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**A thematic analysis of smokers' and non-smokers' accounts of E-cigarettes**

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### Article

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1                   **A Thematic Analysis of Smokers' and Non-Smokers' Accounts of E-cigarettes**

2                   RUNNING HEAD: SMOKERS' AND NON-SMOKERS' ACCOUNTS OF E-CIGARETTES

3  
4                   **Abstract**

5                   This study explored smokers' and non-smokers' accounts of E-cigarettes (ECs). Fifty-one UK-based  
6                   participants, 20 men and 31 women, responded to open-ended questions online. Inductive thematic  
7                   analysis identified that the factors that influence EC behaviour and opinion in adult smokers and  
8                   non-smokers are related to *social context, informative sources, practical aspects, and health*  
9                   *implications*. Participants presented varying accounts of ECs, suggesting that individual narratives  
10                  regarding ECs are multi-faceted. This is important information for health professionals and policy  
11                  makers tasked with advising on EC use.

12  
13  
14                  **Key words:** E-cigarettes; smokers; non-smokers; inductive thematic analysis; open-ended  
15                  questionnaire

**26                    A Thematic Analysis of Smokers' and Non-Smokers' Accounts of E-cigarettes**

27    The global growth of E-cigarettes (ECs) is an unfolding phenomenon. It is estimated around 3.6  
28    million adults in Great Britain currently use ECs, and there are now more ex-smokers (just under 2  
29    million) using ECs than current smokers (1.4 million; ASH, 2019). The increased uptake of ECs  
30    among smokers has often been credited to their ability to satisfy nicotine cravings and prevent  
31    withdrawal, whilst also addressing the behavioural-sensory aspects of smoking (Farsalinos, 2017).  
32    Around 6.1% of the U.K population use ECs having never smoked, which is on the increase (ASH,  
33    2019). This presents an emerging demographic of individuals, with new motivations and perceptions  
34    which have yet to be explored (Sussan et al., 2017).

35    Qualitative explorations of EC understanding and behaviour in adult smokers have found a  
36    continuum of opinions exist, determined by personal experience and history (Kim et al., 2016; Rooke  
37    et al., 2016; Simmons et al., 2016). There is also evidence of uncertainty and misunderstanding  
38    regarding the information available surrounding ECs (Vasconcelos and Gilbert, 2018). This is  
39    understandable as there is inadequate research and lack of regulatory guidelines combined with an  
40    abundance of conflicting information on regulations, brands, flavours, and models (Kaisar et al.,  
41    2016).

42    There is unarguably a lack of qualitative research exploring adult smokers' and non-smokers'  
43    perceptions of ECs and the factors that may encourage or deter use. There have been few studies  
44    focusing on the emerging demographic of EC users who have never smoked cigarettes, and no  
45    studies exploring non-smoker attitudes to EC use. Exploring the experience of these individuals is  
46    important as there is an increasing demographic that could potentially become addicted to nicotine  
47    through a new mode of delivery.

48 The current study provides an opportunity to understand these accounts from the user perspective. It  
49 is also of interest to explore non-smokers' perceptions as non-smoker influence could potentially act  
50 as a facilitator and/or barrier in regard to EC use.

### 51 **The Current Study**

52 This study set out to examine accounts of ECs from both smokers and non-smokers, as described by  
53 the participants themselves, focusing on participants in the U.K aged between 18-65 years.

54 Participants were diverse, and from all genders and all ethnicities. It was important that the  
55 participants were English speaking, due the research relying on qualitative analysis, language and its  
56 interpretation.

57 *Research Question: What are the factors that influence EC behaviour and opinion in adult smokers'*  
58 *and non-smokers'?*

## 59 **Method**

### 60 **Design**

61 To achieve insight into smokers' and non-smokers accounts of EC use, an open-ended questionnaire  
62 (OeQ) design was employed. This qualitative approach provides exploratory information that can  
63 attempt to comprehend influencing factors of EC use (Creswell, 2014), including enlightenment on  
64 contextual factors and perceptions which may not be captured when using quantitative methods. In  
65 order to encourage disclosure, participants were asked to complete a series of open-ended questions  
66 (OeQs) anonymously online. Pilot work was conducted on an original version of the OeQ.  
67 Following the pilot study, the questionnaire received minor amendments to improve clarity.

