E-Cigarettes: Landscape, Health Impacts, Regulations, and Recommendations

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Background

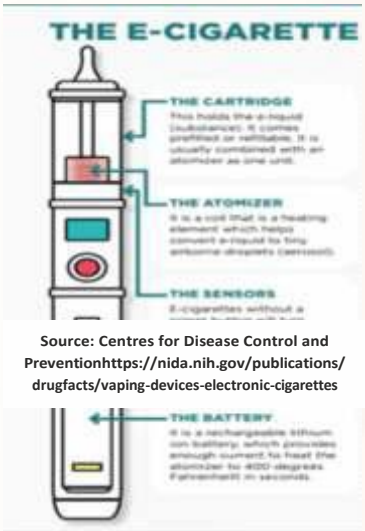
This chapter presents a comprehensive overview of e-cigarettes, with a particular focus on the urgent need to address the rising use of e-cigarettes among youth in India. It delves into the various factors that influence the accessibility and affordability of these devices, highlighting the challenges that persist despite regulation. The section on the health impacts of e-cigarettes discusses several critical concerns, including nicotine addiction, respiratory and cardiovascular health issues, and mental health implications. The chapter recommendations include building enforcement capacity, forming district- level committees in collaboration with civil society organizations, and enhancing coordination among various government ministries. The recommended measures emphasize the need to address online violations, conduct raids, track illegal smuggling, and promote tobacco cessation programs. It also calls for stricter enforcement of restrictions on marketing that targets youth.

Introduction Definition ofe-cigarettes anditsproducts

National Cancer Institute, USA defines e-cigarettes as“a device that has the shape of a cigarette, cigar, or pen and does not contain tobacco. It uses a battery and contains a solution of nicotine, flavourings, and other chemicals, some of which may be harmful.” (1). Broadly, ENDS (Electronic Nicotine Delivery System) and Electronic Non-Nicotine Delivery System (ENNDS) are vaping devices that heat a liquid to produce vapor/aerosol that is inhaled by the user. They are known by various other names such as “electronic cigarettes”, “vapes”, “vape-pens”, “Pod Mods” and come in many shapes, sizes, and device types. The basic design of e-cigarettes consists of the following three components: (1) a part that holds a liquid solution (e-liquid or e-juice) typically a mixture of propylene glycol and glycerol with nicotine and flavouring chemicals; (2) a power source, usually a battery; (3) the heating element (atomizer) (2). E-cigarette devices can be designed in several ways. They exist either as a single device or as a multiple-component product (3), They can be disposable, rechargeable and/or refillable.

The evolution of E-cigarettes or vaping, products (4):

Electronic nicotine delivery systems (ENDS), commonly known as E-cigarettes, were invented back in 2003 and formally introduced and brought to market in 2007 (5). Nearly a decade after the invention, 466 brands encompassing nearly eight thousand flavours exist in the markets (6). It was around 2009- 2010, when ENDS began gaining popularity in the Indian markets, youth in particular (7). A premier tobacco company in India launched and marketed its e-cigarette brand in 2014, with a hot marketing strategy: ‘pleasure of smoking anytime anywhere’ (8). The evolution of e-cigarettes or vaping products has progressed through several generations:



Source: Centres for Disease Control and Preventionhttps://nida.nih.gov/publications/drugfacts/vaping-devices-electronic-cigarettes

First generation: Introduced around 2007, disposable e-cigarettes, also known as "cigalikes," replicated the appearance and sensation of traditional cigarettes. These first-generation devices were intended for single use and were neither rechargeable nor refillable. They aimed to closely mimic the smoking experience and served as substitutes for cigarettes, appealing to individuals attempting to quit smoking or seeking alternatives. This type of e-cigarette is activated by a power button that must be held during use or by drawing breath through the device which triggers an electronic airflow sensor in the battery section. This type was first disposable, once the battery was discharged. First-generation e-cigarettes, often resembling combustible tobacco cigarettes, are also referred to as cigalikes or "vape sticks." Some cigalikes are slightly longer or narrower than traditional cigarettes, known as "pen style “, devices.

