

Cigarette Smoking and Electronic Cigarette Use among Malaysian Adolescents: Urgent Call for Action

Mohamad Haniki Nik Mohamed^{1*}

¹*Department of Pharmacy Practice, Kulliyah of Pharmacy, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, 25200 Kuantan, Pahang, Malaysia.*

Editorial

Article history:

Adolescence is an important developmental period (Holliday & Gould, 2016; Yuan et al., 2015) characterised by engagement in risky behaviours, including the use of tobacco products such as cigarettes and electronic nicotine delivery systems such as e-cigarettes (e-cigs) (Casey et al., 2011).

Received: 30 May 2024

Accepted: 1 July 2024

Published: 31 July 2024

doi: 10.31436/jop.v4i2.328

The use of tobacco in the form of cigarettes and e-cigs is indeed of interest to the public health community and the nation at large. E-cigs are defined as devices that deliver aerosolised or vaporised nicotine form heating of liquids (e-juice) with constituents including nicotine, propylene glycol, glycerol, and other flavouring agents. It has been reported that 90% of smokers start smoking before the age of 18 years (Patel et al., 2017). The Tobacco & E-Cigarette Survey among Malaysian Adolescents (TECMA) 2016, a nationwide school-based survey, found 11.7% current cigarette smokers among students between 10 to 19 years old. 78.7% of ever cigarette smokers tried their first cigarette before the age of 14. In addition, 9.1% of the students were current e-cigarettes users, with 40.9% vaping once a day and 33.9% doing it 2 to 5 times per day. Alarming, data from the 2022 Adolescent Health Survey found a sharp increase in adolescent vaping prevalence among adolescents aged 13 to 17 years old, reaching a high of 14.9% in 2022 (Ministry of Health Malaysia, 2022).

E-cigs are heavily promoted directly to users include advertising and promotion at combustible cigarette point-of-sale (e.g., behind cashier's counter). E-cigs are also promoted via physical and online shops, internet, social media, events, etc. According to TECMA, 10.6% of school-going adolescents aged 10-19 years were offered a free trial session of e-cigarette/vape while 7.9% were offered a free e-cigarette/ vape liquid (e-liquid) (Institute of Public Health, 2016). With proliferation of e-cig promotions via the social media, internet, and vape shops (some under the guise of selling electronic products, handphones, etc.), using celebrities and others, the number of dual users and vapers among non-smokers, especially adolescents in Malaysia can be even higher now.

*Corresponding author's email: haniki@iiu.edu.my

In early adolescence, development of executive function and neurocognitive processes in the brain has not fully matured. Adolescence is a sensitive period for maturation of brain circuits that regulate cognition and emotion, with resulting vulnerability to the effects of nicotine and tobacco. The rapidly changing, immature adolescent brain has differing sensitivity to drugs such as nicotine and tobacco, and drug exposure during this time can lead to long-term changes in neural circuitry and behaviour⁶. The American Academy of Paediatrics produced a policy statement showing evidence regarding the effects of nicotine on the developing brain. Nicotine has neurotoxic effects on the developing brain, an effect on the brain as a "gateway" drug for cocaine and other illicit drugs. The gateway theory postulates that smoking, especially among adolescence, increases the risk of substance use due to effects of nicotine, shown to be a neuroteratogen that exerts long-term, maturational effects at critical stages of brain development (Farber et al., 2015).

Nicotine is highly addictive and is the primary psychoactive component causing addiction. This is related to the high plasma concentration achieved and rapid nicotine delivery to the receptors in the brain from combustible cigarettes or e-cigs use. These two characteristics promote development of nicotine dependence and tobacco use disorder (TUD). The high concentration and rapid delivery of nicotine via smoking cigarettes or e-cigs result in release of neurotransmitters such as dopamine, norepinephrine, GABA, acetylcholine and serotonin. Having bursts of neurotransmitters release such as dopamine increases feeling of pleasure and general well-being. Similarly, smokers identify with the reduction in anxiety and tension with the release of GABA, acetylcholine and serotonin. However, these effects are short-lived due to the relatively short half-life of nicotine, i.e., about 2 hours. During this time, brain nicotinic acetylcholine (nACh) receptors are desensitized, and up-regulation of nACh receptors occurs. These processes contribute to the development of withdrawal syndrome, tolerance and craving for repeated use of nicotine, leading to tobacco use disorder (TUD) (American Psychiatric

Association, 2013).