### 68 **Recruitment**

69 Advertisements for the study were placed in suitable locations including EC shops, chemists,  
70 libraries, community centres, and University campuses. A snowball sampling approach was also  
71 used, and the research team asked their contacts to distribute adverts for the study. The first author

72 also held recruitment events at [Blinded for Review] University whereby she approached individuals,  
73 providing them with the appropriate QR code to access the questionnaire.

#### 74 **Participants**

75 Fifty-one English speaking respondents, 20 men and 31 women, were recruited. Ages ranged  
76 between 18-65 with a mean age of 32.4 years. Table 1 illustrates the demographic characteristics of  
77 the participants [insert Table 1 here].

78 Fifteen participants self-reported successfully quitting smoking using an EC; nine participants self-  
79 reported failing to quit smoking using an EC; one participant was a self-reported smoker who also  
80 used ECs regularly (dual user); four participants were self-reported smokers who had tried ECs;  
81 three participants were self-reported EC users but had never been conventional smokers (identified  
82 below using the phrase “emerging demographic”); and 19 participants were self-reported never  
83 smokers/users. See Supplemental File 1 for full details of participants.

#### 84 **Materials**

85 An OeQ was constructed guided by previous literature surrounding EC perceptions. The first  
86 questions assessed demographic variables such as age, gender and ethnicity (closed). The  
87 participants then answered a question which classified them into one of six categories:

88 Category 1: I have successfully used an E-cigarette to quit smoking (12 items)

89 Category 2: I am a smoker who has tried to quit smoking using E-cigarettes but has failed to  
90 quit (12 items)

91 Category 3: I am a smoker who uses E-cigarettes regularly but has no intention to quit (21  
92 items)

93 Category 4: I am a smoker who has tried an E-cigarette but has no intention to quit (11 items)

94 Category 5: I have never been a smoker but use E-cigarettes regularly (19 items)

95 Category 6: I have never smoked conventional cigarettes or used an E-cigarette (12 items)

96 Each questionnaire contained the same 9 general questions (open and closed) which asked about  
97 knowledge and opinions of ECs. The general section included OeQs such as 'what do you think are  
98 the positive effects of using E-cigarettes and why?' Closed ended questions included 'do you think  
99 E-cigarettes are addictive' with a selection of answers including yes, no, unsure, it depends. The  
100 majority of the questions were open. The section also contained some questions with 5-point Likert  
101 scales whereby participants indicated how much they agree with particular statements such as 'E-  
102 cigarettes encourage non-smokers to start using tobacco cigarettes'. For the purpose of this paper  
103 which focuses on qualitative responses, only the responses to the (OeQs) are discussed. See  
104 Supplement 2 for full list of questions answered by participants in each category.

### 105 **Procedure**

106 Ethical approval was first obtained through [Blinded for Review] University's ethics committee. The  
107 advertisement for the study contained a QR code which took participants to an anonymous *Qualtrics*  
108 questionnaire. The advertisement also contained the first author's email address, in order to broaden  
109 the range of potential participants i.e. those who did not have a device to connect to the internet  
110 when viewing the advertisement. All participants gave informed consent to taking part in the study,  
111 including the use of anonymised quotes in reports, through ticking a box on the OeQ to confirm  
112 agreement. At the end of the questionnaire, participants were de-briefed and informed of their right  
113 to withdraw. They were also given contact details (e-mail) of the researcher for queries or further  
114 information regarding the study.

### 115 **Data Analysis**

116 Braun and Clarke's (2006) guidelines for inductive thematic analysis were employed to identify  
117 themes related to encouraging and deterring EC use, capturing individual understanding and  
118 allowing an in-depth analysis of the data. To ensure a respectable analysis the framework  
119 recommended by Nowell et al. (2017) was followed which emphasises that interpretivist research is  
120 obligated to satisfy the criteria for trustworthiness, which includes: credibility (validity);

121 transferability (generalisability); dependability, and confirmability (Shenton, 2004; Lincoln and  
122 Guba, 1985). Data were described, summarised, and then interpreted in relation to broader  
123 implications.

