E-cigarettes: Facts and legal status

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Abstract: The sale of tobacco-based cigarettes has declined in western countries, and 'Big Tobacco' is trying to make up the deficit in profits from the developing world. The recent introduction of e-cigarette, in which they have invested both their hopes and their finances, has been a boon to them as it serves to confuse smokers and non-smokers about the real issues relating to the toxicity, dangers, and the promotion of nicotine addiction especially among youths who have not previously smoked cigarettes. E-cigarettes cause inflammation and damage to epithelial cells in human airways and increased risk of infection. E-cigarette vapour contains more carcinogens like formaldehyde and acetaldehyde compared to a regular cigarette. Long-term vaping is associated with an incremental lifetime cancer risk. E-cigarettes are neither safe nor effective in helping smokers quit; there is enough evidence to caution children, adolescents, pregnant women, and women of reproductive age about e-cigarette's potential for long term consequences to foetal and adolescent brain development that sub-serve emotional and cognitive functions. The nicotine effects that cause modification of late CNS development constitute a hazard of adolescent nicotine use. The American Heart Association (AHA), Food and Drug Administration (FDA), World Health Organisation (WHO) and two-thirds of the major nations in the world discourage the promotion of e-cigarettes as an alternative to proven nicotine-addiction treatments. Doctors, health care workers, and medical students should be armed with the facts about e-cigarettes, its dangers, and the legal status concerning its use, in order to be able to offer proper counselling to patients and adolescents, in particular, with special reference to the Malaysian context.

IeJSME 2015 9(3): 10-19

Keywords: E-cigarettes, nicotine addiction, cancer risk, brain development consequence, legislation

Introduction

Electronic cigarettes (e-cigarettes) or electronic nicotine delivery systems, have gained popularity among smokers, especially the youth, world-wide. Despite the current legal barriers, the use of e-cigarettes has increased world-wide and among Australian smokers.[1] In the US, e-cigarettes have surpassed snus in adoption rate, even before launching of promotion campaigns by major tobacco companies, suggesting that these companies have tapped into smokers' intuitive preference for potentially harm-reducing products, probably due to the product design. They anticipate that e-cigarette use is likely to increase further in the next few years.[2] Giant tobacco companies are buying up e-cigarettes producers, in order to have their piece of the pie of a global market estimated at USD 3 billion.

Most smokers believe e-cigarettes are safer than regular cigarettes; many use it hoping that it would help them quit smoking.[3] Cheapness of e-cigarettes compared to regular cigarettes also contributes to its popularity. Available data suggest that smokers in the United States of America (USA) are not waiting for a consensus view from health authorities to decide if they should switch to e-cigarettes. E-cigarettes are likely to gain users in the next few years regardless of the opinions of the scientific community.[2] Kanda *et. al.* conducted an e-mail survey of North Carolina physicians and found that two thirds (67%) of the surveyed physicians considered e-cigarettes a helpful aid for smoking, and 35% recommended them to their patients. Physicians were more likely to recommend e-cigarettes when patients asked about them or when the physician believed e-cigarettes were safer than smoking standard cigarettes.[4]

It is apparent that medical students and physicians need evidence-based guidance on e-cigarettes that will help ensure their smoker patients receive evidence-based recommendations about the safety and efficacy of e-cigarettes. They would also need to counsel non-smokers and especially the youths contemplating using e-cigarettes about their potential danger to health, and educate them about the legal status of e-cigarettes in Malaysia and the rest of the world.

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Facts about e-cigarettes

History

A Beijing Chinese pharmacist, Hon Lik first developed e-cigarettes in 2003 as a smoking alternative for traditional tobacco smokers.[5] Following its introduction in 2007, the e-cigarette has become a commercial success in the USA. Big tobacco companies – Lorillard, Atria and Japan Tobacco have moved into the e-cigarette market in UK, US and Japan. With money and political clout, 'Big Tobacco', has become a major player for e-cigarettes in the global market, and is viewed by them as a solid hedge against a half-century decline in adult smoking rates. They actively promote the idea that the benefits of e-cigarettes outweigh their risks.

