Patterns of electronic cigarette use and user beliefs about their safety and benefits: An Internet survey

Maciej L. Goniewicz, Ph.D.[1,2] **[Research Fellow and Assistant Professor]**, **Elena O. Lingas, DrPH, MPH**[3,4] **[Assistant Professor and Assistant Adjunct Professor]**, and **Peter Hajek, Ph.D.**[1] **[Professor and Director]**

[1]Tobacco Dependence Research Unit, Wolfson Institute of Preventive Medicine, Queen Mary University of London, UK [2]School of Pharmacy and Laboratory Medicine, Medical University of Silesia, Sosnowiec, Poland [3]College of Education and Health Sciences, Touro University California, Vallejo, CA, USA [4]School of Pharmacy, University of California, San Francisco, CA, USA

Abstract

Introduction and Aims—As the popularity of electronic cigarettes (e-cigarettes) increases, it is becoming important to find out more about the characteristics of e-cigarette users, why and how they use the product and whether e-cigarettes are used exclusively or in combination with conventional cigarettes. The objective of this study was to investigate patterns and effects of e-cigarette use and user beliefs about e-cigarette safety and benefits.

Design and Methods—E-cigarette users in Poland were recruited online and asked to participate in a web-based survey. The participants provided information on their smoking history, patterns of e-cigarette use, beliefs and attitudes regarding the product and information on concurrent use of conventional cigarettes.

Results—The survey was completed by 179 e-cigarette users. Almost all participants used e-cigarettes daily. E-cigarettes were primarily used to quit smoking or to reduce the harm associated with smoking (both 41%), and were successful in helping the surveyed users to achieve these goals with 66% not smoking conventional cigarettes at all and 25% smoking under 5 cigarettes a day. Most participants (82%) did not think that e-cigarettes were completely safe, but thought that they were less dangerous than conventional cigarettes. Sixty percent believed that e-cigarettes were addictive, but less so than conventional cigarettes.

Discussion and Conclusions—The participants primarily used e-cigarettes as a stop-smoking aid or as an alternative to conventional cigarettes, and the majority reported that they successfully stopped smoking. More data on e-cigarette safety and its efficacy in harm-reduction and in smoking cessation are needed.

Keywords

Corresponding author: Dr Maciej L. Goniewicz, Tobacco Research Unit, Bart's and the London School of Medicine and Dentistry, Wolfson Institute of Preventive Medicine, Queen Mary University of London, 55 Philpot Street, London, E1 2JH, UK; Tel: +44 207 882 8244; Fax: +44 207 377 7237, m.goniewicz@qmul.ac.uk.

Introduction

Electronic cigarettes (e-cigarettes) are battery-powered devices that deliver vaporised nicotine, usually in propylene glycol or glycerin. In addition to nicotine, the vapor also provides a flavour and physical sensation similar to that of inhaled tobacco smoke while no tobacco, smoke or combustion are actually involved. When a user inhales through the device, air flow is detected by a sensor, which activates a heating element ('atomiser') that vaporises a nicotine solution contained in a cartridge in the mouthpiece. It is this vapour that is inhaled by the user. The device includes a rechargeable battery, a heating element and mouthpiece. Mouthpieces ('cartridges') can be replaced or users can refill them with a nicotine solution themselves. Nicotine-free cartridges are also available. A mouthpiece and cartridge may be joined with a heating element as one unit, called a 'cartomizer'. On some models a colour diode at the tip of the device is activated during inhalation to simulate the glow of burning tobacco. E-cigarettes were developed with the goal of mimicking the action of smoking, including nicotine delivery, without the toxic effects of tobacco smoke [1,2].