124 Coding was line by line, allowing data to be organised in to meaningful groups (Tuckett, 2005). Data  
125 were initially coded by the first author for content relating to factors that encourage and deter EC use  
126 in smokers' and non-smokers. Descriptive codes based on patterns within the data, were collated  
127 with predominant focus on identification of salient themes across the questionnaire responses. These  
128 themes were discussed with the second author, revised, and validated by all members of the team. A  
129 thematic map of subordinate themes (Figure 1) was generated demonstrating the overall  
130 conceptualization of the data patterns and their relationships (Braun and Clarke, 2006). The research  
131 team engaged in reflexive analysis throughout the process of analysing the data following Willig  
132 (2008), and all authors agreed thematic structure and content.

### 133 **Results and Discussion**

134 The analysis identified four key themes evidenced across participant responses. In the quotes below  
135 participants have been given codes to protect their anonymity. An example of an identifying code  
136 would be F35W1; this example would denote F (female), aged 35, white and in Category 1.

#### 137 **Theme 1: Social Context**

138 Participants noted how vaping acted as a social practice. Those who were part of the emerging  
139 demographic (Category 5) embodied this notion of social and recreational vaping claiming they use  
140 ECs *'for fun'* (M18AAB5). Language such as this promotes the image of vaping as a hobby/leisure  
141 activity. Placing value on the group experience and social opportunities that come with ECs mirrors  
142 previous research (Keane et al., 2016). One participant even expressed the reasons for his EC use in  
143 relation to his career:

144       Just to socialize and sell. If you don't know anything about a product it's hard to sell. If you  
145       know a lot about a product it is easier to sell (M19AAB5)

146 Smoking and EC use appeared to be parallel situational factors that in some cases maintain social  
147 connections. For (ex)smokers, ECs could act as an alternative to smoking, though unlike other quit  
148 attempts, they do not distance themselves from their existing social networks to avoid relapse. There  
149 were contrasting perceptions of ECs linked to social context, with one participant claiming, '*a lot of*  
150 *people think its uncool*' (F22O2). Previous research has demonstrated that adult vapers place more  
151 value on the group experience and social opportunities that come with ECs (Barbeau et al., 2013;  
152 Keane et al., 2016). Therefore, the novelty of vaping could potentially precede and produce a desire  
153 to quit smoking, or at least of quitting as a possibility, when previously it may never have been  
154 (McNeil, 2015):

155         A friend recommended me to try it for a week, ever since then I've stopped smoking  
156         (M19AAB1)

157 There was also an indication that how those around them perceived ECs acted as an influencing  
158 factor, emphasising the importance of the social context as an encouraging or deterring factor:

159         When I listen to my family, I guess it is influential in the sense that they recommend the use  
160         of e-cigarettes and list the benefits. This is an attempt to convert me (a smoker) to use an e-  
161         cigarette – mainly for the health benefits (F23W4)

162 Second-hand vapour (SHV) and scent were discussed in relation to social acceptability. Generally,  
163 participants believed the vapour from ECs smelt better than combustible tobacco cigarettes (CTC)  
164 smoke and for that reason were more socially acceptable:

165         I think e-cigs are more socially acceptable. As a non-smoker, I have sometimes felt  
166         uncomfortable walking past or being near traditional smokers as I really hate the smell and  
167         worry that the smell will get onto my clothes and hair, and so I end up worrying about this  
168         (F24W6)

169 The differences in perception of SHV from ECs in comparison to CTC smoke were sometimes  
170 associated with the idea that EC vapour was less damaging and less '*irritating for people around me*'



171 (F22O2). However, not all participants agreed with this claiming and there were evident concerns  
172 about passive vaping:

173 Evidently, if e-cigarettes are banned indoors in public places, there must still be concern  
174 about secondary smoking effect (M65O6)

## 175 **Theme 2: Informative Sources**

176 This theme embodies how and where individuals get their knowledge from, the accuracies of this  
177 knowledge, how this contributes to attitude, and whether this encourages or deters EC use. There  
178 was an element of uncertainty as participants felt that available information on safety is inconsistent:

