A Qualitative Study Of Perceptions Of E-Cigarettes Among Youth Smokers And Parents Of Youth In Singapore


ORIGINAL ARTICLE

A QUALITATIVE STUDY OF PERCEPTIONS OF E-CIGARETTES AMONG YOUTH SMOKERS AND PARENTS OF YOUTH IN SINGAPORE

Pratika Satghar*, Restria Fauzian, Shazana Shahwan, Janhavi Vaingankar, Louisa Picco, Siow Ann Chong, Mythily Subramaniam

Research Division, Institute of Mental Health (IMH), Buangkok Green Medical Park 10 Buangkok View Singapore 539747.

Abstract

Objective: Electronic cigarettes (e-cigarettes) are increasingly used globally and the implications of their smoking are being debated. The aim of this study is to identify awareness, use and perceptions of e-cigarettes among young smokers and parents of youths in Singapore. Methods: A total of 12 focus group discussions (FGDs) were conducted among youths (aged 15-29 years) who smoke and parents of youths, from diverse social contexts. Participants were recruited using a mix of network and purposive sampling. Youth FGDs were conducted in English language while the parent FGDs were conducted in Chinese and English language. FGDs were audio recorded and transcribed verbatim. The data were analysed using qualitative content analysis. Results: Awareness about e-cigarettes was perceived more among youth as compared to parents in terms of structure, mechanism and use of the device. Parents considered e-cigarettes to be a healthy substitute for conventional smoking. However, youth expressed the failure of e-cigarettes to provide satiety level same as conventional cigarette smoking. Participants endorsed e-cigarettes as a tool for smoking cessation. Conclusion: It was evident from the study that though there was knowledge of e-cigarettes, both parents and youths were ill-informed about them, owing to varied and inconsistent information on e-cigarettes along with its legal implications in Singapore. Future research is required to assess safety and efficacy of e-cigarettes as well as the association of their use with smoking cessation.

Keywords: Qualitative, E-cigarettes, Smoking, Singapore, Perception, Youth

Introduction

Electronic cigarettes (e-cigarettes) or electronic nicotine delivery system (ENDS) are portable, battery-operated devices that simulate tobacco smoking by vaporizing a liquid solution that is typically made up of propylene glycol or glycerol (glycerine), nicotine, and flavouring agents [1]. This liquid solution is heated via a power source in the device, turning it into an aerosol or vapour, which is then inhaled. Since the development of the e-cigarette by Chinese inventor Hon Lik in 2003 [2] and its introduction to the public in 2007 [3], awareness and sales of e-cigarettes have been skyrocketed across the world [4]. In 2011, the Food and Drug Administration (FDA) in the United States announced its plans to regulate e-cigarettes as tobacco products under the Smoking Prevention and Tobacco Control Act which requires manufacturers to get FDA approval before they are distributed (www.fda.gov/NewsEvents/PublicHealthFocus/ucm252360.html). E-cigarette smokers (vapers) have embraced the device, citing reasons for their use as convenient and a means to help cease or stop smoking. Many companies extol e-cigarettes as smokeless products that can be used anywhere, with lower nicotine emissions and toxin content, making e-cigarettes a promising alternative to conventional cigarettes and smoking habits.

Marketing of e-cigarettes has greatly driven consumer’s perceptions of the risks, benefits and decision to use e-cigarettes. Many popular e-cigarette sites claim that e-cigarettes can help in cessation; and the fact that there is no harmful effects of second-hand smoke from the vapour emitted as compared to conventional ones makes them a cleaner, cheaper and healthier alternative [2]. Additionally, these sites also use strategies such as endorsements by celebrities as well as medical professionals. However, a World Health Organisation’s report of 2014 found these claims to be unfounded with little published scientific evidence on both the diminished health risks compared to traditional cigarettes and their effectiveness as a quitting tool.

Adoption of the e-cigarettes as a means for smoking cessation or as a quitting tool is largely
hampered by its adverse effects, debatable safety, inconclusive toxicology data, the lack of standardization of the device and whether it could truly help in cutting back or in quitting a smoking habit [5]. An online study observed the prevalence of smoking cessation among e-cigarette smokers to be 31% and those respondents using e-cigarettes more than 20 times per day stated a quit rate of 70% [6]. Besides delivering nicotine, they are now perceived as a more attractive substitute for smoking than low toxin smokeless tobacco products [7]. Results from various surveys reported that e-cigarettes use helped respondents to quit or reduce smoking and avoid relapse. By contrast, ex-smokers in the sample feared they might relapse to conventional smoking if they stopped using e-cigarettes [8]. But there is a great deal of contradictory findings on side effects of smoking e-cigarettes. A clinical trial among e-cigarette smokers reported mouth and throat irritation and dry cough in the initial few weeks of use [9] while another study reported that e-cigarettes have positive effects on the respiratory system (improved breathing, reduced cough and expectoration), which were probably associated with cessation of tobacco smoking [10].