There are a number of e-cigarette brands, mostly made in China, but some are now also produced in other countries. According to the Electronic Cigarette Association (an industry association), sales of the product reached an estimated $100 million worldwide in 2009 [3]. This is a small fraction of the sales of conventional cigarettes, but there are signs that e-cigarettes are becoming more popular. According to retailers, there are four main categories of potential e-cigarette users: (i) those who want to quit; (ii) those who want to continue smoking in public places; (iii) those who want a safer alternative to conventional cigarettes; and (iv) those who want to reduce the financial costs of smoking [4]. E-cigarettes are mostly sold via online stores [5]. A study monitoring Google search queries from January 2008 through September 2010 reported that the online popularity of e-cigarettes had surpassed that of snus and nicotine replacement therapy (NRT) products [6]. The study also found an association between e-cigarette popularity and strictness of tobacco control. Over the past few years, the first studies of safety, abuse potential and efficacy of e-cigarettes have emerged. One finding is that e-cigarettes contain varied amounts of nicotine [7]. Although they deliver less nicotine than cigarettes, and deliver it much more slowly, e-cigarettes have been found to alleviate cravings and cigarette withdrawal symptoms [8–10]. E-cigarettes produce trace amounts of various toxic compounds, such as tobacco specific nitrosamines, diethylene glycol, polycyclic aromatic hydrocarbons and aldehydes (formaldehyde, acetaldehyde, and acrolein) [7,11,12]. However, the levels of these toxins are much lower than in tobacco smoke and similar to those delivered by standard NRT medications [13].

Four Internet surveys of e-cigarette users have been published to date. The first study included 81 participants from French speaking countries [14]. The cohort used e-cigarettes mainly to quit smoking and to reduce cigarette consumption. Since respondents were recruited via a smoking cessation website, it is likely that they were highly motivated to quit smoking. The second study included 222 first-time purchasers of e-cigarettes in the US and found that six-month smoking abstinence among responders was 31% (95% confidence interval [CI] = 25%, 37%) [15]. The survey respondents were limited to the users of a single brand of e-cigarettes; therefore the results may not be generalisable to users of other e-cigarette brands. The third survey suggested that e-cigarettes were used in much the same way that people use NRT products [16]. In the most recent study, the majority of e-cigarette users (78%) had not used any tobacco in the 30 days prior to taking the survey [17]. The results of all four surveys are broadly consistent in showing that a high proportion of respondents found e-cigarettes an acceptable replacement for conventional cigarettes. It is not clear whether e-cigarettes promote nicotine addiction and smoking related behaviours similar to those found among users of conventional cigarettes. Furthermore, the side-effects

and health consequences of e-cigarette use remain largely unknown, especially among long-term users.

As of 2009 to 2010, 30.3% (9.8 million) of the Polish population 15 years of age and older were current cigarette smokers, including 36.9% of men and 24.4% of women [18]. It was estimated that in 2000, tobacco-smoking was the cause of approximately 69,000 deaths in Poland [19,20]. Poland allows for the marketing of e-cigarettes within its current regulatory framework, although it bans the sale of tobacco products to minors (<18 years).

As the popularity of e-cigarettes increases, it is becoming important to find out more about the characteristics of e-cigarette users, why and how they use the product, whether e-cigarettes are used exclusively or in combination with conventional cigarettes, and what perceptions and expectations users have of these products. The present study explores the reasons for and patterns of use of e-cigarettes among users in Poland, as well as users' beliefs and attitudes towards the device.

Methods

Survey and Data collection

We developed a web-based survey using existing guidance on utilising the Internet for data collection [21–24]. The survey was targeted to e-cigarette users in Poland and was written in Polish. According to recent data from the Central Statistical Office of Poland, almost 65% of the Polish population has access to Internet resources [25].

The survey was placed on the external server of www.net-ankiety.pl. The survey was partially anonymous in that participants had the option of providing their email addresses and phone numbers to be informed about enrolment for our prospective studies on e-cigarettes. Information about the study was sent to the administrators of 16 e-cigarette discussion forums identified via the Google.pl search engine, and to on-line retailers who sell e-cigarettes and accessories for these products. Five website administrators agreed to publish brief information about the survey and a direct link to the survey website. The brief information included: title and aims of the study, invitation to participate and the names of the sponsoring university and principal investigator. After accessing the link, a more detailed description of the study was displayed. Potential respondents who accessed the survey pages were presented with information about the investigators, the aim of the study, the construction of the survey questionnaire, the expected time required to complete the survey and the consent button. If the potential participant agreed to take part in the study by clicking the "I Agree" button, the survey started. The survey was open for 55 days. No payment was provided to participants. The survey was conducted in compliance with the requirements of the Committee for Human Research at the Medical University of Silesia, Poland.