179 I have a limited knowledge of the safety of e-cigarettes as there are often conflicting  
180 messages in the media. For example, when I first begun using an EC, I read an article that  
181 said vaping would lead to 'popcorn lung' and could therefore be more harmful than  
182 cigarettes. Since then the NHS appears to have supported the use of ECs, this is what led me  
183 to try ECs again to reduce the number of cigarettes I use. I don't know much about the device  
184 other than what I have been told in the stores much of my use of ECs is guess work really  
185 (F28W2)

186 Some participants also expressed scepticism around the sincerity of information sources. Concerns  
187 focused on the intention of suppliers and manufactures as it was assumed they are prone to bias and  
188 in some cases were thought to have affiliations with the tobacco industry:

189 [...] the marketing strategies employed by e-cigarette manufactures indicate aggressive  
190 efforts to appeal to audiences wider than smokers. I'm suspicious of the manufacturers and  
191 suppliers focus on flavour and tastes, as this is of minimal significance to a target population  
192 of smokers that have long lost their senses of taste and smell. Granted these senses return and

193 are likely to contribute to their appeal as a cessation aid, but the flavour ranges themselves in  
194 many senses are infantilising (M28W2)

195 This has been highlighted as a cause for concern in alternative research (Tamini, 2017),  
196 demonstrating a lack of transparency of manufacturers communications.

197 Participants across categories were aware that ECs were commonly used as smoking cessation  
198 devices to slowly stop smoking. Some also viewed them as a tool to prevent the initial initiation of  
199 smoking i.e. for people to use instead of smoking in social situations or to be used by '*people that*  
200 *don't want to start smoking cigarettes*' (F22O2). Device purpose was therefore understood as a  
201 product of individual intentions. Ultimately, whether ECs are viewed as a cessation, recreational or  
202 complementary device was seen as depending on the individual and their personal reasons for doing  
203 either, echoing concepts from the Theory of Planned Behaviour (TPB; Ajzen, 1991) which proposes  
204 that the predominant determinant of individual behaviour is behavioural intention. Examining the  
205 intentions of users has proved useful to health care professions, in order to tailor interventions  
206 accordingly and provide more customised cessation support to those not satisfied with NRT methods  
207 (Wackowski et al., 2016).

208 Ambivalence was common, although the general consensus across categories was that ECs were  
209 better in some senses or 'the lesser of two evils' (Shapiro and Kayner, 2016), though there was a  
210 concern that they were not risk free:

211 I think they are good for heavy smokers who have had difficulty quitting however I think  
212 quitting without the use of an E-cigarette would probably be better because I think we are  
213 still unsure of what really goes in to an E-cigarette (F23W1)

214 As expected, those in Category 6 (non-smokers and non-users) generally claimed to be less  
215 knowledgeable about ECs with some claiming they did not know anything about them. There was

216 also a common concern across categories regarding the lack of information about long-term effects  
217 of ECs .

218 At this current moment in time, we do not seem to have steadfast research to suggest the  
219 negative effects of vaping, given it is a relatively new idea. I believe there could be extremely  
220 negative effects of their use (M29W1)

221 These apprehensions reflect past misconceptions in harm reduction strategies such as the 'light  
222 cigarette' which has led to a mistrust of harm reduction tobacco products (Farrimond, 2016;  
223 Annechino and Antin, 2019). Previous research also demonstrates that the lack of reliable  
224 information and strong evidence for the effectiveness and safety of ECs acted as a barrier to use  
225 (Vasconcelos and Gilbert, 2018).

226 Personal experience and observations also contributed to how some individuals established their  
227 knowledge of ECs. Accessibility was multi-faceted, and ECs were enjoyed due to the convenience of  
228 use, being able to use them in a variety of environments including being able to '*use them inside*'  
229 (F23W4). This allowed some smokers to regain their freedom as they can be used in a wider variety  
230 of places, even where the smoking ban is enforced. However, this raises the concern that it could  
231 potentially undermine current tobacco control efforts (Vogit, 2015). There were also concerns that  
232 this freedom of use may worsen nicotine dependency:

