ENDS users who call quitlines: Surveillance Data and Research Findings

Katrina Vickerman, Laura Beebe, Gillian Schauer, Brian King, & Brooke Magnusson
Introduction

- 36% of smokers have used ENDS
- 31% of quitline callers have ever used ENDS
- 10% using ENDS at quitline registration

Little known about experiences and beliefs of ENDS users who call state quitlines.
Four Studies

1. ENDS Registration Data from 25 State Quitlines
2. Oklahoma Helpline: 7-month Outcomes
3. Commercial Quitlines: 6-month Outcomes
4. Qualitative Interviews with Oklahoma Helpline callers who smoke and use ENDS
1. ENDS Registration Data

- 25 State Quitlines
Quitline ENDS Registration Data

• Current ENDS use? 9.6% at registration

• Type? 51% tank system, 28% cartridge, 15% disposable, 7% does not know (DNK)

• Frequency? 36% using every day (vs. some days)

• Reason for use? 47% quit other tobacco, 38% cut down on other tobacco, 15% neither

• Plan to quit ENDS? 90% yes, 6% DNK, 4% no

N = 446,282

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% Current ENDS Use by State

Average 9.6%

N = 446,282
% Current ENDS use Oct ’13 – Jul ‘15

N = 446,282
2. Oklahoma Helpline: 7-month Outcomes
Outcomes among E-cigarette Users and Non-Users Registering with the Oklahoma Tobacco Helpline

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NACQ Conference 2015
August 18, 2015
Acknowledgments

• Co-Authors: Ted Wagener, PhD, Stephen Gillaspy, PhD and Lindsay Boeckman, MS
• Professional Data Analysts, Inc.
• Oklahoma Tobacco Settlement Endowment Trust
Purpose

• To explore the use of e-cigarettes by Helpline callers between time of registration (intake) and 7-month follow-up
• To compare Helpline service utilization among e-cigarette users and non-users
• To examine quit outcomes among e-cigarette users and non-users at the 7-month follow-up
Methods

- Sample of registrants from December 2013 to April 2014
- 7-month follow-up conducted from July through October 2014
- N=298 e-cigarette users at registration
- N=332 non-users at registration
- Response proportions = 50.2% for e-cigarette sample and 51.3% for non-user sample
Transitions in E-cigarette Use during Follow-Up

E-cigarette users (n=298)
- 172 non-users (57.7%)
- 126 E-cigarette users (42.3%)
  - 106 Dual users (35.6%)

E-cigarette non-users (n=332)
- 283 non-users (85.2%)
- 49 E-cigarette users (14.8%)
  - 35 Dual users (10.5%)

Dual use = both combustible and e-cigarettes
Helpline Service Utilization

- **Call Program**
  - Multiple: 70.8
  - Single: 29.2

- **NRT from Helpline**
  - None: 5.7
  - 2-weeks: 39.3
  - 4-weeks: 31.9
  - 8-weeks: 23.2

**EC user**
- Multiple: 75.4
- Single: 24.6

**EC non-user**
- Multiple: 70.8
- Single: 29.2

**Statistics**
- Call Program: $p = 0.20$
- NRT from Helpline: $p = 0.33$
Mean # calls completed: 2.27 among E-cigarette users and 2.29 among non-users (p=0.93)
## Quit Outcomes: 30-day Point Prevalence Abstinence

<table>
<thead>
<tr>
<th>E-cigarette Use Category</th>
<th>N</th>
<th>30-day ppa (responder)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No at intake/No at follow-up</td>
<td>283</td>
<td>36.4%</td>
</tr>
<tr>
<td>No at intake/Yes at follow-up</td>
<td>49</td>
<td>28.6%</td>
</tr>
<tr>
<td>Yes at intake/No at follow-up</td>
<td>172</td>
<td>33.7%</td>
</tr>
<tr>
<td>Yes at intake/Yes at follow-up</td>
<td>126</td>
<td>15.9%</td>
</tr>
</tbody>
</table>

\[ p=0.004 \]

ITT ppa for e-cig users at intake = 12.9%

ITT ppa for non-users at intake = 18.8%
## Quit Outcomes: Odds of 30-day quit at 7-month follow-up

<table>
<thead>
<tr>
<th>E-cigarette Use Category</th>
<th>OR* (adjusted)</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No at intake/No at follow-up</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No at intake/Yes at follow-up</td>
<td>0.93</td>
<td>(0.45-1.95)</td>
<td></td>
</tr>
<tr>
<td>Yes at intake/No at follow-up</td>
<td>1.00</td>
<td>(0.64-1.57)</td>
<td></td>
</tr>
<tr>
<td>Yes at intake/Yes at follow-up</td>
<td>0.37</td>
<td>(0.20-0.67)</td>
<td>0.0082</td>
</tr>
</tbody>
</table>

