

Peer motivation towards electronic-cigarette smoking among secondary school students in a selected school in Kuantan, Malaysia

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Abstract

Although research in high income countries highlighted that peer influence served as an important factor in the first time use of e-cigarette among the secondary school students, there is a lack of research on this topic in Malaysia. This study measured the prevalence of future intention to smoke e-cigarette and explored the possible determinants, particularly the peer motivation. A cross sectional study was done in April 2016 among 101 Form 4 (secondary school) students using universal sampling procedure. Assisted self-administered questionnaire was adapted and modified from two studies that was done in Scotland and Malaysia. Data were analyzed using frequencies, percentages, Chi-square test and Fisher's exact test. Most students (96%) had previously heard of e-cigarette and among them ever user and never user were 36.1% and 63.9% respectively. About 28.4% of the students reported that more than half of their friends used e-cigarette. The prevalence of intention to smoke e-cigarette in the next 12 months was 8.2% (n = 8). Among them 20% was ever user and 14.3% was male students. Ever user significantly intended to use e-cigarette in the next 12 months ($p = 0.003$). The prevalence of intention to smoke e-cigarette if offered by best friend was 20.6% (n = 20). Both ever user (57.1%) and male students (42.9%) intended to use e-cigarette if offered by best friend ($p < 0.001$). No significant association was realized between the number of friends using e-cigarette and respondents' intention to use e-cigarette. This study highlighted that ever user and male students were more likely to smoke if one of their best friends offered them. Peer influence is one of the main contributing factors for secondary student's future smoking behaviour. School health education programme may be one of the effective strategies to prevent smoking e-cigarette also.

Key words: vaping, smoking, friend, students

Introduction

Electronic cigarettes (EC) are defined as battery-powered devices that deliver vapourised nicotine^{1, 2}. In addition to nicotine, the vapour also provides flavour and physical sensation similar to that of inhaled tobacco smoke^{1, 2}. EC were developed with the goal of mimicking the action of smoking^{1, 2} and it has been marketed as both a smoking cessation tool and an alternative to conventional cigarettes³.

Studies done on the prevalence of awareness of e-cigarette with the same definition as "have you ever heard of e-cigarette" among secondary school students (14 to 18

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years old) for both genders reported an awareness of 92% in Connecticut (2013)⁴, 91% among 15 to 24 years old in Italy (2014)⁵ and 90% among 11 to 18 years old in Scotland (2014)⁶. Among the studies carried out in Asia, the awareness about e-cigarette was 25% among 15 to 24 years old in Malaysia and 14% among 15-24 years old in Indonesia (2011)⁷. The prevalence of ever using e-cigarette, with the same definition as *“those who have tried to use e-cigarette once or twice in their life”*, was reported as 25% in Connecticut⁴, 16% in Scotland⁶ and 8% in Italy⁵. However, among other Asian countries only one study with a similar definition of ever usage was reported from South Korea with 0.5% among 16 to 18 years old students (2011)⁸. The study done in Malaysia described the prevalence of *current* e-cigarette, defined as those who used e-cigarette daily or less than daily reported a prevalence of 4.4% of among those aged 15 to 24 years old (2011)⁷.

There were several factors influencing adolescent demand for e-cigarette and among them ‘marketing strategies, peer and family influence’ were found to be the main determinants for e-cigarette usage among secondary school students⁹⁻¹¹. A lot of manufacturers had been using youth relevant appeals such as celebrity endorsements, trendy/fashionable imagery and variety of flavors to advertise e-cigarettes widely in the internet to attract the younger generation to experiment and try their products^{12,13}. ‘Peer and family members influence’ was another important factor in influencing the adolescents to become an ever-user of e-cigarette. About 50% of current e-cigarette users had very strong peer influence and 34% of them had another smoker at home¹¹. Besides that, about 61% of the secondary school students obtained their first e-cigarettes from a friend and another 21% got them from family members⁶.

