



Cigarette and Vape Use and Perceptions Toward Vaping Among University Students in Malaysia

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ABSTRACT

Background: The increasing use of electronic cigarettes (vapes) among young adults has become an emerging public health concern. Although vaping has gained popularity in Malaysia, evidence regarding cigarette smoking, vape use, and perceptions towards vaping among university students remains limited.

Objective: This study aimed to investigate the patterns of cigarette smoking, vape use, and dual use among Malaysian university students and to assess their perceptions towards vaping.

Methods: An exploratory cross-sectional study was conducted among university students in Malaysia using convenience sampling. A validated and pretested online questionnaire was distributed via email. Data on demographic characteristics, tobacco use behaviours, and perceptions towards vaping were collected and analysed using IBM SPSS Statistics version 25. Descriptive statistics were used to summarise the data, while Pearson's Chi-square test and one-way analysis of variance (ANOVA) were performed where appropriate. Statistical significance was set at $p < 0.05$.

Outcome: Ninety-two university students participated in the study. Most respondents were non-smokers (70.7%), while 9.8% were cigarette smokers, 13.0% were exclusive vapers, and 6.5% were dual users. Cigarette smokers were predominantly male and Malay, whereas exclusive vape use was reported equally by males and females. Most respondents perceived vaping to be as harmful as cigarette smoking ($p = 0.023$) and disagreed that vaping is a better method for smoking cessation ($p = 0.018$). Among tobacco users, socialising was the most commonly reported reason for cigarette smoking and vaping.

Conclusion: Cigarette smoking, vape use, and dual use were relatively uncommon among the university students surveyed. Most respondents perceived vaping to be as harmful as cigarette smoking and did not consider it a more effective method for smoking cessation.

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INTRODUCTION

Vapes are battery-powered devices that are an advanced version of traditional e-cigarettes with a similar mode of function. When inhaling or pressing a button, the solution known as e-liquid, filled in the cartridge, will undergo vaporisation, producing an aerosol (vapour).¹ It does not involve the combustion of tobacco; hence it does not produce smoke. A vape mainly consists of chemicals such as propylene glycol, vegetable glycerine, distilled water, and flavouring.² It may or may not contain nicotine. Users inhale the aerosol generated by the device, allowing the experience of "smoking" without smoking real cigarettes. The act of inhaling the aerosol is known as "vaping", while the users are known as "vapers".

Despite the inconclusive results about the benefits of e-cigarettes, their use has been increasing in recent years around the world; vape use grew tremendously.³ The popularity of vaping has led to a rise in vaping use. Malaysia has become the second-largest market in the world, following the US, in terms of e-cigarette purchasing power and production.^{4,5} Consumer demand has been rapidly increasing due to the expectation of reducing or quitting smoking among conventional cigarette smokers.

Previous studies in America show that vape use among college students was not related to reducing or quitting smoking but was related to heavy drinking.⁶ It was suggested that e-cigarette use may be more predominant among specific ethnic/ racial groups. A study stated that male users were more likely to have used e-cigarettes compared to female users. Vape use is now a public health problem worldwide and causes a rise in the trend of vaping, especially among young adults. Although several studies have examined cigarette smoking and vape use among adolescents and young adults, most have focused on prevalence or smoking behaviour, with relatively limited attention given to university students in Malaysia. Furthermore, few studies have simultaneously examined cigarette smoking, exclusive vape use, dual use, and students' perceptions of vaping, particularly regarding its perceived role as a smoking cessation aid and its potential health risks. As vaping continues to gain popularity among Malaysian young adults, understanding these patterns and perceptions is important for informing tobacco control policies and university-based health promotion programmes.

This study addresses this knowledge gap by investigating the prevalence of cigarette smoking, vape use, and dual use among university students in Malaysia and by assessing their perceptions towards vaping. The findings are expected to provide preliminary evidence on tobacco use behaviours and perceptions within the Malaysian university setting, thereby supporting the development of targeted health education initiatives, smoking cessation interventions, and future research involving larger and more representative samples.

Accordingly, this study aimed to investigate the patterns of cigarette smoking, vape use, and dual use among Malaysian university students, and whether students perceive vaping as a smoking cessation method and its potential health effects.

