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# A Literature Review on Regulations Enforced to Reduce Adolescents' Use of E-Cigarette in Thailand

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## Abstract

In Thailand, increasing use of e-cigarettes among adolescents poses a significant public health concern. This review demonstrated the multifaceted issues of the problem by exploring the origin of e-cigarettes, factors impacting the broad use of vapes among teenagers, and the guidelines/laws of vaping from government authorities across Asian and Western nations. This study examined the health risks associated with e-cigarette use, dispelled misconceptions regarding public safety, and highlighted the existing treatment programs. Furthermore, the report encompasses frameworks that control teenagers' e-cigarette consumption. Here, we present viewpoints on the situation in Thailand, which are now compared to global experiences. This highlights the urgent need for strict laws to curb the increasing trend in e-cigarette use among adolescents. In this study, the strategy to reduce adolescents' vaping use is proposed with an "ECIG" approach which comprises of Establish e-cigarette prohibition law for adolescents, Control retailers from selling e-cigarette, Individuals' understanding of its negative impact and Guardian's supervision.

**Keywords:** Cigarette, E-cigarette, Smoking, Adolescents, Vaping, Tobacco

## 1. Introduction

In the world that is rapidly shaped by technological advancement and drastic change in societal structure, the rising number of electronic cigarettes or e-cigarettes, also called electronic nicotine delivery (ENDS) has become popular among international and Thai adolescents (Evans-Polce *et al.*, 2018; Bhave and Chadi, 2021; Patanavanich *et al.*, 2021; Thepthien *et al.*, 2021; Becker and Rice, 2022). The prevalence of current e-cigarette use in teenagers has remained low since Thai government banned on importation and sales of e-cigarettes (Patanavanich *et al.*, 2021; Thepthien *et al.*, 2021). Aggressive and relentless teenager-targeted marketing from e-cigarette company, readily accessible to vaping products, the cheap price of e-cigarettes, lack of knowledge of harmful health risks, attractive designs and flavors of e-cigarettes are key factors for their popularity among youths (Evans-Polce *et al.*, 2018; Bhave and Chadi, 2021).

## 2. The Past

### 2.1. The origin of e-cigarette

Robinson coined the term electronic vaporizer to describe the vaporization of medicinal elements in 1927. This vaporizer was aimed at making it easier to inhale vapor regardless of the burning of the vaporizer. Nonetheless, selling this puffing item was completely banned, except when it was used for medical treatment (Sun *et al.*, 2023). In 1963, Herbert A. Gilbert initiated a patent for fumeless electric cigarettes as a replacement for burning paper and tobacco, based on the heated air facilitated by moisture (Bekki *et al.*, 2014). Despite Gilbert's ground-breaking invention, his cigarette did not receive attention from all manufacturers, who should have developed its product lines. Nonetheless, it was not until 2003 that Hon Lik, a pharmacologist in China, improved the availability of e-cigarettes (Bekki *et al.*, 2014). In fact, he was inspired to have a new idea for helping his father, who was susceptible to lung cancer and cigarette addiction, completely cease smoking habits (Bekki *et al.*, 2014; Nayir *et al.*, 2016).

## 3. Factors contributing to the use of e-cigarette among adolescents

Puffing e-cigarettes by teen smokers is significantly attributed to various sources, embracing social pressure from friends as well as marketing and advertising gimmicks, together with personal predilection. Disclosing and promoting e-cigarette marketing and advertising are associated with facilitating the consumption of this puffing item by prospective users with high curiosity. Moreover, advertising and marketing ENDS through social media have been found to be significantly associated with strengthening friendly relationships. Indeed, the chances of puffing e-cigarettes used by friends are twice as high as those seen via social media and advertisements when compared to other sources of media (Groom *et al.*, 2021). According to the initial findings, quite a few teenagers were most likely to not use vaporizing cigarettes to cut off their smoking habits.

On the contrary, the use of e-cigarettes significantly derives from mental acquisitiveness, attractiveness of diverse tastes, and social influence by people around. Moreover, the pleasure from smoking contributes to e-cigarette use. On this basis, the causes of puffing e-cigarettes among minors differ greatly, contributing to separate research, as proposed by veteran academics (Patrick *et al.*, 2016). A group of student samples who reported their puffing experience were asked about the main reasons for their inhaling with the query: What are the main causes of your use of vaping items, such as e-cigarettes? As for their responses, 10 main reasons were revealed: "to test and experience what it actually is", "to please its good flavors", "to ease their boredom", "to enjoy life with their friends", "to relax or reduce stress", "to prove its appeal", "to cease smoking traditional cigarettes", "to substitute normal banned cigarettes", "to get it intoxicated", and "to soothe their smoking addiction" (Evans-Polce *et al.*, 2018).