233 I think they're more addictive to e-cigarettes compared to smoking. Because it's more  
234 accessible, doesn't affect the house/smell bad and it seems less harmful, so I think they  
235 'vape' a lot more than they would if they were smoking. This can make them more addicted,  
236 or at least more likely to inhale nicotine. My friend has stated that to use cigarettes as a  
237 comparison to his e-cigarette habit, he must be smoking the equivalent of 40 a day. It doesn't  
238 stop him though. So, the accessibility and the 'niceness' of the e-cigarette, compared to  
239 normal cigarettes can make the habit much worse (F24W6)

240 Previous research has demonstrated that those who perceive devices as safer alternatives to CTCs,  
241 are more likely to distrust healthcare providers, doctors, pharmacists and other sources (Case et al.,  
242 2017). This is an important social risk that should be explored, as it may reveal deeper cultural issues  
243 such as the link between the government, public health bodies and the tobacco industry (Tamini,  
244 2017). Within public health, many harm reduction advocates would argue that the failure to  
245 differentiate between industries is a tragedy (Case et al., 2017), as in some cases there are numerous  
246 well-meaning EC businesses which have smoking cessation at the centre of their ethos (Ward et al.,  
247 2018).

### 248 **Theme 3: Practical Aspects**

249 The third theme focused on practical and physical aspects of EC devices, evidenced by quotes  
250 regarding the products and paraphernalia associated with them, combined with the environmental  
251 issues that arise from use. It is important to point out that the constituents of this theme were of little  
252 relevance to those in Category 6, as participants in this category had no experience using the devices.  
253 In regard to smoking cessation attempts, it was common for participants to prefer menthol flavours  
254 as these were seen as more closely matching the taste of tobacco cigarettes. E-liquid flavours that  
255 could most closely resemble traditional CTCs such as menthol or tobacco appeared to be an  
256 encouraging factor for use, particularly among smokers. In the U.K, menthol and tobacco flavours  
257 are preferable for those who are attempting to quit smoking (ASH, 2019). Menthol flavours are  
258 known to have analgesic and sensory effects which are also present in other tobacco products (Lee  
259 and Glantz, 2011), so may somewhat mirror the effects of CTC.

260 Sweet/fruit flavours such as 'cakey' (M27W2) and 'mango' (M28M2) appeared to be common  
261 flavours among those had failed to quit smoking using an EC, this may be of significance and could  
262 be explored in future research. There were some concerns regarding the safety of the liquids, with  
263 one participant saying, '*sugary liquids can't be good for the mouth*' (M45AAB1).

264 The potential oral effect of ECs has received surprisingly little attention when considering the  
265 intimate relationship of tobacco smoke on oral health, as well as the knowledge that the oral tissues  
266 are the first point of contact for EC aerosols when they are at their hottest and most concentrated.  
267 One study has found that EC aerosols have similar chemical properties to high-sucrose, gelatinous  
268 and acidic drinks (Kim et al., 2018).

269 Environmental matters were discussed, some participants claimed ECs were better for the  
270 environment, with one participant saying, *'prevents cigarette butts on the floor which is better for the*  
271 *environment'* (F24W1). One participant was aware of the appropriate way to dispose of the device  
272 parts:

273           [...] I dispose of my batteries when they no longer hold a charge in a used battery bin. The  
274           tank goes in the general waste (F57W1)

275 Though some participants seemed less informed:

276           I would be interested to know how disposable the supposedly disposable cigarettes are as the  
277           battery must contain some hazardous waste (M24W3)

278 Participants who had used ECs had a better understanding of disposal than non-smokers and non-  
279 users, these issues generally did not seem to concern those in Category 5 and 6. Whether this was  
280 encouraging, or deterring was dependent on how they viewed the device in comparison to the  
281 damage CTCs have on the environment. There is limited information on the environmental impact of  
282 ECs (Chang, 2014). It is vital for public health regulators to maintain that the devices are being  
283 disposed of responsibly and ensure the public have access to the knowledge of how to do this so they  
284 can make informed decisions.

285 Practical aspects, such as physical device properties, money and ease of use were important across  
286 categories (not including Category 6) when discussing ECs. Device inferiorities were commonly a  
287 deterring factor,

288 [...] not always reliable, high maintenance, not always available as a smoking option  
289 (M21AAB5).

