VOLUME 4

POLICY BRIEF SERIES

VAPING

Its implications in public health

Introduction

Vaping, or the use of electronic cigarettes, has emerged as a popular alternative to tobacco consumption. However, there are significant concerns about the long-term effects of vaping on health.

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In response to these concerns, Colombia has enacted a law that regulates and controls the use of electronic cigarettes and vapes. This law, which modifies and expands existing regulations and establishes specific restrictions seeking the welfare of minors, brings challenges and hurdles for its implementation.

The Texas Department of State Health Services, United States, defines Vaping as simulating the effect of smoking. Battery-operated vaporizers generate an aerosol that looks like water vapor, but contains nicotine, flavorings, and over 30 additional chemicals. The aerosol is inhaled and reaches the lungs, where the nicotine and chemicals enter the bloodstream.

The term 'vaping' is associated with the use of electronic cigarettes, which involves inhaling an aerosol created by heating a liquid that generally contains nicotine, flavorings, and additives such as glycerin and propylene glycol (1). Electronic cigarettes are a type of electronic nicotine delivery system that consists of a cartridge containing a liquid, an 'atomizer' (i.e., a vaporization chamber with a heating element), and a battery. The user activates the atomizer by heating the device when inhaling or pressing a button depending on the device's features. The heating of the liquid releases an aerosol that emulates, but is not tobacco smoke (1-4).

The components of an electronic cigarette include a resistor, a rechargeable battery cell, and a chamber that is a hollow container for a liquid solution. The solutions delivered through electronic cigarettes, called 'cartridges', are usually a mixture of nicotine, flavoring, glycerin, and propylene glycol, although some solutions do not contain nicotine.

There are several generations of chemical products for electronic cigarettes, which allow different levels of customization: first-generation products mimic the shape and size of cigarettes; second-generation products are larger than conventional cigarettes and are pen-shaped (medium size) or tank-shaped (large size), both with rechargeable batteries; third-generation products allow more custom changes, such as adjusting the resistance of the atomizer.

'Pod devices' are a type of electronic cigarette that has been gaining popularity among teenagers. These rechargeable devices have replaceable pods that contain nicotine and flavors and can deliver higher concentrations of nicotine (1-4).

Components of an electronic cigarette

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Nicotine: the nicotine content of electronic cigarettes and liquids varies and generally ranges from none (no nicotine) to 36 mg/mL, although it can be higher. Common concentrations of nicotine in electronic cigarette liquids are 6 mg/mL, 12 mg/mL, 18 mg/mL, or 24 mg/mL. Some electronic cigarette liquids contain nicotine salts, in which nicotine is combined with an acid. Propylene glycol/glycerol: propylene glycol or glycerol are humectants that are the main components of most electronic cigarette liquids; some products may use ethylene glycol.

Flavorings: Electronic cigarettes can have characteristic flavorings added. There are over 7000 flavors available, including candy, fruit, soda, and alcohol flavors. Flavorings can increase the appeal of electronic cigarettes for young people, especially those who do not yet smoke (1-4).

1. [Dinardo P, Rome ES. Vaping: The new wave of nicotine addiction. Cleve Clin J Med. 2019 Dec;86(12):789-798. doi: 10.3949/ccjm.86a.19118
2. Wang TW, Gentzke AS, Creamer MR, et al. Tobacco Product Use and Associated Factors Among Middle and High School Students-United States 2019. MMWR Surveillance Summary; CDC, 2019.
3. Centers for Disease Control and Prevention. Outbreak of lung injury associated with the use of e-cigarette, or vaping, products. Available at: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease
4. 4. Winnicka L, Shenoy MA. EVALI and the Pulmonary Toxicity of Electronic Cigarettes: A Review. J Gen Intern Med. 2020 Jul;35(7):2130-2135. doi: 10.1007/s11606-020-05813-2.

It has been found that some liquids and aerosols for electronic cigarettes contain metals such as tin, lead, nickel, chromium, manganese, and arsenic. Other detected compounds include tobacco-specific nitrosamines, metals, volatile organic compounds, and phenolic compounds. Vaping devices can also be used to aerosolize tetrahydrocannabinol (THC) or cannabinoid oils (CBD) (1-4).

The magnitude of the problem

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The National Health Interview Survey (NHIS), which provides nationally representative estimates of electronic cigarette use among adults in the United States, showed an overall increase in the prevalence of current electronic cigarette use among adults from 3.7% in 2014 to 4.9% in 2019, with a transient decrease in 2020 to 3.7 percent and a rebound in 2021 to 4.5%.

The prevalence of current use of electronic cigarettes is highest among young adults (18 to 24 years), having increased from 7.6% to 11% between 2018 and 2021. The prevalence of electronic cigarette use decreases as age increases (5,6). According to a study on vaping-associated disease in Colombia, between 2020 and 2022, 245 cases of diseases related to this practice were reported, with a total of 59 deaths in the evaluated period. It was observed that the highest incidence of vaping-related diseases occurred in adults, over 45 years old, mainly residing in the departments of Antioquia and Boyacá (7).

Health Risks of Vaping

Vaping presents several health risks, some of which have been documented in research and studies. Some of the health risks of vaping include:

Respiratory Effects: Vaping can cause irritation in the throat and lungs, as well as respiratory problems such as coughing, difficulty breathing, and exacerbation of pre-existing respiratory conditions.

Photo: Taken from Pixabay

5. [5Cornelius ME, Wang TW, Jamal A, et al. Tobacco Product Use Among Adults - United States, 2019. MMWR Morb Mortal Wkly Rep 2020; 69:1736.