Given the exploratory nature of this cross-sectional study, no formal hypothesis was proposed. Instead, the study was designed to describe tobacco use patterns and perceptions towards vaping among university students in Malaysia.

RESEARCH METHODS

The study was a cross-sectional survey involving university students in Malaysia. Ethical approval (Ref No. UKM PPI/111/8/JEP-2017-274) to carry out the study was obtained from the Universiti Kebangsaan Malaysia (UKM) Research Ethics Committee.

Sample size and sampling

This study was an exploratory cross-sectional design employing convenience sampling. A formal sample size calculation was not performed because the study was intended to provide preliminary data on cigarette smoking, vape use, dual use, and perceptions towards vaping among university students in Malaysia. Approximately 300 university students from several Malaysian universities were invited to participate via email, of whom 92 completed the questionnaire. The relatively small sample size and convenience sampling approach are acknowledged as limitations and may restrict the generalisability of the findings.

Questionnaire development and validation

The questionnaire was developed based on a review of published literature on cigarette smoking, vaping, and perceptions towards e-cigarette use among young adults. It consisted of three sections: (1) demographic characteristics, (2) cigarette smoking and vaping behaviours, and (3) perceptions towards vaping. The questionnaire underwent face and content validation by experts in dental public health and tobacco control to ensure the relevance, clarity, and appropriateness of the items. Subsequently, it was pretested among a small group of university students to evaluate readability, comprehension, and completion time. Minor modifications were made based on the feedback before the final questionnaire was administered online using Google Forms.

Statistical analysis

Data were analysed using IBM SPSS Statistics version 25. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarise participants' demographic characteristics, smoking and vaping behaviours, and perceptions

towards vaping. One-way analysis of variance (ANOVA) was used to compare mean age across smoking status groups because age was analysed as a continuous variable. Pearson's Chi-square test was used to examine associations between categorical variables, including smoking status, gender, ethnicity, and perceptions towards vaping. Statistical significance was set at $p < 0.05$. Analyses were conducted using complete-case analysis; therefore, the denominators varied across some analyses because respondents with missing data for specific questions were excluded from those analyses.

RESERACH FINDING

Table 1 shows the demographic characteristics of the study population. Overall, non-smokers ($n=65$) comprised a higher proportion than tobacco users, who were smokers ($n=9$), vapers ($n=12$) and dual users ($n=6$) (Table 1). The mean (SD) age of non-smokers was 22.6 (3.1), smokers 24 (4.2), and vapers 23.4 (2.5). Among tobacco users, most smokers were males ($n=5$, 55.5%), and four of them were females (44.4%). There was an equal number of vapers among males ($n=6$, 50%) and females ($n=6$, 50%). All of the dual users were male ($n=6$, 100%). By ethnicity, more than half of the smokers were Malay ($n=23$, 66.7%), while 2 (22.2%) were Chinese. Only one (11.1%) of the smokers was of another ethnicity. Similar proportions of Malay ($n=5$, 41.7%) and Chinese ($n=5$, 41.7%) vapers were observed, while Indians had the lowest proportion ($n=3$, 25%). A rather high percentage (66.7%) of the dual users were Malay, followed by 33.3% of Chinese. No Indian smokers or dual users were found in this study. Significantly, more than half of the tobacco users were Malay.

Table 1. Demographic characteristics of the study population

	Non-smokers (n=65)	Smokers (n=9)	Vapers (n=12)	Dual users (n=6)	<i>p</i> - value
Gender n (%)					
Male	28 (43.1)	5 (55.5)	6 (50.0)	6 (100)	0.600 ^b
Female	37 (56.9)	4 (44.4)	6 (50.0)	0 (0)	
Age (mean $\pm$ SD)	22.6 $\pm$ 3.1	24 $\pm$ 4.2	23.4 $\pm$ 2.5	22.1 $\pm$ 0.75	0.498 ^a
Ethnicity (n, %)					0.024 ^b
Malay	23 (35.4)	6 (66.7)	5 (41.7)	4 (66.7)	
Chinese	35 (53.8)	2 (22.2)	5 (41.7)	2 (33.3)	
Indian	5 (7.7)	0 (0)	3 (25.0)	0 (0)	
Others	2 (3.1)	1 (11.1)	0 (0)	0 (0)	