Study outcomes

The survey consisted of 40 questions grouped into five categories: (i) demographic data; (ii) current patterns of e-cigarette use and beliefs and attitudes regarding the product; (iii) smoking history; (iv) current smoking behaviour; and (v) current health status. Demographic variables included: age, sex, education level, income, residence and current occupation.

The e-cigarette section included questions regarding the pattern of e-cigarette use (history of use, frequency of current use, preferred cartridge strength), opinions about the safety and addictiveness of e-cigarettes, and whether participants perceived themselves as being addicted to e-cigarettes. Two questions modified from the Fagerstrom Test of Nicotine Dependence [26] were included: How soon after waking up do you use an e-cigarette?; and

Do you use your e-cigarette more during the first few hours after waking up than during the rest of the day? Participants were also asked if, in their opinion, e-cigarettes should be regulated by government agencies and sold only in pharmacies like other drugs that contain nicotine (e.g. patch, gum and lozenge). Two questions examined use of any other nicotine products apart from e-cigarettes and conventional cigarettes, and the respondent's main reason for using e-cigarettes.

Smoking history variables included age of smoking initiation, daily cigarette consumption prior to starting the use of e-cigarettes, current smoking status, e-cigarette usage pattern compared to former smoking behaviours, satisfaction received from e-cigarettes compared to conventional cigarettes, and history of using NRT. There is a concern that e-cigarettes may promote nicotine addiction and smoking-related behaviours. To test this hypothesis, we compared two groups: (A) participants who smoked conventional cigarettes when they started using e-cigarettes; and (B) participants who did not smoke at the time they first used e-cigarettes. At the end of the survey, two questions were repeated to assess responders' consistency. Only participants who provided consistent answers were included in the data analysis.

Potential side effects of e-cigarettes were assessed with questions adapted from a study by Varughese et al. on respiratory health consequences of stage smoke exposure in the entertainment industry (stage smoke contains primarily propylene glycol and glycerin – the same compounds generated by e-cigarettes) [27]. Those questions included items from the American Thoracic Society questionnaire and from the European Community Respiratory Health Survey [28,29]. The full survey questionnaire is available from the first author on request.

Statistical analysis

We used descriptive statistics with 95% CI to characterise the study population, patterns of use, beliefs and attitudes towards e-cigarettes, smoking history and potential side effects of e-cigarettes. We used a χ^2 test to compare proportions between participants who smoked conventional cigarettes when they started using e-cigarettes and those who did not smoke at the time they first used e-cigarettes.

All statistical analyses were done with Statistica 9.0 package (Statsoft, Tuscon, USA). All tests were 2-tailed. A P value of < 0.05 was used as the cut-off point for statistically significant differences.

Results

Characteristics of the study sample

A total of 299 people accessed the survey, with 257 starting the survey and 203 completing it. We excluded 11 surveys that were completed from the same IP addresses, and 13 surveys which provided inconsistent answers to the 'consistency check' questions. A total of 179 responders provided usable data (Figure 1). Characteristics of the surveyed population are presented in Table 1.

Patterns of e-cigarette use

Patterns of e-cigarette use are presented in Table 2. Fifty-four percent (95% CI 46%, 62%) of participants were using e-cigarettes for over a month, with 14% (95% CI 8%, 19%) using it for over 6 months. Ninety-eight percent (95% CI 95%, 100%) used e-cigarettes every day and 44% (95% CI 36%, 52%) used it within 30 minutes of waking up. Low or zero nicotine cartridges were less popular than cartridges with medium or high nicotine content.