*Model adjusted for gender, race, insurance status, home smoking policy, cpd at registration, TTFC at registration, mental health disorder, Helpline call program and NRT from the Helpline
Conclusions

• E-cigarette use was common among Helpline registrants, and transitions in the use of e-cigarettes occurred during the 7-month follow-up.
• At the 7-month follow-up, dual use was occurring in more than 1/3 of e-cigarette users at intake, and more than 10% of non-users at intake.
• E-cigarette use did not reduce Helpline service utilization. Both groups had similar levels of calls completed and NRT sent by the Helpline.
• E-cigarette use at registration and follow-up significantly reduced quit success at the 7-month follow-up.
Questions?

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3. Commercial Quitlines: 6-month outcomes
Reasons for Electronic Nicotine Delivery System use and smoking abstinence at 6 months: A descriptive study of callers to employer and health plan-sponsored quitlines

Katrina Vickerman, Gillian Schauer, Ann Malarcher, Lei Zhang, Paul Mowery, & Chelsea Nash

The findings and conclusions in this report are those of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

Funding: CDC OSH Contract #200-2013-M-57025
Objectives

Describe cigarette smoking abstinence among employer or health plan-sponsored quitline registrants based on current ENDS use status at registration:

- Not using electronic nicotine delivery systems (ENDS)
- Using ENDS to quit smoking
- Using ENDS for other reasons
Methods

- \( N = 6,029 \) quitline callers
- Inclusion criteria:
  - aged \( \geq 18 \)
  - Smoked cigarettes at baseline
  - \( \geq 1 \) counseling call completed
  - Responded to baseline ENDS questions
  - Completed 6-month follow-up survey (response rate: 52.4%)
- Outcome:
  - 30-day smoking point prevalence quit rate (PPQR) at 6-month follow-up
  - ENDS-only users were considered quit at follow-up
- Analysis
  - Logistic regression controlling for sex, chronic health conditions, dependence, client type, call completion, use of cessation medications
  - Weighted for response bias
Results

At registration, 13.8% of respondents currently used ENDS

7.9% to quit cigarette smoking
5.9% for other reasons (primarily cut down on cigarettes)

Callers using ENDS for other reasons were less likely to quit than other groups (adjusted Odds Ratios = 0.65-0.77)
At Registration:

Not using ENDS (n=4,974)

Using ENDS to quit (n=460)

Using ENDS for other reasons (n=337)

Limited to callers who responded to current smoking and ENDS use questions on the 6-month survey.
Conclusions

- ENDS users not using ENDS specifically to quit smoking at registration were less likely to be cigarette abstinent at 6-month follow-up compared to callers not using ENDS and callers using ENDS to quit.

- Incorporating reasons for ENDS use may be important for future studies on cessation.
For more information please contact Katrina Vickerman

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Visit: www.alerewellbeing.com

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4. Qualitative Interviews with Oklahoma Helpline callers who smoke and use ENDS
Electronic Nicotine Delivery System (ENDS) Use and Beliefs: Qualitative Interviews with 40 Quitline Callers

Katrina Vickerman, PhD, Laura Beebe, PhD, Gillian Schauer, PhD, MPH, Brian King, PhD, MPH, Brooke Magnusson, MA

The findings and conclusions in this report are those of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.
Collaborators

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- Brooke Magnusson, MA
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- Erica Salmon

University of Oklahoma Health Sciences Center:
- Laura Beebe, PhD
- Dana Mowls, MPH
- Lacy Brame
- Michelle Hopkins

Centers for Disease Control and Prevention:
- Gillian Schauer, PhD MPH
- Brian King, PhD, MPH
- Ann Malarcher, PhD

Funding: CDC OSH #200-2014-M-60619, Oklahoma Tobacco Settlement Endowment Trust
Objectives

To assess the following topics among current ENDS users who contacted a state quitline for help quitting smoking:

- Current ENDS, Nicotine Replacement Therapy (NRT), and cigarette use and intentions for continued use
- **Experiences** using ENDS
- **Beliefs** about ENDS, NRT, and cigarettes
- Non-quitline sources of ENDS information
- **Reactions** to ENDS conversations with quitline
METHODS
Study Participants

Inclusion Criteria

- Current ENDS users at OKHL Registration
- Enrolled Nov 2014 – Feb 2015
- Completed at least 1 coaching call
- Consented to evaluation follow-up
- Current cigarette smoker
- English speaking
- Age 18+
- Not pregnant

