Feasibility of a Remotely-Delivered Contingency Management Intervention for Nicotine Vaping Abstinence among Young Adults

Bethany R. Raiff, PhD, BCBA-D
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  – Jack Bowker
  – Mariana Cardenas
  – Schyler Newman
  – Caitlyn Upton
  – Connor Burrows
Vaping Prevalence in Young Adults

- Young adults 18-20 years old (Cwalina et al, 2020)
  - 45% lifetime use
  - 27% past 30-day use

- Similar prevalence of vaping in college students living in rural, South-central Appalachia (Omoike & Johnson, 2021)
  - 43%
Why focus on vaping cessation?

- Unknown health effects
  - EVALI
- Pathway to combustible cigarette/ cannabis use
- Interest in quitting
What can we do about it?

- **Contingency management**: Deliver incentives **immediately** to individuals contingent on **objective evidence** of healthy behavior.
Contingency Management
Recruitment site: Rowan University

- Glassboro, NJ
  - Population ~20,000

- Rowan University
  - Student Population ~15,000
Methods | recruitment

Inclusion Criteria
- Vaping for at least 25 of the past 30 days, for at least 6 mos
- Not using other nicotine products
- <35 years of age
- Desire to quit vaping
- Internet and video-conferencing capability, using Doxy.me
Methods | recruitment

Recruitment took place from February-March 2020

- Recruited through university listserv e-mail
- 50 students screened
- 22 met inclusion criteria
- 8 enrolled
### Methods | Participant Demographics

#### Table 1

**Participant Demographics**

<table>
<thead>
<tr>
<th>Participants</th>
<th>V01</th>
<th>V02</th>
<th>V03</th>
<th>V04</th>
<th>V05</th>
<th>V06</th>
<th>V07</th>
<th>V08</th>
<th>Mean or %</th>
<th>St. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>22</td>
<td>18</td>
<td>22</td>
<td>20</td>
<td>19</td>
<td>19</td>
<td>20</td>
<td>19</td>
<td>19.88</td>
<td>1.46</td>
</tr>
<tr>
<td>Gender</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>M</td>
<td>63 (F)</td>
<td>N/A</td>
</tr>
<tr>
<td>Race</td>
<td>White</td>
<td>White</td>
<td>White</td>
<td>White</td>
<td>White</td>
<td>White</td>
<td>White</td>
<td>White</td>
<td>100 (W)</td>
<td>N/A</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Non-hispanic</td>
<td>Hispanic</td>
<td>Non-hispanic</td>
<td>Non-hispanic</td>
<td>Non-hispanic</td>
<td>Non-hispanic</td>
<td>Non-hispanic</td>
<td>Hispanic</td>
<td>25 (Hisp)</td>
<td>N/A</td>
</tr>
<tr>
<td>Age first vaped</td>
<td>19</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>16</td>
<td>16.75</td>
<td>1.16</td>
</tr>
<tr>
<td># Years vaping</td>
<td>1.5</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2.56</td>
<td>1.12</td>
</tr>
<tr>
<td>Vaping (VAP) dependence score</td>
<td>19</td>
<td>4</td>
<td>13</td>
<td>16</td>
<td>14</td>
<td>17</td>
<td>11</td>
<td>17</td>
<td>13.88</td>
<td>4.73</td>
</tr>
<tr>
<td>Flavored vape</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>100 (Y)</td>
<td>N/A</td>
</tr>
<tr>
<td>Black market</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>25 (Y)</td>
<td>N/A</td>
</tr>
<tr>
<td>Desire to quit</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>8.5</td>
<td>8.69</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>(10 = very much)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vape anything other than nic</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>50 (Y)</td>
<td>N/A</td>
</tr>
<tr>
<td>History with combustible cigs</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>25 (Y)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Note.* Black Market refers to vaping cartridge or solutions purchased from a non-reputable source.
Methods | Covid Impacts

- Rowan University Covid-19 lockdown – March 12, 2020
  - 50% recruited pre-lockdown

- Always designed to be remotely delivered – easy pivot
  - Strength for participants living in rural environments
Verification of Vaping Status

Salivary Cotinine
• Primary outcome based on Alere iScreen
  • binary outcome

• NicAlert
  • semi-quantitative
Methods | Procedure

2 days

4 days

6 days

Multiple Baseline

- Randomly determined BL
- $3/submission
- 1-3 depending on duration
- No abstinence goals

14 days

Abstinence Induction

Escalating schedule with reset

- $3 + $2
- $3 + $7
- $3 + $12
- $3 + $17
- $3 + $22
- $3 + $27
- $3 + $32

Total: $140
Video Calls

• 20 minutes
• NicAlert submitted first
• iScreen submitted second
• Calls included
  – Counseling (Motivational Interviewing)
  – Social support and encouragement
  – Discussing problems and stressors
Results | Alere iScreen

- 72 scheduled samples
- 1 invalid
- 0 missed
Results

iScreen

NicAlert
Treatment Acceptability

• Intervention was rated convenient, effective, fair
• Would recommend to a friend
• Every other day, 20-min meetings were “just right”
• 40% of participants thought it should be longer than 14-days
• 75% would use treatment again if needed in the future
• Supportive staff and every other day calls (63%) were best part of the intervention
Participant Perspective

- **iScreen vs NicAlert**
  - Easier to use (9.75 vs 7.38)
  - More accurate (9.13 vs 6.5)
  - Liked more (9.63 vs 7.25)

- Some potential advantages to NicAlert, but not sure if they are worth the costs
Discussion and Considerations

• It is feasible, and potentially effective, to use CM for vaping abstinence

• Value of 20-min telemedicine calls
  – Asynchronous delivery

• Access to broadband internet & technology
  – Low income populations
  – Rural areas
Future Plans

• Co-use/ substitution with other nicotine and/or non-nicotine products
  – Cotinine will not distinguish nicotine source
    • Addresses concerns raised by Dr. Siegel’s talk yesterday
  – V01 reported using CBD during quit attempt
  – V03 reported using marijuana

• Long-term maintenance

• Accessibility of technology is an issue
The Feasibility, Acceptability, and Initial Efficacy of a Remotely Delivered, Financial-Incentive Intervention to Initiate Vaping Abstinence in Young Adults

Bethany R. Raiff, Schyler T. Newman, Caitlyn R. Upton, and Connor A. Burrows
Department of Psychology, Health and Behavioral Integrated Treatments (HABIT) Research Unit, Rowan University
THANK YOU!

Questions?
Contact: raiff@rowan.edu