What are e-cigarettes?

E-cigarette is an electronic re-chargeable battery-powered nicotine delivery system that simulates tobacco smoking. It appears like a cigarette, has a mouthpiece, a heating element, a disposable or refillable cartridge, and an atomiser that produces an aerosol (vapour) instead of smoke which the user inhales. A LED light at the end of the device glows when the smoker inhales to simulate real smoking. There are disposable and reusable versions. E-liquids comprise a mixture of propylene glycol, glycerol, nicotine, and flavourings. Various E-liquids are available with or without nicotine, propylene glycol, and flavours like tobacco, mint and fruit. Experienced smokers can achieve nicotine blood levels similar to tobacco smoking.[7]

Impact of e-cigarettes on health

E-cigarettes are being promoted as an aid to quitting cigarette smoking, and a safer long-term alternative to tobacco cigarette smoking, but the question is whether e-cigarettes promote addiction?

E-cigarette as an aid to quitting cigarette smoking

There is very limited data on whether e-cigarettes help individuals quit cigarette smoking. A prospective proof-of-concept study by Polosa *et. al.* showed that the use of e-cigarette substantially decreased cigarette consumption without causing significant side-effects in smokers not intending to quit.[8] Adkison *et. al.* found e-cigarettes, with or without nicotine, were modestly effective at helping smokers quit, with achievement of similar rates of abstinence as with nicotine patches. Uncertainty exists about the place of e-cigarettes in tobacco control and their overall benefits and harms at both individual and population levels.[9] Addiction Magazine 7 has reported that among smokers who have attempted to stop smoking without professional support, those who used e-cigarettes were more likely to report continued abstinence than those who either used a licensed nicotine replacement therapy product that they had bought over-the-counter, or those who did not use any aid to help quit smoking.[10]

A study on the use of e-cigarettes among state tobacco quit line callers found that nearly one-third of respondents reported ever using or trying e-cigarettes. Of those who had tried e-cigarettes, over six in ten (61.7%) reported using them for less than one month. Reasons for using e-cigarettes included help with quitting tobacco smoking (51.3%) or using it to replace other tobacco products (15.2%). E-cigarette users (both those who had used e-cigarettes for more than one month and less than one month) were significantly less likely to quit tobacco smoking seven months after calling a state quit line compared with participants who had never tried e-cigarettes (30-day point prevalence rates: 16.6% and 21.7% vs. 31.3%, $p<.001$).[11] A prospective 6-month pilot study on the effect of e-cigarette on smoking reduction and cessation showed a substantial decrease in smoking and cessation without causing significant side effects in smokers not intending to quit. However, large and carefully conducted RCTs will be required before a definite answer about the efficacy and safety of these devices can be formulated.[13]

Is e-cigarette a safer long-term alternative to tobacco cigarette smoking?

Researchers at the National Jewish Health in Denver have provided strong evidence that the liquid used in e-cigarettes, whether it contains nicotine or not, has negative effects on the airways and on the lungs. Its vapour can damage human airway epithelial cells and increase the risk of infection. The researchers noted a significant increase in the level of IL-6 protein from the cells, which indicates an immune response to the e-cigarette exposure. The epithelial cells were damaged after only a few minutes of exposure and the immune response lasted up to 48 hours. These cells responded quickly to the presence of e-cigarette liquid or vapours by producing IL-6 protein, which contributes to the lung inflammation and injury.[14] This study confirms the real dangers of e-cigarettes and the need to prevent e-cigarettes falling into the hands of children and teenagers who falsely assume that they are safe.

