PUBLIC HEALTH RESEARCH

Cessation of E-Cigarette Use Among Adults in Malaysia: Findings from a Nationwide Survey

Muhammad Fadhli Mohd Yusoff,[1] Jane Ling Miaw Yn,[1] Thamil Arasu Saminathan,[1] Jamaluddin Ab Rahman,[2] Wan Shakira Rodzlan Hasani,[1] Tania Gayle Robert Lourdes,[1] Lim Kuang Hock,[3] Sumarni Mohd Ghazali[3] and Mohamad Haniki Nik Mohamed[4]

[1]*Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia, Setia Alam, 40170 Shah Alam, Selangor, Malaysia.*
[2]*International Islamic University Malaysia, 25200, Kuantan, Pahang, Malaysia.*
[3]*Institute for Medical Research, National Institute of Health, Ministry of Health Malaysia, Setia Alam, 40170, Shah Alam, Selangor, Malaysia.*
[4]*International Islamic University Malaysia, 25200, Kuantan, Pahang, Malaysia.*

*For reprint and correspondence: Muhammad Fadhli Mohd Yusoff, Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia, Setia Alam, 40170 Shah Alam, Selangor, Malaysia.

Email: fadhli_my@moh.gov.my

ABSTRACT

Introduction	The use of e-cigarettes has increased rapidly around the world including in Malaysia. However, a significant proportion of people who started using e-cigarettes later discontinued using them. The aim of this study is to identify prevalence of former e-cigarette use and factors associated with quitting, among Malaysian adults.
Methods	This study is a part of a national household survey examining the use of e-cigarettes among Malaysian adults aged 18 years and above in 2016. A multistage stratified cluster sampling method was used in the survey. A bilingual (Malay and English) structured questionnaire was used and data was collected via face-to-face interview. Prevalence of current e-cigarette use and former e-cigarette use were determined. A multiple logistic regression model was used to identify factors associated with quitting e-cigarettes.
Results	A total of 4,288 adults participated in the survey, where 110 (3.2%) and 289 (8.6%) were identified as current and former e-cigarette users respectively. The following factors were significantly associated with quitting e-cigarette use: e-cigarette users who had no exposure to e-cigarettes at the workplace (aOR = 2.70; 95% CI: 1.39, 5.24); the perception that e-cigarette is more harmful to people compared to tobacco smoke (aOR = 2.46; 95% CI: 1.22, 4.97); and the perception that e-cigarettes do not help people to maintain cigarette abstinence (aOR = 2.19; 95% CI: 1.23, 3.92).
Conclusions	This study contributes to a better understanding of the factors associated with cessation of e-cigarettes. Findings from this study can assist any e-cigarette cessation intervention measures such as strengthening on policy that prohibit e-cigarette use at workplace and increase advocacy on not using e-cigarette as a method to stop smoking.
Keywords	Electronic Nicotine Delivery Systems – vaping – quit – cease - Malaysia

INTRODUCTION

E-cigarettes or vaping devices, are battery-powered devices that deliver a smoke-like aerosol that the user inhales, similar with the act of smoking a conventional cigarette.[1] The use of electronic cigarettes (e-cigarettes) has increased rapidly around the world.[2-4] In the United States, it was reported that 12.6% of adults have tried an e-cigarette at least once in their lifetime.[5] In Malaysia, apart from cigarettes use, the use of e-cigarettes has emerged as a new habit among Malaysians.[6] Among the common reasons reported for using e-cigarettes are curiosity[6] and to quit smoking.[1,5] Unique features of e-cigarettes, such as flavour and battery rechargeability, could be the factors making e-cigarettes more attractive to young adults.[7]

Studies have shown that e-cigarettes are perceived as less harmful than cigarettes.[8,9] This perception was associated with subsequent e-cigarette use in never-users.[8] Besides, there are also concerns that the use of e-cigarette would serve as a step to nicotine addiction and eventually lead to cigarette smoking among non-smokers.[10,11] Studies have shown that e-cigarette use increases risk for subsequent initiation of cigarette smoking.[12,13]

A significant proportion of people who initiated e-cigarette use later stop using them. A study revealed that almost two-thirds of people who started using e-cigarettes later discontinued them.[14] Among the reasons for stopping e-cigarette use include health concerns, negative reactions to taste, inferiority to other forms of tobacco, expense, lack of availability and social disapproval.[10] The aim of this study is to identify prevalence of former e-cigarette use among Malaysian adults and to identify factors associated with cessation of e-cigarettes.

