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Original Research Article

Current practices of vaping in Sibu Municipal Council area, Sarawak, Malaysia

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ABSTRACT

Background: The purpose of the study was to explore the attitude and practices towards vaping habits in the Sibu Municipal Council area, Sarawak, Malaysia.
Methods: A cross-sectional study was conducted on 403 participants in Sibu Municipal Council area which is under Sibu district in Sibu Division, Sarawak, Malaysia.
Results: The proportion of vape users (11.7%) was higher than the 2016 Malaysian National E-Cigarette Survey's 3.2%. Among vape users, 31.9% had less than 50 puffs daily, 40.4% had 50-100 puffs daily, and 27.7% had more than 100 puffs daily. Prefilled cartridges were the most used vape, followed by drip feed from bottle and tank feed, while 12.8% used other devices and 4.3% were uncertain about their vaping method. Responding with positive attitude towards vaping was 31.8%. Peer pressure to vape among vapers was experienced in 19.1%. Male respondents were more susceptible to vaping. Knowledge about vaping was less informed among 50.4% of participants. There was a significant association between the level of peer pressure and attitude towards smoking where the more peer pressured participants had a more positive attitude towards vaping. Attitudes are not significant difference among different education levels.
Conclusions: The rise in male vapers, particularly among young people under peer pressure, is influenced by peer influence, and misconceptions about vaping effects. This study shows the complexity of vaping trends, transcending gender and ethnic boundaries. Further research is needed to understand the underlying factors and young individuals' choices to address this growing public health concern.

Keywords: E-cigarette, Peer pressure, Vaping

INTRODUCTION

E-cigarettes are electronic nicotine delivery systems with a lithium battery as a power source, heating element, and reservoir for e-liquid. Vaping devices have various street names, including e-cigs, e-hookahs, vape pens, mods, vapes, and tank systems.[1] Vaping devices, introduced in the US in 2007, have gained popularity among youth and young adults, but they may introduce dangerous chemicals and cause severe lung injuries. The global backlash against e-cigarette use is increasing, with E-cigarettes (EC) gaining popularity among adolescents and young adults due to their high nicotine content, appealing flavors, low costs, wide availability, and discreet designs.[2]

International estimates show EC use increased from 2.3 million in 2013 to 5.1 million in 2015. In recent years, there has been a decline in cigarette smoking among adolescents and young adults in Germany, but at the same time, there is a rising prevalence of e-cigarette use.[3]

E-cigarette use is prevalent in Malaysia, particularly among younger adults, males, and smokers. The Malaysian National E-Cigarette 2016 survey in Malaysia found 74% of current e-cigarette users also smoke conventional cigarettes and 3.2% prevalence rate of vape users.4,5 Reasons for vaping use among local users in Klang Valley, Malaysia showed that the enjoyment of the products (85.9%), the sense of lesser toxicity than tobacco (87%), and the fact that it was a cheaper smoking alternative were all reasons for using the e-cigarette (61%).[6]

Peer influence significantly influences adolescent vaping, shaping attitudes and behaviors, and contributing to its adoption among adolescents.[7] The use of electronic cigarettes (vaping) by youth has been found to be strongly associated with an increased risk of ever using cigarettes (smoking).[8] This suggests that vaping may serve as a gateway to smoking for young individuals. In terms of public health, the vaping epidemic poses both challenges and opportunities. While vaping is frequently seen as a safer alternative to smoking, it is critical to understand the potential health hazards linked with this rapidly emerging trend.[9]

A Malaysian study found that 74.9% of university students smoke e-cigarettes, with 40.3% using both. Males are most e-cigarette users.[10] The study conducted in the US and Canada found that non-tobacco flavors are preferred by most frequent vapers, with fruit and candy flavors reporting higher levels of satisfaction and enjoyment. The study also found that non-tobacco flavors are popular among ex-smokers who now vape, and there is no significant association between certain flavors and smoking cessation attempts among current users.[11] A study in France found a median daily puff count of 132, with 14.60% exceeding 300 puffs, while a significant minority consumes more than 140.[12]

