

E-CIGARETTE USE AMONG ADOLESCENTS IN MALAYSIA

FINDINGS FROM A NATIONAL SURVEY

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INTRODUCTION

E-cigarettes are battery-powered devices that allow users to inhale nicotine into their lungs through vapour. The use of e-cigarettes, especially among adolescents, has become increasingly prevalent.¹ In Malaysia, the prevalence of e-cigarette use among adolescents aged 13 to 17 years was 9.8% in 2017.² Studies have shown that individual factors such as being male³ and cigarette smoking⁴ are associated with e-cigarette use. Apart from individual factors, parental factors such as parental tobacco product use and poor parental monitoring were also reported to be associated with adolescents e-cigarette use.

OBJECTIVE

This study would determine the prevalence of e-cigarette use and the associated factors among adolescents in Malaysia.

METHOD

The study utilised data from a national survey on adolescents, i.e., the National Health and Morbidity Survey (NHMS) 2022. The survey used a two-stage stratified sampling design to select adolescents aged 13 to 17 from secondary schools in Malaysia. Stratification was according to states in Malaysia. The survey used a structured questionnaire that was adapted and validated from the Global Youth Tobacco Survey Questionnaire. Current e-cigarette use was defined as the use of an e-cigarette in the past 30 days. Complex sample design estimates and complex sample binary logistic regression were used in the analysis.

DISCUSSION

E-cigarette use among adolescents has become a public health concern because of its health effects and potential to lead to nicotine addiction. The study shows that the prevalence of e-cigarette use among adolescents in Malaysia has significantly increased in the past 5 years. Being male and a current cigarette smoker were associated with higher odds of e-cigarette use. These findings are consistent with studies in other countries, such as Hong Kong and Indonesia.^{3,4} In terms of ethnicity, the risk was higher among Malays, which is similar to a previous study in Malaysia.⁵ This study also found that older adolescents were associated with higher odds of e-cigarette use. This is also consistent with the findings by Tania et al. (2019) in Malaysia and studies elsewhere.^{5,6} This study revealed a positive association between e-cigarette use among adolescents and parental smoking as well as parental e-cigarette use. Our study substantiates the findings of other studies that reported an association between parental tobacco use and e-cigarette use among adolescents.^{7,8}

CONCLUSION

The prevalence of e-cigarette use among adolescents in Malaysia is on the rise. Anti-smoking measures among adolescents need to be strengthened to include various types of tobacco products, especially e-cigarettes.

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REFERENCES

- Goniewicz ML, Gawron M, Nadolska J, Balwicki L, Sobczak A. Rise in Electronic Cigarette Use Among Adolescents in Poland. *J Adolesc Heal.* 2014;55(6):713-715. doi:10.1016/j.jadohealth.2014.07.015
- Institute for Public Health. National Health and Morbidity Survey (NHMS) 2017: Adolescent Health Survey 2017, Malaysia 2017. Available from: <http://iku.moh.gov.my/images/IKU/Document/REPORT/NHMS2017/AHSReportNHMS2017.pdf>.
- Jiang N, Wang MP, Ho SY, Leung LT, Lam TH. Electronic cigarette use among adolescents: a cross-sectional study in Hong Kong. *BMC Public Health.* 2016; 16(1):1-8.
- Bigwanto M, Nurmansyah MI, Orlan E, Farradika Y, Purnama TB. Determinants of e-cigarette use among a sample of high school students in Jakarta, Indonesia. *International journal of adolescent medicine and health.* 2019; <https://doi.org/10.1515/ijamh-2019-0172> PMID: 31800392.
- Robert Lourdes TG, Abd Hamid HA, Mohd Yusoff MF, Rodzlan Hasani WS, Mat Rifin H, Saminathan TA, Ab Majid NL, Ling JMY, Ismail H, Aris T. Factors Associated With E-Cigarette Usage and the Reasons for Initiation Among Malaysian Adolescents. *Asia Pac J Public Health.* 2019 Oct;31(7 suppl):445-52S. doi: 10.1177/1010539519870663. Epub 2019 Sep 14. PMID: 31522514.
- Hrywna M, Manderski MTB, Dalnevo CD. Prevalence of electronic cigarette use among adolescents in New Jersey and association with social factors. *JAMA network open.* 2020; 3(2):e1920961-e. <https://doi.org/10.1001/jamanetworkopen.2019.20961> PMID: 32049291.
- Jane Ling MY, Ahmad N, Mohd Yusoff MF, Lim KH (2022) Current e-cigarette use among in-school adolescents in West Malaysia: Examining the interactions between sociodemographic characteristics and lifestyle risk behaviours. *PLoS ONE* 17(1): e0263355. <https://doi.org/10.1371/journal.pone.0263355>
- Joung MJ, Han MA, Park J, Ryu SY. Association between family and friend smoking status and adolescent smoking behavior and e-cigarette use in Korea. *International journal of environmental research and public health.* 2016; 13(12):1183. <https://doi.org/10.3390/ijerph13121183> PMID: 27898019