Final Sample

- 40 completed interviews (61.5% response rate)

Incentive

- $49 gift card to Walmart or Amazon
Interviews and Analysis

45 minute semi-structured interview by phone

Experienced interviewers from OUHSC

1-month post-registration

Coding informed by template analysis and grounded theory

Reliability established by double-coding and consensus meetings
RESULTS

Participants
Participant Characteristics

- 45 years old (mean)
- 65% female
- 73% White, non-Hispanic
- 45% <$10K annual household income
- 73% HS diploma +
- 53% 1+ chronic condition
- 63% 1+ mental health condition

Dependence
- 16 cigarettes per day (mean)
- 45% first cigarette within 5 minutes
- 70% smoked 20+ years

Program Engagement
- 83% in 5-call program
- 1.7 calls (mean)
- 100% sent NRT

Total N = 40
ENDS Data Reported at Registration

Daily ENDS users \((n=19)\)

Reasons for Using ENDS reported at Interview

- **Quit smoking** \((n=21)\)
- **Cut down to quit smoking** \((n=13)\)
- **Cut down only** \((n=3)\)

2 used ENDS when can’t smoke, 1 used ENDS around kids

Thinking about quitting ENDS \((n=37)\)

Total \(N = 40\)
Number using Product Combination at Interview

<table>
<thead>
<tr>
<th>Product Combination</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarettes &amp; ENDS</td>
<td>10</td>
</tr>
<tr>
<td>Cigarettes, ENDS, &amp; NRT/Meds</td>
<td>9</td>
</tr>
<tr>
<td>Cigarettes only</td>
<td>7</td>
</tr>
<tr>
<td>Cigarettes &amp; NRT/Meds</td>
<td>6</td>
</tr>
<tr>
<td>ENDS &amp; NRT/Meds</td>
<td>4</td>
</tr>
<tr>
<td>ENDS only</td>
<td>2</td>
</tr>
<tr>
<td>NRT/Meds only</td>
<td>2</td>
</tr>
</tbody>
</table>

Total $N = 40$
Beliefs About How ENDS Changed Smoking

Almost all said “ENDS helped quit or cut down”

- Helped quit: 7
- Quit temporarily: 5
- Quit temporarily; now cut down: 2
- Cut down but not quit: 21
- Conflicting response: 1
- No change or smoking more: 4

Total N = 40
RESULTS

Interview Themes
Framework of Interview Themes

Users bring their own background, knowledge, and beliefs

ENDS users are a diverse group

Many sources of ENDS information

Relative Harms of Products

Impacts their assessment of products and information

Importance of Experience

Cognitive Appraisals of Products

Leads to different strategies that make up their Quit Plan

Adaptive Quit Strategies

Maladaptive Quit Strategies

Which may impact long-term outcomes
Framework of Interview Themes

Users bring their own background, knowledge, and beliefs

Impacts their assessment of products and information

Relative Harms of Products

ENDS users are a diverse group

Which may impact long-term outcomes

Leads to different strategies that make up their Quit Plan

Adaptive Quit Strategies

Maladaptive Quit Strategies

Self Directed

Quitline Influence

ENDS information leads to different strategies that make up their Quit Plan

Which may impact long-term outcomes

Self Directed Quitline Influence

ENDS Information
Theme #1: ENDS Users are diverse group

- 0–10+ previous quit attempts
- Open to multiple quit strategies
- Range in motivation & quit readiness
- Varied cessation medication experience
ENDS Users are diverse group

Theme #1: ENDS Users are diverse group

- 0 – 10+ previous quit attempts
- Open to multiple quit strategies
- Range in motivation & quit readiness
- Varied cessation medication experience

Range in # of previous attempts:
- None
- 1 to 2
- 3 to 4
- 5 or more
ENDS Users are diverse group

- 0 – 10+ previous quit attempts
- Open to multiple quit strategies
  - All sent NRT
  - Many using or planning to use multiple cessation methods
- Range in motivation & quit readiness
- Varied cessation medication experience
ENDS Users are diverse group

Theme #1: 🧪

- 0 – 10+ previous quit attempts
- Open to multiple quit strategies
- Range in motivation & quit readiness
- Varied cessation medication experience

“I want to quit because of my grand babies... problems breathing and stuff so I know I need to quit [smoking].”

“I question myself all the time ‘Am I really serious?’... Or are you just telling your doctors...that [you] want to quit?”
ENDS Users are diverse group

Varied cessation medication experience

Good or helpful (n=13)

“Yes the patch is excellent because it takes the edge off.”

