School	10574	4.2 (3.4–5.1)	8.3 (7.6–9.1)	35.2 (33.6–36.8)	52.3 (50.6–54.0)
<b>Number of days used smokeless tobacco within past 30 days</b>					
0 days	19268	3.2 (2.7–3.8)	7.2 (6.6–7.8)	34.5 (33.2–35.8)	55.1 (53.7–56.4)
1–5 days	248	12.7 (8.5–18.7)	33.5 (27.5–40.2)	38.8 (27.5–40.2)	14.9 (11.0–19.8)
6–19 days	75	25.5 (15.3–39.3)	38.5 (28.1–50.0)	22.6 (13.5–35.2)	13.5 (6.7–25.1)
20–30 days	177	36.7 (28.5–45.6)	23.6 (16.3–32.7)	23.8 (16.2–33.4)	16 (11.6–21.6)
<b>Other (past 30-day) Tobacco Product Use</b>					
Yes	2539	9.5 (7.8–11.5)	16.2 (14.7–17.8)	33.1 (30.6–35.6)	41.3 (38.8–43.8)
No	17424	3.0 (2.5–3.6)	6.8 (6.2–7.5)	34.6 (33.2–35.9)	55.6 (54.1–57.0)
<b>Any tobacco product use by others in household</b>					
Yes	7042	4.8 (4.0–5.7)	10.8 (9.7–12.1)	35.6 (34.0–37.3)	48.8 (46.8–50.7)
No	12033	3.1 (2.5–3.7)	6.4 (5.8–7.0)	33.9 (32.3–35.5)	56.7 (55.2–58.1)
<b>HOOKAH/WATERPIPE</b>					
<b>Overall</b>	19981	5.3 (4.7–6.0)	13.4 (12.8–14.1)	35.5 (34.1–36.9)	45.8 (44.3–47.3)
<b>Sex</b>					
Male	9801	4.4 (3.7–5.2)	13.4 (12.5–14.3)	36.8 (35.4–38.1)	45.5 (43.9–47.0)
Female	9906	6.2 (5.5–7.1)	13.5 (12.6–14.4)	34.2 (32.4–36.1)	46.1 (44.2–48.0)