Researchers commissioned by Japan's Ministry of Health have found carcinogens such as formaldehyde and acetaldehyde in the vapour produced by several types of e-cigarette liquid. These carcinogens were present at much higher levels than those found in the smoke from regular cigarettes. In one brand of e-cigarette, the level of carcinogens was 10 times more than the level contained in one regular cigarette; the amount of formaldehyde detected varied through the course of analysis. When the wire which vaporises the liquid gets overheated, higher amounts of those harmful substances were produced.[15]

Kosmider *et. al.* found that in many samples of the particulate matter of the aerosol of "vaped" e-cigarettes, more than 2% of the total solvent molecules had converted to formaldehyde-releasing agents that reached concentrations higher than those of nicotine.[16] This happens when propylene glycol and glycerol are heated in the presence of oxygen to temperatures reached by commercially available e-cigarettes operating at high voltage. How formaldehyde-releasing agents behave in the respiratory tract is unknown, but formaldehyde is a recognised International Agency for Research on Cancer group 1 carcinogen.[16]

In another study published in the New England Journal of Medicine, Jensen *et. al.*[17] observed that formaldehyde-containing hemiacetals, shown by others[18] to be entities that are detectable by means of nuclear magnetic resonance (NMR) spectroscopy, can be formed during the e-cigarette vaping process. Formaldehyde, a known degradation product of propylene glycol, reacts with propylene glycol and glycerol during vaporisation to produce hemiacetals molecules that are known formaldehyde-releasing agents and are used as industrial biocides.[19] Jensen *et. al.* found that long-term vaping is associated with an incremental lifetime cancer risk of 4.2×10^{-3}. This risk is 5 times as high compared with the risk associated with long-term standard smoking based on the calculation of Miyake and Shibamoto[20] or even 15 times as high based on the calculation of Counts *et. al.*[21] In addition, formaldehyde-releasing agents deposit more efficiently in the respiratory tract than gaseous formaldehyde, and thus carry a higher slope factor for cancer.

Some retailers have falsely claimed that e-cigarette is an effective nicotine replacement therapy and a smoking cessation aid endorsed by the World Health Organisation (WHO), but WHO's position is quite clear; it does not support e-cigarettes as a legitimate therapy to help smokers quit as there is a lack of conclusive scientific evidence to substantiate the efficacy, safety and quality of e-cigarettes. WHO calls on marketers of e-cigarettes to immediately stop their false and unproved claims about the safety of e-cigarettes, and encourages smokers to quit smoking using nicotine patches as an aid instead of e-cigarettes. In July 2014, WHO issued a comprehensive report on the harms of e-cigarettes and proposed options to regulate the import, sale and use of the products. This position is supported by the Singapore Ministry of Health.[22] E-cigarettes have also not been approved as a cessation aid by the Food and Drug Administration (FDA) that is responsible for assuring the safety, efficacy and security of drugs and medical devices in the United States. In January 2015, the California Department of Public Health (CDPH)

issued a Health Advisory warning to the public on the health risks posed by the marketing, sale and use of e-cigarettes, especially to children and young people.[23] Electronic cigarettes have so far not been proven to be either safe or effective in helping smokers quit. To date, there are no double-blind, placebo-controlled studies establishing the usefulness of e-cigarettes to help people quit smoking but there is enough evidence "to caution children, adolescents, pregnant women, and women of reproductive age" about e-cigarette use, as foetal and adolescent nicotine exposure has the potential to cause long-term consequences for brain development". WHO also advocates that e-cigarettes should be banned from indoor public spaces and has called on governments to ban the sale of e-cigarettes to minors, warning that they pose a "serious threat" to unborn babies and young people.[24]

Does e-cigarette promote nicotine addiction?