290 Long battery life was seen as vital and failure in this often led to relapse as participants felt they were  
291 *'a lot more likely to smoke'* (M23W1). Device malfunctions were commonly associated with relapse  
292 and were a deterring factor as buying replacement parts eventually counteracted the cost-  
293 effectiveness of ECs when compared to CTCs. One participant expressed concerns about the device  
294 leaking:

295 I find a lot of ecigs leak which put me off using it (F24AAB2)

296 There were also some apprehensions about the safety of the device parts with one participant  
297 claiming that poor quality devices could be dangerous, and concerns about batteries which *'might*  
298 *explode'* (F19AAB6). A large influencing factor encouraging smokers to try ECs was the amount of  
299 money they were spending on CTCs:

300 the cost for me is the most noticeable positive effect of using an EC (F28W2)

301 Previous research has demonstrated that variations in price of devices when compared to  
302 combustibles impact the likelihood of smokers switching (Liber et al., 2016). Unfortunately, the  
303 aforementioned device inferiorities often led to frequently buying new parts making the cost  
304 effectiveness argument unworkable. Experiences of the device as a cessation product was affected by  
305 this and differed across categories and, the success rate, shaping the general attitude toward them as  
306 a cessation device.

#### 307 **Theme 4: Health Implications**

308 The final theme focused on health repercussions, both positive and negative, that arise from EC use  
309 regardless of intentions. The efficacy of the device as a cessation method was discussed,  
310 understandably those who had managed to quit smoking generally had more positive views of ECs:

311 Totally effective method that has saved thousands of lives, users are in control of managing  
312 their addiction (M45AAB1)

313 Successful quit attempts were due to reasons such as assistance in dealing with cravings. It also  
314 provided a sense of autonomy as one participant felt in control of managing their addiction. Those  
315 who had not managed to quit had more negative perspectives:

316 E-cigarettes as I see them create a false sense of safety and when coupled with the inability to  
317 monitor consumption, a dependency that is difficult to achieve through even the most  
318 obscene tobacco use (M28M2)

319 Perceived risks play an important role in selecting tobacco products (Hammond et al, 2009). The  
320 Health Belief Model (HBM: Rosenstock, 1974) proposes that perceived risk can affect the  
321 motivation to perform a particular health behaviour (Pepper et al., 2015). The degree to which  
322 individuals believe ECs to be a less harmful alternative to CTCs will affect the prevalence of their  
323 use. Those who initiate EC use for smoking cessation or harm reduction purposes, which are the two  
324 most commonly reported goal-orientated reasons (ASH, 2019), may be explicitly or implicitly  
325 attempting to reduce their chances of developing a smoking-related illness.

326 As ECs have rapidly evolved, their nicotine delivery has improved, meaning they may be more  
327 attractive to smokers as a replacement (Unger and Unger, 2018). ECs generate an aerosol that  
328 penetrates deep into the respiratory tract, which achieves instant absorption of nicotine to the  
329 pulmonary venous circulations, mirroring tobacco consumption in the form of CTCs (Sosnowski and  
330 Odziomek, 2018). Although this could be viewed positively, this means that the addiction potential  
331 has also increased (Unger and Unger, 2018). Concerns about nicotine dependency was also a  
332 deterring factor; once participant suggested the devices should have specific mechanism in order to  
333 prevent nicotine abuse:

334 An automatic locking mechanism that prevents nicotine flooding/abuse. My latest e-cigarette  
335 had such a feature (M28W1)

336 Even for those who had manage to quit smoking CTCs there were still hesitations about the device as  
337 replacing cigarette addiction with an EC addiction:

338 I have given up cigarettes but just adopted another addiction with E-cigarettes although it is  
339 not as bad as cigarettes, I don't think I could ever quit both (F22O1)

340 Smokers and ex-smokers noticed differences from switching from CTCs to ECs including  
341 improvements in skin, breathing, and energy. Although noticeably beneficial for some, not all  
342 participants were convinced:

343 a small number of benefits come to mind, but they're outweighed by the negatives (M28M2)

344 It is important to examine the roles of affect and perceived risks in tobacco and nicotine products  
345 (Popova et al., 2018). Research should ensure to differentiate between perceived risk and actual  
346 negative experience. Given the lack of scientific agreement and uncertainty surrounding the use of  
347 devices, means to clearly convey accurate information need to be considered.