Believes, concerns, and attitudes towards e-cigarettes

The two main reasons given for initiating e-cigarette use were to quit smoking or to try a safer alternative to smoking. Very few respondents (4%; 95% CI 1%, 7%) started using e-cigarettes out of curiosity. Sixty-four percent (95% CI 56%, 72%) of participants who smoked at the time they started to use e-cigarettes had stopped smoking conventional cigarettes at the time of the survey.

Twenty-five participants (14%; 95% CI 18%, 32%) reported that they were not smoking conventional cigarettes at the time they started to use e-cigarettes. Forty percent indicated their reason for using e-cigarettes was mainly to try a safer alternative to conventional cigarettes. Their pattern of e-cigarette use did not differ from the rest of the sample (see Table 2). Twenty percent (95% CI 4%, 36%) of those who indicated they were non-smokers at the time of initiating e-cigarette use reported that they now smoked conventional cigarettes as well as e-cigarettes, compared to 36% (95% CI 28%, 44%) in the rest of the sample ($P = 0.11$).

The majority of participants (85%) did not think that e-cigarettes were safe, but perceived them to be less dangerous than conventional cigarettes. Similarly, the majority (93%) believed that e-cigarettes were addictive but less so than conventional cigarettes. Interestingly, about half perceived themselves as being addicted to e-cigarettes. For those who had been smokers at the time they initiated use of e-cigarettes, the overall, the pattern of e-cigarette use and the degree of satisfaction with the product was similar to conventional cigarettes (Table 3).

E-cigarette side effects

Of 17 potential side effects assessed by the survey (see supplemental Table 1), three were reported to be present 'sometimes' or 'often' by more than 20% of the participants. These included headaches (21%; 95% CI 15%, 28%), cough during the day (27%; 95% CI 20%, 34%) and phlegm production (25%; 95% CI 18%, 32%).

Discussion

This survey has generated potentially novel insights into e-cigarette effects and the motivation and attitudes of their users. The participants used e-cigarettes primarily as a stop-smoking aid or as an alternative to conventional cigarettes, and the majority of respondents who had been smokers of conventional cigarettes when they began using e-cigarettes reported that they had successfully stopped smoking.

This study had several limitations. First, the participants were primarily recruited via e-cigarette discussion forums. The survey was thus more likely to attract users who were enthusiastic about e-cigarettes rather than those who found them disappointing or otherwise lost interest in them. Secondly, as is often the case with Internet surveys, the participants had above-average levels of education and income. Thus, the findings are not generalisable to the general population. It is also likely that the respondents were using e-cigarettes that effectively delivered nicotine. Not all e-cigarette brands deliver high nicotine levels [31,32], and such products are less likely to receive positive endorsements.

The survey identified a subgroup of e-cigarette users who were not smoking at the time they started to use e-cigarettes. Unfortunately, the survey did not ask participants who reported no smoking at the time of starting the e-cigarette use about their smoking history. It is likely that most or all of these respondents were smokers who were in the process of trying to quit. The fact that they reported using e-cigarettes as a safer alternative to smoking, and that their reported use of e-cigarettes followed the same pattern (including frequency of use and use

after waking up)as the rest of the sample of respondents who reported they were current smokers when they started using e-cigarettes supports this hypothesis. However, we cannot rule out that some of these twenty-five individuals might never have smoked. The question of e-cigarette use by non- or ex-smokers requires further research.

Among respondents who were smoking at the time of starting e-cigarette use, almost 90% used e-cigarettes to stop smoking or to reduce the harm associated with smoking. This finding is consistent with previously reported results [15,16]. In this sample, e-cigarettes were remarkably successful in helping its users to achieve these goals. Over half of these users reported complete abstinence from their usual cigarettes and the rest reported reduced levels of smoking. This was despite the fact that over half of the participants had tried other NRT products before and found them ineffective. If such an effect were achieved in even a minority of e-cigarette users in the general population, it would suggest that e-cigarettes may have the potential to convey health benefits on a population scale through reduced conventional cigarette smoking. On the other hand, since only a small fraction of respondents had been using e-cigarettes for a year or more, it is also possible that many are going to relapse (as they did with NRT) and the impact is overstated.