Animal studies

McDonald *et. al.* have reported that periadolescent nicotine administration to male Long-Evans hooded rats produces enduring changes in dendritic morphology of medium spiny neurons from nucleus accumbens. A subsequent behavioural experiment suggested that the observed anatomical changes are associated with enduring psychomotor differences. These findings indicate that periadolescent exposure to nicotine can result in long-lasting structural changes in the nucleus accumbens shell and are consistent with behavioural data suggesting that adolescent nicotine exposure may result in vulnerability to nicotine addiction in adulthood.[25] Bergstrom *et. al.* found that chronic nicotine exposure produces lateralised, age-dependent dendritic remodelling in the rodent basolateral amygdala,[26] that is generally thought to be involved in the acquisition and consolidation of emotional memory.[27] There is some evidence to suggest that prior nicotine produces lasting alterations of emotional memory that depend on BLA functioning, including auditory fear conditioning.[28] Persisting anxiety or stress as a consequence of smoking represents an important contributing factor to nicotine addiction.[29] Nicotine has been found to act as a typical drug of abuse in experimental animals and humans. It can function as an effective reinforcer of drug-seeking and drug-taking behaviour both in experimental animals and humans, under appropriate conditions. Interruption of chronic nicotine exposure produces withdrawal symptoms that may contribute to relapse.[30] In adolescent rats, nicotine-induced dendrite remodelling in the nucleus accumbens is rapid, persistent, and D1-dopamine receptor dependent.[31]

Slotkin *et. al.* found that nicotine administration in adolescent rats reprogrammes the subsequent response to nicotine treatment and withdrawal in adulthood. In males, prior exposure to nicotine in adolescence greatly augmented the increase in serotonin turnover evoked by nicotine given in adulthood, an interaction that was further exacerbated during withdrawal. The effect was sufficiently large to cause a significant depletion of serotonin stores, an effect that was not seen with nicotine given alone in either adolescence or adulthood. In females, adolescent nicotine exposure blunted or delayed the spike in serotonin turnover evoked by withdrawal from adult nicotine treatment, a totally different effect from the interaction seen in males. Combined with earlier work showing persistent dysregulation of serotonin receptor expression and receptor coupling, the results indicated that adolescent nicotine exposure reprogrammes future responses of 5HT systems to nicotine, changes that may contribute to life-long vulnerability to relapse and re-addiction.[32]

Adolescent nicotine induces persisting changes in the development of neural connectivity. Adolescent nicotine may induce a more addiction-prone phenotype, and the structures altered by nicotine also sub-serve some emotional and cognitive functions, which may also be altered. Dendritic elaboration and associated changes are mediated by activity-dependent synaptogenesis, acting in part through D1DR receptors, in a network activated by nicotine. The adolescent nicotine effects

suggest that modification of late CNS development constitutes a hazard of adolescent nicotine use.[33]

Studies in school children

Azzazola *et. al.*[34] studied tobacco use among middle and high schools in the United States from 2011-2014; they found tobacco use and addiction most often begin during adolescence and early adulthood. The Centre for Disease Control (CDC) in Atlanta and the FDA analysed data from the 2011-2014 National Youth Tobacco Surveys (NYTS) to determine the prevalence and trends of current (past 30-day) use of nine tobacco products (cigarettes, cigars, smokeless tobacco, e-cigarettes, hookahs, tobacco pipes, snus, dissolvable tobacco, and bidis) among U.S. middle (grades 6-8) and high school (grades 9-12) students. In 2014, e-cigarettes were the most commonly used tobacco products among middle (3.9%) and high (13.4%) school students. Between 2011 and 2014, statistically significant increases were observed among these students for current use of both e-cigarettes and hookahs ($p<0.05$), while decreases were observed for current use of more traditional products, such as cigarettes and cigars, resulting in no change in overall tobacco use. Consequently, 4.6 million middle and high school students continue to be exposed to harmful tobacco product constituents, including nicotine. Nicotine exposure during adolescence, a critical window for brain development, might have lasting adverse consequences for brain development, causes addiction, and might lead to sustained tobacco use. For this reason, comprehensive and sustained strategies are required to prevent and reduce the use of all tobacco products among youths in the United States.[34]