Second generation: During this phase, rechargeable e-cigarettes with prefilled or refillable cartridges became prominent. These cartridges housed e-liquids containing nicotine, flavourings, or other additives and were connected to rechargeable battery pens (9). This phase also introduced variations such as e-hookahs and rechargeable versions. Typically, the cartridge and battery pen were sold separately, often in starter packs. Second-generation e-cigarettes featured a clearomizer—a transparent cartridge containing e-liquid and an atomizer—paired with a slim battery. These devices were often shaped like pens, larger and cylindrical compared to their predecessors, and known as "tank systems" due to their transparent reservoirs capable of holding larger e-liquid volumes.

Third generation: Third-generation devices, often advertised as "vaping" products, represent a significant departure from combustible tobacco cigarettes. They bear little resemblance to cigarettes aesthetically, with many being square or rectangular and featuring customizable and rebuildable atomizers and large-capacity lithium batteries. Additionally, users have been modifying or building their own devices, known as "mods," since the availability of e-cigarettes. These differences in design and engineering impact the size, distribution, and amount of aerosol particles produced. Variability in levels of chemicals and nicotine in the e-liquid/aerosol determines the composition of the aerosol delivered to the user (10). Tanks or mods became popular, offering users customizable options. These devices were rechargeable Source: Centres for Disease Control and Preventionhttps://nida.nih.gov/ publications/drugfacts/ vaping-devices-electronic- and designed for multiple uses. Sub-ohm tanks, featuring low-resistance coils, were developed to produce larger aerosol clouds and deliver nicotine or other substances more effectively.

Source:CentresforDiseaseControland Preventionhttps://nida.nih.gov/publications/drugfacts/vaping-devices-electronic-

Fourth generation: Fourth-generation e-cigarette devices, the latest iteration, are essentially third-generation devices with added temperature control functionality. Users can set a temperature limit, ensuring stable vaporization temperature even with longer and more frequent puffs. This feature helps reduce the risk of dry and burnt hits (11). These devices offer the versatility to vape alternative products such as plant materials and drug-containing waxes. Some models allow for e-liquid to be dripped directly onto the heating coil, enhancing vapor strength and taste. These vaporizers feature customizable options, including different types of heating coils, some specifically for vaporizing solids. Pod mods, like JUUL and Suorin, entered the market with prefilled or refillable pods and adjustable systems. Utilizing nicotine salts for smoother inhalation, these devices are shaped like USBs and contain pods with higher nicotine concentrations, catering to users seeking stronger hits (12).

Vaporizers: An inhalation device used to release the active substances of organic or inorganic materials as an aerosol through the application of non-combusting heat. Vaporizers can be used to aerosolize dry herbs, wax, or oil, releasing their active ingredients for inhalation. They were versatile tools used for various materials, including marijuana, to deliver aerosols without combustion.

Market growth and trends

According to the latest analysis, the global E-Cigarette market is valued at USD 20.61 billion (approx. INR 1,690.02 billion.) in 2023. It is anticipated to experience an annual growth rate of 3.06% (CAGR 2024-2028) on a global scale, generate a revenue of USD 26.0 billion (approx. INR 2,132 billion) in 2024, and projected to reach a market size of USD 46.98 billion (approx. INR 3,852.36 billion) by the end of 2030. The market is largely fragmented, with smaller, non-tobacco companies dominating it.

Most popular brands worldwide are BAT's Vuse, JUUL Labs' JUUL, RELX, Elfbar, blu, Logic, and NJOY. Most popular brands in India are: JUUL, iGet, Elfbar, DYB, IQOS, and Dinner Lady (13).

E-cigarettes and their impact on Health: Nicotine addiction and its consequences

Addiction is compulsive drug use at the cost of health consequences. Tobacco users consume tobacco regularly because of nicotine addiction. Only a small percentage of tobacco users quit unassisted. The use of medicines including Bupropion, Varenicline, and nicotine-replacement therapy (NRT) along with counselling doubled the quit rate. A brief euphoria (enhanced alertness and an ability to concentrate with improved recall) due to endorphins is there when nicotine is taken. For most tobacco users, the brain changes due to nicotine exposure result in addiction which on abstinence precipitates withdrawal symptoms. After quitting, withdrawal symptoms in the majority last from one to four weeks, but in a few cases, it may last for months (14).