## 4. Policy development about vaping in Asian and Western countries

The government's opting for policies responsible for regulating tobacco could have an impact on the e-cigarette vaping habits of students as well as their contribution to controlling tobacco. The nations in the Asia-Pacific region are being exposed to the tobacco landscape with great revolution and improvement, while the rules and regulations responsible for easing the adverse impacts of tobacco on public health are being formulated and made much more efficient than ever before. It was not until 2013 that the crucial report made by the WHO Tobacco Free Initiative aimed to assist many nations worldwide in fortifying policies for precluding e-cigarette smoking in public areas where these items are totally banned and disallowed for sales to buyers with no legal rights for purchasing at certain places in which e-cigarettes are entirely discouraged for use. Meanwhile, there are strict limitations against marketing and advertising e-cigarettes in common with regular cigarette counterparts, whereas the practice of e-cigarette tastes is utterly prohibited, and tobacco companies are precluded from making advertisements to help users quit smoking by turning to e-cigarette use, except when approved by suitable regulatory agencies. Subsequently, as of 2017, the Association of Pacific Rim Universities (APRU) Global Health Program officially

acknowledged the rising rates of e-cigarette use among student smokers. This act aimed to make public health professionals and policymakers more conscious of the adverse effects of e-cigarettes as a critical issue for adolescent smokers in certain regions. Moreover, they are intended to provide in-depth information that acts as an intervention for addressing this problem (Wipfli *et al.*, 2020).

In many European countries, minors with relatively low socioeconomic status are more likely to smoke e-cigarettes than those with higher socioeconomic status. On this basis, the enforcement of school policies by precluding students with diverse socioeconomic contexts from smoking e-cigarettes in school can be highly effective since they are inevitably subject to school settings. Additionally, smoking policies in many schools differ in line with their enforcement and implementation. However, the smoking habits and behaviors of students may be significantly related to their perception of the smoking policies of each academic institution in which they are studying. According to many studies, the chance of cigarette smoking among students is prone to decrease if they clearly know the anti-smoking rules and regulations strictly enforced by that school (Kuipers *et al.*, 2016). It was also revealed that e-cigarettes have been incrementally well-received among young and mature smokers in the EU, Canada, and the United States since e-cigarettes were granted international patents, thus making them legally available for sale in global markets in 2007 (Becker and Rice, 2022). Likewise, not only the EU, but also the United States and Canada comply with the approaches of the federal government responsible for regulating e-cigarettes. In this way, the EU, the US, and Canadian federal governments collaboratively determine policy frameworks, thus requiring all states and provinces to have autonomy in implementing extra rules and regulations against the use of e-cigarettes. In the meantime, not only the member states but also the European Parliament in the EU collaboratively take responsibility for selling, manufacturing, producing, distributing, and even promoting cigarette items that are strictly controlled both domestically and internationally. Nevertheless, all rules and regulations enforcing the use of e-cigarettes must be based on the guidelines and approaches required by the World Health Organization Framework Convention on Tobacco Control (FCTC). In addition, as of 2014, the European Parliament approved the EU so that it could take the Tobacco Products Directive (TPD) into effect. Consequently, it was not until May 2016 that the Tobacco Products Directive became effective in the EU member states. Canada became a member of the FCTC, which enabled the implementation of the Tobacco and Vaping Products Act (TVPA) as of May 2018. Consequently, all provinces, territories, and municipalities in Canada legitimately received regulatory frameworks, allowing them to take extra restrictions, impositions, and regulations on e-cigarettes before 2018 (Snell *et al.*, 2021).

## 5. The present

### 5.1. Health risks

Although e-cigarette particles are less dangerous than the components breathed during smoking, they adversely affect the physical health of users, especially the respiratory system. Heavy metals from batteries and coils heated by e-cigarette devices are responsible for making smokers vulnerable to toxins or carcinogens, which substantially harm their hearts and lungs, although the long-term effects of e-cigarette exposure are unpredictable. Respiratory irritants can also be ascribed to E-liquid bases such as propylene glycol (Becker and Rice, 2022).

The national epidemic of e-cigarettes or vaping product use-associated lung injury (EVALI) marked the first instance of a vaping-linked illness affecting a considerable number of individuals. Essentially, EVALI represents chemical injury from inhaled substances, likely resulting from the heating, aerosolization, and inhalation of Vitamin E found in THC liquids and vapor devices. Analysis of the respiratory passages and lungs revealed a pattern of epithelial and alveolar damage (Casey *et al.*, 2020). Radiographic detection in smoking teens exposed to EVALI includes centrilobular ground-glass nodules and opacities, with subpleural sparing. There is also an explanation for puffing-associated health risks. Exposure to e-cigarette liquids is also associated with seizures. Meanwhile, e-cigarettes negatively affect oral health, although they are less severe than normal cigarettes are. Similar to normal cigarettes, not only can smoking fumes of used e-cigarettes cause health risks, but it also contaminates indoor air quality, despite this secondhand e-cigarette causing less severity than its cigarette counterpart. It is highly possible that teenagers violated social distancing while COVID-19 was spreading (Becker

and Rice, 2022), thus exposing them to the virus, which is mediated via a neurobiologically determined valuation of risks, while smokers who share e-cigarette devices with other users without wearing masks made them increasingly exposed to the risks of spreading and illness suffered by family members when they return home.