There were research findings on ‘peer influence served as an important factor in the first time use of e-cigarette’^{6,11} but there is lack of research in Malaysia especially among the secondary school students. This research set out to provide baseline information on the use of e-cigarette, to find out problems regarding e-cigarette and the factors which encourages and fuel experimentation with e-cigarette among Form 4 students. This study also measured the prevalence of future intention to smoke e-cigarette and explored its associated factors, particularly the peer influence.

Methods

A school-based cross-sectional study was done in a secondary school in April 2016 among 101 Form 4 students. In Malaysia, 10th grade is also known as Form 4 in secondary school. The students at this stage are 16 years old, and it is the fourth year in the secondary school. Universal sampling procedure was used to get target population with exclusion criteria of those without parental consent, those who do not want to participate in the survey and those who were on medical leave and were absent at data collection time. Sample size was calculated based on data from a study done in Scotland⁶ which reported the proportion of ever use of e-cigarette among secondary school pupils at 16% with 30% non-response rate. The minimum sample size required was calculated to be around 100. The sample size was calculated using open epi statistical software.

Assisted self-administered questionnaire with 2 sections (A and B) was adapted and modified from the following two studies that was done in Scotland⁶ and Malaysia 2012¹⁴ as main references.

The section A included socio-demographic characteristics¹⁴ such as age, gender, ethnicity and marital status of the family. The section B covered the prevalence of awareness on e-cigarette, prevalence of e-cigarette usage and exposure to e-cigarette used by friends⁶. Awareness about e-cigarette was defined as those respondents who answered “yes” to the question, “have you ever heard of e-cigarette”. Respondents who answered ‘yes’ to the awareness question was then required to answer the question “Have you ever used e-cigarette?”. The answer was then divided into 3 groups namely: never user, previous user and current user. Current user would have to answer either “I sometimes use e-cigarettes but less than once a month”, “I use e-cigarettes at least once a month, but less than once a week” and “I use e-cigarettes at least once a week”. Previous user would have to answer “I have only tried using e-cigarettes once or twice” and “I used e-cigarettes in the past, but I never use them now”. Never user would have to answer the question if they have never used e-cigarette or if they do not prefer to respond they are then categorized into 2 groups as ever use (both current and previous user) and never use¹⁵.

For exposure to e-cigarette used by friends: the respondent was required to answer “*How many of your friends use e-cigarettes?*”. The answers were categorized into ‘half and more’ (all or almost all, more than half, half) and ‘less than half’ (less than half, hardly any, none and I don’t know).

Next two questions on intention to use e-cigarette were modified from “Global School-based Student Health Survey GSHS Malaysia 2012”¹⁴. The questions were: “*At any time during the next 12 months, do you think you will smoke an e-cigarette?*”. However, this question was purely assessing the intention of e-cigarette usage without any valid reason behind it. And then, the 2nd question was “*If one of your best friends offered you an e-cigarette would you smoke it?*”. Respondent was instructed to choose one answer from four options available which were definitely not, probably not, probably yes and definitely yes.

Since the questionnaire in this study was conducted in Malay language, the questionnaire from Scotland⁶ was translated from English to Malay by a certified translator from Malaysian Institute of Translation and Books and from Malay to English by the year 4 medical students. On the other hand, GSHS¹⁴ questionnaire was available in dual language, Malay and English.

After notifying the target population, the team arranged a meeting with the headmistress. The consent letters for parents were distributed to the students two days ahead of data collection. The consent letters were collected on the day of data collection. All research team members were explained one day prior to data collection regarding data collection procedures and quality control in guiding the respondent while answering the questionnaire to minimize errors. At the end of the data collection day, all the forms were

submitted to the respective research members based on serial number to check for any missing data.

Statistical Analysis

Statistical analysis was performed by using IBM SPSS Statistics for Windows version 20.0. As for descriptive data, socio-demographic variables such as age, gender, ethnicity and marital status of parents were presented in the form of frequency and percentages. Descriptive analysis was performed to obtain the prevalence of awareness, usage of e-cigarette and other related factors among respondents. Cross tabulation by bivariate analysis: Chi-square test and Fisher’s exact test were used to assess the association between intention to smoke e-cigarette and the possible independent variables. Association was considered statistically significant when the p value was less than 0.05.