Motivations for regular vaping often revolve around perceived benefits, such as reducing or quitting smoking.[13] Vaping was reported as a helpful tool for smoking cessation for some individuals.[14] The impact of vaping on respiratory function, cardiovascular health, and seizures, as well as the longer-term impacts on brain development, increased risk of transitioning to combustible cigarettes and marijuana, and the risk of nicotine addiction. Some studies suggested that vaping may have similar detrimental effects on pulmonary function as cigarette smoking. However, other studies argue that vaping is a healthier alternative to smoking and may aid in smoking cessation.[15]

The impact of vaping introduction on cigarette smoking has also been examined in various jurisdictions with different regulatory approaches to vaping.[16] Furthermore, there was an association between vaping and smoking behavior. While vaping may help some individuals quit smoking, there was also a possibility that it may lead to smoking initiation or progression.[17,18]

The National Youth Tobacco Survey 2020 revealed that 53.4 percent of e-cigarette users aged 11-18 years wanted to quit, with 67.4% having tried. E-cigarette use positively impacts quit intentions and past-year stop attempts, with vaping for fun increasing past-year quit attempts. However, hiding smoking through vaping lowers these intentions and attempts. This highlights the need for comprehensive strategies to tackle both vaping and smoking behaviors among youth. Accurate information about potential health risks associated with vaping is crucial for effective clinical intervention.[19,20] Understanding these dynamics is crucial for developing effective smoking cessation strategies.

METHODS

The cross-sectional study was carried out on a total of 403 participants in the Sibu municipal council area, Sarawak, Malaysia from November to December 2023. Sample size calculation was based on the method of estimation proportion with specified absolute precision demonstrated in "Sample size determination in health studies: a practical manual" by S. K. Lwanga and S. Lemeshow. Convenience sampling was used to obtain participants for this study with a minimum targeted sample size of 385 and a total of 403 responses were collected. To collect the data, the researchers approached passersby on food courts, shopping malls and wet markets, and explained them about research objectives and asked whether they wanted to participate in research. The questionnaire was translated into Malay language for proper understanding. All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki. After getting informed consent, we utilized interviewer-administered questionnaires to measure the age-group, gender, ethnicity, and education level associated with the attitude and practice of vaping.

Descriptive statistics, such as percentages and frequency tables, are used to provide demographic data about individuals (age group, gender, ethnicity, education level, a history of smoking and current smoking) linked with vaping.

The Chi-squared test was performed to assess the relationship between categorical variables such as independent variables such as age group, genders, ethnicity, educational level, the history of smoking and current smoking and dependent variables such as peer pressure, attitude, informed (knowledge) towards vaping practice.

RESULTS

A total of 403 participants conducted the survey through the interviewer-administered questionnaires.

Table 1: Descriptive statistics of sociodemographic characteristics.

Sociodemographic characteristics		N	%
Age group (in years)	≤20	106	26.3
	21-30	227	56.3
	31-40	55	13.6
	41-50	12	3.0
	>50	3	0.7
Gender	Male	197	48.9
	Female	206	51.1
Ethnicity	Iban	90	22.3
	Chinese	215	53.3
	Malay	38	9.4
	Orang ulu	4	1.0
	Melanau	36	8.9
	Bidayuh	4	1.0
	Others	16	4.0
Education level	No formal education	3	0.7
	Primary	1	0.2
	Secondary	98	24.4
	STPM	65	16.2
	Diploma	52	12.9
	Undergraduate	150	37.3
	Postgraduate	33	8.2

Table 1 presents the descriptive characteristics of the sample on vaping status. The majority of 403 participants were aged 21-30 (56.3%), followed by those under 20 (26.3%), and the minority was over 50 years old. Seven ethnic groups: Iban, Chinese, Malay, Orang Ulu, Melanau, and Bidayuh, with 206 females (51.1%) and 197 males (48.9%) were involved. The majority (53.3%) were Chinese, followed by 22.3% Ibans, 9.4% Malays, 8.9% Melanau's, and 4.0% others. 37.3% were undergraduates, a minority were primary school graduates, 24.4% were secondary school graduates, 16.2% were STPM certificate holders, 12.9% were diploma holders, 8.2% were postgraduates, and 0.7% had no formal education.

