AWARENESS AND EVER USE OF “HEAT-NOT-BURN” TOBACCO PRODUCTS AMONG U.S. ADULTS, 2017

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Introduction: Heated tobacco products, sometimes marketed as “heat-not-burn” technology, represent a diverse class of products that heat leaf tobacco to produce an inhaled aerosol. Global sales of heated tobacco products are increasing; however, the extent of current heated tobacco product awareness and use in the U.S. is unknown. This study assessed awareness and ever use of heated tobacco products among U.S. adults.

Methods: Data were obtained from the 2017 SummerStyles, an Internet survey of U.S. adults aged ≥18 years (N=4,107). Respondents were given a description of heated tobacco products, then asked about awareness and ever use. In 2017, descriptive statistics were calculated overall and by sex, age, race/ethnicity, and cigarette smoking status. Logistic regression was used to calculate AORs.

Results: In 2017, a total of 5.2% of U.S. adults were aware of heated tobacco products, including 9.9% of current cigarette smokers. Overall, 0.7% of U.S. adults, including 2.7% of current smokers, reported ever use of heated tobacco products. Odds of ever use were higher among current smokers (AOR=6.18) than never smokers, and higher among adults aged <30 years (AOR=3.35) than those aged ≥30 years.

Conclusions: As of July 2017, few U.S. adults had ever used heated tobacco products; however, about one in 20 were aware of the products, including one in ten cigarette smokers. The uncertain impact of heated tobacco products on individual- and population-level health warrants timely and accurate public health surveillance. These first estimates among U.S. adults can serve as a key baseline measure.
Table 1. Awareness and Ever Use of “Heat-Not-Burn” Tobacco Products Among U.S. Adults, 2017

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Awareness of “heat-not-burn” tobacco products</th>
<th>Ever use of “heat-not-burn” tobacco products</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>% (95% CI) AOR (95% CI)</td>
</tr>
<tr>
<td>Overall</td>
<td>3,536</td>
<td>5.2 (4.4, 6.1) –</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1,841</td>
<td>3.7 (2.7, 4.6) ref</td>
</tr>
<tr>
<td>Male</td>
<td>1,695</td>
<td>7.0 (5.6, 8.4) 1.86 (1.31, 2.65)</td>
</tr>
<tr>
<td>Age, years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 30</td>
<td>3,048</td>
<td>4.6 (3.8, 5.4) ref</td>
</tr>
<tr>
<td>&lt; 30</td>
<td>488</td>
<td>7.6 (5.0, 10.2) 1.57 (1.00, 2.46)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>2,628</td>
<td>5.1 (4.1, 6.0) ref</td>
</tr>
<tr>
<td>Other</td>
<td>908</td>
<td>5.6 (3.9, 7.2) 1.05 (0.72, 1.53)</td>
</tr>
<tr>
<td>Cigarette smoking status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never smoker</td>
<td>2,052</td>
<td>4.9 (3.8, 5.9) ref</td>
</tr>
<tr>
<td>Former smoker</td>
<td>968</td>
<td>3.7 (2.3, 5.0) 0.80 (0.50, 1.27)</td>
</tr>
<tr>
<td>Current smoker</td>
<td>459</td>
<td>9.9 (6.8, 12.9) 2.10 (1.37, 3.22)</td>
</tr>
</tbody>
</table>

Note: Boldface indicates statistical significance (p<0.05).

aDefined as a response of yes to the question, “Heat-not-burn” tobacco products heat tobacco sticks or capsules to produce an aerosol or “vapor.” They are different from electronic vapor products such as e-cigarettes, which heat a liquid to produce an aerosol or “vapor.” Some brands of “heat-not-burn” tobacco products include iQOS, glo, Ploom TECH, and Revo. Before today, have you heard of “heat-not-burn” tobacco products?
bDefined as a response of yes to the question, Have you ever tried a “heat-not-burn” tobacco product, even just one time? Those who reported don’t know or did not respond (n=3) were excluded.
cORs calculated using logistic regression adjusting for sex, age, race/ethnicity, and smoking status.
dIncludes Hispanics, non-Hispanic blacks, non-Hispanic other minorities, and non-Hispanic respondents with multiple races.
eCurrent smokers are defined as respondents who self-reported having smoked at least 100 cigarettes in their lifetime and currently smoked some days or every day. Former smokers are defined as respondents who reported having smoked at least 100 cigarettes within their lifetime, and currently smoked not at all. Never smokers are defined as those who smoked fewer than 100 cigarettes within their lifetime.

METHODS

Study Sample

Data came from SummerStyles, an Internet survey of U.S. adults aged ≥ 18 years (N=4,107) fielded by Porter Novelli during June–July 2017. Respondents were drawn from GfK’s Knowledge-Panel®, and data were weighted to be nationally representative and match U.S. Current Population Survey proportions based on gender, age, household income, race/ethnicity, household size, education, Census region, and metro status.6,7 As this study analyzed de-identified, secondary data, human subjects review was not required.

Measures

Respondents were asked, “Heat-not-burn” tobacco products heat tobacco sticks or capsules to produce an aerosol or “vapor.” They are different from electronic vapor products such as e-cigarettes, which heat a liquid to produce an aerosol or “vapor.” Some brands of “heat-not-burn” tobacco products include iQOS, glo, Ploom TECH, and Revo. Before today, have you heard of “heat-not-burn” tobacco products? Those who responded yes were asked, Have you ever tried a “heat-not-burn” tobacco product, even just one time? Descriptive statistics were calculated overall and by sex, age, race/ethnicity, and cigarette smoking status. Logistic regression was used to calculate AORs. Analyses were conducted in 2017 using R, version 3.2.3.