Singapore is an island city nation off the southern tip of the Malay Peninsula. Singapore’s tobacco control laws are strict by international standards. Smoking Prohibition in Certain Places Act enforced by National Environment Agency renders it an offence to smoke in listed places which includes areas of public gathering and all indoor places. In Singapore, sale, distribution and importation of e-cigarettes are strictly banned but users are still able to purchase them overseas or from online stores. In 2013, the Health Sciences Authority (HSA) confiscated over 2,400 e-cigarettes which was a huge jump from a mere 10 devices confiscated in 2009-indicating its burgeoning popularity amongst people in Singapore [11]. Recently, the Ministry of Health (MOH) of Singapore has banned emerging tobacco products like smokeless cigars, e-cigarettes, smokeless tobacco via the Prohibited Tobacco Products Regulations under Section 15 of the Tobacco (Control of Advertisements and Sale) Act (www.moh.gov.sg/content/moh_web/home/pressRoomItemRelease/2015/singapore-enhances-tobacco-control-efforts-with-han-on-emerging-.html). Recently, few qualitative studies explored the risks and protective factors for youth tobacco initiation as well as reactions to anti-smoking campaigns amongst Singaporean youths aged 15-29 years [12,13]. But there is dearth of research in Singapore on either the prevalence or the perceptions of e-cigarette use. The aim of our study was to explore awareness, use and perceptions of e-cigarettes among youths who smoke and parents of youths between the ages of 15-29 (regardless of their or their children’s smoking behaviour) in Singapore.

Methods

Twelve focus group discussions (FGDs) were conducted in English with youths in Singapore who was smokers; smokers were defined as those who had smoked at least once in the past one month. 91 youth smokers (54 males, 37 females) aged between 15-29 years participated in the study. With parents of youths between the ages of 15-29 years, 12 FGDs were conducted, regardless of their or their children’s smoking behaviour. Thus, 100 parents (16 males, 84 females) participated in the study. The FGDs for parents were done in English (9 FGDs) and Chinese (3 FGDs) language. All the participants, youth smokers as well as parents, were recruited using a mix of network and purposive sampling. Emails were sent out to all staff in the institute of mental health, requesting to refer referrals for smokers (non-patients) for the FGDs. Later, the staff referrals were complemented by snowball sampling wherein the respondents who were smokers, who had participated in the previous FGDs referred their smoker, non-smoker friends and parents. The study was approved by the relevant ethics committee (National Healthcare Group, Domain Specific Review Board) and all participants provided written informed consent before participating in the study FGDs.

FGDs were conducted by two team members; a facilitator and a note-taker. The facilitators and the note-takers were trained in qualitative research methodologies. FGDs were conducted using a common topic guide to ensure standardization across the focus groups. Socio-demographics characteristics and details of conventional cigarette smoking status were collected using a structured questionnaire to provide an overall comprehension of the sample characteristics. Participants were allowed to raise additional issues which they considered important towards the end of the FGD. Data collection ended when data saturation was reached.

All FGDs were audio recorded and transcribed verbatim. The parent FGDs conducted in Chinese were translated and transcribed into English by the team members. The facilitators checked the transcripts for consistency. Data was analysed using qualitative content analysis, with the goal of answering the research question [14]. NVivo V.10 was used for data analysis (QSR International. NVivo V.10 (2012, http://qsrinternational.com) which is a computer software. An analysis of a subset of transcribed FGDs was conducted independently by PS, MS, SS and RF. The data
acquired was broken down into smaller units and assigned codes based on the content they represented. Following this, the codes were grouped together according to concepts to develop themes [15]. Code terms were discussed and refined to construct a codebook after second level of analysis of the same sub-set of data. Consensus was reached through discussion and an iterative review of codes and themes. Three authors (MS, PS and SS) coded the same transcripts (three transcripts in total) using the codebook developed. The inter-rater reliability tests performed on NVivo V.10 established Cohen’s kappa coefficient among the three coders to be 0.74-0.78. The three authors then coded the transcripts independently. The ethical approval was obtained from the National Healthcare Group Domain Specific Review Board. Figure explains the stepwise approach exercised in methodology.

