

Original Article

Can Smoking Cessation Clinics Reflect a Country's Tobacco Control Status? Trends in Electronic Cigarette Use Among Individuals Attending a Smoking Cessation Clinic: A Retrospective Analysis (2017–2023)

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ABSTRACT

OBJECTIVE: The increasing use of electronic cigarettes (e-cigarettes) has emerged as a significant challenge for tobacco control efforts. Despite legal restrictions in Türkiye, e-cigarette use is becoming increasingly widespread. This study aimed to assess annual trends in e-cigarette use, motivations for use, and supply patterns among individuals who visited a smoking cessation clinic between 2017 and 2023.

MATERIAL AND METHODS: This retrospective study included 7,140 individuals who visited a Smoking Cessation Clinic of a public hospital between January 1, 2017, and December 31, 2023. Annual trends in e-cigarette use, reasons for use, dual use characteristics, awareness of product content, and supply sources were analyzed using descriptive frequency analyses.

RESULTS: Overall, 13.1% of the participants (n = 935) reported using e-cigarettes before, during, or after their smoking cessation process. The annual prevalence of e-cigarette use has increased significantly over time, rising from 0.2% in 2017 to 39.9% in 2023. While the most frequently reported reason for use in 2017 was “curiosity,” the most common motivation in 2023 was “the intention to quit smoking.” Between 2017 and 2021, e-cigarettes were predominantly obtained through online shopping, while their availability from physical retail outlets increased in subsequent years. Although applications to smoking cessation clinics decreased over time, e-cigarette use and its use in enclosed spaces steadily increased.

CONCLUSION: The significant increase in e-cigarette use among individuals applying to smoking cessation clinics between 2017 and 2023 indicates a worrying weakening of tobacco control efforts in Türkiye. The findings raise significant concerns about the societal normalization of e-cigarette use, increased accessibility through online and informal markets, and non-compliance with smoke-free environment policies.

KEYWORDS: E-cigarette, smoking, tobacco control, MPOWER, smoking cessation outpatient clinic

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INTRODUCTION

Tobacco use is one of the leading causes of preventable morbidity and mortality worldwide. Türkiye ratified the World Health Organization Framework Convention on Tobacco Control in 2004, followed by significant amendments to Law No. 4207 on the Prevention and Control of Hazards of Tobacco Products through Law No. 5727, which was enacted on January 3, 2008.¹ These laws encompass the following key components of tobacco control in Türkiye:

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Smoke-Free Indoor Environments: The prohibition of smoking in indoor public places, workplaces, public transportation, and other designated smoke-free areas, thereby reducing exposure to secondhand smoke.

Ban on Advertising, Promotion, and Sponsorship: A comprehensive ban on the advertising, promotion, and sponsorship of tobacco products, aimed at reducing their visibility and appeal.

Packaging and Labeling Regulations: Mandatory health warnings and graphic images on tobacco product packaging to inform consumers about the health risks associated with tobacco use.

Regulation of Tobacco Sales: Restrictions on the sale of tobacco products, particularly the prohibition of sales to minors and the regulation of points of sale.

Control of Tobacco Product Contents: Regulation of the contents and emissions of tobacco products to mitigate harm.

Public Awareness and Education: Promotion of public awareness campaigns and educational programs addressing the harms of tobacco use.

Enforcement and Penalties: Establishment of enforcement mechanisms to ensure compliance with tobacco control measures and the imposition of penalties for violations.¹ In Türkiye, the gains achieved in tobacco control appear to have weakened since 2016.

During this period, the tobacco industry has developed new marketing strategies centered around the concepts of “alternative products” or “reduced-harm products.” With the increasing prevalence of products such as electronic cigarettes (e-cigarettes), heated tobacco products, and nicotine pouches, the use of tobacco and nicotine products has risen; this increase has been particularly pronounced among young people.^{2,3}

According to data from the Turkish Household Health Survey, the prevalence of tobacco use among individuals aged ≥ 15 years increased from 28.0% in 2022 to 34.8% in 2023. The rate of daily tobacco use was reported as 31.3%, with rates of 41.6% in men and 21.1% in women. Notably, tobacco use

in the 15–29 age group was 33.0%, indicating a concerning prevalence among young adults.⁴ These findings suggest that the effectiveness of current tobacco control policies in Türkiye may be limited and indicate that the gains achieved in recent years have not been sustained.