Mixed (n=23)

“Chantix worked for me but sometimes [insurance] wouldn’t pay for it and I can’t afford it...My system on the patch – it rejects it.”

Not good or helpful (n=3)

“I have tried patches, the gum, the lozenges, and everything else and nothing has worked.”

Total N = 40
ENDS Users are diverse group

- 0 – 10+ previous quit attempts
- Open to multiple quit strategies
- Range in motivation & quit readiness
- Varied cessation medication experience

...and *may* be open to and have different reactions to conversations about the role of ENDS in their quit plan
Many sources of ENDS information

- Family / friends
- Community of users
- Ads, internet, media
- Vape shops
- Health professionals

“My son gave them to me, because he upgraded and got a bigger one.”
### Many sources of ENDS information

<table>
<thead>
<tr>
<th>Use ENDS</th>
<th>Do not use ENDS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Friend/Family</strong></td>
<td>“I know my son says they’re not harmful.”</td>
</tr>
<tr>
<td></td>
<td>“My sister said they may cause you to have pneumonia but I don’t agree with her.”</td>
</tr>
<tr>
<td><strong>Internet</strong></td>
<td>“They might be able to help you quit.”</td>
</tr>
<tr>
<td></td>
<td>“They’re saying they’re worse than normal cigarettes and I’m almost inclined to listen to them because they hurt my throat worse than normal cigarettes do.”</td>
</tr>
<tr>
<td><strong>Vape Shops</strong></td>
<td>“Evidently they’ve done some research because that’s how it is advertised on television... I could go over there [vape shop] probably and find out if they’ve got any studies.”</td>
</tr>
<tr>
<td></td>
<td>“I’ve heard that they [ENDS] were more harmful than cigarettes... from one vape store.”</td>
</tr>
<tr>
<td><strong>Doctor</strong></td>
<td>“My primary care physician said they cannot be any worse than cigarettes.”</td>
</tr>
<tr>
<td></td>
<td>“Well the problem is that it got nicotine in it and the nicotine according to my doctor is part of will clog my arteries up.”</td>
</tr>
<tr>
<td><strong>General people/“They”</strong></td>
<td>“I still would say, according to everybody else and all the publicity and everything, vaping is supposed to still be better than cigarettes.”</td>
</tr>
<tr>
<td></td>
<td>“I’ve heard rumors that they aren’t that safe.”</td>
</tr>
</tbody>
</table>
Relative harm of products

- ENDS and aerosol completely safe
- Concerns about safety of NRT

**Misinformation**

- Over half said NRT least harmful, just under half said ENDS
  - "I would put [patches] in the rank close to the cigarette, cause it makes your heart beat really fast."

**NRT or ENDS least harmful?**

- Equal mix of concerned, supportive, and unsure
  - "I am afraid 20 years from now we are going to find out this [ENDS] was a bad idea."
Do you recommend ENDS or NRT for quitting?

“You probably are gonna stand a **better chance with the vapor stick** than the nicotine patch because you don’t have to fight the **hand and mouth craving** and the **weight gain**. You can cut down the nicotine just like you can with the patch step down process, but you’re not fighting the other discomforts as well.”

“When I put it [**patch**] on, physically I don’t crave a **cigarette**. The only thing that I have to fight is the mental part... That’s pretty darn good and that **doesn’t happen with the e-cigarette**.”
### Cognitive Appraisals of Products

#### One participant’s story:

<table>
<thead>
<tr>
<th>ENDS</th>
<th>Primary Use</th>
<th>NRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>- ENDS as a partial replacement</td>
<td>- May use patches</td>
<td></td>
</tr>
<tr>
<td>- Cutting down to quit</td>
<td>- Not using yet because not ready to quit completely</td>
<td></td>
</tr>
<tr>
<td>- Quit using ENDS, relapse, but ↓ cigs</td>
<td>- Worked in past, but relapsed</td>
<td></td>
</tr>
<tr>
<td>- Likes using</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Recommends ENDS, finding reputable vape shop to help</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Unsure whether ENDS or NRT more harmful; believes nicotine bad for you</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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ENDS

- ENDS as a partial replacement
- Cutting down to quit
- Quit using ENDS, relapse, but ↓ cigs
- Likes using
- Recommends ENDS, finding reputable vape shop to help
- Unsure whether ENDS or NRT more harmful; believes nicotine bad for you

Primary Use

- May use patches

Dual Use

- Not using yet because not ready to quit completely
- Worked in past, but relapsed

Experience

- Worked in past, but relapsed
(Potentially) Adaptive Quit Strategies

Much is still unknown about the role of ENDS in quitting smoking. However, we do know some strategies are more likely or unlikely to aid quitting.