CDC has warned that e-cigarette use has more than doubled among U.S. middle and high school students from 2011-2012.[34] It considers this increased use by teens deeply troubling, as nicotine is highly addictive. Many teens who start with e-cigarettes, may be condemned to a struggle with a lifelong addiction to nicotine and conventional cigarettes.[35] Robert Preidt found that the number of young non-smokers who tried e-cigarettes had tripled in a span of 2 years.[36] The CDC report also found that non-smoking children who used e-cigarettes were nearly twice as likely to plan to start smoking tobacco cigarettes compared to those who never used e-cigarettes – about 44 percent versus 21.5 percent, respectively. CDC is concerned about nicotine use among the youth, regardless of whether it comes from conventional cigarettes, e-cigarettes or other tobacco products. Not only is nicotine highly addictive, it can harm adolescent brain development and cause lasting problems in thinking and memory.[36] Tobacco control efforts that have cut in half the youth smoking rate from 1997 to 2007, and have saved >8 million lives in the past 50 years, may be undermined by the pernicious introduction of e-cigarettes. The American Heart Association (AHA) has called for e-cigarettes to be subject to the same laws that apply to tobacco products, and for the U.S. government to ban the marketing and sale of e-cigarettes to young people.[37]

Tobacco advertisements increase teenagers' chances of smoking, and the greater the number of tobacco ad sources the more likely teens planned to start smoking. Celebrity endorsement of electronic cigarettes will have the same impact on today's youth that tobacco advertisements of the past, by Hollywood icons, had on today's adult smokers. Cigarette advertising encourages youth to smoke and should be banned. These findings highlight the need for the FDA to develop strong regulations regarding electronic cigarettes, as without these regulations, the use of e-cigarettes is bound to increase among teenagers, leading to a reversal of the success that has been achieved in tobacco control over the past years, especially among adolescents.[38]

E-cigarettes in Malaysia and its legal status in the region

Early this year, the Society for Research on Nicotine and Tobacco published the results of a household survey that revealed worrying data on e-cigarettes in Malaysia. Of the four lower and middle income countries surveyed, 21% of adult respondents in Malaysia compared to 10.9%

in Indonesia, 49% in Qatar, and 88.5% in Greece were aware or ever heard of e-cigarettes. The use of e-cigarette among those who were aware of e-cigarettes was 3.9% in Malaysia compared to 2.5% in Indonesia, 2.2% in Greece and 1.8% in Qatar respectively. The sample size and overall response rate for this Global Adult Tobacco Survey in each country was 8305 (Indonesia, 94.3%), 4250 (Malaysia, 85.3%), 8389 (Qatar, 98.5%), and 4357 (Greece, 69.6%) respectively.[39]

Another survey, the Malaysia Adult Smoker Survey (MASS), was conducted in June 2015 by Ipsos, a leading global polling company representing factasia.org[40] (an independent non-profit consumer orientated advocacy organisation representing the rights of adults in Asia who choose to enjoy smoking or other related forms of consumption of nicotine). This survey also showed distressing data; most Malaysian smokers (82 percent) considered e-cigarettes a "positive alternative" to regular cigarettes, and 75 percent of them stated they "would consider purchasing e-cigarettes from other channels or countries if the government were to restrict their availability in Malaysia. Currently, 26 percent of e-cigarette users obtain their e-cigarette products online where there are no recognised standards or quality regulations.

The latest reported number of e-cigarettes users in Malaysia is between 250,000 and 1 million; many vendors are thriving in this extremely profitable market by targeting the public with false advertisements that e-cigarette is a safer alternative to standard cigarette. Some medical doctors and administrators, ignorant of the true facts, appear to accept these false baseless claims made by e-cigarette manufacturers and retailers. Worried by the facts and figures on e-cigarettes, the Malaysian consumer associations are now demanding more effective regulations and enforcement.[41] It takes merely 0.15mg of nicotine to cause addiction, and there is a strong potential for e-cigarettes to cause nicotine addiction as the liquid nicotine concentrations stated in commercial products are often inconsistent with measured nicotine.[42]

