Smoking and Mental Health: Associations between Adolescent E-cigarette Use and Feelings and Behaviors toward Suicide

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**INTRODUCTION**

- Tobacco use remains a principal cause of morbidity and mortality in the U.S., and often begins in teenage years.¹
- Electronic cigarette use among adolescents promotes nicotine dependence and results in more dangerous combustible tobacco use.²
- Smoking has been found to predict suicidal ideation and behavior among adolescents.³
- Suicide is also the second leading cause of death among high school-aged youths 14–18 years, and between 2009–2018, suicide rates among this age group increased by 6.0 to 9.7 per 100,000 population.⁴
- This study examined the association between current adolescent e-cigarette use and suicidal feelings and behaviors, compared to non-e-cigarette users.

**METHODOLOGY**

- Cross-sectional analysis of data from the 2019 National Youth Risk Behavior Survey (NYRBS).
- 13,677 respondents completed the NYRBS and of these 11,929 were between 13 and 17 years of age and qualified for the study.
- 11,172 answered whether they currently used e-cigarettes, and this was the final sample size used in the study.
- Current e-cigarette users were defined as those who reported 1) having ever used an electronic vapor product, and 2) used an electronic vapor product in the past 30 days prior to the survey.
- The measure for feelings toward suicide was how often respondents reported having 1) ever seriously considered attempting suicide, 2) made a plan to attempt suicide, 3) actually attempted suicide, and 4) needed to be treated by a doctor or nurse after an injurious suicide attempt.
- Descriptive statistics to characterize the sample population. Chi-square analysis to determine differences between current and non-e-cigarette users.

**RESULTS**

**Demographic Characteristics of the Sample**

- **Figure 1. Age**
  - Male 48%
  - Female 52%

- **Figure 2. Sex**
  - Missing 1%

- **Figure 3. Race**
  - White 60%
  - Others 4%

- **Figure 4. Grade Level**
  - High School 51%
  - College 49%

- **Figure 5. Ever Electronic Cigarette Use**
  - Yes 46%

- **Figure 6. Current Electronic Cigarette Use (1-30 days)**
  - Yes 59%

**RESULTS (CONT.)**

<table>
<thead>
<tr>
<th>Feeling sad or helpless</th>
<th>E-cig users (n=3,459)</th>
<th>Non-E-Cig Users (n=7,713)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1,636 (14.6%)</td>
<td>2,355 (21.1%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>No</td>
<td>1,764 (15.8%)</td>
<td>5,269 (47.2%)</td>
<td></td>
</tr>
</tbody>
</table>

**Considered attempting suicide**

- Yes 955 (8.5%)
- No 2,447 (21.9%)

**Made a suicide plan**

- Yes 789 (7.1%)
- No 2,598 (23.3%)

**Attempted suicide**

- Yes 416 (3.7%)
- No 2,280 (20.4%)

**Had an injurious suicide attempt**

- Yes 102 (0.9%)
- No 227 (2.0%)

* p < 0.05 considered significant

**CONCLUSIONS**

- This study found that electronic cigarette users were more likely to report suicide-related feelings and behaviors, compared to nonusers.
- These results should inform targeted prevention and cessation interventions to discourage electronic cigarette use and address mental health among adolescents.
- Further, longitudinal studies remain important to better understand electronic cigarette use and its long-term influence on mental health.

**References:**


This research project was supported through the LSU Health Sciences Center, School of Medicine.
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METHODOLOGY

Design
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Sample
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- 11,172 answered whether they currently used e-cigarettes, and this was the final sample size used in the study.
- **Current e-cigarette users** were defined as those who reported 1) having ever used an electronic vapor product, and 2) used an electronic vapor product in the past 30 days prior to the survey.

Measures
- The measure for feelings toward suicide was how often participants reported feeling hopeless or sad every day for two weeks, within the past twelve months.
- Measures of suicide behavior were how often responders reported having 1) ever seriously considered attempting suicide, 2) made a plan to attempt suicide, 3) actually attempted suicide, and 4) needed to be treated by a doctor or nurse after an injurious suicide attempt.

Analysis
- Descriptive statistics to characterize the sample population.
- Chi-square analysis to determine differences between current and non-e-cigarette users.
RESULTS

Demographic Characteristics of the Sample

Figure 1. Age

Figure 2. Sex
Figure 5. Ever Electronic Cigarette Use

Figure 6. Current Electronic Cigarette Use (1-30 days)
## RESULTS (CONT.)

**Table 1.** Results of Chi-square Analysis Assessing the Relationship between Smoking Status and Feelings and Behaviors Toward Suicide

<table>
<thead>
<tr>
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<td>p&lt;0.001*</td>
</tr>
<tr>
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<td>5,269 (47.2%)</td>
<td></td>
</tr>
<tr>
<td>Considered attempting suicide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>955 (8.5%)</td>
<td>1,180 (10.6%)</td>
<td>p&lt;0.001*</td>
</tr>
<tr>
<td>No</td>
<td>2,447 (21.9%)</td>
<td>6,454 (57.8%)</td>
<td></td>
</tr>
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<td>Made a suicide plan</td>
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<td></td>
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<tr>
<td>Yes</td>
<td>789 (7.1%)</td>
<td>968 (8.7%)</td>
<td>p&lt;0.001*</td>
</tr>
<tr>
<td>No</td>
<td>2,598 (23.3%)</td>
<td>6,670 (59.7%)</td>
<td></td>
</tr>
<tr>
<td>Attempted suicide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>416 (3.7%)</td>
<td>413 (3.7%)</td>
<td>p&lt;0.001*</td>
</tr>
<tr>
<td>No</td>
<td>2,280 (20.4%)</td>
<td>5,518 (0.0%)</td>
<td></td>
</tr>
<tr>
<td>Had an injurious suicide attempt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>102 (0.9%)</td>
<td>68 (0.6%)</td>
<td>p&lt;0.001*</td>
</tr>
<tr>
<td>No</td>
<td>227 (2.0%)</td>
<td>255 (2.3%)</td>
<td></td>
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* p < 0.05 considered significant
CONCLUSIONS

• This study found that electronic cigarette users were more likely to report suicide-related feelings and behaviors, compared to nonusers.

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