^a One-way analysis of variance (ANOVA); ^b Pearson Chi-Square Test

A total of 20 of the 27 smokers and vapers completed this section of the questionnaire, comprising 9 smokers, 6 exclusive vapers, and 5 dual users (Table 2). Seven respondents (6 vapers and 1 dual user) had missing responses and were excluded from this analysis; therefore, the denominators vary across the groups. Among the respondents included in this analysis, a

greater proportion of smokers and dual users reported daily use than occasional use. No statistical comparison was performed because of the small sample size. Among smokers, 6 (66.7%) reported smoking daily, and 3 (33.3%) reported smoking occasionally during the past 30 days. Among exclusive vapers, 4 (66.7%) reported vaping daily, and 2 (33.3%) reported vaping occasionally. Among dual users, 3 (60.0%) reported daily smoking and/or vaping, while 2 (40.0%) reported occasional use.

Table 2. Frequency of cigarette smoking and vaping during the past 30 days

Frequency of intake	Smokers (n=9)	*Vapers (n=6) n (%)	*Dual users (n=5)
Daily	6 (66.7)	4 (66.7)	3 (60.0)
Occasionally	3 (33.3)	2 (33.3)	2 (40.0)

*Percentages were calculated using the number of respondents who answered each question. Respondents with missing responses were excluded from the corresponding analyses (complete-case analysis).

Table 3 shows the reasons for cigarette smoking and vaping among tobacco users. Among smokers, the most commonly reported reason for smoking was socialising (n = 5, 55.5%), followed by stress (n = 3, 33.3%) and for fun (n = 1, 11.1%). Among exclusive vapers, socialising (n = 4, 36.4%) and for fun (n = 4, 36.4%) were the most frequently reported reasons for vaping, followed by quitting smoking (n = 2, 18.2%) and stress (n = 1, 9.1%) (Table 3). Among dual users, stress was the most frequently reported reason (n = 2, 40.0%), while one respondent (20.0%) each reported socialising, vaping for smoking cessation, and vaping for fun as the primary reason. These findings should be interpreted with caution because of the small number of respondents in each subgroup.

Table 3. Reasons for cigarette smoking and vaping among tobacco users

Reasons	Smokers (n=9)	*Vapers (n=11) n (%)	*Dual users (n=5)
To quit smoking	0 (0)	2 (18.2)	1 (20.0)
For fun	1 (11.1)	4 (36.4)	1 (20.0)
Stress related	3 (33.3)	1 (9.1)	2 (40.0)
To socialise	5 (55.5)	4 (36.4)	1 (20.0)

*Percentages were calculated using the number of respondents who answered each question. Respondents with missing responses were excluded from the corresponding analyses (complete-case analysis).

Table 4 illustrates the change in smoking habits of vapers (n=12) and dual users (n=6) after using a vape. Among the vapers, a rather high proportion (n=8, 66.7%) reported no change in habit, a smaller number (n=3, 25%) reported quitting smoking, and one (8.3%) reported

smoking less. No vapers were found to have smoked more. Among the dual users, those who reported no changes in their smoking habits and those who had smoked less were comprised of an equal proportion (n=2, 33.3%), respectively (Table 4). A small proportion reported having smoked more (n=1, 16.7%) and having quit smoking (n=1, 16.7%), respectively, among the dual users. The study also revealed that vapers had a higher proportion who quit smoking (n=3, 25%) compared to dual users (n=1, 16.7%). However, there is an equal chance of dual users smoking more frequently or quitting smoking completely.

Table 4. Changes in cigarette smoking behaviour after initiating vaping

	Vapers (n=12)	Dual users (n=6)
	n (%)	
No changes	8 (66.7)	2 (33.3)
Smoke more	0 (0)	1 (16.7)
Smoke less	1 (8.3)	2 (33.3)
Quit smoking	3 (25.0)	1 (16.7)

Table 5 shows the respondents' perceptions of vaping. Of non-smokers, 60% (n=39) disagree that vaping is a better choice to stop smoking, and 32.3% (n=21) agree with the former. Among smokers (n=9), more than half of them (n=5) disagree with vaping as a better choice. Half of the vapers (n=6) disagree that vaping is a better choice to stop smoking. Two-thirds of the dual users (n=4) think that vaping is a better choice to quit smoking, whereas one-third of them (n=2) disagree with the former. The study revealed that most of the non-smokers (n=56, 86.2%) and smokers (n=8, 88.9%) think that vaping is as harmful as smoking (Table 5).