Ethical consideration

Before conducting the research, Faculty of Medicine, International Islamic University Malaysia had obtained permission from the Ministry of Education and District Education Office to conduct this study among Form 4 students. All respondents who agreed to participate had the permission from their parents whereby a written consent was given beforehand. They were also reassured that their data will be kept private and confidential.

Results

The socio-demographic characteristic of 101 students from Form 4 grade in a secondary school reveals that most of the respondents were 16 years of age (97%), Malay (87.1%) and from intact family (83.2%). About 57% of the respondents were female students (Table 1).

Table 1. Socio-demographic characteristics of the Form 4 students (n = 101)

Sociodemographic characteristic of the students			
Variables	Category	n	%
Age	16 years old	98	97
	17 years old	3	3
Gender	Male	43	42.6
	Female	58	57.4
Ethnicity	Malay	88	87.1
	Chinese	9	8.9
	Indian	3	3
	Others*	1	1
Marital Status of the Parents	Intact Family**	84	83.2
	Single Parent***	17	16.8

Note:
 *Sabah & Sarawak Bumiputera & Siamese
 **married and living together or married but not living together due to work at other place
 ***Widower or separated

The prevalence of awareness about e-cigarette among respondents was 96% (97/101 students). The prevalence of current e-cigarette users was 7.2% (7/97 students), previous user 28.9% (28/97 students) and never user 63.9% (62/97 students). Ever user (combination of current and previous users) and never user were 36.1% and 63.9% respectively.

The prevalence of future intention to smoke e-cigarette in the coming next 12 months was 8.2% (n = 8 out of 97 students) (95% CI: 3.6%-15.6%). Among them 20% were ever user and 14.3% were male students. Ever user was significantly (p = 0.003) found to intend using e-cigarette in the next 12 months (Table 2).

Table 2. Future intention to smoke e-cigarette among respondents & usage of e-cigarette and gender (n = 97)

Intention to smoke e-cigarette in the next 12 months			
	*Yes (%)	**No (%)	'P' value
Never use (n = 62)	1 (1.6)	61 (98.4)	P = 0.003 [#]
Ever use (n = 35)	7 (20)	28 (80)	
Intention to smoke e-cigarette in the next 12 months			
	*Yes (%)	**No (%)	'P' value
Male (n = 42)	6 (14.3)	36 (85.7)	P = 0.073 [#]
Female (n = 55)	2 (3.6)	53 (96.4)	

The prevalence of intention to smoke e-cigarette if offered by a best friend was 20.6% (n = 20 out of 97 students) (95% CI: 13.1%-30.0%). About 57.1% of ever user and 42.9% of male students were found to intend to use e-cigarette significantly (p < 0.001) if offered by best friend (Table 3).

Table 3. Future intention to smoke e-cigarette if offered by best friend among respondents & usage of e-cigarette and gender

Intention to smoke e-cigarette if offered by best friend			
	*Yes (%)	**No (%)	'P' value
Never use (n = 62)	0	62 (100)	P < 0.001 [#]
Ever use (n = 35)	20 (57.1)	15 (42.9)	
Intention to smoke e-cigarette if offered by best friend			
	*Yes (%)	**No (%)	'P' value
Male (n = 42)	18 (42.9)	24 (57.1)	P < 0.001 [#]
Female (n = 55)	2 (3.6)	53 (96.4)	

Around 11.3% and 28.3% of the respondents (n = 74) ‘whose friends used e-cigarettes’ intended to smoke in the future or offered by best friend, but there were no statistically significant association between these variables (Table 4).