Current regulations on e-cigarettes vary between countries, some have no regulations and others ban the devices totally.[43] It is estimated that in 2014, there were 466 brands of e-cigarettes and more than USD 3 billion were spent on it globally.[44] In 2015, around two thirds of major nations have regulated e-cigarettes in some way.[45] More than half of the world's population have access to it with its market increasing exponentially despite warnings by WHO.[46] Turkey was the first to ban e-cigarettes in 2008.[47] WHO reported a ban on e-cigarettes in 13 out of 59 countries that regulate them. A summary of the data collected by WHO from its survey is provided below[46]:

- Comprehensive advertising, promotion and sponsorship bans on e-cigarettes are in place in 39 countries (in which 31% of the world's population live)
- Use of e-cigarettes in enclosed public places is banned in 30 countries (35%);
- Premarket review is required by 19 countries (5%)
- Vendor licences are required by nine countries (4%)
- Policies on e-cigarettes sales to minors were confirmed by 29 countries (8%).

Many countries operate a two-tier system: nicotine and non-nicotine products i.e.:

- Hardware that does not contain nicotine is permitted;
- Refills without nicotine are permitted; and
- Refills with nicotine (or units sold pre-filled with a nicotine-containing refill) that require a medical license.

In May 2015, John Hopkin Bloomberg School of Public Health comprehensively reviewed the regulations on e-cigarettes in 123 countries.[48] Table 1 summarises the regulation and policies in Malaysia and the region based on literature review as well as web searches of government websites and media reports. Brunei, Singapore and Thailand have banned the sale of e-cigarettes; the jury is still out in Malaysia.

Table 1: Policies on sale of nicotine, tobacco products and e-cigarettes in different countries.

Country	Policy
Malaysia	The sale, distribution or importation of unlicensed *nicotine* containing e-cigarettes is prohibited and can only be sold by licensed pharmacies or registered medical practitioners. Devices *without nicotine* are classified as electrical appliances and is legal. Nicotine is classified as a Class C poison under the Poisons Act of 1952 and the Control of Drugs and Cosmetics Regulations of 1984 (Malaysia). Poisons Act forbids the sale or supply of poisons to people under 18. Liable to a fine not exceeding RM3,000 and / or up to two years imprisonment.
Australia[1]	Australian laws about e-cigarettes are complex and vary between different jurisdictions. • E-cigarettes containing nicotine cannot be sold in any Australian state or territory. • It is illegal to use nicotine in e-cigarettes without a prescription. • In Queensland it is legal to sell e-cigarettes that do not contain nicotine under the same conditions as for tobacco products.
Bahrain	E-cigarettes are classified as tobacco products. Bans of sale, importation and distribution. Tobacco control law prohibits the advertisement, promotion, sponsorship and use of tobacco products (including e-cigarettes) in enclosed public places and public transportation.
Brunei	E-cigarettes are tobacco imitation products. Tobacco Order prohibits the sale, offer for sale or importation of items that imitate tobacco products. Nicotine preparations above 7.5 percent are classified as poisons and the Poisons Act stipulates that a license/permit from the Pharmacy Enforcement Unit of the Ministry of Health must be obtained before a person can import, possess for sale or offer for sale any poison. Liable to a fine of $10,000.
Cambodia	Bans their sale, importation and use.
Hong Kong	E-cigarette containing nicotine is regarded as pharmaceutical product and must be registered with the Pharmacy and Poisons Board before sale or distribution. Prohibits the possession or sale of unregistered pharmaceutical product, and the possession or sale without authority of Part I poison. Liable to a fine not exceeding $100,000 and 2 years' imprisonment for each offence. Pharmacy and Poisons Ordinance (Chapter 138, Laws of Hong Kong).
Japan	Non-nicotine e-cigarettes are currently not being regulated. Nicotine e-cigarettes are classified as medicinal products. Japanese pharmaceutical affairs law - marketing approval for the sale, advertisement, manufacture, importation and distribution of medicinal products must be sought under this law. The Ministry of Health, Labor and Welfare permits the private importation of medicinal e-cigarettes for private use only and an amount of less than one month's supply.
Nepal	Bans advertising, promotion and sponsorship as well as use in public places and transportation.
New Zealand	Medicines Act states that e-cigarettes promoted as therapeutic products are classified as medicinal. As medicinal products, there are restrictions on sale, advertising and distribution. Smoke-free Environments Act prohibits the sale of nicotine-containing e-cigarettes. Non-nicotine e-cigarettes that are not marketed as therapeutic products can be sold, but not to minors under 18 if they look like tobacco products. E-cigarettes can be imported, provided they are for personal use only.
Philippines	E-cigarettes are classified as medicinal products and medical devices. They must pass the safety, efficacy and quality evaluation of the Food and Drug Authority of the Philippines for market authorization as a health product and health-related device to be issued. E-cigarettes are subject to clean air laws in the tobacco regulation act, which prohibits their use in public places and restricts their use on public transportation.