6. Cornelius ME, Loretan CG, Jamal A, et al. Tobacco Product Use Among Adults - United States, 2021. MMWR Morb Mortal Wkly Rep 2023; 72:475.

7. Malagon-Rojas J, Toloza YG, Idrovo AJ, Niederbacher-Velazquez J. First data on the disease associated with vaping in Colombia. SciELO Preprints. 2023. Available from: https://doi.org/10.1590/SciELOPreprints.7197.

Lung Damage: The use of electronic cigarettes has been associated with acute lung injuries, such as the syndrome of lung injury associated with the use of electronic cigarettes (EVALI/VALI), which can result in serious hospitalizations and even death. Cardiovascular Effects: Some studies have suggested that vaping can affect cardiovascular function, increasing the risk of heart disease and strokes.

E**xposure to Toxic Substances:** The liquids used in electronic cigarettes may contain substances with carcinogenic potential. In addition to the health risks identified by the consumption of electronic cigarettes, there are public health risks, such as nicotine addiction or the development of a Nicotine Use Disorder. This highly addictive substance can make it difficult to quit the habit of vaping (8-10)."

Impact of Advertising on Vaping

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Electronic cigarette companies have used marketing tactics aimed at a young audience, such as colorful packaging, striking flavors, and promotions on social networks. These strategies make electronic cigarettes more attractive and accessible to teenagers and young adults. Initially, they were marketed as a safer alternative to traditional cigarettes, promoted as devices to quit smoking. Some aggressive advertising campaigns have minimized the potential health risks (8-10).

Regulation and Challenges of Vaping in Colombia

In Colombia, the approval of the law that regulates and controls the use of electronic cigarettes and vapes in the country took place on March 6, 2024. This law modifies and expands the 'anti-tobacco law' (law 335 of 2009).

The project has been approved in the Senate and the House of Representatives, and only the reconciliation of the texts and the signature of the president are missing.

8. Lyzwinski LN, Naslund JA, Miller CJ, Eisenberg MJ. Global youth vaping and respiratory health: epidemiology, interventions, and policies. NPJ Prim Care Respir Med. 2022 Apr 11;32(1):14. doi: 10.1038/s41533-022-00277-9.
9. Besaratinia A, Tommasi S. Vaping epidemic: challenges and opportunities. Cancer Causes Control. 2020 Jul;31(7):663-667. doi: 10.1007/s10552-020-01307-y.
10. Wasfi RA, Bang F, de Groh M, Champagne A, Han A, Lang JJ, McFaull SR, Melvin A, Pipe AL, Saxena S, Thompson W, Warner E, Prince SA. Chronic health effects associated with electronic cigarette use: A systematic review. Front Public Health. 2022 Oct 6;10:959622.

Among the new provisions are specific restrictions for the use of vapes, such as the prohibition of sale to minors, the obligation to have a warning label, the regulation of content about electronic cigarettes in the media, and the restriction of advertising on billboards and similar and other similar media.

This Standard adds to the regulations of others that have implemented regulations on electronic cigarettes and vapes, 21 countries in the Americas regulate in some way the electronic systems of nicotine administration. Eight of them (Argentina, Brazil, Mexico, Nicaragua, Panama, Suriname, Uruguay, and Venezuela) prohibit their sale, and the other 13 have partially or fully adopted one or more regulatory measures, although without a common approach. In Asia, countries like Bhutan, India, Malaysia, Nepal, and Turkey have implemented regulations. In Europe, many countries apply their general tobacco legislation to these products (11-12).

As an institution, we highlight the importance of this new regulation, which seeks to protect especially minors and future generations from the deleterious effects of electronic cigarettes, vapes, and other tobacco-derived products, as well as to reduce the impact on public health. However, the important task of educating the population about the possible dangers associated with the use of these devices and disseminating information to society about the current regulations seeking their strict compliance remains pending.

Recommendations

To address the problem of vaping and its health risks, it is essential to implement comprehensive strategies at the individual, community, and public policy levels. Some effective measures to address the problem of vaping include:

- **Education and Awareness:** It is crucial to provide accurate and evidence-based information about the risks of vaping to the general population, especially young people. Awareness campaigns in schools, communities, and media can help inform about the dangers of vaping.

- A**ccess Restrictions:** Implementing access restrictions to vaping products, especially for minors, can help reduce the initiation of vaping in vulnerable populations. This includes strictly complying with regulations on the sale and advertising of vaping products.

- **Support for Quitting Smoking:** Providing resources and support programs to help people quit smoking electronic cigarettes and other tobacco products. This may include helplines, individualized counseling, and nicotine replacement therapies.

11. Statista. (2024, 4 de abril). ¿Qué países prohíben los cigarrillos electrónicos?. [Gráfico]. Statista. https://es.statista.com/grafico/19484/paises-que-prohiben-el-cigarrillo-electronico/
12. Organización Panamericana de la Salud. (2024, 12 de marzo). Ocho países de las Américas prohíben los cigarrillos electrónicos. [Internet]. Disponible en: https://www.paho.org/es/noticias/25-8-2023-ocho-paises-americas-prohiben-cigarrillos-electronicos

Ongoing Research: It is essential to continue researching the long-term effects of vaping on health to better understand the associated risks and develop more effective prevention and treatment strategies.

P**roduct Regulation:** Implement stricter regulations on the manufacturing, marketing, and labeling of vaping products to ensure consumer safety and reduce exposure to harmful substances.

Intersectoral Collaboration: Encourage collaboration between different sectors, including government, industry, health professionals, and community organizations, to comprehensively address the problem of vaping and protect public health**.**

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