Electronic Cigarette Trajectories (The ECtra Study): Real world experiences of using e-cigarettes for avoiding relapse to smoking

Dr Caitlin Notley & Dr Sarah Gentry
Dr Caitlin Notley
Dr Emma Ward, Dr Lynne Dawkins, Professor Richard Holland

With special thanks to Sarah Jakes, Dr Sarah Gentry Dr Isabel Greaves

Competing interests - No tobacco industry, electronic cigarette company or pharmaceutical industry funding

@Addictionuea
Background: Smoking, relapse and nicotine addiction

- E cigarettes are now the most popular aid to quitting smoking (STS, August 2018)
- Although many smokers quit, relapse is very common, suggesting that: “tobacco dependence…might be better viewed as a chronic disorder, requiring repeated episodes of treatment” (Etter & Stapleton, 2006).
- But much of our robust evidence on relapse prevention predates widespread use of e cigarettes (last Cochrane review 2013)
- Is there something about nicotine addiction that is particularly difficult to overcome in sustaining abstinence?
- Might e cigarettes play a role in relapse prevention for those who successfully quit?
Why is continued abstinence from smoking so difficult?

- Physical dimension – Nicotine addiction, ‘benefits’ of smoking (appetite and weight control)
- Psychological dimension – Beliefs about use and function of smoking (stress, anxiety)
- Social dimension – smoking as a group behaviour, association of smoking with particular environments, cues/associative learning
- Cultural dimension – smoking norms, specific groups
- Identity – as a concept intersects psychological, social and cultural dimensions
Cessation and relapse prevention – the options for support

- Cold turkey
- Alternative therapies (e.g. hypnotherapy)
- Pharmacological therapies
- Psychological therapies
- Combined pharmacological and psychological therapy - the ‘gold standard’

The problem for relapse prevention is the inability of any of these methods to address all of the dimensions of smoking behaviour simultaneously
Electronic cigarettes: a consumer product and a ‘disruptive technology’ – an opportunity for relapse prevention

1st Gen. Cig-a-like

2nd Gen. Vape pen

3rd Gen. Mod & Tank
Real world experiences of using e-cigarettes for avoiding relapse to smoking - the ECtra Study

• Exploring in-depth participant perspectives on patterns of e-cigarette use over time in the context of smoking cessation or relapse.
• Qualitative study initially purposefully recruiting from a larger longitudinal survey.
• Adverts, snowballing
• Interviews
• Additional online interview.
• Photo elicitation to explore patterns of use
• Thematic analysis
• Vape shop observations
Interview design

- Initiating smoking
- Smoking history including any quit attempts
- Awareness of e-cigs
- Starting e-cig
- Changes over time
- Current e-cig use
- Future e-cig use
- Support
- Relationships
- Health beliefs
- Professionals
- Satisfaction
- Belonging
- Stigma
- Identity
- Routines
- Rituals
- Relapse
- Heat-not-burn
- Regulation
- Advice
- Photo elicitation

Professionals

E.C.tra

University of East Anglia

Norwich Medical School
Sample

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample target number</td>
<td>20</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Achieved sample</td>
<td>20</td>
<td>20</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>16-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample target number</td>
<td>8</td>
<td>10</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td>Achieved sample</td>
<td>5</td>
<td>8</td>
<td>12</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Grade</th>
<th>Middle Class (AB, C1)</th>
<th>Working Class (C2-E)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample target number</td>
<td>18</td>
<td>22</td>
<td>40</td>
</tr>
<tr>
<td>Achieved sample</td>
<td>33</td>
<td>7</td>
<td>40</td>
</tr>
</tbody>
</table>

* Sampling frame target number based on profile of people who tried to quit smoking in the last year (Smoking Toolkit Study data, UCL, November 2016)
Tobacco Smoking History

- Started smoking (n=40)
- Desire to give up smoking: Various quit attempts
- Relapsed (5 dual using)
- Abstinence after initiating e-cigs
- Vaping and abstinent from tobacco 31 (19 experienced lapses)
- Abstinent from both

Future Intentions

- Plan to stop using e-cigs
- Continue using e-cigarettes

Initiating and Continuing Vaping

- Started using e-cigarettes 40
- Initiated use out of curiosity/as a temporary tobacco replacement
- Relapse after initiating e-cigs [16 full relapse /8 dual use]
- Abstinence after initiating e-cigs
- Vaping and abstinent from tobacco 31 (19 experienced lapses)

Current Tobacco Smoking/Vaping Status

- Relapsed (5 dual using)
- Abstinent from both

Findings: Pathways through smoking cessation and e-cigarette use
Findings – Quitting – cessation ‘revelations’

“having made the decision after one day I was just staggered at how easy it was, just staggered” [33F]. This participant quit after 40 years of being a smoker using an e-cigarette.