METHODS

Sample Size and Sampling

This study is part of a larger national household study on the use of e-cigarettes among Malaysian adults aged 18 years and above in 2016. Eligible respondents were those who have been living in the selected living quarters (LQs) for at least six months in the past one year prior to data collection, understood Malay or English, and consented to participate in the survey. Institutionalized populations such as those staying in hostels and hotels were excluded from the survey.

Sample size was calculated based on the estimated prevalence of e-cigarette users of 5%, 1.5% margin of error, design effect of 2 and 95% confidence interval. Using a single proportion formula, with estimated response rate of 70% and 90% eligibility rate, the sample size for 2 strata analysis was 5722. The sample size of the survey was also reported by Ab Rahman et al.[15]

A multistage stratified cluster sampling method was used in the study. Stratification was by state with three districts randomly selected from each state. The country was divided into contiguous geographical areas known as Enumeration Blocks (EB) and the EB frames were used as the secondary sampling units (SSU). A number of EBs were selected proportionate to the population size from each district and 12 LQs were sampled from each selected EB. About 3500 LQs were sampled in the study. All eligible respondents from the selected LQs were included in the study. The details on the sampling were described by Ab Rahman et al.[15]

Ethical approval for the study was obtained from the Medical Research and Ethics Committee of Ministry of Health Malaysia (NMRR-16-171-28819).

Data collection

A bilingual (Malay and English) structured questionnaire was developed with input from the experts in tobacco control in the country and validated prior to the actual study. During the development, the questionnaire was checked for content validity by a group of experts in smoking and e-cigarette prevention and control to ensure all the questions are relevant and appropriate for the study objectives. The experts consisted of epidemiologists, pharmacists, medical doctors and senior researchers. The questionnaire was pre-tested among university staffs. Weakness and problems were identified and improvements were made to the questionnaire accordingly to ensure for a good construct validity and face validity. Data was collected by trained data collectors via face-to-face interview. It took about 30 minutes to complete the questionnaire. To increase response rate, LQs that were found locked during the initial visit or respondents who were not at home were revisited up to three times before they were excluded from the study.

Questionnaire and Variables

The working definitions for e-cigarette use in this study were adopted from an NCHC Data Brief.[4] *Current e-cigarette user*: Individual who has smoked at least a puff of e-cigarette and has been smoking e-cigarette in the last 30 days. *Former e-cigarette user*: Individual who has ever smoked e-cigarette but has not smoked in the past 30 days. The definition used for tobacco-smoking status were adopted from CDC[16]. *Current smoker*: Individual who has smoked at least 100 cigarettes in his or her lifetime and who currently smokes cigarettes.

Residential location was classified into urban and rural by the Department of Statistics Malaysia. Education level was classified into primary or less, secondary and tertiary. Exposure to e-cigarette at home was defined as ever had someone smoke e-cigarettes in the respondent's house in the past one month. Exposure to e-cigarette at the workplace was defined as ever had someone smoke e-cigarettes at the respondents' workplace in the past

one month. Respondents' perceptions about e-cigarettes were defined based on whether they agree on each of the statements given about e-cigarette which include 1) e-cigarette helps people quit smoking tobacco cigarettes; 2) e-cigarette helps people maintain cigarette abstinence; 3) e-cigarette helps people cut down tobacco smoking; 4) e-cigarette use is less satisfying than tobacco smoking; 5) The smell of an e-cigarette is better than a tobacco cigarette; 6) e-cigarette is less harmful to the health of the user compared to tobacco smoking; 7) e-cigarette vapour is more harmful to others compared to tobacco smoke.

Data Analysis
Data were analysed using IBM SPSS Statistics (IBM Corp, Armonk, NY) version 26, for analysis. The prevalence of current and former e-cigarette use were estimated. Bivariate analysis and multiple logistic regression were carried out to examine factors associated with former e-cigarette use. The factors included in the analysis were demographic factors, respondents' age when he/she first started using e-cigarette, smoking status, e-cigarette exposure and perceptions on e-cigarette. A backward stepwise variable selection method was used to obtain significant variables in the model. Variables excluded during the stepwise method were re-evaluated using the enter method to ensure no important variables were excluded from the model. The model was assessed for the presence of interactions between variables. The regression coefficients were tested using the Wald statistic and adjusted odds ratios (aOR) were estimated. Goodness-of-fit statistics were used to assess the fit of the model. Statistical significance was set at p value < 0.05.