Dual use of regular and electronic cigarettes does not seem to be a major problem as it has no known negative consequences over and above smoking conventional cigarettes only. It was also was reported by only one-third of respondents, and only 12% reported smoking regular cigarettes on daily basis.

The amount of nicotine delivered seems to be a key factor that determines the e-cigarette pattern of use. In this study, low nicotine e-cigarettes were rarely used. Furthermore, respondents reported that the e-cigarettes were often used within 30 minutes of waking up, their patterns of use of e-cigarettes followed the pattern of previous conventional cigarette smoking, and about half of the users felt addicted to e-cigarettes. These findings are in line with results reported by Etter et al. showing that users of nicotine-containing e-cigarettes experienced better withdrawal relief and a greater effect on smoking cessation than those using non-nicotine e-cigarettes [16].

The participants provided a rational appraisal of the safety and addictiveness of e-cigarettes, thinking that the product is addictive and may contain toxins, but less so than cigarettes. Although half of respondents said they are addicted to e-cigarettes, only one-third thought e-cigarettes were as addictive as conventional cigarettes and two-thirds believed they are either not as addictive or not addictive at all. This finding is in line with previous studies [33,34]. Data are urgently needed on e-cigarette toxicants and their clinical relevance, and on changes in systemic toxin intake in smokers who switch from usual cigarettes to e-cigarettes.

Although respondents were concerned about safety and potential health effects of e-cigarettes they did not want the product to be regulated by government agencies. A previous study also found that e-cigarette users were concerned about its legal status, including the possibly that they maybe banned [15].

Regarding the adverse effects of e-cigarette use, our study lacked a control group and thus the reported adverse effects cannot be attributed with confidence to e-cigarette use. Symptoms such as cough and headache are common among the general population and among smokers in particular. Additionally, given the variability in e-cigarette brands it is likely that potential side effects might vary from product to product. Recently, a case of exogenous lipoid pneumonia due to glycerin inhalation from e-cigarette has been reported [35]. If there is a causal relationship, this would not apply to brands of e-cigarettes which do not use glycerin.

In summary, in this self-selected and possibly atypical sample, e-cigarettes were used primarily as an aid to stopping smoking or for harm reduction, and it was highly successful in assisting users to achieve these goals. The findings support the notion that e-cigarettes may have a potential in smoking cessation and in harm reduction and that its safety and efficacy should be evaluated as a matter of urgency.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Current e-cigarette users
who accessed web-site with a survey
n=299

Did not participate
n=42

Participated
n=257

Survey completed
n=203 (100%)

Survey not completed
n=96

I.P. address verified

Repeated I.P address
n=11 (5%)

Single I.P address
n=192 (95%)

Control questions verified

Valid survey
n=179 (88%)