## 6. Misconceptions about using e-cigarette

A range of misconceptions regarding e-cigarettes have been identified in the literature. First, it is commonly misunderstood that e-cigarettes are less harmful than traditional cigarettes are. For example, non-white respondents believed that puffing e-cigarettes was less dangerous than smoking normal cigarettes. This misconception is possibly attributed to the ability of e-cigarettes to avoid dangerous compounds, such as arsenic, which are normally abundant in normal cigarettes. In addition, this misperception may be derived from the variety of tastes and beautiful designs of e-cigarettes, making many smokers believe that they are relatively safe (Golan *et al.*, 2023). In addition, many vapers believe that positive moods can be enhanced by vaping. However, research has revealed that an array of mental health symptoms, especially anxiety, depression, and even thinking about suicide, are significantly related to e-cigarette smoking (Javed *et al.*, 2022).

## 7. Programs of treatment

Since evidence-based pharmaceutical treatments applied to teenagers addicted to e-cigarette puffing cannot be officially confirmed, behavioral strategies have become the first step in treating patients addicted to e-cigarette smoking. These strategies are considered efficient in ceasing e-cigarette addiction, and include individual and group consultations, interviews for building motivation, cognitive and behavioral therapy, emergency management, conscious intervention, and strategies based on websites and smartphones. In addition to behavioral strategies, patches, gums, and lozenges can be used as efficient substitutes for nicotine to treat teenagers with e-cigarette addiction when e-cigarettes contain high levels of nicotine. Anti-craving drugs such as bupropion and varenicline can also be used as efficient substitutes for nicotine. It was not until January 2020 that the new policy statement was released by the Society for Adolescence and Medicine in collaboration with a group of Adolescent Medicine Providers from India, Canada, and the United States, including the United Kingdom, who were responsible for recommending and guiding teenagers to learn how to protect themselves from the dangers of e-cigarette smoking, while being advocated by policies for regulating the sales of e-cigarette products to adolescent consumers. In the meantime, support for public health-based education campaigns and educational curricula adopted by school students, community programs, and health providers reminding the dangerous effects of e-cigarettes on health are applied to teens and early adults (AYAs). At the same time, the researchers responsible for developing the guidelines based on evidence to preclude the dangers of e-cigarette smoking, as well as to quit vaping behaviors, also contributed to AYAs. Concurrently, however, these health providers need to receive more training to screen for e-cigarette smoking integrated into regular health visits for AYAs, together with increasing consultation based on evidence, as well as resources responsible for ceasing e-cigarette smoking habits (Bhave and Chadi, 2021).

## 8. Laws that control the use of e-cigarette by teens

The laws that affect e-cigarette consumption play an important role in controlling and restricting the sales, taxation, and marketing of e-cigarettes, as well as access to teen consumers when e-cigarettes are considered to be different from traditional cigarettes. Unless extra rules for the use of e-cigarettes are applied in places where smoking is prohibited, people are encouraged to continue their e-cigarette smoking habits, rather than complete cessation. Additionally, unless similar smoke-free regulations are applied to e-cigarettes, imitation of e-cigarette smoking can be multiplied, which is antagonistic to efforts to reduce the use of e-cigarettes and interfere with attempts to control their use.

It is very difficult to identify what e-cigarettes are defined because of their different names, such as e-cigarettes, e-hookahs, vape-pens, hookah pens, and personal vaporizers, together with various types and brands of e-cigarettes

existing, while consumers can build e-cigarette devices modified by themselves. It was not until 2010 that e-cigarettes were disapproved in court to be accepted as medical devices if they were not marketed for medical objectives. Moreover, e-cigarettes could not be regulated as tobacco derivatives if the FDA was negligent to keep them protected by the Tobacco Control Act. Subsequently, in April 2014, the FDA proposed a rule for regulating e-cigarettes that is not different from tobacco items. However, in October 2014, this attempt remained outstanding, making e-cigarettes unfederally defined. Nonetheless, the sale and use of e-cigarettes have been regulated by the laws of states and local governments. Although e-cigarette standards are being controlled by the FDA, they are still controlled by the laws prescribed by the states and localities, as they are enabled by the Tobacco Control Act to legitimately obtain the use, sales, distribution, access, and marketing of e-cigarette products, unless they are not considered as such (Lempert *et al.*, 2016).