- **Patch with no nicotine ENDS**
  “I’m going to use patches for the nicotine. And then I’m going to fill my e-cig with the zero nicotine. That way I have the habit still and I’m getting the nicotine but I can cut back with the patches.”

- **Step down ENDS nicotine similar to NRT**
  “I went and bought the vials so that I could cut down eventually. After you do one vial then you go down to the next.”

- **Cut down with ENDS; switched to patch**
  “I have completely quit the tobacco at this time. It is wonderful and I am not using [ENDS] either at this time. But I am wearing patches.”
Maladaptive Quit Strategies

Using in situations did not smoke

“I sit at my desk...and I will catch myself. I will be puffing on that thing for like 15 or 20 minutes. It gets real hot you know it is like I am using it a lot more...”

Frequent use, automatic behavior

“I can’t even count to be honest with you...I just go ‘oh look, I want this’ and I grab it. I have a lanyard that’s around my neck all day long.”

Smoke when high stress/craving

“[Yes I feel they’ve helped] until I get stressed out and then I usually jump back on a regular cigarette.”

Cutting down to quit without plan / schedule
QUITLINE CONVERSATIONS ABOUT ENDS

What role does the quitline play?
Framework of Interview Themes

Users bring their own background, knowledge, and beliefs

Impacts their assessment of products and information

ENDS users are a diverse group

Which may impact long-term outcomes

Leads to different strategies that make up their Quit Plan

Adaptive Quit Strategies

Maladaptive Quit Strategies

Self Directed

Quitline Influence

Relative Harms of Products

Manage the Levels of Products

Experience

ENDS Information
“I told them I used vapors and they informed me that there was no FDA regulations on it and they suggested I didn’t use those at all.”

“They said try to use the vapor when you have your cravings. Just use that instead of reaching for a cigarette.”

Nearly all would recommend other ENDS users call the OKHL
Quitline ENDS Conversation Impact

About half did not remember discussing ENDS

“Very much discouraging...I blew it off...”

“No, I had my own concerns about it too...I’ve got to be off the vape too, but I want to get through this...”

“It changed them...they are not regulated and you don’t know what is in it. He really put an idea in my head.”

Did not impact participant

Impacted participant

Several reported action or belief changes following conversation with coach

Total N = 40
What other messages do ENDS users want from the QL?

- **Nothing, don’t know, no response**
  
  “No, she covered pretty much all of it.”

- **More information/Safety of ENDS**

  “It would be **helpful if we could get some type of information mailed to us**...if studies have been done to inform us of the e-cigarette versus regular cigarettes.”

- **ENDS are helpful**

  “I was hoping that he would **tell me that was good idea to vape**.”

- **Quit ENDS before start NRT?**

  “They encouraged that you discontinue all nicotine intake other than the lozenges and the gum... **I just assumed that I would need to discontinue it [ENDS]**... To me that was just common sense, so I didn’t inquire and they did not discuss it with me.”

Total $N = 40$
Quitting Strategies Callers May Use

IF ENDS is not being addressed...

- Behavioral Strategies
- NRT or FDA-approved Cessation Medications
- ENDS
- Coordinated Quit Plan: Integration of Strategies

Quitline Influence
Self Directed
Limitations

- Small qualitative sample not meant to reflect general population
- Most callers had completed only one quitline call, some limited memory of call
- Unique group of ENDS users also interested in NRT?
- Interviews conducted around holidays may have led to a higher proportion of delayed quit dates
Conclusions

In this sample...

- ENDS users were a **diverse group** with some openness to different quit methods.

- **Confusion or misinformation** present about ENDS information and relative **harm of products**.

- ENDS used in (potentially) **adaptive and maladaptive ways**, including dual use of nicotine and tobacco.

- **Quitline opportunity** to direct coordinated quit plan, educate, and identify maladaptive strategies.
For more information please contact Katrina Vickerman

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Conclusions

• Notable rates of ENDS use, ENDS uptake after registration, and dual use with smoking.

• Quit outcomes may be lower for state quitline callers who choose to use ENDS; however, important to factor in reasons for use.
  • *Future research: Impact of behavioral support related to ENDS use?*

• ENDS knowledge and beliefs about products may impact how participants incorporate ENDS into their quit plans.
Implications for Quitlines

- Awareness of ENDS use and multiple product use
- Important to understand why and how using ENDS
- Opportunity to educate about ENDS & cessation
- How consider ENDS when dosing NRT?