Invalid survey
n=13 (6%)
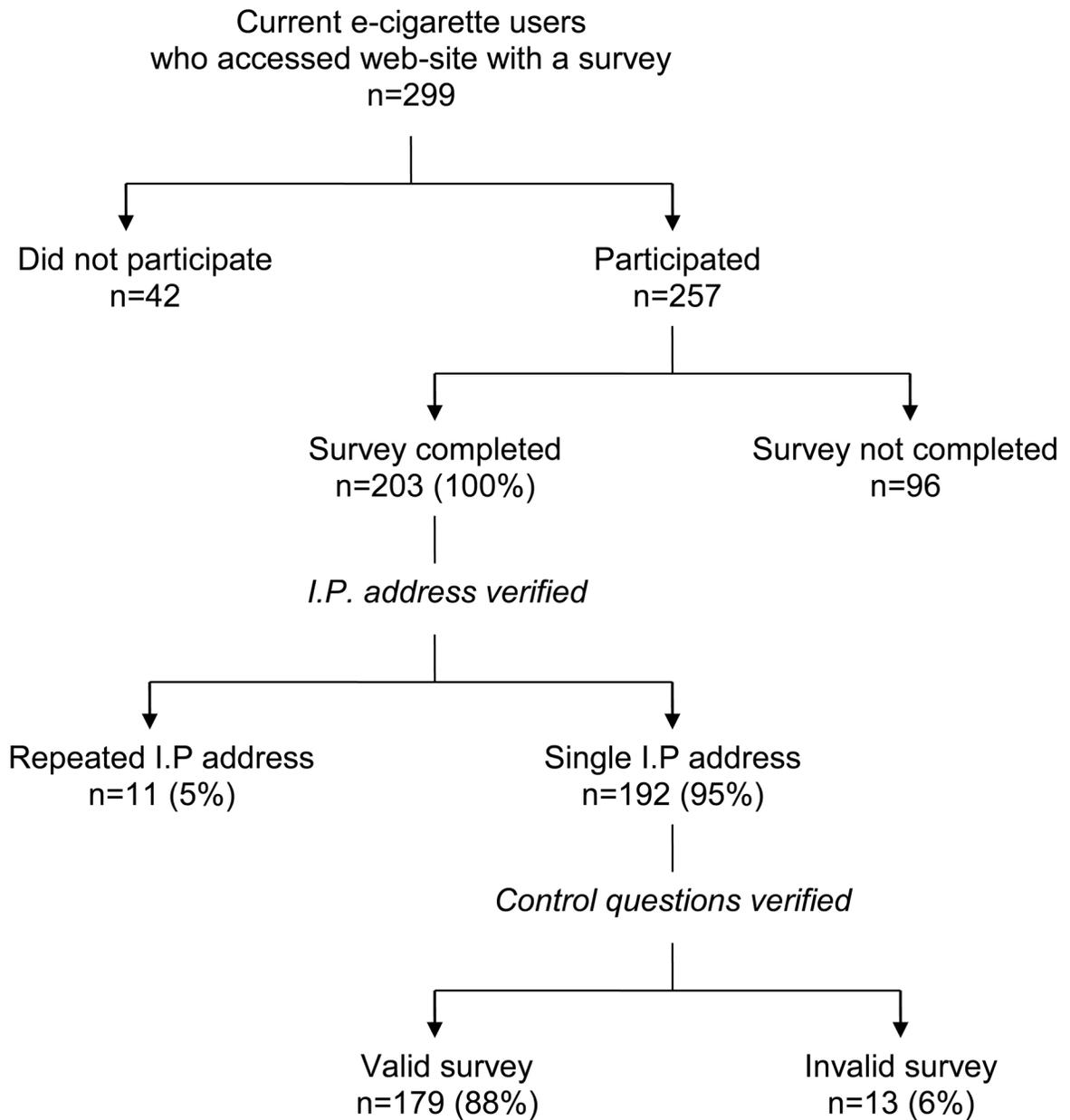
Fig. 1.
Organization and verification of the surveys for current e-cigarette users.

Table 1

Demographic characteristics of the surveyed sample of e-cigarette users (n=179).

	n (%)
Sex	
Male	149 (83%)
Age, years	
16–18	5 (3%)
19–24	32 (18%)
25–34	57 (32%)
35–50	60 (33%)
>50	25 (14%)
Education	
Elementary	2 (1%)
Secondary	65 (36%)
Current Student	33 (19%)
Higher	79 (44%)
Residence	
Countryside	17 (9%)
Small (<200,000)	62 (35%)
Medium (200,000–500,000)	27 (15%)
Large (>500,000)	73 (41%)
Income[a]	
Low (<12K PLN[b])	23 (13%)
Medium (12K-18K PLN)	47 (26%)
High (18K-36K PLN)	69 (39%)
Very high (>36K PLN)	40 (22%)
Occupation	
Freelance/Specialist	29 (16%)
Public service	29 (16%)
Student	27 (15%)
Private business	23 (13%)
Manager	18 (10%)
Other	53 (30%)

[a]Average income per capita in Poland in 2009 was 13.4K PLN (about 4.3K USD) [30].