Country	Policy
Republic of Korea[52]	Nicotine-containing e-cigarettes are classified as tobacco products. Sale is banned to minors (under 19). Use is banned in public places and transport. Korea has the highest retail prices for e-cigarettes in the world under a special health tax (Tobacco Business Act). Electric cigarette possession among teenagers remains an issue.
Saudi Arabia	The sale and marketing of e-cigarettes is banned in accordance with a decision of health ministers of gulf countries.
Singapore[53]	Prohibits the import, distribution, sale or offer for sale of any article that is designed to resemble a tobacco product; that includes Vaporisers such as e-cigarettes, e-pipes, e-cigars and the likes. Liable to a fine not exceeding $5,000 for a first offence and a fine not exceeding $10,000 for a second or subsequent offence and any e-cigarettes imported will be seized and confiscated. Section 16 of the Tobacco (Control of Advertisement and Sales) Act. Tobacco (Control of Advertisements and Sale) Act (CHAPTER 309) (Original Enactment: Act 10 of 1993).
Thailand	Medicine Act prohibits manufacturing, sale and importation of "modern" medicinal products. Tobacco Products Control Act prohibits importation and sale of products imitating cigarettes. Notification by the Ministry of Commerce bans the import of e-cigarettes. Customs Acts prohibits people from bringing untaxed products into Thailand. There is no explicit law banning the use of e-cigarettes, but e-cigarettes are banned where laws prohibit smoking.
United Arab Emirates	Sale and marketing of e-cigarettes is banned in accordance with a decision of health ministers of gulf countries.
Vietnam	Classified as tobacco products. The national tobacco control law bans sale to minors and marketing/advertising. Smoking tobacco products is prohibited in public spaces and public transport, with the exception of designated smoking areas.

E-cigarettes are banned in Singapore and strict enforcement instituted. The public is encouraged to assist in identifying and reporting e-cigarette smokers, manufacturers and retailers. One peddler selling e-cigarettes was fined $64,500 by the Singapore Health Sciences Authority (HSA). All websites managed by the peddlers selling e-cigarettes were shut down.[49] There is no reason why Singapore's success in dealing with e-cigarettes cannot be repeated in Malaysia and the rest of the world, other than lack of political will. Whistle blowers can be rewarded from revenues generated from heavy fines, and punishment imposed on those who permit e-cigarette smoking on their premises, e-cigarette retailers, and smokers alike. The identity of whistle blowers should be protected, and whistle-blowing could provide a substantial income for many, and serve the public good.

Conclusion

There are no "health benefits" associated with e-cigarettes; it does not help stop or cure nicotine addiction; instead, it initiates and reinforces addictive behaviour. E-cigarettes should not be promoted as a means of getting tobacco smokers off their habit; nicotine patches are effective in this regards. Introduction of e-cigarettes only serves to increase the number of adolescents who have never previously smoked to be hooked on this addiction. Addiction in any form should not be supported. E-cigarettes should be banned despite fears that this may lead to a thriving illegitimate market promoted and supported by "Big Tobacco". The onus is on e-cigarette lobby to prove that e-cigarette is safe and not e-cigarette is safer than standard cigarette, and secondly, that e-cigarette does not increase nicotine addiction especially among adolescents and young adults.

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