“it’s hard to just give up really it’s stressful and you get, you know, anxiety and you’ve got a temper, it was, when I got my e-cig it was like magic because it was completely painless, it really was for me, it mightn’t be for everybody but I didn’t want a cigarette and I weren’t missing a cigarette and it was, I couldn’t believe it just how painless it was to just give up” [37M] 37M 67 year male participant.
Findings - switching

“When I first started with e-cigarettes, actually going to, then later on when I did start properly that was kind of the fill in for cigarettes and then it progressed into taking over from them” [34F]

“little ritual of rolling…rolling your cigarette well that’s why that takes over from it cos that’s like a ritual that, you build your, you know, your coils and all that, and you fill it up and, you know, unlike patches and things you’ve got the hand to mouth, and you’ve got smoke, well it’s like smoke, and it just completely replaces it” [37M 67 years, 44 years smoking]

“They’re the perfect replication of smoking nothing else gives you that, and if you’re like me and there is a lot of people like me enjoy smoking, the action of it the feel of it, it becomes, it’s important to you isn’t it, that feeling, and you enjoy it” [31F]
Example photo diary
Findings – dual using & ‘sliding’

For some:

- Experimentation with different devices
- Periods of dual use with tobacco
- Search for a suitable product
- Experimentation with e liquids
- Trying different nicotine strengths – sufficient substitution needed to satisfy cravings
- No pressure on self to quit (fear of failing?)
- Many move to prefer vaping over smoking
Findings – ‘permissive lapse’

“The only times I’ve had a cigarette are just social environment again, but I’ve only done it a handful of times, if that, and the great thing is when I have had one I haven’t even enjoyed it (ok wow), because it just doesn’t taste very nice, it makes you smell, and it’s not a particularly pleasant thing to be doing compared to vaporising, its just so much nicer.” [01M]

“I thought that after everything that I’d done that having a cigarette again I hated the taste I hated how I smelt just holding it” [36F] participant who had been abstinent one lapse due to stress
Tobacco smoking lapse

We identified three distinct patterns of lapse within our qualitative data:

<table>
<thead>
<tr>
<th>No lapse</th>
<th>Lapse in past</th>
<th>Current lapse (permissive)</th>
</tr>
</thead>
</table>
| - No desire/ attraction to smoking  
- Replication – satisfying device – vaping preference  
- And/or  
  - Disgust anticipation  
  - Most (but not all) Abstinence  
    Violation Effect (AVE) anticipated – previous AVE experience  
  - Negative emotions anticipated  

Strategies to prevent relapse:
- Ensure device reliability  
- Limit opportunities  
- Adamance – moved away from smoker identity  

"I feel physically sick but I just can’t stand to be around it never mind trying to consider putting it to my mouth and inhaling it it’s that level of detest" (06F)

| Cues:  
- Curiosity: addiction/ enjoyment testing  
- Alcohol/cannabis/social/nostalgia Stress, less common, justification?  
- Device failure/lack of access  
- Perceived control: no AVE anticipated impact:  
  - Some minimising ‘lapse was nothing’  
  - Negative reinforcement – disgusting experience, negative emotions  
  - Lapse curtailed for some – affirmation mid-lapse  
  - Affirming quit: satisfying device – vaping preference  

"probably about six months after I’d been completely tobacco free a friend of mine in the pub, she was rolling a cigarette, and I said ‘do you mind if I steal one of those?’ and she said ‘no, help yourself’ and I took two drags of it and hated it” (22M)

<table>
<thead>
<tr>
<th>Cues</th>
<th>Perceived control</th>
<th>Not considered lapse / minimising</th>
</tr>
</thead>
</table>
| Stress - justified  
- Specific situation – linked to nostalgia, identity, treat  
- Guilt free  
- Or/and (mixed feelings)  
  - Negative emotional reaction  
  - Disgust reaction  
  - Crutch not cure  

“it’s very easy for somebody that does vape to think, well you know, ‘I can smoke tonight, I’m out let my hair down,’ and then go back to vaping the next day” (12M)
Emergent findings – pleasure

**Hit**

“the hit and the nicotine delivery and I think that’s what e-cigarettes do for me is that they do that they do those two things and if they do those two things I don’t need tobacco” [26M]

**Habit**

“I like the action of smoking at the end of the day that’s what it is I enjoy that that side of it and vaping gives me that it gives me that feeling of actually smoking” [31F- 34 year old female smoked 20 a day for 15 years.]