RESULTS

A total of 4,288 adults aged 18 years and above participated in the survey, among whom 110 (3.2%) and 289 (8.6%) were identified as current and former e-cigarette users, respectively; the other 3,889 respondents had never used e-cigarettes. The main reasons given for quitting e-cigarettes were 'e-cigarette was not satisfying' (29.4%), followed by cost (17.8%), health (13.9%) and 'just trying' (12.1%). There was no significant difference in mean age and age of first e-cigarette use between current and former e-cigarette users. In terms of exposure to e-cigarettes at home, the proportion of adults who were exposed at home was significantly lower among former e-cigarettes users (36.6%) compared with current e-cigarettes users (54.6 %). Similarly, exposure at the workplace was significantly lower among former e-cigarette users (54.8%) compared with current e-cigarette users (81.0%). Compared to current e-cigarette users, at bivariate analysis a significant lower proportion of former e-cigarette users agreed that e-cigarettes help people to quit tobacco smoking (64.5% and 41.1% respectively), helps people to maintain cigarette abstinence (56.1% and 31.8% respectively), helps people to cut down tobacco smoking (77.6% and 57.7% respectively) and is less harmful to users compared to tobacco smoking (62.6% and 39.4% respectively). In contrast, a significant higher proportion of former e-cigarette users agreed that e-cigarette is more harmful to others compared to tobacco smoke (34.0% and 17.6% respectively). The details of the characteristics of current and former e-cigarettes users are shown in Table 1.

Table 1 Differences in the Characteristics of Current and Former E-Cigarette Users (n = 396)

	Current E-Cigarette User (n=109) Mean (SD)	Former E-Cigarette User (n=287) Mean (SD)	p value*
Age – mean (SD)	28.8 (9.19)	29.9 (10.35)	0.336
Age of e-cigarette initiation	27.7 (11.54)	28.4 (10.96)	0.552
	n (%)	n (%)	
Sex – N (%)			
Male	103 (93.6)	257 (88.9)	0.157
Female	7 (6.4)	32 (11.1)	
Residential location			
Urban	63 (57.3)	163 (56.4)	0.875
Rural	47 (42.7)	126 (43.6)	
Education			
Primary or less	16 (14.5)	53 (18.4)	0.285
Secondary education	52 (47.3)	148 (51.4)	
Tertiary education	42 (38.2)	87 (30.2)	
Current smoker			
Yes	77 (70.0)	198 (68.5)	0.774
No	33 (30.0)	91 (31.5)	
Exposed to e-cigarette at home			

Yes	59 (54.6)	98 (35.6)	0.001
No	49 (45.4)	177 (64.4)	
Exposed to e-cigarette at work			
Yes	68 (81.0)	115 (54.8)	< 0.001
No	16 (19.0)	95 (45.2)	
Perception on e-cigarette:			
Helps people to quit tobacco smoking			
Agree	71 (64.5)	116 (41.1)	< 0.001
Don't agree	39 (35.5)	166 (58.9)	
Helps people to maintain cigarette abstinence			
Agree	60 (56.1)	90 (31.8)	< 0.001
Don't agree	47 (43.9)	193 (68.2)	
Helps people cut down tobacco smoking			
Agree	83 (77.6)	162 (57.7)	< 0.001
Don't agree	24 (22.4)	119 (42.3)	
Less satisfying than tobacco cigarette			
Agree	64 (62.7)	193 (72.8)	0.059
Don't agree	38 (37.3)	72 (27.2)	
Less harmful to health of the user compared to tobacco smoking			
Agree	62 (62.6)	98 (39.4)	< 0.001
Don't agree	37 (37.4)	151 (60.6)	
E-cigarette is more harmful to others compared to tobacco smoke			
Agree	18 (17.6)	83 (34.0)	0.002
Don't agree	84 (82.4)	161 (66.0)	

