

Review

Turkish Thoracic Society's Statement Report on Electronic Cigarettes and Heated Tobacco Products

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Cite this article as: Duru Çetinkaya P, Pazarlı Bostan P, Salepçi B, et al. Turkish thoracic society's statement report on electronic cigarettes and heated tobacco products. *Turk Thorac J.* 2022;23(4):296-301.

Abstract

Tobacco addiction, which causes the death of more than 8.5 million people in the world every year, is a preventable global public health problem. There are 1.1 billion adult smokers worldwide and 60% of them desire or intend to quit but unfortunately, the tobacco industry continues to profit at the expense of people's lives by marketing electronic cigarettes and heated tobacco products as a smoking cessation method and they continue to poison young people with new threat tobacco products, promising a "smoke-free future" Turkish Thoracic Society is actively involved in the implementation of the National Tobacco Control Program to protect public health and has warned and raised awareness of new threats to the youth, such as electronic cigarettes and heated tobacco products. The purpose of this report is to provide information about electronic cigarettes and heated tobacco products and to present TTJ's position on the subject.

KEYWORDS: Electronic cigarettes, heated tobacco products, tobacco addiction

Received: February 7, 2022

Accepted: April 27, 2022

Available Online: June 15, 2022

Tobacco addiction, which causes the death of more than 8.5 million people in the world every year, is a preventable global public health problem.¹ There are 1.1 billion adult smokers worldwide and 60% of them desire or intend to quit² but unfortunately the tobacco industry continues to profit at the expense of people's lives by marketing electronic cigarettes and heated tobacco products as a smoking cessation method and they continue to poison young people with new threat tobacco products, promising a "smoke-free future."³

There is a raging debate over the alleged potential benefits and known harms of electronic cigarettes (e-cigarettes) and heated tobacco products (HTPs). International respiratory societies like American Thoracic Society, European Respiratory Society (ERS), Turkish Thoracic Society (TTS), and other health organizations continue to raise awareness about the hazards of e-cigarettes and heated tobacco products.⁴⁻¹¹ Turkish Thoracic Society is actively involved in the implementation of the National Tobacco Control Program to protect public health and has warned and raised awareness of new threats to the youth, such as e-cigarettes and heated tobacco products. The purpose of this report is to provide information about e-cigarettes and heated tobacco products and to present TTD's position on the subject.

GLOBAL TREND ON ELECTRONIC CIGARETTES AND HEATED TOBACCO PRODUCTS

Electronic cigarettes were first pronounced as tobacco-free smokeless cigarettes in 1963. In 2003, it was offered to the Chinese market for the first time and it has been spreading in the American and European markets since 2006. It's a battery-operated tobacco product that contains a variety of chemicals, nicotine, and sweetness, produces steam instead of smoke and has the shape of the cigarette.¹²⁻¹⁴

Electronic cigarette consumption rates were known to vary significantly among individuals, ranging from 0.2% to 11%, although reliable data are not available for many countries. Between 2011 and 2020, e-cigarette use surged from 1.5% to 19.6% among high school students in the United States. Between 2014 and 2020, the percentage of current

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e-cigarette users who use flavored e-cigarettes climbed from 65.1% to 84.7%. In Australia, the proportion of teenagers aged 18-24 who reported current smoking e-cigarettes on a less frequent basis than daily, weekly, monthly, or monthly basis at the time of the survey nearly doubled from 2.8% in 2016 to 5.3% in 2019.³ In 2016, e-cigarette was reported to be the most popular tobacco product among middle- and high school kids in the United States.¹⁵ Over 20% of adults between the ages of 18 and 20 have experimented with e-cigarettes and 3.7% of adults use e-cigarettes daily or weekly.¹⁶

According to data from 26 national surveys involving 3925 children and adolescents from 69 countries and regions, the prevalence of usage of electronic and non-electronic nicotine delivery devices was 17.2% among children aged 8-20. According to the same survey, e-cigarette use was most prevalent in high-income geographic regions.¹⁷