Characteristic	n (unweighted)	Weighted % (95% CI)			
		No Harm	Little Harm	Some Harm	A Lot of Harm
<b>Race/Ethnicity</b>					
White, non-Hispanic	8761	3.3 (2.8 – 4.0)	13.1 (12.1 – 14.1)	37.5 (35.5 – 39.5)	46.1 (44.2 – 48.0)
Black, non-Hispanic	3060	9 (8.0 – 10.2)	15.2 (13.8 – 16.7)	30.2 (28.4 – 32.0)	45.7 (43.1 – 48.2)
Hispanic	5526	7.6 (6.5 – 8.9)	15 (13.8 – 16.2)	35 (33.1 – 36.9)	42.4 (40.4 – 44.5)
Other, non-Hispanic	1614	5.2 (3.4 – 7.8)	8.7 (7.1 – 10.6)	33 (30.7 – 35.4)	53 (49.9 – 56.1)
<b>School Level</b>					
Middle School	9237	4.2 (3.6 – 5.0)	9.5 (8.8 – 10.2)	31.7 (29.7 – 33.9)	54.5 (52.3 – 56.8)
High School	10508	6.1 (5.2 – 7.2)	16.5 (15.5 – 17.5)	38.4 (36.7 – 40.7)	38.9 (37.2 – 40.7)
<b>Number of days used hookah/waterpipe within past 30 days</b>					
0 days	18715	4.4 (3.8 – 5.0)	12.6 (12.0 – 13.3)	36 (34.6 – 37.5)	46.9 (45.5 – 48.4)
1–5 days	461	20 (16.3 – 24.2)	37.9 (32.1 – 44.1)	28.8 (23.9 – 34.2)	13.4 (10.1 – 17.5)
6–19 days	123	19.3 (12.6 – 28.3)	32.3 (24.1 – 41.6)	33.4 (25.4 – 42.4)	15.1 (8.9 – 24.5)
20–30 days	116	52.5 (40.3 – 64.3)	22.2 (14.6 – 32.4)	11.8 (5.9 – 22.5)	13.5 (7.5 – 23.0)
<b>Other (past 30-day) tobacco product use</b>					
Yes	2456	13.4 (11.3 – 15.8)	25.8 (23.7 – 28.0)	34.9 (32.4 – 37.5)	26 (23.6 – 28.5)
No	17342	4.1 (3.5 – 4.7)	11.5 (10.9 – 12.2)	35.6 (34.1 – 37.1)	48.8 (47.3 – 50.3)
<b>Any tobacco product use by others in household</b>					
Yes	7007	6.7 (5.8 – 7.8)	16.6 (15.3 – 18.0)	36.2 (34.2 – 38.2)	40.5 (38.0 – 43.0)
No	11987	4.2 (3.6 – 4.9)	11.7 (10.9 – 12.5)	35.3 (33.6 – 37.0)	48.9 (47.2 – 50.5)
<b>E-CIGARETTES</b>					
<b>Overall</b>	19911	9.8 (9.0–10.7)	27.7 (26.7–28.8)	36.4 (35.4–37.5)	26.0 (24.8–27.3)
<b>Sex</b>					
Male	9853	6.7 (5.9 – 7.6)	24.7 (23.6 – 25.8)	40.8 (39.4 – 42.2)	27.9 (26.4 – 29.3)
Female	9953	13 (11.9 – 14.0)	30.8 (29.2 – 32.3)	32.2 (30.8 – 33.7)	24.1 (22.6 – 25.6)
<b>Race/Ethnicity</b>					
White, non-Hispanic	8797	7.9 (7.1 – 8.7)	29.6 (28.0 – 31.2)	38 (36.9 – 39.2)	24.5 (22.7 – 26.4)
Black, non-Hispanic	3074	14.2 (12.6 – 16.0)	25.6 (23.3 – 28.0)	31.3 (29.1 – 33.6)	28.9 (26.6 – 31.4)
Hispanic	5547	12 (10.4 – 13.9)	26.3 (24.7 – 27.8)	36.1 (34.3 – 38.0)	25.6 (24.2 – 27.0)



Characteristic	n (unweighted)	Weighted % (95% CI)			
		No Harm	Little Harm	Some Harm	A Lot of Harm
Other, non-Hispanic	1621	7.9 (6.0 – 10.3)	23.5 (20.8 – 26.4)	36.9 (34.3 – 39.5)	31.8 (28.7 – 34.9)
<b>School Level</b>					
Middle School	9283	9 (7.9 – 10.1)	24 (22.4 – 25.6)	35.8 (34.0 – 37.6)	31.3 (29.8 – 32.8)
High School	10548	10.4 (9.3 – 11.7)	30.6 (29.0 – 32.3)	37.1 (35.7 – 38.5)	21.9 (20.0 – 23.9)
<b>Number of days used e-cigarettes within past 30 days</b>					
0 days	18239	7.9 (7.1 – 8.7)	26 (25.0 – 27.1)	38.2 (37.0 – 39.4)	27.9 (26.7 – 29.2)
1–5 days	918	25 (21.6 – 28.8)	51.4 (48.1 – 54.7)	18.8 (16.1 – 21.8)	4.7 (3.3 – 6.8)
6–19 days	281	33.4 (27.4 – 40.1)	44.7 (38.2 – 51.3)	17.7 (13.2 – 23.2)	4.2 (2.3 – 7.7)
20–30 days	252	49.2 (40.4 – 58.0)	33 (25.1 – 41.9)	11.1 (6.6 – 18.1)	6.8 (4.1 – 10.9)
<b>Other (past 30-day) tobacco product use</b>					
Yes	1904	22.9 (20.6 – 25.5)	42.9 (40.4 – 45.6)	23.8 (21.5 – 26.3)	10.3 (8.6 – 12.4)
No	17600	8 (7.3 – 8.8)	26 (24.9 – 27.1)	38.2 (37.0 – 39.3)	27.9 (26.6 – 29.2)
<b>Any tobacco product use by others in household</b>					
Yes	7028	13.2 (12.0 – 14.5)	34.8 (33.4 – 36.2)	33.9 (32.6 – 35.2)	18.1 (16.7 – 19.6)
No	12015	7.5 (6.7 – 8.5)	23.8 (22.5 – 25.1)	38.0 (36.7 – 39.3)	30.7 (29.1 – 32.3)