RESULTS

A total of 240 schools were selected, and 33,532 students participated in the survey, with a response rate of 89.4%. The prevalence of e-cigarette use was 14.9% (95% CI: 13.7, 16.1). Almost half of the users, 48.5% (95% CI: 46.36, 50.63) initiated it before the age of 14 years. The adjusted odds ratio (aOR) of e-cigarette use was 56.3 (95% CI: 46.76, 67.77) in adolescents who smoke, 3.8 (95% CI: 3.37, 4.30) in males, 3.7 (95% CI: 3.02, 4.57) in Malay compared to Chinese, 1.6 (95% CI: 1.42, 1.89), and 1.3 (95% CI: 1.16, 1.49) among students with parents who use e-cigarettes and who smoke, respectively.

Table 1: Sociodemographic characteristics of the respondents

Variables	Count	%
Location		
Urban	28165	84
Rural	5358	16
Sex		
Male	15493	46.2
Female	18030	53.8
Age (Form)		
13 (Form 1)	7216	21.5
14 (Form 2)	6902	20.6
15 (Form 3)	6460	19.3
16 (Form 4)	6756	20.1
17 (Form 5)	6189	18.5
Ethnicity		
Malays	23125	67.2
Chinese	5985	17.4
Indians	1556	4.5
Others	3757	10.9

Table 2: Prevalence of current e-cigarette users by socio-demographic characteristics in Malaysia, 2022

Variables	Count	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Overall	4640	307109	14.9	13.7	16.1
Location					
Urban	3,650	226,132	13.5	12.2	14.9
Rural	990	80,977	20.8	18.1	23.7
Sex					
Male	3,582	242,849	23.5	21.6	25.6
Female	1058	64,260	6.2	5.7	6.8
Age (Form)					
13 (Form 1)	708	47,928	10.7	9.3	12.3
14 (Form 2)	806	55,129	12.8	11.4	14.3
15 (Form 3)	858	63,398	15.2	13.6	17
16 (Form 4)	1179	67,708	17.3	14.7	20.2
17 (Form 5)	1089	72,946	19.1	16.8	21.8
Ethnicity					
Malays	3,477	220,305	16.9	15.5	18.5
Chinese	254	19530	5.2	4.3	6.3
Indians	170	13165	10.7	8.5	13.4
Others	739	54109	20.2	18.1	22.5
Smoking Status					
Smoker	2386	157892	84.5	82.9	86
Non-smoker	2254	149217	7.9	7.2	8.7

Table 3: Factors associated with current e-cigarette use among adolescents in Malaysia

Variables	Adjusted* Odds Ratio	95% CI	
		Lower	Upper
Sex			
Male	3.81	3.37	4.3
Female (Ref)	1		
Age (Form)			
13 (Form 1) (Ref)	1		
14 (Form 2)	1.3	1.02	1.66
15 (Form 3)	1.83	1.46	2.29
16 (Form 4)	2.35	1.79	3.08
17 (Form 5)	2.27	1.72	3.01
Ethnicity			
Malays	3.71	3.02	4.57
Chinese (Ref)	1		
Indians	2.25	1.59	3.19
Others	3.83	3.02	4.87
Smoking Status			
Smoker	56.29	46.76	67.77
Non-smoker (Ref)	1		
Parents smoking status			
Smoker	1.32	1.16	1.49
Non-smoker (Ref)	1		
Parents ecig user			
Ecig user	1.64	1.42	1.89
Non-user (Ref)	1		