p value of chi square test, significant level: < 0.05

Factors Associated with Quitting E-Cigarette

The results of analysis for factors associated with former e-cigarette use are given in Table 2. The analysis revealed that after considering for other factors, e-cigarette users who had no exposure to e-cigarettes at the workplace were 2.7 times more likely to stop using e-cigarette (aOR = 2.70; 95% CI: 1.39, 5.24), e-cigarette users who perceived that e-cigarette use does not help people to maintain cigarette abstinence were 2.19 times more likely to stop e-cigarette use (aOR = 2.19; 95% CI: 1.23, 3.92) and perception that the e-cigarette is more harmful to others compared to tobacco smoke (aOR = 2.46; 95% CI: 1.22, 4.97) was significantly associated with stopping e-cigarette. However, no significant association of quitting e-cigarettes was noted with age, age of e-cigarette initiation, sex, residential location, current smoking status, education level and exposure to e-cigarettes at home. Quitting e-cigarette use was also noted to have no association with the following perceptions: e-cigarette helps people to quit tobacco smoking, e-cigarette helps people to cut down tobacco smoking, e-cigarette is less satisfying than tobacco smoking and e-cigarette is less harmful to health of the user compared to tobacco smoking.

Table 2 Factors Associated with Stopping E-cigarette Use

	Crude OR (95% CI)	Adjusted OR (95% CI)	p value*
Age	1.01 (0.99, 1.03)	1.00 (0.95, 1.07)	0.872
Age of e-cigarette initiation	1.00 (0.99, 1.03)	0.99 (0.96, 1.02)	0.347
Sex			
Male	1		
Female	1.8 (0.78, 4.28)	3.18 (0.35, 28.55)	0.302
Residential location			
Urban	1		
Rural	1.04 (0.66. 1.61)	1.09 (0.56, 2.11)	0.797
Education			0.563
Primary or less	1.60 (0.82, 3.12)	1.45 (0.51, 4.14)	
Secondary education	1.37 (0.85, 2.23)	1.48 (0.70, 3.14)	
Tertiary education	1	1	
Current Smoker			

Yes	1	1	
No	1.07 (0.66, 1.73)	1.29 (0.58, 2.84)	0.530
Exposed to e-cigarette at home			
Yes	1	1	
No	2.17 (1.38, 3.42)	1.54 (0.81, 2.92)	0.189
Exposed to e-cigarette at work			
Yes	1	1	
No	3.51 (1.91, 6.45)	2.70 (1.39, 5.24)	0.003
Perception on e-cigarette:			
Helps people to quit tobacco smoking			
Agree	1	1	
Don't agree	2.60 (1.65, 4.11)	1.38 (0.52, 3.63)	0.514
Helps people to maintain cigarette abstinence			
Agree	1	1	
Don't agree	2.74 (1.73, 4.32)	2.19 (1.23, 3.92)	0.008
Helps people cut down tobacco smoking			
Agree	1	1	
Don't agree	2.54 (1.52, 4.24)	1.52 (0.63, 3.65)	0.346
Less satisfying than tobacco cigarette			
Agree	1.59 (0.98, 2.58)	1.67 (0.84, 3.31)	0.141
Don't agree	1	1	
Less harmful to health of the user compared to tobacco smoking			
Agree	1	1	
Don't agree	2.58 (1.60, 4.17)	1.72 (0.84, 3.53)	0.138
More harmful to others compared to tobacco smoke			
Agree	2.41 (1.35, 4.27)	2.46 (1.22, 4.97)	0.012
Don't agree	1	1	

p value of Wald statistics, significant level: < 0.05

DISCUSSION

To our knowledge, this is the first study on e-cigarette use among adults in Malaysia using a nationally-representative sample. Our study showed the prevalence of current and former e-cigarette use was 3.2% and 8.6% respectively. Almost three quarters of those who had ever used e-cigarettes quitted. This finding is consistent with findings from other countries where ever use was more prevalent than current e-cigarette use.[14,17] In a USA study, 65% of people who started using e-cigarettes later discontinued them.[14] The main reasons for quitting e-cigarettes in our study were 'e-cigarette was not satisfying' (29.4%), followed by financial cost (17.8%), health (13.9%) and 'just trying' (12.1%). The reasons were almost similar with studies in other countries.[14,18] As e-cigarettes are relatively new, most epidemiological studies focused more on the factors associated with the use of e-cigarette.[17,19]

This study found no significant difference in current cigarette smoking between current and former e-cigarette users. Although e-cigarette use was reported to be related to tobacco smoking in many studies,[4,13,20] in the present study, discontinuing e-cigarette use was not associated with current cigarette smoking. This finding is different to a study by Pepper JK, et al. where the odds of discontinuing e-cigarette use were lower among current smokers compared to non-smokers.[14] This could be due to differences in the motivations for using e-cigarettes between the study populations. Those who use e-cigarette for goal-oriented reasons such as aiming to reduce smoking will continue using it while those who try for non-goal-oriented reasons will stop.[14] Use of e-cigarettes out of curiosity among smokers has been associated with discontinued use.[18]