[b]Polish Zloty.

Table 2

Patterns of use, beliefs and attitudes towards e-cigarettes.

	All (n=179) % (95% CI)	Smoking status on the day of starting e-cigarette use	
		Smoker (n=154) % (95% CI)	Nonsmoker (n=25) % (95% CI)
How long have you been using e-cigarettes?			
Less than one month	46 (38, 54)	47 (38, 55)	40 (20, 60) [*]
1–6 months	40 (33, 48)	40 (32, 48)	44 (24, 64)
6–12 months	12 (7, 17)	11 (6, 16)	16 (2, 31)
Longer than one year	2 (0, 5)	2 (0, 4)	0 (0, 14)
Use e-cigarettes every day	98 (95, 100)	99 (96, 100)	96 (88, 100) [*]
How many times a day do you use e-cigarettes?			
Less than 5 times	4 (1, 7)	4 (1, 7)	4 (0, 14) [*]
6–15 times	29 (22, 36)	28 (20, 35)	36 (17, 55)
16–25 times	27 (20, 34)	28 (20, 35)	20 (4, 36)
More than 25 times	40 (33, 48)	40 (32, 48)	40 (20, 60)
How soon after waking up do you reach for an e-cigarette?			
Within 30 minutes	44 (36, 52)	44 (36, 52)	40 (20, 60) [*]
After 30 minutes	56 (48, 64)	56 (48, 64)	60 (40, 80)
Do you use e-cigarettes more during the first few hours after waking up than during the rest of the day?			
During the first few hours after waking up	34 (27, 41)	34 (26, 42)	36 (17, 55) [*]
During the rest of the day	66 (58, 73)	66 (58, 74)	64 (45, 83)
What is the level of nicotine in a single cartridge that you usually use?			
Zero (0 mg)	3 (0, 6)	2 (0, 5)	8 (0, 19) [*]
Low (>8 mg)	8 (3, 12)	6 (2, 10)	16 (2, 31)
Medium (8–16 mg)	41 (33, 48)	41 (33, 49)	44 (24, 64)
High (>16 mg)	25 (18, 32)	26 (19, 33)	20 (4, 36)
Cartridge filled by user with e-liquid	23 (16, 29)	25 (18, 33)	12 (1, 25)
Do you smoke regular cigarettes?			
Yes, everyday	12 (7, 17)	14 (8, 20)	0 (0, 14) [*]
Yes, every 2–3 days	5 (1, 9)	6 (2, 10)	4 (0, 12)