RESULTS

In 2017, a total of 5.2% (95% CI=4.4%, 6.1%) of U.S. adults were aware of HTPs (Table 1). By sex, prevalence of HTP awareness was 3.7% (95% CI=2.7%, 4.6%) among females and 7.0% (95% CI=5.6%, 8.4%) among males. By age, awareness was 4.6% (95% CI=3.8%, 5.4%) among adults aged ≥ 30 years and 7.6% (95% CI=5.0%, 10.2%) among adults aged < 30 years. By race/ethnicity, awareness was 5.1% (95% CI=4.1%, 6.0%) among non-Hispanic whites and 5.6% (95% CI=3.9%, 7.2%) among other racial/ethnic groups. By smoking status, awareness was 3.7% (95% CI=2.3%, 5.0%) among former smokers, 4.9% (95% CI=3.8%, 5.9%) among never smokers, and 9.9% (95% CI=6.8%, 12.9%) among current cigarette smokers. The adjusted odds of awareness were significantly higher among males than females (AOR=1.86, 95% CI=1.31, 2.65); adults aged < 30 years were higher (AOR=1.57, 95% CI=1.00, 2.46) than those aged ≥ 30 years; and current cigarette smokers were higher than never smokers (AOR=2.10, 95% CI=1.37, 3.22).

Overall, 0.7% (95% CI=0.4%, 1.0%) of U.S. adults reported ever use of HTPs. By sex, prevalence of ever use was 0.6% (95% CI=0.2%, 1.0%) among females and 0.8% among males.
(95% CI=0.3%, 1.3%) among males. By age, ever use was 0.5% (95% CI=0.2%, 0.7%) among adults aged ≥30 years and 1.6% (95% CI=0.4%, 2.7%) among adults aged <30 years. By race/ethnicity, ever use was 0.5% (95% CI=0.2%, 0.8%) among non-Hispanic whites and 1.0% (95% CI=0.3%, 1.7%) among other racial/ethnic groups. By smoking status, ever use was 0.5% (95% CI=0.2%, 0.9%) among never smokers and 2.7% (95% CI=1.0%, 4.4%) among current cigarette smokers. The adjusted odds of ever use were significantly higher among adults aged <30 years compared with those aged ≥30 years (AOR=3.35, 95% CI=1.27, 8.81) and higher among current cigarette smokers than never smokers (AOR=6.18, 95% CI=2.28, 16.75).

DISCUSSION

As of July 2017, about one in 20 U.S. adults were aware of HTPs, including one in ten cigarette smokers. Overall, ever use of HTPs was rare, but more prevalent among adults under age 30 years and current cigarette smokers. HTPs have been projected to displace a significant proportion of global cigarette sales by 2025.1 These projections are based on rapid sales growth in Japan, where Philip Morris International’s “iQOS” HTP occupied 16.7% share, by volume, of the combined market for cigarettes and HTPs as of January 2018.1,3,8 Given the uncertain impact of HTPs on individual- and population-level health, timely and accurate public health surveillance is critical to monitor emerging trends. These are the first estimates of awareness and ever use of HTPs among U.S. adults, which can serve as a key baseline measure once new HTPs become available in the U.S. CDC similarly leveraged SummerStyles to track the first national trends in adult e-cigarette awareness and use, demonstrating the utility and importance of conducting surveillance of emerging use patterns to inform tobacco control policy, planning, and practice.9 The present study can also inform the development of questions in complementary surveillance systems of youth and adults at the national and subnational levels.

Limitations

This study is subject to at least three limitations. First, SummerStyles is not a population-based probability survey. However, data are weighted to be nationally representative, and prior Styles estimates of tobacco use align closely with other large cross-sectional surveys.9,10 Second, small sample sizes for some demographic subgroups resulted in unstable estimates that were not presented. Third, these self-reported responses may be subject to reporting bias.

In addition to continued surveillance, independent research could help to answer fundamental questions about HTPs, including occurrence of complete or incomplete combustion and appropriateness of “heat-not-burn” terminology. To date, tobacco industry-funded studies of HTPs have reached contradictory conclusions, and as noted by the Surgeon General, the tobacco industry has a well-documented record of manipulating scientific information and the extent of the harms of cigarette smoking.11 Although studies funded by Philip Morris International for its “iQOS” HTP conclude that the products present lower risks than cigarettes and do not negatively impact indoor air quality,12,13 a study funded by Imperial Tobacco Group of the iQOS concluded that the product releases sidestream emissions and that HTPs should fall under the same indoor use restrictions as cigarettes.14 The first independent analysis of the “iQOS” HTP detected carbon monoxide and volatile organic compounds in emissions.5 Additional research on constituents of mainstream and sidestream emissions across the full spectrum of HTPs; use patterns among youth and adult non-tobacco users, current smokers, and former smokers; and any potential for these products to reduce tobacco-related disease risks among adult smokers could help guide the development and implementation of both clinical and population-based tobacco control strategies.

CONCLUSIONS

Despite limited literature on HTPs, decades of evidence support efforts to prevent youth access to and use of any tobacco product, including HTPs, and to prevent indoor exposure to secondhand tobacco product emissions.15 The rapidly changing landscape of tobacco product marketing, sales, and use requires continued awareness and monitoring by diverse stakeholders, including researchers, public health practitioners, healthcare providers, and policymakers. The present study represents an important initial component of a comprehensive research effort to inform strategies to maximize any potential benefits and minimize risks of these products on the public’s health.

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KM developed the concept for the paper, interpreted the results, wrote the first draft, and reviewed and revised subsequent drafts of the paper; TW analyzed the data, interpreted the results, contributed to writing, and reviewed drafts; BK, IA, ER, and CG interpreted results, contributed to writing, and reviewed...
drafts. All authors approved the final version of the manuscript for submission.

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REFERENCES


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