Table 5. Respondents' perceptions towards vaping

	Non-smokers (n=65)	Smokers (n=9)	Vapers (n=12)	Dual users (n=6)	p - value
	n (%)				
Do you think vaping is a better choice to stop smoking?					
Yes	5 (7.7)	0 (0)	4 (33.3)	3 (50.0)	0.018 ^b
No	39 (60.0)	5 (55.6)	6 (50.0)	2 (33.3)	
Maybe	21 (32.3)	4 (44.4)	2 (25.0)	1 (16.7)	
Do you think vaping is harmful to health as smoking is?					
Yes	56 (86.2)	8 (88.9)	6 (50.0)	4 (66.7)	0.023 ^b
No	9 (13.8)	1 (11.1)	6 (50.0)	2 (33.3)	
Do you know about the components used in vapes?					
Yes	25 (38.5)	4 (44.4)	9 (75.0)	5 (83.3)	0.031 ^b
No	40 (61.5)	5 (55.6)	3 (25.0)	1 (16.7)	

^b Pearson Chi-Square Test

Among vapers (n=12), half of them think (n=6) vaping is as harmful as smoking. As for dual users (n=6), two-thirds of them (n=4) think that vaping is as harmful to health as smoking is. Most of the non-smokers (n=40, 61.5%) and smokers (n=5, 55.6%) claimed that they do not understand the components used in vapes. Three-quarters of the vapers (n=9) claimed that they understand the components used in vapes. A rather high percentage of respondents (n=5, 83.3%) among dual users reported understanding the components of vapes (Table 5).

DISCUSSION

This study provides preliminary evidence on cigarette smoking, vape use, dual use, and perceptions towards vaping among university students in Malaysia. Although the prevalence of tobacco use was relatively low in this sample, the findings highlight important differences in tobacco use patterns and perceptions that may inform tobacco control initiatives within university settings.

The majority of respondents were non-smokers, with only a small proportion reporting cigarette smoking, vaping, or dual use. This finding differs from studies conducted among university students in the United States, where e-cigarette use has been reported to be considerably higher among young adults.⁷ Such differences may reflect variations in tobacco control policies, product accessibility, social norms, and cultural factors between countries. However, because this study employed convenience sampling with a relatively small sample size, caution is required when comparing the findings directly with national or international prevalence estimates.

Consistent with the National Health and Morbidity Survey (NHMS) 2022, tobacco use in this study was more common among males than females.⁷ Interestingly, an equal number of male and female respondents reported exclusive vape use, suggesting that vaping may be becoming increasingly acceptable among female university students.⁸ Although this observation should be interpreted cautiously due to the limited sample size, it may indicate changing patterns of nicotine product use among young adults and warrants further investigation using larger representative samples.

Most cigarette smokers and dual users in this study were Malays, a finding that is consistent with previous Malaysian national surveys.⁹ Nevertheless, the ethnic distribution should not be interpreted as reflecting population-level differences because the study sample was not proportionally representative of all ethnic groups or universities. The unequal distribution of respondents, particularly the small number of Indian participants, may have influenced these findings.

Daily cigarette smoking was more common than occasional smoking among cigarette smokers, while vaping frequency was more variable among exclusive vapers and dual users. Regular nicotine consumption may indicate greater nicotine dependence and continued exposure to tobacco-related health risks. The continued presence of dual users is particularly noteworthy because dual use may increase overall nicotine exposure and delay complete smoking cessation. Rather than replacing conventional cigarettes, some individuals may continue using both products simultaneously, thereby maintaining nicotine dependence.

An important finding of this study relates to students' perceptions towards vaping. Most respondents, particularly non-smokers and cigarette smokers, perceived vaping to be as harmful as cigarette smoking and did not consider it to be a better method for smoking cessation. These findings are encouraging from a public health perspective because they suggest that misconceptions regarding the safety of vaping may not be widespread among university students. In contrast, a greater proportion of vapers and dual users believed that vaping was less harmful or could assist smoking cessation.⁷ Such perceptions may partly explain continued vape use despite increasing evidence regarding the potential health risks associated with electronic cigarettes. These findings highlight the importance of providing evidence-based health education to improve awareness of nicotine addiction and the potential health consequences of both vaping and dual use.