## 9. The Prospect

### 9.1. What is going on and what will be continuing in Thailand?

Since 2015, the sale and import of e-cigarettes has been prohibited in Thailand for eight consecutive years, with the aim of preventing teens from vaping addiction (Patanavanich *et al.*, 2021; Thepthien *et al.*, 2021). The continuous low ubiquity of e-cigarette uses by teenagers, as presented in this study, was possibly attributed to the outcomes of banning e-cigarettes, as the prevalence of e-cigarettes did not show a statistically significant difference from the use of e-cigarettes. One explanation for the frequent use of e-cigarettes in Thailand compared to other nations where e-cigarettes are prohibited was possibly put down to no conformity with the prohibition on tobacco, advertising, promotion, and sponsorship (TAPS) in Thailand, particularly through social networking sites as the most popular distribution channel, allowing the tobacco industry to access these target consumers (Patanavanich *et al.*, 2021). Another serious concern is the lack of knowledge about the adverse effects of e-cigarette use.

There is an apparent limitation to school-based anti-smoking education programs and schools devoid of smoking, with emphasis on information. However, based on existing literature, two main priorities have been emphasized in Thailand. The first priority is to prohibit minors entirely from initially smoking e-cigarettes and being addicted to vaping, whereas the second is to take stronger laws into effect and penalize perpetrators who violate the rules, particularly with regard to marketing e-cigarette products online (Patanavanich *et al.*, 2021). In parallel, schools should increasingly adopt effective anti-smoking programs to address e-cigarette problems, as well as to provide parents and the public with knowledge about the harmful effects of e-cigarette products as well as the risks suffered by non-smokers who are vulnerable to secondhand smoke from e-cigarette products (Thepthien *et al.*, 2021).

## 10. Regulatory Approaches for Curbing Adolescent E-Cigarette Usage in Thailand

In this paper, we propose an acronym for defining an approach to reducing adolescents' vaping behaviors. The acronym is ECIG, which stands for Establish an e-cigarette prohibition law for adolescents, Control retailers from selling e-cigarettes to people across all ages, Individuals' understanding of the negative effects of e-cigarettes, and Guardian's supervision.

### *E: Establish e-cigarette prohibition law for adolescents*

Despite existing regulations, it is important to address the use of e-cigarettes by teenagers. It is crucial to ensure that teenagers abstain from smoking e-cigarettes irrespective of their justification. Nonetheless, e-cigarette devices are popular among teenagers despite regulations being enforced. The sources of these breaches should be identified and addressed. One of the most effective strategies is to take laws into effect and penalize those who cannot abstain from e-cigarette smoking. Moreover, should minors be educated about compliance with the laws and the outcomes of non-conformity to the laws?

### *C: Control retailers from selling e-cigarette to people across all ages*

Although many countries have enforced legislation to curb e-cigarette puffing, retailers continue to distribute e-cigarette products sneakily, leading to conspiracy practices and illegal enterprises. Meanwhile, e-cigarette products are prevalent on online sites and e-commerce markets without conformity to legal status. Accordingly, it is necessary to adopt a resolute stance to protect teens, adults, and nonsmokers from exposure to potential damage to the lungs and secondhand smoke by reinforcing measures to curb these smoking activities.

#### *I: Individuals' understanding of the negative effects of e-cigarette*

In a world greatly influenced by social media, audiences find it easy to access abundant information on various topics, and this information can be absorbed by people very quickly, regardless of whether it is accurate. Consequently, the Internet has become overwhelmingly circulated with plentiful fake news, exposing most people to deception. Additionally, fake news is responsible for causing damage by getting audiences to form misconceptions regarding the advantages and disadvantages of e-cigarettes. Accordingly, fake news and false information must be eradicated because negligence in this act can lead naive teenagers to misunderstand and continue using e-cigarette products in a negative manner.

#### *G: Guardian's supervision*

To promote the safety of these teenagers, it is important that parents and guardians opt for parenting approaches that are engaged in having the acts of children closely supervised and overseen. Meanwhile, they must take responsibility for acknowledging the likelihood of e-cigarette use by their children, which poses significant damage to their physical condition. In parallel, these children must be educated about e-cigarette smoking and its potential adverse effects on their health.

## **11. Conclusion**

This study revealed the intricate challenges posed by the increasing use of e-cigarettes among Thai teenagers. The origins of e-cigarettes, the factors driving their popularity among users, and global regulations have been explored. The health risks associated with e-cigarettes are illuminated to dispel misconceptions and support informed decision making. To reverse this trend, urgent action must be implemented through stringent regulations and comprehensive education. Currently, Thailand is facing a crucial moment. Through collaborative efforts and public awareness, we can pave the way for positive societal change.

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