Respiratory health implications:

The harmful chemicals when using E-Cigarettes include some flavours and nicotine or THC (the chemical in marijuana), causing an inflammatory response. Vitamin E is frequently used as a thickening agent in e-liquids. It is safe when used on the skin or taken orally but is an irritant when inhaled. Also, chemicals like Diacetyl, a food additive, used to deepen e-cigarette flavours damage bronchioles in the lungs. Acrolein, used as a weedicide can also damage lungs.

Popcorn Lung resulting from e-cigarettes is bronchiolitis obliterans which results from damage to the bronchioles. Diacetyl, a food additive (present in e-cigarette) used to simulate butter flavour, causes inflammation and permanent scarring in the bronchioles and makes breathing difficult. Further, individuals who inhale oily substances present in e-liquid, suffer from E-cigarette-related Lipoid Pneumonia leading to inflammation in the lungs. Lungs may collapse with spontaneous Pneumothorax with E-Cigarette use when there's a hole in the lung through which oxygen escapes. E-cigarette use may be associated with an increased risk of bursting of air blisters leading to lung collapse.

E-cigarettes may be tumour promoters and cause lung cancer due to the many chemicals inhaled. Ultrafine particles due to E-Cigarette use deposited deep in the bronchial tree can lead to the development of cancer. Second-hand smoke from e-cigarettes is known to contain ultrafine particles, Nicotine, Diacetyl, and Benzene (15). However, since these products have been in the market for a short time, not many long-term studies are available.

Cardiovascular health implications:

The studies on the effect of smoking e-cigarettes on myocardial infarction in subjects who never smoked conventional cigarettes reported oxidative stress, endothelial dysfunction, platelet activation, and inflammation (16). The available literature shows that the use of e-cigarettes is associated with an increased risk of cardiovascular diseases (17). It has also been observed that smokers are likely to become dual users with e-cigarette use (18). It is also evident that e-cigarettes also lead to an increase in heart rate, arrhythmias, and increased blood pressure and formaldehyde, a toxic chemical that can lead to heart diseases.

The vascular changes due to e-cigarette use include inflammation, oxidative stress, endothelial dysfunction, vascular injury, platelet aggregation, and atherosclerosis (19).

Mental health and other health issues:

Nicotine from tobacco or e-cigarettes leads to other addictions in later life. E-cigarettes are used by

teens mostly who have symptoms of depression, but the use may worsen the symptoms (20). Moreover, it can lead to decreased judgment, and problems in concentrating and nicotine dependence, which is associated with increased anxiety, restlessness, and irritability. The use of e-cigarettes leads to mood swings, insomnia, depression, and suicidal tendencies (21). A higher level of alcohol dependence, and loneliness was also reported amongst users (22).

E-cigarette use during pregnancy:

E-cigarette liquids also contain flavours, chemicals, and other additives that are not safe for the foetus given the damage to the developing brain. It can also lead to premature births, low birth weight, and systemic inflammation (23). Exposure to e-cigarette aerosol has been associated with the increased expression of inflammatory cytokines in both in vitro and in vivo studies which causes high levels of serum high-sensitivity C-reactive protein and increased expression of inflammatory cytokines that may lead to cardiovascular disease, respiratory diseases, and several cancers similar to conventional cigarette smoking (24, 25).

E-cigarettes can lead to injuries:

Explosions have happened in defective e-cigarette batteries when being charged, leading to fires and serious burn injuries (26). Additionally, due to Nicotine toxicity, children have been poisoned by swallowing, breathing, or even absorption through skin or eyes (27).

Electronic cigarette uses and perception during COVID-19

It has been observed during COVID-19 that those who use E Cigarettes may be at higher risk for worsening symptoms injury to the lungs and other health effects as mentioned above (28). The Center for Disease Control (CDC) in 2019 started an investigation of increased lung injuries with symptoms of breathlessness, cough, and chest pain and hospitalization during COVID-19, mostly using e-cigarettes. By February 2020 about 2800 hospitalizations were recorded and the condition came to be known as EVALI (e-cigarette product use associated with lung injury) (29).