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (APA, 2013), TUD is diagnosed when an individual uses tobacco for more than a year and a minimum of two of the eleven following sub-features appear:

1. More amounts of tobacco over a longer timeframe than planned are used
2. Inability to quit or lessen the amount of tobacco use in spite of efforts to do so.
3. Excessive amount of time spent on attaining or using tobacco.
4. Craving or strong desire or urge to use tobacco.
5. Relinquish responsibilities because of the tobacco use.
6. Use of tobacco persists in spite of its negative impacts both socially and in relationships.
7. Abandon career, social and other activities to use tobacco.
8. Use tobacco in harmful situations/settings.
9. Use is persistent even in the face of physical or emotional difficulties that are related to the use of tobacco.
10. Tolerance, as defined by either the need for markedly increased amounts of tobacco to achieve the desired effect or a markedly diminished effect with continued use of the same amount of tobacco.
11. Withdrawal, as manifested by either the characteristic withdrawal syndrome or the use of tobacco to relieve or avoid withdrawal symptoms.

In Malaysia, nicotine is regulated as a Group C poison under the Poisons Act 1952. However, exemption is given to tobacco products such as combustible cigarettes and cigars. Similar exemption was granted last year to nicotine in liquids and gels of e-cigarettes. However, there were no regulations approved prior to the removal, resulting in a judicial review against the then Health Minister. Following the standalone Control of Smoking Products for Public Health Act 2024, the regulations for tobacco products including e-cigs were supposed to be ready in June 2024 but yet to be released. This lacuna resulted in a significant increase in current vaping

among Malaysians 15 years old and older; from 0.8% in 2011 to 5.8% in 2023 (Institute for Public Health, 2024).

E-cig use is claimed as a safer alternative to combustible tobacco smoking. A recent review reported that nicotine e-cig probably help more people to stop smoking than NRT medications or nicotine-free e-cigs, with low numbers of unwanted effects. However, the authors warned that these results are based on a small number of studies in adults with wide variability in the measured data. More importantly, the reported unwanted effects are likely to change when more evidence becomes available (Hartmann-Boyce et al., 2020).

While some proponents of e-cigs are suggesting that e-cigs are useful for cessation of cigarette smoking, others have shown that e-cigs still contain harmful ingredients. The 2016 report of the U.S. Surgeon General on e-cigarette use among youth and young adults reiterates the fact that e-cigarettes can expose users to various chemicals, including carbonyl compounds, and volatile organic compounds, known to have adverse health effects. The health effects and potentially harmful doses of heated and aerosolized constituents of e-cigarette liquids, including solvents, flavourings, and toxicants, are not completely understood. In simple terms, e-cigarette aerosol is not harmless “water vapor” as claimed by some (U.S. Department of Health and Human Service, 2016).

Important strides have been made over the past several decades in reducing conventional cigarette smoking among youth and young adults especially in developed countries. Sadly, smoking prevalence among Malaysian adults, has remained at least 20% since the first National Health Morbidity Survey was conducted in 1986. The Ministry of Health in particular is trying its utmost to curb the smoking epidemic towards achieving the endgame in 2040 targeting smoking prevalence to be less than 5% (Ministry of Health Malaysia, 2021, National Strategic Plan on Tobacco Control 2015-2020). Hence, more stringent measures must be implemented so that whatever progress thus far will not be compromised by the initiation and use of new

tobacco products, such as e-cigarettes or heated tobacco products. Effective implementation of the WHO Framework Convention on Tobacco Control as well the accompanying MPOWER strategies are needed to help protect Malaysians from the dangers of tobacco and nicotine, especially for our youths. The use of other nicotine products, including e-cigs is creating a new generation who are at risk of nicotine addiction and poisoning. We have failed to ban e-cigarettes and are now faced with the consequences of trying to regulate them, especially following the exemption of nicotine from e-cigarette liquids and gels by the previous Health Minister on 31st March 2023.