**Results**

Majority of the youths were males (59%) and of Chinese ethnicity (52%) (Table1). Their duration of smoking varied between 1 to 16 years. The age of parents ranged from 30-70 years, majority were females (84%) and of Chinese ethnicity (79%) (Tables 1 and 2).

<table>
<thead>
<tr>
<th>N=91</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>54</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
</tr>
<tr>
<td>15-20</td>
<td>24</td>
</tr>
<tr>
<td>21-29</td>
<td>67</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>47</td>
</tr>
<tr>
<td>Malay</td>
<td>29</td>
</tr>
<tr>
<td>Indian</td>
<td>14</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
</tr>
<tr>
<td>Highest qualification</td>
<td></td>
</tr>
<tr>
<td>PSLE/Completed primary education</td>
<td>2</td>
</tr>
<tr>
<td>Secondary</td>
<td>5</td>
</tr>
<tr>
<td>'O'/N'/Completed secondary education</td>
<td>23</td>
</tr>
<tr>
<td>'A' level/Completed Pre-U or Junior college</td>
<td>6</td>
</tr>
<tr>
<td>Vocational Institute/ITE Nitec Certificate</td>
<td>10</td>
</tr>
<tr>
<td>Diploma</td>
<td>28</td>
</tr>
<tr>
<td>University degree</td>
<td>15</td>
</tr>
<tr>
<td>Others qualification</td>
<td>2</td>
</tr>
</tbody>
</table>

While the study did not specifically explore the awareness and perception of e-cigarettes, the topic came up spontaneously during initial FGDs and a decision was made to explore the theme in future focus groups. The questions asked to the participants were: ‘What have you heard or read about e-cigarettes?’ ‘What are the advantages or disadvantages of e-cigarettes?’
Table 2. Socio-demographic profile of parents of the youths

<table>
<thead>
<tr>
<th></th>
<th>N=100</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Female</td>
<td>84</td>
<td>84</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 50</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Above 50</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Malay</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Indian</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Highest qualification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal education/Primary</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>PSLE/Completed primary education</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Secondary</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>‘O’/’N’/Completed secondary education</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>‘A’ level/Completed Pre-U or Junior college</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Vocational Institute/ITE Nitec Cert</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Polytechnic Diploma</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Other Diploma</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>University degree</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Post graduate degree (e.g. Masters/PhD)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Others qualification</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Four themes emerged from the FGDs conducted with youth smokers and parents:

**Understanding of structure and working mechanism of e-cigarette**

The majority of youths as well as parents were aware of e-cigarettes in terms of structure and
working mechanism. Youths described e-cigarettes as portable versions of shisha while some felt it was similar to conventional cigarettes, “Like a portable shisha, something like that.” (Youth, 21 years, male).

“You know, so basically e-cigarettes works like something like a shisha basically, because it has to be like water operated and battery operated.” (Youth, 26, female).

“I think its battery operated. It doesn’t need a lighter; it feels like a real cigarette, it gives off real smoke.” (Parent, 40 years, female).

“Something (a stick) slim and small, looks nice, I said “Is this for guys to smoke? Is probably for the ladies.” Its design is too nice already.” (Parent, 45 years, male).

Stepping stone towards smoking cessation
Another theme that emerged from the discussions was the perception of use of e-cigarettes as a means for smoking cessation or quitting and that they were a healthier alternative.

“I don’t know if it has like nicotine inside, in the e-cigarette itself, but a lot of people told us that the first step to quit…you can try to pick up e-cigarettes instead of the normal cigarettes.” (Youth, 25 years, male).

“At least from what I’ve read on the net is that, it has a very… it’s a very good and viable way for people to quit smoking.” (Youth, 24 years, female).

Parents also endorsed that e-cigarettes may help smokers to remain abstinent during their quit attempt or to reduce cigarette consumption:

“I think it’s supposed to help the person quit.” (Parent, 36 years, female).

“Because, one of my friends says, don’t smoke, so expensive. Go and buy the electronic one then. It’s similar; this is to help us quit smoking you know.” (Parent, 40 years, male).

Advantages of e-cigarettes
Youths mentioned the perceived advantages of e-cigarettes, which echoed some of the reasons stressed by e-cigarette companies:

“Technically cause you can smoke it anywhere. Like, indoors. In someone’s car, in shopping centres, I mean no one really knows. It’s not, technically it’s not smoking.” (Youth, 29 years, male).

“It doesn’t have any side effect like smoke cigarette like carbon monoxide and everything else so it’s currently a controlled item and I think it should be allowed you know because, like there’s no harmful things. So the whole liquid right, it’s just tobacco…Yeah but you can mix it with flavours. That’s the interesting part.” (Youth, 26 years, male).