Association of E-Cigarette Use and Metabolic Syndrome:

E-cigarette use or dual use of e-cigarettes and tobacco cigarettes leads to Metabolic Syndrome, which is associated with increased blood sugar levels, high blood pressure, elevated triglycerides, and reduced HDL-cholesterol (good quality cholesterol) (30).

Access and availability

Electronic cigarettes are marketed as innovative, colorful, and portable technological gadgets, while other products are designed to even look like everyday school supplies such as highlighters and USB drives. Technophilia, or a positive orientation towards new technology - especially among youth - has been cited as a factor of young people's attraction and curiosity towards electronic cigarettes. Marketers emphasize that these products may be used in public areas where smoking cigarettes is prohibited. These products are also shown to improve sociability and as a marker of glamourous lifestyles. Another marketing strategy is to offer price promotions to consumers making electronic cigarettes affordable and accessible to young people which may undermine taxation policies.

Findings of the study (2023) reported electronic cigarettes were obtained by young adults primarily through their network, specifically peers (57%) or siblings (17%) and from retail electronic cigarette shops (46%) and tobacconists (32%). The social context of electronic cigarette use occurred at parties (46%), at home (36%), at restaurants and cafes (33%) and even workplaces (30%). Underage users

often borrow or access devices from friends or older siblings who can legally buy the products (31, 32).

Tobacco Enforcement and Reporting Movement (TERM), an online AI-driven tool that monitors marketing instances on social media and digital news platforms, reported electronic cigarettes being sold online to youth by third-party retail shops. Customers order these

Image 1. Customers can purchase electronic cigarettes via private messaging apps like WhatsApp. This is a screenshot of a WhatsApp conversation between a customer and seller. This positive feedback was shared by the seller on his Instagram account.

Image source: vape_india_smoke

products by sending personal messages to a WhatsApp number or through the Facebook messenger application (Image 1). Despite the ban, adolescents and young adults can buy these products from e-commerce platforms, online stores, and through social media applications (33, 34).

A population-based representative household survey of electronic cigarette awareness showed that adolescents (12-14 years of age) in Mumbai (16%) and Kolkata (11%) had higher awareness than their caregivers (35). In 2015, a study on online sales of ENDS revealed that 69% of the 65 ENDS models sold in India were flavoured, and non-compliant with Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 (COTPA, 2003), luring the youth to experiment and ultimately leading to nicotine addiction (36). At that time, due to the absence of any clear regulations, online shopping portals and social media sites were selling and advertising the ENDS in the Indian markets. It became evident that the majority belonged to a younger age group, and were tobacco smokers and online buyers.

E-cigarette and Regulations The Ministry of Health and Family Welfare (MoHFW), on 8th August 2018, issued an advisory to ban the "sale (including online sales), manufacture, distribution, trade, import, export and advertisements of ENDS" (37), followed by an Ordinance in September 2019 (38), and the Prohibition of Electronic

Cigarettes (Production, Manufacture, Import, Export, Transport, Sale, Distribution, Storage and Advertisement) Act, 2019 (No. 42 of 2019), on 2nd December 2019 which eventually came into force on 5th December 2019 (39), also known as PECA (40). It was designed to protect people, especially adolescents and young adults from the health harms of electronic cigarette use. The advertising in traditional mass media (cinema, radio, tv, billboards) and on the internet of electronic cigarettes is also banned.

A multi-centric study conducted immediately after the ban in India found that 35.6% of internet electronic cigarette vendors (IEVs) were not compliant with the Ordinance and the Act (41). A similar study conducted to assess the e-cigarette retailer storefronts availability in India revealed that despite being aware (90%) of the Ordinance, ENDS were sold by 18.6% of the retailers (42).

Despite the ban, regulating e-cigarette use in India remains challenging due to a persistent black market, undermining tobacco control efforts. Comprehensive tobacco control policies, youth and parent education, strict marketing regulations, and enhanced enforcement are crucial. While PECA 2019 is a milestone, further amendments to penalize e-cigarette use are needed to effectively curb its usage nationwide.

Conclusion:

E-cigarettes represent a complex issue with associated significant health risks. E-cigarettes have been marketed as alternatives to traditional tobacco products, their use poses significant health risks including nicotine addiction, respiratory and cardiovascular issues, and adverse effects on mental health and pregnancy. The global market for e-cigarettes continues to expand, raising concerns about their efficacy in smoking cessation and associated harmful health outcomes. Their appeal, particularly to youth, and the potential for long-term health effects presents significant challenges.