<sup>a</sup> Respondents were asked the following separate questions: “How much do you think people harm themselves when they [smoke cigarettes; use chewing tobacco, snuff, dip, or snus; use e-cigarettes; smoke tobacco in a hookah or waterpipe] some days but not every day?” Responses for each of the four products assessed included: ‘no harm’, ‘little harm’, ‘some harm’, and ‘a lot of harm’.

<sup>b</sup> Refers to past 30-day use of other tobacco product types separate from the primary tobacco product categories of interest. The universe of products assessed in NYTS comprised the following product types: cigarettes; chewing tobacco; snuff or dip; snus; hookah/waterpipe; e-cigarettes; cigars, cigarillos or little cigars; bidis; roll-your own; pipe tobacco; dissolvables.

<sup>c</sup> Respondents were asked “Does anyone who lives with you now...?” and provided with the following response options: “smoke cigarettes”; “smoke cigars, cigarillos or little cigars”; “use chewing tobacco, snuff, or dip”; “use cigarettes, smokes tobacco in a hookah or waterpipe”; “smokes pipes filled with tobacco; snus”; “use dissolvable tobacco products”; “smoke bidis”; and “no one who lives with me now uses any form of tobacco”. Those who selected any response other than “no one who lives with me now uses any form of tobacco” were considered to have a household member use tobacco.

**Table 2**

Adjusted Prevalence Ratios (aPRs) of Current (past 30-Day) Tobacco Product Use and Perception of Harm among U.S. Youth – National Youth Tobacco Survey 2016

	<b>n (unweighted)</b>	<b>Current Tobacco Product Use aPR<sup>a</sup> (95% CI)</b>
<b>Cigarettes</b>		
No Harm	827	2.7 (2.1 – 3.4)
Little Harm	1188	2.6 (2.1 – 3.3)
Some Harm	6363	1.7 (1.4 – 1.9)
A lot of harm	11631	Ref
<b>Smokeless Tobacco</b> (chewing, snuff, dip, snus)		
No Harm	854	5.6 (4.3 – 7.2)
Little Harm	1577	4.4 (3.5 – 5.5)
Some Harm	6636	2.0 (1.6 – 2.5)
A lot of harm	10914	Ref
<b>Hookah or Waterpipe</b>		
No Harm	1122	6.3 (4.6 – 8.7)
Little Harm	2712	3.8 (2.8 – 5.1)
Some Harm	6894	1.9 (1.4 – 2.5)
A lot of harm	9090	Ref
<b>E-cigarettes</b>		
No Harm	2067	8.0 (5.7 – 11.4)
Little Harm	5494	4.7 (3.2 – 6.8)
Some Harm	7059	2.0 (1.4 – 2.9)
A lot of harm	5291	Ref

<sup>a</sup> Adjusted prevalence ratios (aPRs) of the association between current tobacco use and harm perceptions were calculated using multivariable logistic regression with predicted marginals. Models adjusted for sex (male, female); school level (middle school, high school), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and non-Hispanic other), current (past 30-day) use of other tobacco products (cigars, cigarillos or little cigars; bidis; roll-your own; pipe tobacco; dissolvables), and tobacco use by a household member (yes, no).