Whereas parents believed that apart from being a substitute for conventional cigarettes, e-cigarettes reduce the harmful effects of second hand smoke as they do not emit side-stream smoke similar to conventional cigarettes. Also the aerosol exhaled smells good as the e-liquid is flavoured.

“But it smells good you know. Yeah, it has flavours, it is flavoured. It is vapour: Hah, its vapour. And it smells good and they say that it will not affect the kids. My brother is taking it and introduced it to my husband and bought it for my husband.” (Parent, 48 years, female).

Disadvantages of e-cigarettes
However, majority of youth highlighted certain disadvantages of the e-cigarettes such as dryness of throat and the fragility of the device. In most cases, youth eventually abandoned the device as they were aware of its legal implications in Singapore.

“I have an e-cigarette …… I think it was like ‘### (expletive)’ that was when I smoke. Cos, I’m not quite sure is it was more harmful than cigarette cost I tried once, my own one, I think the thing… the cigarette thing flows out so it get into my mouth so I feel very disgusted. So you know like, I heard that it’s much more harmful lash, and then when I smoke my friend’s one, when I click right feels damn dry for my throat so I don’t really like it.” (Youth, 19 years, male).

Also, lack of satiety was common disadvantage mentioned by both the participating groups.

“No kick; I don’t feel any - I don’t feel relaxed, I feel like it’s just some fake thing that I’m smoking. Like toy that doesn’t give the same sensation.” (Youth, 29 years, male).

“I heard of that (e-cigarettes) as well but I think if you are a real smoker and you need the nicotine to kick you, that one is a waste of money but if you are a social smoker, it’s a habitual, just you know, you just want to have something, then that one okay. Rightfully, I think if you are not a heavy smoker, you can”. (Parent, 60 years, male).

Some parent participants also expressed that they were unaware about the existence of e-cigarettes. Also, lack of knowledge was observed among parent participants about the contents and usage of the e-cigarettes as compared to youth.

Discussion
The study found that opinions about e-cigarettes among young people who smoked were largely in congruence with parents of youths. This finding is explained by various studies which suggest that the e-cigarette industry targets young people by disseminating information on e-cigarettes widely through social media [16]. Awareness of e-cigarettes and population based studies of e-cigarette use among both adults and adolescents have at least doubled in United States and European Union from 2008 to 2012 [17]. Previous studies on use of e-cigarettes among adults projected the rate of e-cigarette use to be highest
among current smokers, followed by ex-smokers and non-smokers [18]. Findings from our study are in line with prior work where participants believed use of e-cigarettes could help smokers maintain or reduce their conventional tobacco cigarette consumption [9, 10]. Previous research suggested use of e-cigarettes as one of the harm-reduction strategies, thus shifting smokers away from smoking tobacco [19]. Use of the device has shown to result in reliable nicotine delivery to levels similar to conventional cigarettes in experienced smokers [20] as well as producing levels of toxicants which are comparatively lower [21], highlighting their potential to be effective replacements. Several studies have also demonstrated that the device could be utilised as a cessation and relapse prevention tool [22].

E-cigarettes are also perceived as a more useful tool for stopping smoking in ex-smokers and are more effective at reducing withdrawal symptoms in experienced users [23]. On the contrary, a study among smokers showed that e-cigarette use was negatively associated with intentions to quit and not associated with quitting behavior [24]. While the findings are largely encouraging, its potential is undermined by its variability in nicotine delivery, content, and performance. User manipulation of the device exacerbates this further. A prior study revealed that the association between e-cigarette use and quitting suggests greater adherence to nicotine replacement therapy with motivations to stop smoking, level of nicotine dependence and a higher socio-economic status as predictors of quitting [25]. Also, data from previous epidemiological, population based studies suggests that dual use with conventional cigarettes is the predominant pattern of e-cigarette use among youth [4]. Smoking e-cigarettes poses a health hazard by encouraging adolescents to start smoking conventional cigarettes after they take up e-cigarettes as first line of smoking. A longitudinal study among young Swiss men reported that e-cigarette use may lead to progression in smoking among non-smokers by acting as a gateway to conventional cigarette use [26]. Few other studies reported that adolescents who vaped for recreational purposes were more likely to experiment with conventional tobacco products like cigarettes as compared to non-vapers [27,28].

Majority of the participants identified positive features or advantages of e-cigarettes including the convenience to smoke indoors, gives out pleasant smelling vapor and also reduces second hand exposure [29]. A recent study revealed that second-hand exposure or using an e-cigarette indoors may involuntarily expose bystanders to some levels of nicotine but not to toxic tobacco-specific combustion products [30]. The availability of different flavoured fluid content of e-cigarettes is also considered a benefit over conventional cigarettes by young smokers.