To effectively combat these issues, a multi-faceted approach is necessary. Strengthening enforcement mechanisms, enhancing the capacity of relevant agencies, and improving coordination among stakeholders are crucial steps. Comprehensive public health strategies, including education and community engagement, are vital for preventing e-cigarette use, particularly among youth. Youth leadership and public-private partnerships can further bolster these efforts by promoting awareness and advocating for stricter regulations. A collaborative approach involving government agencies, health professionals, educators, and community organizations is essential to ensure the effective implementation of PECA and safeguard public health from the risks associated with e-cigarettes.

References

1. Cancer NI of. Electronic cigarette [Internet]. 2024 [cited 2024 Sep 24]. Available from: https://www.cancer.gov/publications/dictionaries/cancer-terms/def/electronic-cigarette
2. Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), "Final Opinion on Additives tobacco products." p.131, 2016, [Online].
   https://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_051.pdf.
3. CHEMICAL AND TOXICOLOGICAL ASSESSMENT OF E-CIGARETTE LIQUIDS SOPHIA BARHDADI 2019-2020
4. E-CIGARETTE, ORVAPING, PRODUCTSVISUAL DICTIONARY, Centres for Disease Control and Prevention
5. Jin, P., & Jiang, J. Y. (2017). E-cigarettes in ten Southeast Asian countries: a comparison of national regulations. Global Health Journal, 1(3), 1-10.
6. Zhu SH, Sun JY, Bonnevie E, et al. Four hundred and sixty brands of e-cigarettes and counting: implications for product regulation. Tob Control. 2014;23(suppl 3):1113.
7. Yadav A, Yadav N. Ban on electronic nicotine delivery systems in India: A review. 2020;6:26. Available from: http://rsrr.in/wp-content/uploads/2020/07/BAN-ON- ELECTRONIC-NICOTINE-DELIVERY.pdf
8. M. Rao, Should e-cigarettes be banned in India? Experts are divided, Scroll.in (11/06/2020), available at https://scroll.in/pulse/810375/can-e-cigarettes-subvert- tobacco-control-measures-in-the-country
9. J. C. Chen, B. Das, E. L. Mead, and D. L. G. Borzekowski, "Flavored E-cigarette Use and Cigarette Smoking Susceptibility among Youth," Tobacco regulatory science, vol. 3, no. 1, pp. 68–80, Jan. 2017.
10. Brown CJ, Cheng JM. Electronic cigarettes: Product characterisation and design considerations. Tobacco Control. 2014;23(Supplement 2):ii4–ii10.; http: //tobaccocontrol.bmj.com/ content/23/suppl_2/ii4.
11. A. Khlystov and V. Samburova, "Flavoring Compounds Dominate Toxic Aldehyde Production during," Environmental Science & Technology, vol. 50, no. 23, pp. 13080–13085, 2016.
12. The Evolution and Impact of Electronic Cigarettes, National institute oif Justice, 2020, https://nij.ojp.gov/topics/articles/evolution-and-impact-electronic- cigarettes#:~:text= Electronic%20cigarettes%2C%20first%20introduced%20in,a%20r ange%20of%20illicit%20drugs.
13. House of vapes [Internet]. [cited 2024 Sep 24]. Available from: https://www.houseofvapes.in/