This study found that those who were not exposed to e-cigarettes at their workplace were 2.7 times more likely to stop using e-cigarettes compared to those who were exposed. Exposure to e-cigarettes at the workplace suggests e-cigarette use among peers, and peer influence on e-cigarette use has been documented in many studies.[21] Not being exposed to e-cigarette use by peers would probably contribute to stopping of e-cigarettes use among current users. It is not known whether this finding is consistent in other countries as published studies on the effect of exposure to e-cigarette at workplace on

the probability of stopping e-cigarette use is hardly available.

Many studies reported that among the reasons for using e-cigarettes is to quit smoking.[5,14,17] However, there is inconsistent evidence on the effects of e-cigarette use on quitting smoking or smoking abstinence. Some studies found no effect of e-cigarette use on smoking abstinence among smokers who attempted to quit.[11,22] In contrast, David T and Tharyan P reported positive effects of e-cigarettes use on smoking abstinence.[23] In the present study, we found that those who perceived that e-cigarette use does not help people to maintain cigarette abstinence were 2.2 times more likely to stop using it.

Harm perception is a subjective judgment about the potential health risks associated with e-cigarette use. Studies have shown that harm perception is one of the factors in determining the use of e-cigarette where e-cigarette users perceived e-cigarette as less harmful to health compared to conventional cigarettes.[9,24] In the present study, it was noted that there was no difference in quitting e-cigarettes regardless of their perception on the harmful effects of e-cigarette use compared to tobacco smoking. However, with regards to harm perceptions of e-cigarette vapour to others, the present study revealed that former e-cigarette users perceived e-cigarette vapours as more harmful to others compared to tobacco smoke. Nevertheless, there is no other evidence on the relation between harm perception and quitting e-cigarette as no published study was found on this.

In the present study, it is interesting to note that among females, former e-cigarette use (11.1%) was higher than current e-cigarette use (6.4%). This indicates that a bigger proportion of females quit e-cigarette use as compared to males. This could be explained by the reason of quitting among the females where almost 1/3 of them (30.7%) just wanted to try e-cigarette. The difference, however, could not be shown statistically in the multivariate analysis and this could also be due to small cell size to detect the difference as the prevalence of e-cigarette use was very low among females (0.3%).

The strength of the present study is its representativeness of the Malaysian adult population from the nationwide survey. Furthermore, the face-to-face data collection method also increases the quality of the data. Nonetheless, the present study also has a few limitations. First, our study was based on self-reported e-cigarette use. Thus, we were unable to rule out under- or over-reporting. However, those who admitted to using e-cigarette were asked to show their device as well as the juice or liquid used. Second, as the prevalence of e-cigarette use among females in this study is very low, hence, gender differences could not be showed statistically. Further studies with bigger sample sizes are needed especially among those with low prevalence of e-cigarette use in the population to examine the influence of these factors.

CONCLUSION

This study contributes to a better understanding of the factors that contribute to quitting e-cigarettes among adults in Malaysia. These factors should be considered in any intervention initiatives for quitting e-cigarettes which include strengthening on policy that prohibit e-cigarette use at workplace and increase advocacy on not using e-cigarette as a method to stop smoking.

ACKNOWLEDGEMENTS

REFERENCES

1. Grace K, Meghan EM, Dana AC, Deepa RC, Suchitra KS. Reasons for electronic cigarettes experimentation and discontinuation among adolescents and young adults. Nicotine & Tobacco Research. 2015;847-854.

2. Greenhill R, Dawkins L, Notley C, Finn MD, Turner JJD. Adolescent Awareness and Use of Electronic Cigarettes: A Review of Emerging Trends and Findings. Journal of Adolescent Health. 2016;59:612-619.

3. Lanza ST, Russell MA, Braymiller JL. Emergence of electronic cigarette use in US adolescents and the link to traditional cigarette use. Addictive Behaviors. 2017;67:38-43.

4. Schoenborn CA, Gindi RM. Electronic Cigarette Use Among Adults: United States, 2014. NCHS data brief, no.217. Hyattsville, MD: National Centre for Health Statistics; 2015.