Table 2 presents 47 participants (11.7%) were vape users among 403 participants. Out of 47 vape users, 19 (35.2%) were currently smoking, 43 (79.6%) had a history of smoking, 17 (31.5%) were only using vape while 18 (33.3%) were using both vape and cigarettes while 19 (35.2%) were ex-smokers who switched to vaping, 18 (33.3%) of users vape less than 50 puffs daily, while 21(38.9%) used 50-100 puffs daily, and 15 (27.8%) used more than 100 puffs daily, and prefilled cartridges were the most commonly used vape (48.1%), followed by drip feed from bottle and tank feed.

Table 3 shows 77 participants (19.1%) had more peer pressure to vape. The remaining 326 (80.9%) had less peer pressure to vape. 128 (31.8%) participants had a positive attitude towards vape. The other 275 (68.2%) had a negative attitude towards vape. 203 (50.4%) participants are less informed about vape. The other 200 (49.6%) participants are well-informed about vape.

Table 2: Practice of vaping.

		N	%
Vaping		47	11.7
History of vaping		50	92.6
Current smoker		19	35.2
History of smoking		43	79.6
Vaping status	Vaper only	17	31.5
	Dual user	18	33.3
	Ex-smoker switch to vaping	19	35.2
Vaping frequency	<50 puffs/day	18	33.3
	50-100 puffs/day	21	38.9
	>100 puffs/day	15	27.8
Prefilled cartridges		26	48.1
Drip feed from bottle		17	31.5
Tank feed		15	27.8

Table 3: Peer pressure, attitude and informed to vape.

		N	%
Peer pressure	Less peer pressure	326	80.9
	Peer pressure	77	19.1
Attitude	Negative attitude	275	68.2
	Positive attitude	128	31.8
Informed	Less information	203	50.4
	Well informed	200	49.6

Table 4 depicts the difference between genders and practice of vaping, the result showed that 20.81% of male participants using vapes and 79.19% of female participants not using it. The Chi-square test showed a p value less than 0.05, indicating a significant difference in male vaping.

For the difference between ethnicities and practice of vaping, 18.89% were vape users, while 73 (81.11%) were non-users among 90 Iban. 4.65% were vape users, while 95.35% were non-users among 215 Chinese. Malays, Orang Ulu, Melanau, Bidayuhs, and other ethnicities had varying levels of vaping usage. The Chi-square test showed a significant difference in vaping practices among different ethnicities.

The Chi-square test results showed no significant difference between age, educational level, smoking history, current smoking, and vaping practice.

Table 5 found that there was a significant difference between peer pressure to vape and vaping practice among 326 participants. 13.99% were vape users, while 96.01% were non-users among those less pressured. 44.16% were vape users, while 55.84% were non-users among those more pressured. Thus, the more peer pressured

participants were more likely to vape compared to the less peer pressured participants.

Table 4: Difference between age groups, gender, ethnicity, education level and smoking status and practice of vaping.

		Vaping		
		Yes	No	Total
Age group (in years) p=0.165	≤20	7	99	106
	21-30	33	194	227
	31-40	7	48	55
	41-50	0	12	12
	>50	0	3	3
Gender p<0.001	Male	41	156	197
	Female	6	200	206
Ethnicity p<0.001	Iban	17	73	90
	Chinese	10	205	215
	Malay	9	29	38
	Orang ulu	0	4	4
	Melanau	8	28	36
	Bidayuh	1	3	4
	Others	2	14	16
Education level p=0.568	No formal education	0	3	3
	Primary	0	1	1
	Secondary	16	82	98
	STPM	4	61	65
	Diploma	7	45	52
	Undergraduate	16	134	150
	Postgraduate	4	29	33
History of smoking p=0.113	Yes	39	4	43
	No	8	3	11
Current smoker p=0.215	Yes	18	1	19
	No	29	6	35

Table 5: Difference between peer pressure, attitude and informed towards vaping and practice of vaping.