14. NIDA. 2021, April 12. Is nicotine addictive? Retrieved from https://nida.nih.gov/ publications/research-reports/tobacco-nicotine-e- cigarettes/nicotine-addictive on 2024, February 21
15. Broderick SR. What Does Vaping Do to Your Lungs? [Internet]. 2024 [cited 2024 Sep 24]. Available from: https://www.hopkinsmedicine.org/health/wellness-and- prevention/what-does-vaping-do-to-your-lungs
16. Alzahrani T. Electronic Cigarette Use and Myocardial Infarction. Cureus. 2023 Nov;15(11):e48402.
17. Wang, J. B., Olgin, J. E., Nah, G., Vittinghoff, E., Cataldo, J. K., Pletcher, M. J., & Marcus, G. M. (2018). Cigarette and e-cigarette dual use and risk of cardiopulmonary symptoms in the Health eHeart Study. PloS one, 13(7), e0198681.
18. Kim, C. Y., Paek, Y. J., Seo, H. G., Cheong, Y. S., Lee, C. M., Park, S. M., ... & Lee, K. (2020). Dual use of electronic and conventional cigarettes is associated with higher cardiovascular risk factors in Korean men. Scientific reports, 10(1), 5612.
19. Bianco E, Skipalskyi A, Goma F, Odeh H, Hasegawa K, Zawawi M Al, et al. E- Cigarettes: A New Threat to Cardiovascular Health – AWorld Heart Federation Policy Brief. 2021.
20. E-Cigarettes and Vaping [Internet]. 2023 [cited 2024 Sep 24]. Available from: https://www.psychiatry.org/patients-families/e-cigarettes-vaping#:~:text=And using e- cigarettes is,greater likelihood of experiencing depression
21. Javed S, Usmani S, Sarfraz Z, Sarfraz A, Hanif A, Firoz A, Baig R, Sharath M, Walia N, Chérrez-Ojeda I, Ahmed S. A Scoping Review of Vaping, E-Cigarettes and Mental Health Impact: Depression and Suicidality. J Community Hosp Intern Med Perspect. 2022 May 2;12(3):33-39. doi: 10.55729/2000-9666.1053. PMID: 35711397; PMCID: PMC9195082
22. Evans SL, Alkan E. Personality Risk Factors for Vape Use amongst Young Adults and Its Consequences for Sleep and Mental Health. Vol. 12, Healthcare. 2024.
23. Vilcassim MJR, Stowe S, Majumder R, Subramaniam A, Sinkey RG. Electronic Cigarette Use during Pregnancy: Is It Harmful? Toxics. 2023 Mar 18;11(3):278. doi: 10.3390/toxics11030278. PMID: 36977043; PMCID: PMC10058591
24. Moon, J., Lee, H., Kong, M., Kim, H., & Oh, Y. (2020). Association between electronic cigarette use and levels of high-sensitivity C-reactive protein and uric acid. Asia Pacific Journal of Public Health, 32(1), 35-41.
25. Wang, H., Chen, H., Fu, Y., Liu, M., Zhang, J., Han, S., ... & Hu, Q. (2022). Effects of smoking on inflammatory-related cytokine levels in human serum. Molecules, 27(12), 3715.
26. Seitz, C. M., & Kabir, Z. (2018). Burn injuries caused by e-cigarette explosions: A systematic review of published cases. Tobacco prevention & cessation, 4
27. Centres for Disease Control and Prevention. About E-Cigarettes (Vapes) [Internet]. [cited 2024 Sep 24]. Available from: https://www.cdc.gov/tobacco/e- cigarettes/about.html? CDC_AAref_Val=https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html
28. Merz W, Magraner J, Gunge D, Advani I, Crotty Alexander LE, Oren E. Electronic cigarette use and perceptions during COVID-19. Respir Med. 2022 Aug- Sep;200:106925. doi: 10.1016/j.rmed.2022.106925. Epub 2022 Jul 2. PMID: 35797927; PMCID: PMC9250168.
29. E-cigarette, or Vaping Product, Use Associated Lung Injury (EVALI) [Internet]. [cited 2024 Sep 24].Available from: https://www.yalemedicine.org/conditions/evali#:~:text=Sheets %3E Yale Medicine- ,E-cigarette%2C or E Cigarette use Product%2C Use Associated Lung Injury,Treatments include steroids and antibiotics
30. Cai J, Bidulescu A. Associations between e-cigarette use or dual use of e-cigarette and combustible cigarette and metabolic syndrome: results from the National Health and Nutrition Examination Survey (NHANES). Ann Epidemiol [Internet]. 2023;85:93-99.e2. Available from: https://www.sciencedirect.com/science/ article/pii/S1047279723000947
31. Graham-DeMello A, Hoek J, Drew J. How do underage youth access e-cigarettes in settings with minimum age sales restriction laws? A scoping review. BMC Public Health. 2023;23(1):1809.
32. Pettigrew S, Alvin Santos J, Miller M, Sudhir Raj T, Jun M, Morelli G, et al. E- cigarettes: A continuing public health challenge in India despite comprehensive bans. Prev Med Rep. 2023;31:102108
33. Amalia B, Kapoor S, Sharma R, Fu M, Fernandez E, Rana JS. Online sales compliance with the electronic cigarettes ban in India: a content analysis. Int J Public Health. 2020;65(8):1497-505.
34. Times E. Despite ban, e-cigarettes widely available at tobacco shops, sold without age verification: Survey . Economic Times. 2022 April.