Table 4. Future intention to smoke e-cigarette among respondents and frequency of exposure to e-cigarette by friends

Intention to smoke e-cigarette in the next 12 months			
	*Yes (%)	**No (%)	'P' value
Less than half (n = 53)	6 (11.3)	47 (88.7)	P > 0.99 [#]
Half and more (n = 21)	2 (9.5)	19 (90.5)	
Intention to smoke e-cigarette if offered by best friend			
	*Yes (%)	**No (%)	'P' value
Less than half (n = 53)	15 (28.3)	38 (71.7)	P = 0.695 ^{##}
Half and more (n = 21)	5 (23.8)	16 (76.2)	

Notes: * Definitely Yes and Probably Yes ** Definitely No and Probably No
 # Fisher's Exact Test ## Pearson Chi-Square

Discussion

The prevalence of awareness about e-cigarette among Form 4 students was 97%. This result was seen to be comparable to the studies which were conducted in Western countries such as Scotland 90%⁶, Connecticut 92%⁴ and Italy 94.8%⁵. However, this finding was in contrast with that of another study carried in Malaysia where the awareness was 25%⁷ (2011-2013). This rising awareness may be due to recent developments in the issue of e-cigarette in Malaysia. The National E-cigarette Survey (2016) which participated over 4,000 respondents reported that ‘more than 40% of current e-cigarette users started using between ages 12 and 15’; ‘two-thirds of the respondents want e-cigarette and vape (ECV) banned, and 90% want them prohibited in places where smoking is banned’. Health Ministry deputy director general (public health) Datuk Dr Chong Chee Kheong said ECV with nicotine is regulated by the Poison Act 1952¹⁶.

The prevalence of ever use of e-cigarette was 36%. It was higher than the prevalence what was found in a previous study done in Malaysia in 2011⁷ which was 19%. The prevalence among 10-56 years old found in South Korea was 0.5% in 2011⁸. Increase in prevalence may be attributed to increase in the global popularity for the use of e-cigarette each year^{17, 18}. Furthermore, e-cigarette business is expected to soar up to US\$ 10 billion by 2017¹⁷ due to worldwide market penetration despite the inadequate information regarding its safety, effectiveness as a smoking cessation tool and lack of adequate labelling⁹.

When compared to Western countries, the prevalence observed in this study was also higher. They include Connecticut USA (25.2%)¹⁹, Poland (23.5 %) ²⁰, Finland (17.4%)²¹,

Scotland (16%)⁶ and Italy (11.6%)⁵. A possible reason for this difference may be due to this study focusing only on one particular age with a limited sample size which may lead to over-estimating the prevalence.

Regarding future intention to use e-cigarette, among those who were aware about e-cigarette (n = 97), the intention of to use e-cigarette in the next 12 months was reported to be 20% among the ever user group and it was 1.6% among never user group. The intention to use e-cigarette in the next 12 months was also reported to be 14.3% among male students and 3.6% among female students. One study pointed out that young adults who had a positive attitude towards e-cigarette despite being never users could have greater intentions to try out e-cigarettes in the future²². In another study a higher percentage of future intention to smoke e-cigarette was reported among current cigarette smokers⁴.

The prevalence of intention to smoke e-cigarette if offered by a best friend was 20.6%. Almost all the ever user (57.1%) and male students (42.9%) were found to have high intention to use e-cigarette if offered by a best friend. There were similar studies highlighting peer pressure as one of the major contributing factors for experimenting e-cigarette⁴. In a study carried out in Finland, almost 80% of adolescents reported that the primary source information on e-cigarette was their peers, implying that if offered by friends they might be using e-cigarette in future²¹.

The limitation of this study was that the findings did not represent the whole population of that particular secondary school age group despite having good response rate because it was done only among Form 4 students and the sample size was small. Most of the respondents in this study was Malay. This could affect the generalizing ability of the results of the study. Moreover, the present study utilized cross sectional design that is not able to prove the causation.

Conclusion

The ever user and male students have a higher intension to smoke an e-cigarette if one of their best friends offered them. Peer influence is one of the contributing factors for future smoking behaviour among the Form 4 students of a secondary school. School health education programmes may an effective strategy to prevent e-cigarette smoking in future.

Conflict of interest

The author has no conflicts of interest to express in this study.

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