		Vaping		
		Yes	No	Total
Peer pressure p<0.001	Less peer pressure	13	313	326
	Peer pressure	34	43	77
Attitude p<0.001	Negative attitude	11	264	275
	Positive attitude	36	92	128
Knowledge p=0.179	Less informed	28	175	203
	Well-informed	19	181	200

There was a significant difference between the attitude towards vaping and practice. Among 275 participants with a negative attitude, 44% are vape users, while 96.6% are non-users.

The result of knowledge about vaping showed that there was no significant difference in knowledge between vape users and non-users among 28 poorly informed participants (13.79% vaping) and 19 well-informed participants (9.5% vaping).

DISCUSSION

Vaping has become a habitual practice, and it is important to understand the attitudes and practices associated with vaping among adults and adolescents. Out of 47 vape users, 35.2% are currently smoking, 79.6% have a history of smoking, 31.5% use vape and cigarettes, and 35.2% are ex-smokers. Most users vape less than 50 puffs daily, with prefilled cartridges being the most used vape (48.1%), followed by drip feed from bottle and tank feed.

There was a significant difference in vaping practices among genders and ethnicities. 20.81% of male participants used vapes, while 79.19% of female participants did not. Ethnicity also played a role, with 18.89% of Iban and 4.65% of Chinese being vape users, while Malays, Orang Ulu, Melanau, Bidayuhs, and other ethnicities had varying levels of vaping usage.

There was a significant difference in vaping practice among 326 participants, with more peer pressured individuals being more likely to vape. The usage of vaping is highest among young adults compared to other age groups. Furthermore, advertising flavored e-cigarettes has been found to increase interest in vaping among young people, particularly young adults.[21] Peer pressure can have a significant influence on attitudes towards vaping, particularly among adolescents. Peer pressure plays a significant role in encouraging males to adopt vaping behavior, as male smokers tend to smoke more cigarettes relative to females. Adolescents may be encouraged to adopt vaping behavior by their peers, especially in the form of encouraging males to vape as a less harmful alternative to smoking.[22] Another study showed that peer pressure influenced adolescents to engage in both vaping and smoking behaviors due to social pressure or social access. The social nature of vaping and smoking, such as sharing devices and cigarettes, and increased access when with peers, contributes to this influence.[23] Furthermore, peer influence is a primary social influencer and reinforcer for vaping.[24]

There is a significant difference in attitudes towards vaping, with 44% of participants with a negative attitude being vape users, and 28.12% of participants with a positive attitude being non-users. The desire to be seen as cool and engage in vaping-related tricks positively influences youth's attitudes towards vaping.[25] Adolescents and young adults were highly sensitive to the conformity pressures associated with real and perceived social norms, which can influence their attitudes towards vaping.[26] This increase in vaping behavior is concerning, especially considering the potential health effects and addictive

nature of nicotine, which can negatively impact brain development and vaping-related lung injuries particularly in young users.[27,28]

No significant differences were found between age, educational level, smoking history, current smoking, and vaping practice. Some literature mentioned that age, educational levels, smoking history, and current smoking status influenced vaping behavior, though specific findings varied depending on study design, population, and other contextual factors.

Limitations

In this study, one of the main limitations was the sampling method, which could affect the generalizability of the results, as the findings may not be representative of the larger population. Additionally, the study relied on self-reported data, which may introduce bias due to respondents' memory recall or willingness to respond truthfully. Future research could address these limitations by securing representative a sample by using probability sampling and by utilizing more objective data collection methods.

CONCLUSION

The increased number of male vapers among various ethnicities and young people, particularly those under peer pressure, is attributed to factors such as peer influence, advertising, and misperceptions about the effects of vaping indicated in the study area. The findings highlight the complex nature of vaping trends, the influence of peer pressure, transcending gender and ethnic boundaries. This complexity necessitates ongoing research to better understand the underlying factors, young individuals' choices, and nuances driving this behavior to address this growing public health concern and protect the health and well-being of vulnerable populations.

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