**Hobby**

“I think it’s the satisfaction of when I do build…I get the bigger clouds and I just it feels good the fact that I did that myself” [36 F - 21 year old female – started vaping because didn’t want to be smoking around her daughter but found the appeal a E-cigarettes greater than just the replacement of nicotine]

**Flavour**

“I had a cigarette and it was the most disgusting thing I’ve ever tasted…I’d got to the point where really, you know, just the whole flavour thing, it (the cigarette) just didn’t really do it” [15M 44 year old male, tobacco abstinent]

**Habitat**

“I mean the social side of it is a lot of it I mean I’ve met people I didn’t know before I’ve made so many very good friends” [37M 64 year old male]
ECtra Survey

- Qualitative study recruited very well
- Additional participants directed to online survey – convenience sample
- Qualitative and quantitative data collected – analysis so far has focused on the quantitative
- Most participants were long-term abstinent smokers intending to continue vaping
Hypotheses

1. Those who initiate vaping with an earlier generation device will be more likely to relapse

2. Those who start on a low nicotine strength, after controlling for cigarettes per day, will be more likely to relapse

3. There will be a relationship between device type and nicotine strength

Participants entered online interview Version 1 (n=249)
Participants entered online interview Version 2 (n=260)
Participants consented to participate (n=183)
Participants consented to participate (n=188)
Total participants in online interview (n=371)
Did not consent V1 (n=66)
Did not consent V2 (n=72)
Results

• Most participants initiated e-cigarette use with a vape pen (45.8%) or cig-a-like (38.7%) before moving onto a tank device (89%)

• Those using a tank or vape pen were less likely to relapse than those using a cig-a-like (tank vs. cig-a-like OR = 0.06 (95% CI 0.01 to 0.64, p = 0.019)

• Inverse association between starting nicotine strength and relapse, interacting with device type (OR = 0.79, 95% CI 0.63 to 0.99, p = 0.047). Suggests risk of relapse was greater if starting with a low nicotine strength and/or less sophisticated device.

• Moved from higher strength, earlier generation, tobacco flavoured devices onto lower strength, later generation, food flavours over time.
Limitations

- Cross-sectional survey
- Recall bias
- Convenience sample
- Sample size
- Not all participants completed all questions
- Two versions of the survey

Implications

- Those initiating vaping with a less sophisticated device and lower nicotine strength e-liquid appear to be at higher risk of relapse to tobacco smoking.
- There is a need for studies that follow people up over time to understand trajectories of e-cigarette use.
Conclusions: Vaping for smoking relapse prevention

- Vaping meets the long term needs of ex-smokers by satisfying physical, psychological, social, cultural and identity related dimensions of addictive behaviour
- Vaping can be incorporated easily into daily routines – substituting smoking patterns or allowing ‘little and often’ use to satisfy cravings
- Users change their devices, e liquids and flavourings to suit their own needs, that change over time
- E cigarettes are pleasurable to use, encouraging long term use
- Vaping may encourage those who never intended to quit to eventually quit (dual users?)
- Evidence of ‘permissive lapses’ that don’t necessarily slide towards full relapse
- Permissive lapses allow a ‘no pressure’ quit strategy
- Quantitative evidence suggests that those initiating vaping with a less sophisticated device and lower nicotine strength e-liquid appear to be at higher risk of relapse to tobacco smoking
- Observational work with vape shops suggests that expert by experience’ support is critical in helping consumers to choose devices, learn to use them, and maintain them, in order to maintain smoking abstinence.
ECtra Project Conclusions: Dissemination, impact and next steps

PAPERS IN SUBMISSION:

VAPING AS AN ALTERNATIVE TO SMOKING RELAPSE FOLLOWING BRIEF LAPSE

REPORTED PATTERNS OF VAPENG TO SUPPORT LONG TERM ABSTINENCE FROM SMOKING

RELAPSE PREVENTION LEAFLET FOR VAPERS
E mail: c.notley@uea.ac.uk
@Addictionuea
www.uea.ac.uk/medicine/research/addiction
Tel: (+44) 01603 591275