| | All (n=179) % (95% CI) | Smoking status on the day of starting e-cigarette use | |
		Smoker (n=154) % (95% CI)	Nonsmoker (n=25) % (95% CI)
Yes, once per week	12 (7, 17)	12 (6, 17)	8 (0, 19)
Yes, but less often than once per week	5 (1, 9)	4 (0, 7)	8 (0, 19)
No	66 (58, 73)	64 (56, 72)	80 (64, 96)
How many regular cigarettes do you usually smoke during the days when you do smoke?			
I don't smoke cigarettes	66 (58, 73)	64 (56, 72)	80 (64, 96) [*]
Less than 5	25 (18, 32)	27 (20, 35)	8 (0, 19)
5–10	4 (1, 7)	4 (0, 7)	4 (0, 12)
11–20	3 (0, 6)	3 (0, 6)	4 (0, 12)
More than 20	2 (0, 5)	2 (0, 4)	4 (0, 12)
Do you use any nicotine products in addition to cigarettes or e-cigarettes?			
No	94 (90, 98)	94 (90, 98)	100 (86, 100) [*]
Waterpipe (hookah)	3 (0, 6)	4 (0, 7)	0 (0, 14)
Snuff	1 (0, 3)	1 (0, 3)	0 (0, 14)
Others	2 (0, 5)	1 (0, 3)	0 (0, 14)
What was the reason you tried an e-cigarette for the first time?			
To quit smoking regular cigarettes	41 (33, 48)	47 (38, 55)	n/a[a]
To try a safer alternative for cigarettes	41 (33, 48)	41 (33, 49)	40 (20, 60) [*]
To try something new	4 (1, 7)	4 (0, 7)	8 (0, 19)
Other[b]	14 (8, 19)	8 (3, 12)	52 (32, 72)
Do you think that e-cigarettes are safe for your health?			
Yes, they are absolutely safe	15 (9, 21)	15 (9, 21)	16 (2, 31) [*]
No, but they are less dangerous than cigarettes	82 (76, 88)	83 (77, 89)	72 (54, 90)
No, they are as dangerous as cigarettes	1 (0, 3)	1 (0, 4)	4 (0, 12)
No, they are more dangerous than cigarettes	2 (0, 5)	1 (0, 4)	8 (0, 19)
Do you think that e-cigarettes are addictive?			
Yes, as addictive as cigarettes	33 (26, 40)	35 (27, 43)	20 (4, 36) [*]
Yes, but less addictive than cigarettes	60 (52, 67)	58 (49, 66)	72 (54, 90)
No, they are not addictive	7 (3, 11)	7 (3, 12)	8 (0, 19)
Do you think you are addicted to e-cigarettes?			

	All (n=179) % (95% CI)	Smoking status on the day of starting e-cigarette use	
		Smoker (n=154) % (95% CI)	Nonsmoker (n=25) % (95% CI)
Yes	54 (46, 62)	52 (44, 60)	64 (45, 83) [*]
No	46 (38, 54)	48 (40, 56)	36 (17, 55)
In your opinion, should e-cigarettes be regulated by government agencies and sold only in pharmacies like other drugs that contain nicotine (patch, gum, lozenge)?			
Yes	26 (19, 33)	27 (20, 35)	16 (1, 31) [*]
No	74 (67, 81)	73 (65, 80)	84 (69, 99)

[*] *P*> 0.05.

[a] Option not available to those not smoking at the time of starting e-cigarette use.

[b] Explanations included: e-cigarettes are cheaper; can be used in smoke-free venues; do not stink; do not affect people around me. CI, confidence interval.

Table 3

History of smoking among e-cigarette users who smoked regular cigarettes when they started using e-cigarettes (n=149)[a]

	% (95% CI)
How many regular cigarettes did you smoke before switching to e-cigarettes?	
Less than 10 cigarettes	14 (8, 20)
10–20 cigarettes	36 (28, 44)
More than 20 cigarettes	50 (42, 58)
How long had you smoked regular cigarettes before you started using e-cigarettes?	
Less than 10 years	27 (19, 34)
10–20 years	31 (23, 39)
More than 20 years	42 (34, 51)
How often do you use e-cigarettes compared to regular cigarettes?	
Less often	37 (29, 45)
With the same frequency	36 (28, 44)
More often	27 (19, 34)
When compared to regular cigarettes, how deeply do you inhale e-cigarettes?	
Less deeply	29 (21, 37)
The same	52 (43, 60)
More deeply	19 (12, 25)
When compared to regular cigarettes, do you take puffs more or less frequently from e-cigarettes?	
Less frequently	35 (27, 43)
With the same frequency	43 (35, 51)
More frequently	22 (15, 29)
When compared with regular cigarettes, how much satisfaction do you get from e-cigarettes?	
Less	32 (24, 40)
The same	32 (24, 40)
More	36 (28, 44)
Did you ever try to quit smoking using any nicotine replacement products such as a patch, gum or lozenge?	
Yes, but I found them ineffective	56 (47, 64)
Yes, and I found them effective	4 (1, 8)
No	40 (32, 49)

[a]Five respondents (3% of smokers) did not answer the question about their smoking history. Answers from participants who were not smoking at the time of starting e-cigarette use are not available. CI, confidence interval.