5. Wong LP, Mahavera S, Shakir M, Alias H, Aghamohammadi N, Hoe VC. Reasons for Using Electronic Cigarettes and Intentions to Quit Among Electronic Cigarette Users in Malaysia. J Community Health. 2016;14(6):1101-1109.

6. Lee H-Y, Lin H-C, Seo D-C, Lohrmann DK. Determinants associated with E-cigarette adoption and use intention among college students. Addictive Behaviors. 2017;65:102-110.

7. Goniewicz ML, Gawron M, Nadolska J, Balwicki L, Sobczak A. Rise in Electronic Cigarette Use Among Adolescents in Poland. *Journal of Adolescent Health.* 2014;55:713-715.

8. Brose LS, Brown J, Hitchman SC, Mcneill A. Perceived relative harm of electronic cigarettes over time and impact on subsequent use. A survey with 1-year and

2-year follow-ups. Drug Alcohol Depend. 2015;157:106-111.

9. Pericot-Valverde I, Gaalema DE, Priest JS, Higgins ST. E-cigarette awareness, perceived harmfulness, and ever use among U.S. adults. Preventive Medicine. 2017;104:92-99.

10. Biener L, Song E, Sutfin EL, Spangler J, Wolfson M. Electronic cigarette trial and use among young adults: Reasons for trial and cessation of vaping. Int J Environ Res Public Health. 2015; 12(12):16019-16026.

11. Glantz SA, Bareham DW. E-Cigarettes: Use, Effects on Smoking, Risks, and Policy Implications. Annu Rev Public Heal. 2018;39:215-235.

12. Loukas A, Marti CN, Cooper M, Pasch KE, Perry CL. Exclusive e-cigarette use predicts cigarette initiation among college students. Addictive Behaviors. 2017;76:343-347.

13. East K, Hitchman SC, Bakolis I, Williams S, Cheeseman H, Arnott D, et al. The Association Between Smoking and Electronic Cigarette Use in a Cohort of Young People. J Adolesc Health. 2018;62(5):539-547.

14. Pepper JK, Ribisl KM, Emery SL, Brewer NT. Reasons for starting and stopping electronic cigarette use. Int J Environ Res Public Health. 2014; 11(10):10345-10361.

15. Ab Rahman J, Mohd Yusoff MF, Nik Mohamed MH, Mahadir Naidu B, Lim KH, Tee GH, Mohamad MS, Kartiwi M, Draman S, Ab Rahman NS, Aris T. The Prevalence of E-Cigarette Use Among Adults in Malaysia. Asia Pac J Public Health. 2019 Oct;31(7_suppl):9S-21S. doi: 10.1177/1010539519834735. Epub 2019 Mar 17. PMID: 30880403.

16. Adult Tobacco Use Information: Glossary (CDC). Available online at cdc.gov/nchs/nhis/tobacco/tobacco_glossary.htm

17. Li J, Newcombe R, Walton D. The prevalence, correlates and reasons for using electronic cigarettes among New Zealand adults. Addictive Behaviors. 2015;45:245-251.

18. Simonavicius E, Mcneill A, Arnott D, Brose LS. What factors are associated with current smokers using or stopping e-cigarette use? Drug Alcohol Depend. 2017;173:139-143.

19. Park S, Lee H, Min S. Factors associated with electronic cigarette use among current cigarette-smoking adolescents in the Republic of Korea. Addictive Behaviors. 2017;69:22-26.

20. Ping Wang M, Yin Ho S, Tung Leung L, Hing Lam T. Electronic cigarette use and its association with smoking in Hong Kong Chinese adolescents. Addictive Behaviors. 2015;50:124–7.

21. Maglalang DD, Brown-Johnson C, Prochaska JJ. Associations with E-cigarette use among Asian American and Pacific Islander young adults in California. Preventive Medicine Reports. 2016;4:29-32.

22. Gorini G, Ferrante G, Quarchioni E, Minardi V, Masocco M, Fateh-Moghadam P, et al. Electronic cigarette use as an aid to quit smoking in the representative Italian population PASSI survey. Preventive Medicine. 2017;102:1-5.

23. David T, Tharyan P. Electronic cigarettes for smoking cessation and reduction. Summary of the evidence and implications for public health programmes. Clin Epidemiol Glob Heal. 2016;4:146-150.

24. Soule EK, Rosas SR, Nasim A. Reasons for electronic cigarette use beyond cigarette smoking cessation: A concept mapping approach. Addictive Behaviors. 2016;56:41-50.