35. Gupta PC, Pednekar MS, Narake S, Puntambekar N, Mc Carthy WJ, Mistry R. Awareness and Use of e-cigarettes among Adolescents and Their Adult Caregivers in Two Cities of India. Asian Pac J Cancer Prev. 2023;24(7):2195-7.

36. Mohanty VR, Chahar P, Balappanavar AY, Yadav V. Electronic Nicotine Delivery Systems (ENDS): Mapping the Indian Online Retail Market. Nicotine Tob Res. 2017;19(11):1386-1389.

37. Sharma P (2019) All you need to know about India's e-cigarette ban. In: Week. https://www.theweek.in/news/india/2019/09/18/allyou-need-to-know-about-indias-e- cigarette-ban.html.

38. Ministry of Law and Justice (2019) The prohibition of electronic cigarettes (production, manufacture, import, export, transport, sale, distribution, storage and advertisement) ordinance, 2019. New Delhi

39. Press Trust of India (2019a) E- cigarettes set to be banned in India as Parliament passes bill. https://www.indiatoday.in/india/story/ecigarettes-set-to-be-banned-in-india-as- parliament-passes-bill-1624496-2019-12-02.

40. Prohibition of Electronic Cigarettes (Production, Manufacture, Import, Export, Transport, Sale, Distribution, Storage and Advertisement) Act, 2019 (42 of 2019), (2019)

41. Amalia, B., Kapoor, S., Sharma, R., Fu, M., Fernández, E., & Rana, J. S. (2020). Online sales compliance with the electronic cigarettes ban in India: a content analysis. International Journal of Public Health, 65, 1497-1505.

42. Amalia, B., Kapoor, S., Sharma, R., & Singh, R. J. (2020). E-cigarette retailer storefront availability following a nationwide prohibition of e-cigarettes in India: A multicentric compliance assessment. Tobacco Prevention & Cessation, 6.

RECOMMENDATIONS

5.2 E-Cigarette

5.2.1. At the Government level:

5.2.1.1 Ministry of Health and Family Welfare (MoHFW)

a) Need to build the capacity of law enforcers, the Department of Education, Directors/officials of the Directorate of Revenue Intelligence (DRI), and the police department, to enforce the restriction on ENDS products at the central and state level or additional officers may be notified for effective enforcement of provisions under PECA-2019.

b) Formation of district-level committees including CSOs to monitor the availability of ENDS products and take action through existing legal mechanisms.

c) Establish a mechanism for: (i) coordination and collaboration between all the stakeholders (inclusive of all concerned ministries); and (ii) planning quarterly update meetings with Ministry of Electronics and Information Technology, Directors of all Directorate of Revenue Intelligence (DRI) units, Chief Secretaries(State) Director Generals of Police (State), Department of Education (State), and other relevant ministries/departments(Central and State) on strictest enforcement of PECA-2019 including appropriate reporting mechanism for all stakeholders.

d) Collect information/data on E-Cigarettes/ENDS as part of regular national/sub-national tobacco surveillance to strictly monitor regulations and actions on sale and advertising, promotion of ENDS products on the internet, online stores, and home deliveries aligned to PECA 2019.

e) Do not allow projects/grants promoting "harm reduction or reduced harm"(1).

f) Need to enhance the scope of the prevailing policies in line with the WHO FCTC Article 5.3 [state protocols and the MOHFW Code of Conduct to prevent tobacco industry interference] to include the E-Cigarettes/ENDS industry.

5.2.1.2. Ministry of Electronics and Information Technology

a) Identify, remove/block and take strict action against violations regarding the sale, advertisement, and web presence of E-cigarettes/ENDS. All commercial webpages (.com, .biz, and others as notified) be barred by MOIC/ DEITY and generate regular reports of monitoring.