Participants also identified some disadvantages of e-cigarettes. Youths expressed e-cigarette smoking didn’t give them the same ‘kick’ or pleasure, that is, satiety level was not the same as compared to smoking a conventional cigarette. This may be attributed to combined effect of amount of nicotine content and nicotine delivery, levels of nicotine absorption [31] and differences in the engineering characteristics of the device [3]. Hence, most smokers eventually reverted to conventional cigarettes citing reasons of being unsatisfied with e-cigarettes and endorsed dual use with cigarettes [2,4]. Few e-cigarette trials indicated that smoking e-cigarettes elevates serum cotinine levels with passive exposure of serum cotinine which is similar to that of conventional cigarettes. This illustrates that these two means of smoking deliver the same levels of nicotine despite the health claims companies make for e-cigarettes [32]. Others suggested that vaping is unlikely to yield a high concentration of nicotine in the circulation of inexperienced users while experienced users can extract as much nicotine from electronic cigarettes as smokers can from tobacco cigarettes [20]. But the fact that cigarette smokers are at a higher risk of developing lung cancers and a myriad of other respiratory and pulmonary diseases cannot be ignored [33].

The Centre for Disease Control (CDC) in the United States has reported an exponential jump in the numbers of calls made regarding e-cigarette nicotine-infused liquids: from 0.3% in September 2010 to 41.7% in February 2014. 51.1% of these calls involved the accidental poisoning of children [34]. Recent research has shown that smoking these electronic devices also cause adverse effects similar to smoking conventional cigarettes such as upper respiratory tract irritation, cough, nausea, vomiting, allergies due to flavoured e-cigarette liquid and the chemical with addictive properties contributing to cardiac complaints [32,35]. But any of these disadvantages of smoking e-cigarettes were not mentioned by our study participants.

The study had some limitations. Firstly, sale, distribution and importation of e-cigarettes are illegal in Singapore and therefore, may have resulted in participants being less inclined to discuss their personal use of e-cigarettes. Another is the wide age range among participants, parents (30-70 years) and youth (15-29 years). The knowledge, awareness and experiences about e-cigarette use among parents of youths between the ages of 15-29 years, may vary considerably with
those belonging to young smokers which could be attributable to globalisation and accessibility to information on e-cigarettes through various media.

Multiple debriefings were done to ensure that the researchers were not missing the viewpoint of any group or participant or inadequately exploring themes that were exclusive to a group. However, despite our best efforts we do acknowledge that this remains a limitation of our study. The strengths of the study are that it was performed in an Asian country where e-cigarettes are banned, large sample size and diversity of the sample in terms of age, ethnicity and gender and use of stringent qualitative methodology.

**Implications**

It was evident from the current study that while there were knowledge-cigarettes among youths, parents’ knowledge was limited, owing to the varied and inconsistent information on e-cigarettes locally. At present, it is obvious that there is a need for further research, including the pattern of use and behaviour amongst e-cigarette smokers, its trend over time, as well as the long-term effects. Future research also needs to look into the association of e-cigarette use and smoking behaviour along with factors that could contribute to its safety and efficacy. Regulation of e-cigarettes could lead to more consistent overall performance of the device. With the rising popularity of the device, it is crucial that consumers, regulators and policy makers take decisions that are based on evidence from high-quality independent research and not on the information provided by the manufacturers. Furthermore, unbiased data should be disseminated to the public.

**Conclusion**

The current qualitative study among a multi-ethnic Asian population of young smokers and parents of youth provides an insight on e-cigarettes that are comparable to other studies reported in non-Asian countries. Although preliminary, study findings highlight the importance of further research to understand youth behaviours associated with e-cigarette smoking, particularly with the largely ‘accepted’ and ‘beneficial’ perceived outlook on e-cigarette use among the youths and their parents in Singapore.

**Declaration of Conflicts**

None

**Acknowledgement**

The authors are grateful to the individuals who agreed to participate in this research and whose responses provided the basis for this article.

**Funding**

The study was funded by National Healthcare Group, Small Innovative Grant. NHGSIG/13003.

**References**


A Qualitative Study Of Perceptions Of E-Cigarettes Among Youth Smokers And Parents Of Youth In Singapore


Corresponding author: Pratika Satghare, Buangkok Green Medical Park, 10 Buangkok View, Singapore 539747
E-mail: pratika_satghare@imh.com.sg
Received: 11 October 2017
Accepted: 1 February 2018
Published: 8 February 2018