The study also found that relatively few respondents reported initiating vaping as a smoking cessation strategy. Socialisation and enjoyment were more commonly reported reasons for vaping than quitting smoking. This finding differs from previous European research in which most users reported adopting e-cigarettes primarily as a complete substitute for conventional cigarettes.¹⁰ The difference may reflect variations in social norms, marketing practices, accessibility of vaping products, and public perceptions across countries. It also suggests that vaping among Malaysian university students may be driven more by recreational and social factors than by an intention to quit smoking.

Although some exclusive vapers reported quitting smoking or reducing cigarette consumption after initiating vape use, similar improvements were not consistently observed among dual users. Because the study did not collect information on whether participants initiated cigarette smoking or vaping first, or whether current vapers were former smokers, the findings cannot determine whether vaping facilitated smoking cessation. Therefore, the results should not be interpreted as evidence supporting or refuting the effectiveness of vaping as a smoking cessation aid.

Several limitations should be considered when interpreting these findings. First, the study employed convenience sampling and achieved a response rate of approximately 30%, which increases the possibility of selection bias. Second, the relatively small sample size limits statistical power and restricts the generalisability of the findings to the wider population of Malaysian university students. Third, the unequal distribution of respondents across universities and ethnic groups may have influenced the observed demographic patterns. Finally, the cross-sectional design precludes any inference regarding temporal or causal relationships between vaping behaviour, smoking habits, and perceptions towards vaping.

Despite these limitations, this study contributes preliminary evidence regarding cigarette smoking, vape use, dual use, and perceptions towards vaping among Malaysian university students. The findings underscore the need for university-based tobacco prevention programmes, targeted health education addressing misconceptions about vaping, and accessible smoking cessation support for students. Future research should involve larger, randomly selected samples from multiple universities and longitudinal study designs to better understand changes in tobacco use behaviours and the role of vaping in smoking cessation among Malaysian young adults.

CONCLUSION

This study provides preliminary evidence on cigarette use, vape use, dual use, and perceptions toward vaping among university students in Malaysia. The findings may support the development of targeted health promotion and tobacco control strategies within university settings. This study found that cigarette smoking, vape use, and dual use were relatively uncommon among the university students surveyed. Nevertheless, vaping and dual use remain important public health concerns because they continue to expose young adults to nicotine and may contribute to sustained tobacco use. Most respondents perceived vaping to be as harmful as cigarette smoking and did not consider it to be a more effective method for smoking cessation. However, some vapers and dual users held more favourable perceptions towards vaping, highlighting the need to address misconceptions regarding its safety and role in smoking cessation.

These findings provide preliminary evidence on tobacco use behaviours and perceptions towards vaping among Malaysian university students and underscore the importance of implementing university-based tobacco prevention programmes, evidence-based health education, and accessible smoking cessation support services. Given the study's convenience sampling design and relatively small sample size, the findings should be interpreted with

caution and are not intended to represent all Malaysian university students. Future studies should involve larger, randomly selected and more representative samples from multiple universities and consider longitudinal designs to better understand the changing patterns of cigarette smoking, vaping, dual use, and their long-term health implications.

DECLARATION

Authors Contributions

[NAY, HKSJ, LYT]: Conceptualization, Methodology, Writing – Original Draft; [HKSJ, LYT]: Investigation, Formal Analysis; [NAY, HKSJ, LYT]: Supervision, Writing – Review & Editing. All authors have read and approved the published version of the manuscript and agreed to be accountable for all aspects of the work.

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Ethics Approval and Consent to Participate

The study protocol was reviewed and approved by the Research Ethics Committee of Universiti Kebangsaan Malaysia (Protocol No. UKM PPI/111/8/JEP-2017-274). Informed consent was obtained from all individual participants included in the study.

Consent for Publication

Not applicable.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Declaration of Generative AI In Scientific Writing

The authors reviewed, verified, and edited all outputs and take full responsibility for the integrity and accuracy of the publication.

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