5.2.1.3. Ministry of Home Affairs -

a) Authorized enforcement agencies should conduct raids on kiosks particularly those near schools, in order to seize the illegal e-cigarettes.

b) Frame appropriate guidelines elucidating the process for the prompt, complete, and irretrievable disposal of stock of electronic cigarettes seized by authorized officers in coordination with the Central/State Pollution Control Boards.

5.2.1.4. Directorates of Revenue Intelligence (DRIs) -

a) Mechanism to provide regular update to DRIs in every state and UT to investigate the illegal smuggling of banned E-Cigarettes/ENDS and take appropriate measures under PECA-2019

5.2.1.5. Health Care Professionals (HCPs), Media and CSOs -

a) HCPs should be trained and sensitised to the needs of Indian smokers in order to encourage and implement tobacco cessation.

b) Encourage reporting of violations of sale or misleading media stories at the State- & local- levels and provide a thrust to policymakers, and enforcement officers to take legal action against violators.

5.2.2. Public-private partnerships for awareness campaigns at Educational Institution and Community Level:

a) Campaigns and initiatives to create and improve awareness at the school (including integration into the School Health Program), college/university, and community level regarding the harms of ENDS products and laws about their restriction.

b) Teachers and parents to be engaged in awareness about the adverse impact of nicotine on adolescents' brains and other attributable health effects of e-cigarette use.

c) Mass - Sustainable media campaigns to disseminate information on the harms of ENDS products and burst myths associated with them.

d) TOFEI guidelines to be expanded on awareness on ENDS, develop/update teacher training manual for the school health programmes on ENDS

e) Stricter enforcement of the prohibition on ENDS products, especially in restaurants, pubs, and bars.

f) Electronic cigarette companies may also be prohibited from using flavors, designs, or labels that appeal to youth.

5.2.3. Need for school and community engagement:

a) Engaging adolescents and youth at school and in the community is crucial to combating the rise in e-cigarette use. School-based education programs (including the School Health Program under Ayushman Bharat) provide vital information about the risks while involving parents through workshops help them identify and prevent e-cigarette use.

b) Collaboration with community organizations, healthcare providers, and local businesses creates a supportive environment, and empowering youth to promote within their peer groups leverages peer influence for positive change and fosters a culture of prevention. By combining these approaches, school, and community engagement initiatives can work synergistically to address the complex challenges posed by youth e-cigarette use.

c) In India, fostering youth leadership to address the challenges posed by e-cigarette usage requires a multifaceted approach. Firstly, empowering youth through peer education initiatives is essential. By training young leaders to educate their peers about the risks associated with e-cigarette use, we can leverage peer influence to promote healthier choices and discourage experimentation with these products.

d) Equipping young individuals with media literacy skills is crucial in navigating the pervasive influence of e-cigarette marketing. By teaching youth to evaluate advertisements and media messages surrounding e-cigarettes critically, and empowering them to make informed decisions and resist societal pressures to use these products.

e) Engaging youth in policy discussions is crucial for effective e-cigarette regulation, ensuring that measures reflect their needs and concerns. Ultimately, by investing in youth leadership and engagement, we can create a more inclusive and impactful approach to tackling the e-cigarette epidemic in India. Example: Tobacco-related content on social networking sites: evidence from a youth-led campaign in India (44): A youth-led campaign was conducted to identify and analyse violations of tobacco advertising, promotion, and sponsorship (TAPS) on Social networking sites (SNS). Through capacity-building webinars, the youth identified 748 posts violating tobacco advertising laws, with 84.7% promoting smoking products and many endorsed by celebrities. Additionally, the youth identified 148 pages that were selling tobacco products online, mostly on Instagram (62.7%) and Facebook (23.7%)., and 1,412 hashtags (#vape and #smoke being the most prevalent) related to tobacco promotion were identified. These findings highlight the urgent need to amend COTPA, 2003, particularly Section 5, to include all internet-based platforms in the prohibition of tobacco advertising and promotion to protect Indian youth. In 2017-18, adolescents from the HRIDAY youth network monitored violations of Tobacco Control Laws in India and at the point of sale of Electronic Nicotine Delivery Systems (ENDS).