There are no precise data on the global use of HTPs. In Japan, HTP use increased from 0.3% in 2015 to 0.6% in 2016, 3.6% in 2017, and 6.9% in 2018.¹⁸ Again, a study conducted in Japan discovered that 20.7% of people use HTP at home, 11.8% in restaurants, and 11.9% in workplaces.¹⁹

MAIN POINTS

- Scientific evidence clearly establishes a link between tobacco use and lung diseases. Electronic cigarettes (e-cigarettes) and heated tobacco products (HTPs) are both tobacco products and are therefore detrimental to the user's health.
- It has been proven that these products, which are claimed to be less harmful, can cause serious lung damage and respiratory failure that can result in death even after short-term use.
- With new tobacco products such as e-cigarettes and heated tobacco products, the tobacco industry aims to maintain dependence while increasing supply.
- Studies have shown that electronic cigarettes and heated tobacco products cannot be used as a smoking cessation method.
- Alarmingly, the use of electronic cigarettes and heated tobacco products among young people, who are the primary target audience for the tobacco business, is on the rise. Non-smokers, teenagers, youngsters and vulnerable populations should be barred from using electronic cigarettes and heated tobacco products, as well as those who are already addicted.
- It is critical to preserve the prohibition on the manufacture, import, and sale of new generation tobacco products (HTPs, e-cigarettes, etc).
- On the February 25, 2020, the Official Gazette issued presidential decree number 2149 regarding the import of e-cigarettes and similar devices as well as some tobacco products and items used in the manufacture of imitation tobacco products. This decree and the necessary inspections must be carried out in full.
- Websites and social media accounts that illegally promote and market e-cigarettes and heated tobacco products should be shut down and prevented.

TREND IN TURKEY

In Turkey, electronic cigarette marketing, indoor smoking of it, and its sale are prohibited by the legislative change in 2013.²⁰ Although the sale of e-cigarettes is not allowed in our country, it has been noticed that they are pushed on social media, that e-cigarettes and liquids are sold online, and that instructions for their preparation are shared.²¹⁻²³ Because the sale, advertisement, and marketing of cigarettes are outlawed in our country, there are no national surveys on e-cigarette usage rates but according to some studies conducted in our country, the rate of e-cigarette use ranges between 0.02% and 43.1%. The mean age of participants in these studies ranged from 20.76 ± 1.92 to 35.9 years as shown in Table 1.²⁴⁻³⁰

According to the Framework Convention on Tobacco Control (FCTC), which our country ratified in 2004, the countries who are signatories to the convention should combat not only tobacco use but also nicotine addiction. According to Article 5.3 of the FCTC, it is mandatory to safeguard public health policies connected to tobacco control against the tobacco industry's commercial and other interests, and to take necessary steps in accordance with national legislation.

The presidential decision numbered 2149 on the importation of electronic cigarettes and similar devices, certain tobacco products, and products used in the imitation of tobacco products" was published in the Official Gazette on February 25, 2020. It is prohibited to import all types of products, including electronic cigarettes and electronic hookahs, that are used in a manner that imitates tobacco products, regardless of whether they contain tobacco, as well as electronic devices, components, replacement parts, and solutions used in the consumption of these products.³¹ Additionally, it prohibits the entry of e-cigarettes and heated tobacco products. While it is illegal to sell e-cigarettes and heated tobacco products in our country, some data shows that this prohibition is ignored, and young people's consumption is increasing. Ensuring that the decision numbered 2149 is implemented and conducting the necessary inspections should be done meticulously.