### 348 **Strengths and Limitations**

349 Strengths of this study were that participants were detailed in their responses and shared a large  
350 amount of information. The anonymity of the process enabled this level of disclosure. This study  
351 also broadened the participant pool by accessing participants from a range of ages and genders.  
352 There were undeniable limitations to the study. Accounts are from participants from one  
353 geographical area of the UK so it is uncertain how far these responses would generalise to others  
354 outside this area. There are disadvantages to the snowball sampling strategy, as it is not random and  
355 can therefore lead to bias (Emerson, 2015). Socioeconomic status (SES) was also not explored in this  
356 study, which is limiting, as previous research has demonstrated it has been linked to differences in  
357 perceptions of ECs (Hartwell et al., 2017). Future research could compare themes between people in  
358 different SES groups. There were also conceptual challenges such as self-categorization of



359 smoking/EC use; there is a possibility that participants could self-identify incorrectly due to social  
360 expectations. Although participants in this study varied in ethnicity, participants largely identified as  
361 white, so it is uncertain how far these responses can generalise to other ethnicities. Further research  
362 could examine this through a wider group of participants with varied ethnicities, as well as from  
363 wider range of geographical areas.

#### 364 **Key Implications**

- 365 1. Future research should continue to explore the social practice, including perceptions of SHV  
366 that surround vaping behaviour in order to provide more effective ways of understanding and  
367 conceptualising attitudes toward ECs, as well shifting the focus from individuals as the agent  
368 of behaviour, toward alliances between EC behaviour and social practices.
- 369 2. There is a need for more transparency between communication systems. It is important for  
370 information that is available to be accurate and communicated efficiently to avoid  
371 stigmatizing ECs, which could prevent smokers from wanting to use them, whilst also  
372 ensuring non-smokers are deterred from using them. Harm-reduction campaigns should  
373 ensure that it is clear when information comes from credible sources or is a form of  
374 marketing, in order to accurately influence EC attitudes and knowledge.
- 375 3. It is important to find a balance between cost efficiency without compensating for device  
376 product quality, whilst also ensuring the cost is high enough to deter youth access. The most  
377 cost-effective method for cessation is important for public health gain. The accessibility of  
378 EC products highlights an important risk factor of smoking relapse. Future harm reduction  
379 policies should consider this and contemplate implementing policies to allow EC  
380 paraphernalia to be more readily available than CTCs. It is also vital for waste disposal  
381 authorities to maintain that the devices are being disposed of responsibly and ensure the  
382 public have access to the knowledge of how to do this, so they can make informed decisions.  
383 Health policy debates around ECs should consider the health of the environment.

384 4. Given the general misunderstanding on the health effects of ECs and the vital role of  
385 perception in behaviour, health care providers, health education practitioners, campaign  
386 designers and policy makers should remain vigilant and unbiased when advising on ECs.

### 387 **Reflexive Analysis**

388 We have tried to present participant accounts fairly and disinterestedly. The first author is a PhD  
389 student in Psychology, and the other authors are the supervisory team which consisted of five  
390 academics, two from health psychology and three from public health. The analysis benefits from  
391 having a range of perspectives on ECs from those in a range of disciplines. However, our roles as  
392 academics involved in health promotion may have influenced our analysis of data, so this needs to be  
393 taken into account when reading our analysis and interpretation.

### 394 **Conclusion**

395 This study demonstrates the variability of EC experiences. The social context surrounding  
396 individuals moulds their experience and perception of ECs. The intentions and implications of  
397 informative sources absorbed also shape individual accounts. Practical and physical aspects of EC  
398 devices, and how users and non-users have experienced these individually, contributes toward their  
399 perception. The health implications of ECs highlight both the positive and negative effects of ECs. It  
400 is therefore important that health professionals do not expect homogenous patterns of experiences, so  
401 tailored and efficient advice can be given.

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