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Short Communication

Electronic cigarette awareness and use among adults in Hong Kong

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HIGHLIGHTS

- We reported the awareness and ever use of e-cigarettes among adults in Hong Kong.
- The awareness of e-cigarettes was widespread among both smokers and nonsmokers.
- E-cigarette use was associated with male gender, young age, and cigarette smoking.
- Main reasons for use were curiosity, the stylish design, and quitting smoking.

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ABSTRACT

Introduction: Electronic cigarettes (e-cigarettes) have gained popularity rapidly in the Western world but data in the East are scarce. We examined the awareness and ever use of e-cigarettes, and reasons for e-cigarette use in a probability sample of adults in Hong Kong.
Methods: Cross-sectional data were collected in 2014 from Chinese adults aged 15–65 in Hong Kong (819 never smokers, 800 former smokers, 800 current smokers) via computer-assisted telephone interviews (response rate: 73.8%). Analysis was limited to a subset of 809 respondents (i.e., 357 never smokers, 269 former smokers, 183 current smokers) who were randomly selected to answer questions on e-cigarettes. Chi-square analyses compared e-cigarette awareness and ever use by gender, age, education, and cigarette smoking status. Multivariable logistic regression examined if e-cigarette awareness was associated with demographic variables and cigarette smoking status.
Results: 75.4% of adults had heard of e-cigarettes, and 2.3% reported having used e-cigarettes. Greater awareness was associated with male gender and higher education. Ever use of e-cigarettes was higher among males (3.6%, $p = .03$), younger adults (aged 15–29, 5.2%, $p = .002$), and current cigarette smokers (11.8%, $p < .001$). Common reasons for using e-cigarettes were curiosity (47.4%), the stylish product design (25.8%), and quitting smoking (13.6%).
Conclusions: Awareness of e-cigarettes was widespread in Hong Kong. Although the use of e-cigarettes was low, its relation with younger age and current smoking is of concern. Health surveillance of e-cigarette use is needed. Interventions should target young adults and cigarette smokers, and address the marketing messages, especially the effect of e-cigarettes on smoking cessation.

1. Introduction

Electronic cigarettes (e-cigarettes) are battery-operated vaporizing devices that produce vapor by heating the liquid solution (usually containing nicotine, flavorings, glycerol, and propylene glycol) (Grana, Benowitz, & Glantz, 2013). Since their introduction to the market in China in 2005, e-cigarettes have rapidly gained popularity in the Western world (Adkison et al., 2013; Dockrell, Morrison, Bauld, & McNeill, 2013; Grana, Benowitz, & Glantz, 2014; Pepper & Brewer, 2014). Today, over 200 companies worldwide manufacture e-cigarettes (Southeast Asia Tobacco Control Alliance, 2014) with more than 466 brands on the market (Zhu et al., 2014). Big tobacco companies (e.g., Lorillard, R. J. Reynolds, Altria, British American Tobacco, and Imperial Tobacco) have entered the e-cigarette market since 2012 (Pepper & Brewer, 2014; The Economist, 2014). The world's largest e-cigarette producer and exporter, China, launched its own e-cigarette lines in 2014 (O'Neill, 2014). The rapidly growing business of e-cigarettes represented a $2 billion (US dollar) global market in 2013,

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and the revenue is estimated to rise to $10 billion by 2017 (Lopes, 2013; Mangalindan, 2014).

E-cigarette manufacturers and retailers often marketed the products as healthier alternatives to conventional cigarettes and a smoking cessation device (Grana & Ling, 2014; Yao, Jiang, Grana, Ling, & Glantz, 2014). These marketing claims have been successfully transmitted to consumers as the most common reasons for smokers' initiating e-cigarette use were to reduce the harm of traditional cigarettes or to help quit cigarette smoking (Adkison et al., 2013; Dawkinns, Turner, Roberts, & Soar, 2013; Etter, 2010; Etter & Bullen, 2011; Goniewicz, Lingas, & Hajek, 2013; Pepper, Emery, Ribisl, Rini, & Brewer, 2014). However, recent studies showed that e-cigarette users were less likely to quit smoking (Vickerman, Carpenter, Altman, Nash, & Zbikowski, 2013), or there was no difference in cessation between e-cigarette users and non-users (Adkison et al., 2013) or nicotine patch users (Bullen et al., 2013).

Little is known about e-cigarette use in Asian countries. China produces 90% of the world's e-cigarettes (Barboza, 2014), but the Chinese government has no regulation on the device (O'Neill, 2014). Hong Kong, a special administration region of China, has no law targeting e-cigarettes, but e-cigarettes containing nicotine are regulated as pharmaceutical products. As of August 2015, no one has applied for a license to sell e-cigarettes with nicotine in Hong Kong. E-cigarette use is banned in smoke-free venues in Hong Kong as the clean indoor air law bans smoking without specifying what is being smoked (The Government of the Hong Kong Special Administrative Region, 2013a). However people, including children, can easily get e-cigarettes (many claimed to be nicotine-free) in shopping malls, local stores, or through the Internet (Tsang, 2015). E-cigarettes containing nicotine are available from websites for online shopping, such as taobao.com, the largest online shopping destination in China. In 2012/13, 1.1% of secondary school students in Hong Kong reported current (past 30-day) e-cigarette use, and e-cigarette use is associated with smoking intention and nicotine dependence in adolescents in Hong Kong (Wang, Ho, Leung, & Lam, 2015). The government is now considering a total ban on e-cigarettes, including sales, advertising, distribution, sponsorship and manufacturing (Chan, 2015; Tsang, 2015).