Various NGOs have come forward against cigarettes, e-cigs and other tobacco products which are targeting youth. Various platforms, including press conferences, social and printed media as well as reports to the authorities have been made. It is highly encouraging that the new standalone Tobacco Control Act 2024 is available, but sadly, the generational Endgame part has been dropped. Furthermore, regulations for the Act will be key, as better implementation and enforcement activities are urgently needed to thwart the vast promotional activities in Malaysia by both tobacco and vape industry. Hence, to protect young people from initiating or continuing the use of e-cigarettes and other tobacco products, stringent actions must be taken at the local, state and national levels. All parties must continue to take aggressive steps to protect our youth from the harmful effects of using tobacco products and e-cigarettes. These include enforcing effective taxation system and expanding smokefree areas, as well as regulatory authority over the manufacturing, distribution, and marketing. Ideally, banning e-cigarettes or any similar emerging products would be the best way to ensure our future generation will be free from nicotine addiction. The health and well-being of our nation’s young people depend on it.

References

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*. Arlington, VA: American Psychiatric Association.
- Casey, B., Jones, R. M. & Somerville, L. H. (2011). Braking and Accelerating of the Adolescent Brain. *Journal of Research on Adolescent*, 21, 21–33.
- Farber, H. J., Walley, S. C., Groner J. A. & Nelson K. E. (2015). Section on Tobacco Control. Clinical Practice Policy to Protect Children from Tobacco, Nicotine, and Tobacco Smoke. *Pediatrics*, 136(5), 1008-17. <https://doi.org/10.1542/peds.2015-3108>.
- Hartmann-Boyce J., McRobbie H., Lindson N., Bullen C., Begh R., Theodoulou A., Notley C., Rigotti N. A., Turner T., Butler A. R., Hajek P. (2020). Electronic cigarettes for smoking cessation. *Cochrane Database of Systematic Reviews* 2020, Issue 10. Art. No.: CD010216. <https://doi.org/10.1002/14651858.CD010216.pub4>.
- Holliday, E. & Gould, T. J. (2016). Nicotine, Adolescence, and Stress: A Review of How Stress can Modulate the Negative Consequences of Adolescent Nicotine Abuse. *Neuroscience and Biobehavioral Reviews*, 65, 173–184.
- Institute for Public Health (IPH). (2016). *Tobacco & E-Cigarette Survey Among Malaysian Adolescents (TECMA) 2016*. National Institutes of Health, Ministry of Health Malaysia, Kuala Lumpur. ISBN: 978-983-2387-30-5.
- Institute for Public Health (IPH). (2024). *National Health and Morbidity Survey 2023*. National Institutes of Health, Ministry of Health Malaysia, Kuala Lumpur. ISBN: 978-967-5340-91-8.
- Ministry of Health Malaysia. (2022). *National Health and Morbidity Survey 2022. Adolescent Health Survey 2022*. [Internet]. Available from: https://iku.gov.my/images/nhms-2022/Report_Malaysia_nhms_ahs_2022.pdf
- National Strategic Plan on Tobacco Control 2015-2020. [Internet]. Available at: https://www.moh.gov.my/moh/resources/Penerbitan/Rujukan/NSP_Tobacco_buku_bind_24oct2015.pdf.
- Patel, M., Kaufman, A., Hunt, Y. & Nebeling, L. (2017). Understanding the Relationship of Cigarette Smoking Trajectories Through Adolescence and Weight Status in Young Adulthood in the United States. *Journal of Adolescent Health*, 61, 163–170.
- Poisons Act 1952. https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/poisons-list-1.9.2020_0.pdf
- U.S. Department of Health and Human Services. (2016). *E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General—Executive Summary*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- Yuan, M., Cross, S. J., Loughlin, S. E. & Leslie, F. M. (2015). Nicotine and the Adolescent Brain. *Journal of Physiology*, 593, 3397–3412.