HEALTH EFFECTS OF ELECTRONIC CIGARETTE AND HEATED TOBACCO PRODUCTS

Numerous chemical compounds like propylene glycol, glycerol, ethylene alcohol, polyethylene glycol (PEG400), diacetyl, diethylene glycol, amino-tadalafil, rimonabant, cannabidiol, nitrosamines, formaldehyde, acetaldehyde ketone, mercury, tetramethyl pyrazine, lead, nickel, chromium, and artificial nicotine have been found in e-cigarettes, including also aromas.^{21,32-36} Nitrosamines known to be carcinogenic were also detected in e-cigarettes, including nitrozonornicotine (NNN), 4-(nitroso methyl-amino)-1-(3-pyridyl)-butanon e (NNK), and nitroso-anatabine (NAT).³⁵ Diethylene glycol, anabasine, myosmine, and beta nicotryine are also accessible in e-cigarettes, all of which have been shown to be detrimental to human health.^{32-35,37}

It has been reported that e-cigarette additives, particularly flavoring additives, are cytotoxic to human embryonic stem

Table 1. Percentages of E-Cigarette Use in Survey Studies Conducted in Turkey

Literature	N	Age	Smokers	E-cigarette Users	Cigarettes and E-cigarettes Dual Use
Sayılı et al 2020	225	22.77 ± 3.07	36.4%	43.1%	24.6%
Özpulat et al 2020	1241	20.76 ± 1.92	9.0%	0.2-1.6%	----
Ogan et al 2019	312	21 ± 2.1	22.8%	%.7-32%*	43.7%
Saçlı A. 2019	374	21.20 ± 1.91	36.6%	3.2-29.9%*	----
Atlam et al 2020	353	35.9	49%	19%	26.6%
Kanık et al 2020	210	30-59	SBP	16.7%	16.7%

*Those who try 1 or more e-cigarettes.

SBP, patients who come to the smoking cessation clinic; e-cigarettes, electronic cigarettes.

cells, mouse neural stem cells, and human pulmonary fibroblasts.³⁸ According to animal studies, it has a neurotoxic effect on brain development, and maternal e-cigarette smoking has been linked to behavioral and cognitive changes in the child.³⁹ It has been reported that e-cigarettes can cause a variety of diseases by altering the epigenome, resulting in abnormal gene expression.⁴⁰ Electronic cigarettes have a major impact on the respiratory and cardiovascular systems and can also cause damage to other organs and systems, including the liver, kidneys, and nervous system. Electronic cigarettes can wreak havoc on the lungs by causing oxidative stress, inflammation, and DNA damage.⁴¹ The outbreak of electronic cigarettes can result in acute lung injury Electronic Cigarette or Vaping Product Use-associated Lung Injury (EVALI) in the United States of America resulted in a large number of hospitalizations and deaths. The presence of high levels of metals in e-cigarette aerosol is detrimental to lung health. Flavors containing a benzene ring and/or a carbonyl group have been linked to lung cellular damage and cytotoxicity. Cigarettes, both conventional and electronic, have been shown to increase susceptibility to SARS-CoV-2 infection and the development of COVID-19.⁴² It is well established that the substances contained in it are at least as harmful as those found in cigarettes and that they pose additional risks such as head and neck injuries and skin burns as a result of battery explosions and ignition.⁴³⁻⁴⁵ Electronic cigarettes have a detrimental effect on the immune system and increase the risk of infection of the lower respiratory tract, such as pneumonia. Furthermore, electronic cigarettes can result in acute lung injury (EVALI), respiratory failure, and death.^{46,47}

Mouth and throat irritation, dry coughing, dry eyes, gastrointestinal symptoms, and local irritation are the most common causes. Increased heart rate, short-term breathlessness, headache, and sore throat are all possible symptoms. Nitrosamines found in it are known carcinogens. Additionally, there are studies demonstrating a decline in respiratory functions.⁴⁶⁻⁵⁰ There have been reports of life-threatening diseases such as pneumonia, heart failure, and hypotension as a result of e-cigarette use.⁵¹ It poses similar health risks to traditional tobacco products. As with traditional cigarettes, passive smoking is a concern with e-cigarettes.⁴⁸⁻⁵⁰