This study examined the awareness and use of e-cigarettes in a probability sample of Chinese adults in Hong Kong. We compared the responses among three subgroups, including never smokes, former cigarette smokers, and current cigarette smokers, and described their reasons for using e-cigarettes. Findings may help understand the potential need to regulate e-cigarette marketing in Hong Kong.

2. Material and methods

2.1. Data source

We analyzed data from the 2014 Hong Kong Tobacco Control Policy-related Survey (thereafter referred as "the Survey") commissioned by the Hong Kong Council on Smoking and Health. This cross-sectional probability survey was conducted annually via computer-assisted telephone interviews among Chinese adults aged 15–65 years in Hong Kong since 2013. Households with a landline telephone (about 70% of the total population in Hong Kong) were covered by the Survey. Data for this study were collected in May–September 2014 by the Policy 21 Limited, a local renowned survey company (Policy 21 Limited, 2014). The questionnaire was anonymous, including core questions (responded by all participants) and random questions (responded by a random subset of participants).

A total of 2419 respondents (including 819 never smokers who had never smoked cigarettes, 800 former smokers who smoked cigarettes before but did not smoke now, and 800 current smokers who smoked cigarettes in the past 30 days) completed the interviews with a response rate of 73.8%. The analysis was limited to a subset of 809 respondents (including 357 never smokers, 269 former cigarette smokers, and 183 current cigarette smokers) who were randomly selected to answer the questions about e-cigarettes.

2.2. Main measures

The awareness of e-cigarettes was assessed by a question "Have you ever heard of e-cigarettes? (E-cigarette is a battery-powered device that looks like cigarettes and delivers aerosol to a user while heating the cartridges.)" Respondents who answered "Yes" were asked "Have you ever tried an e-cigarette?" E-cigarette users were asked "Why do you use e-cigarettes?" Multiple answers could be selected from 17 response options, including "I like the taste," "It looks stylish and cool," "It is novelty," "It helps quit smoking," "It helps reduce cigarette consumption," "It is a gift from others," "It is less harmful," "No secondhand smoke, so it does not bother others," "I can use it in smokefree areas," "It is cheaper than traditional cigarettes," "It is green, good for the environment," "It is safer than traditional cigarettes," "It is clean," "I am curious about it," "It is convenient to use," "I saw friends using the device, so want to have a try," and "other reasons". Demographic characteristics such as gender, age, and education attainment were recorded.

2.3. Statistical analysis

Data were analyzed using Stata version 13.0. Analyses were adjusted with sample weight according to Hong Kong 2014 census data (Government of Hong Kong Special Administrative Region, 2012; The Government of the Hong Kong Special Administrative Region, 2013b) and accounted for oversampling of former and current cigarette smokers according to the prevalence of former and current smoking for the entire adult population (aged 15–65 years) in Hong Kong (The Government of the Hong Kong Special Administrative Region, 2013b). Sample demographics, weighted prevalence of e-cigarette awareness and use, and reasons for using e-cigarettes were summarized using descriptive statistics. We conducted chi-square tests to compare e-cigarette awareness and ever use by demographics and cigarette smoking status. We then conducted multivariable logistic regression to examine if e-cigarette awareness was associated with gender, age, education and cigarette smoking status with mutual adjustment.

Table 1
The awareness and ever use of e-cigarettes among Chinese adults in Hong Kong.

	N	Awareness			Ever use		
		n	%	*p*-Value for χ^2	n	%	*p*-Value for χ^2
Total	809	575	75.4		41	2.3	
Gender				.04			.03
Male	416	317	80.4		29	3.6	
Female	393	258	71.2		12	1.3	
Age				.20			.002
15–29	248	186	83.1		20	5.2	
30–49	224	161	73.7		12	1.8	
50–65	327	220	72.5		9	1.0	
Education				.06			.39[a]
Primary	86	49	57.5		1	1.2	
Secondary	436	305	74.8		20	2.0	
Post-secondary	267	208	79.4		18	2.9	
Cigarette smoking status				.51			<.001[b]
Never smokers	357	268	76.3		4	1.0	
Former smokers	269	180	70.1		13	4.3	
Current smokers	183	127	71.2		24	11.8	

[a] Due to small cell size, we combined respondents with primary and secondary education levels into one group. Chi-square test examined the difference between the combined group and those with post-secondary education level.

[b] Due to small cell size, we combined never smokers and former cigarette smokers into one group as non-cigarette smokers. Chi-square test examined the difference between non-cigarette smokers and current cigarette smokers.