Heated tobacco products, such as e-cigarettes, have been marketed as “harm-reduced” products and/or as aids in the cessation of traditional tobacco use. In traditional cigarettes, when

tobacco is heated above 600°C, combustion occurs, while in HTPs, it heats up to 350°C and volatile components are released instead of smoke.⁵¹⁻⁵⁵ Due to the reason that tobacco is heated rather than burned, it is claimed that the average level of harmful chemicals in tobacco smoke is significantly lower but heated tobacco products contained nicotine, volatile organic compounds, polycyclic aromatic hydrocarbons, and carbon monoxide.⁵⁴ Heated tobacco products utilize an electronically controlled heating system to release nicotine without burning the tobacco. As with all tobacco products, HTPs are naturally toxic and contain carcinogens.^{18,51,53,55}

Heated tobacco products expose users to toxic emissions, many of which are carcinogenic, and there is currently insufficient evidence to suggest that they are less harmful than conventional cigarettes. There is currently insufficient evidence regarding the effects of HTPs’ secondhand emissions, but these products’ emissions contain harmful and potentially harmful chemicals.^{56,57} The World Health Organization states that smoking any type of tobacco, including heated tobacco products, is harmful. According to the ERS, heated tobacco products, like regular cigarettes, are addictive and contain carcinogenic substances for humans.⁵

There is a positive correlation between the use of HTP and the occurrence of respiratory diseases, according to some studies. Increased oxidative stress, mitochondrial dysfunction, and an increase in respiratory tract infections are all possible consequences.⁵⁸ Due to the use of HTP, cases of acute eosinophilic pneumonia and subacute lung injury have been reported.^{59,60}

The most common reasons for using e-cigarettes and HTPs are to quit or reduce tobacco use on the assumption that they are less harmful than other tobacco products, as well as to use them in locations where smoking is prohibited.⁶¹⁻⁶⁴ In fact, it has been noted that they have potential risks of dual use with conventional cigarettes, and that they do not induce people to stop smoking.⁶⁵⁻⁶⁷ A meta-analysis of 55 observational studies and 9 randomized controlled trials concluded that e-cigarettes have no benefit for smoking cessation.⁶⁸ E-cigarettes have been shown in studies to be ineffective for smoking cessation and the evidence for smoking cessation is known to be deficient.⁶⁹⁻⁷² Allowing HTP use in smoke-free areas may re-normalize smoking, resulting in dual use of HTP and cigarettes and continued nicotine

dependence. Regrettably, this may make smoke-free policies more difficult to implement.⁷²⁻⁷⁴

In a research among the TTS members it was found that some of the physicians are hesitant to use new generation tobacco products to quit smoking and this result suggests that the tobacco industry's marketing efforts are especially effective among some young physicians who also smoke. Non-current smokers, elders, and those with training and expertise in smoking cessation aid were significantly more likely to respond "I never agree with the opinion that next generation tobacco products can be used in smoking cessation" in this research.⁷⁵ Physicians must become much more aware about these new tobacco products and hazards because it is their obligation to safeguard and educate the general public about the tobacco industry's marketing techniques. Otherwise, these novel tobacco products may represent significant risks to tobacco control efforts at the national and international levels.

In this context, TTS aimed to provide more information about e-cigarettes and heated tobacco products to the physicians with this report and to present TTD's statements on the subject with these main points.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – P.D.Ç., P.P.B., B.S., E.D.; Design – P.D.Ç., P.P.B., B.S., E.D.; Supervision – O.E., M.A.U., E.U., C.Ö., O.K., E.D., O.I.; Materials – P.D.Ç., P.P.B., B.S., O.E., M.A.U.; Data Collection and/or Processing – A.G., O.E., F.Ç.U.K., D.K., S.A., S.D.; Analysis and/or Interpretation – A.G., O.E., F.Ç.U.K., D.K., S.A., S.D.; Literature Review – P.D.Ç., P.P.B., B.S.; Writing – P.D.Ç., P.P.B., B.S.; Critical Review – M.A.U., E.U., C.Ö., O.K., E.D., O.I.

Acknowledgments: The authors would like to thank the Turkish Thoracic Society for their support of the tobacco control study group.

Declaration of Interests: The authors have no conflict of interest to declare.

Funding: The authors declared that this study has received no financial support.

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