Another indication of the weakening of tobacco control in Türkiye is the rising prevalence of e-cigarette use among both adults and adolescents. Despite the ban on the sale and advertisement of e-cigarettes in Türkiye, studies have shown that their use has increased since 2016.^{5–8} Owing to marketing strategies and the misconception that they may aid in smoking cessation, e-cigarettes are perceived by some individuals as an alternative to conventional cigarettes or as a tool to support quitting. However, evidence indicates that e-cigarettes are not an effective smoking cessation method; rather, they may serve as a gateway to nicotine addiction, particularly among the youth, including progression to conventional cigarette smoking.^{9,10} This study aimed to evaluate the annual frequency of e-cigarette use among patients who visited a smoking cessation outpatient clinic of a secondary care public hospital in a metropolitan city between 2017 and 2023 and to analyze the motivations for their use.

MATERIAL AND METHODS

Study Design and Study Population

This was a retrospective descriptive study. Data were obtained from the application records of the Smoking Cessation Outpatient Clinic of Seyhan Hospital in Adana province between January 1, 2017, and December 31, 2023. Individuals aged 18 years and older who applied to the outpatient clinic declaring that they were smokers and whose initial evaluation forms (“Smoking Assessment Form”) were fully completed were included. Individuals with incomplete forms were excluded from the study. Data were collected using the “Smoking Assessment Form” routinely administered in the outpatient clinic. This form includes information on demographic characteristics, comorbidities, duration of smoking, daily cigarette consumption, level of nicotine dependence (Fagerström Test for Nicotine Dependence), previous quit attempts, motivation to quit smoking, and the use of other tobacco products (e-cigarettes, waterpipe, pipe, roll-your-own tobacco, etc.), as well as related behavioral characteristics (frequency of use and method of procurement) (Appendix 1). In addition, during follow-up interviews conducted with patients who completed one year of follow-up, current tobacco use status and transitions to e-cigarette use were updated and recorded. Among individuals who reported e-cigarette use, additional variables including duration of use, reasons for use, source of procurement, and concurrent cigarette use were evaluated in detail.

Ethics Approval and Consent to Participate

The study protocol was approved by the Ethics Committee of Adana City Training and Research Hospital (approval no: 662, date: August 21, 2025). The study was conducted in accordance with the approved guidelines and adhered to the principles of the Declaration of Helsinki.

Main Points

- Electronic cigarette (e-cigarette) use increased dramatically among smoking cessation clinic attendees between 2017 and 2023, reaching nearly 40% of applicants in the final study year despite national sales prohibitions.
- The primary motivation for e-cigarette use shifted from curiosity to smoking cessation intent over time, suggesting growing misperceptions regarding their effectiveness as quit aids.
- Smoking cessation clinics may function as sentinel indicators of tobacco control performance, as declining clinic attendance coincided with rising e-cigarette use, expanding access channels, and normalization of indoor consumption.

Statistical Analysis

In this study, data were analyzed using IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, NY, USA). The annual distribution of e-cigarette use, reasons for use, dual-use characteristics, and methods of procurement were evaluated using frequency analysis. Changes in e-cigarette usage prevalence over the years were assessed using chi-square trend analysis. A P value < 0.05 was considered statistically significant.

RESULTS

During the 7-year study period, 7,586 individuals applied to the outpatient clinic; 446 were excluded because of missing data, and 7,140 individuals were included in the final analysis. Overall, 935 of 7,140 participants (13.1%) reported ever using e-cigarettes before, during, or after smoking cessation attempts.

The annual prevalence of e-cigarette use increased markedly over time, rising from 0.2% in 2017 to 39.9% in 2023, despite a decline in smoking cessation clinic applications over the years. Chi-square trend analysis demonstrated a statistically significant upward trend in e-cigarette use prevalence across the study years ($P < 0.001$). The annual distribution of e-cigarette use is presented in Figure 1.

In addition to changes in prevalence, the reasons for e-cigarette use varied across years. In 2017, the most commonly reported

reason was “curiosity” (66.7%), whereas in 2023, the most frequently reported reason was “intention to quit smoking” (25.7%) (Table 1).

Other reported reasons included the perception that conventional cigarettes are more harmful to health, the desire to reduce daily cigarette consumption, coping with anxiety or stress, convenience of use in indoor settings, and the widespread use among peers (friends/family members). The proportion of individuals who reported using e-cigarettes because they could use them comfortably in indoor environments increased from 9.5% in 2018 to 19.5% in 2023 (Table 2).

A substantial proportion of users lacked adequate knowledge regarding product contents. Among e-cigarette users, 45.2% ($n = 421$) reported not knowing the nicotine concentration in e-liquids, and 33.4% ($n = 312$) were unaware of the proportions of propylene glycol and/or vegetable glycerin. Additionally, three participants reported adding a plant-derived substance with unclear legal status to the e-cigarette liquid and using it in this manner.

Regarding procurement sources, e-cigarettes were primarily obtained through online shopping between 2017 and 2021, whereas in 2022 and 2023, they were more commonly purchased from physical stores, such as tobacco shops. The sources of procurement are summarized in Table 1.

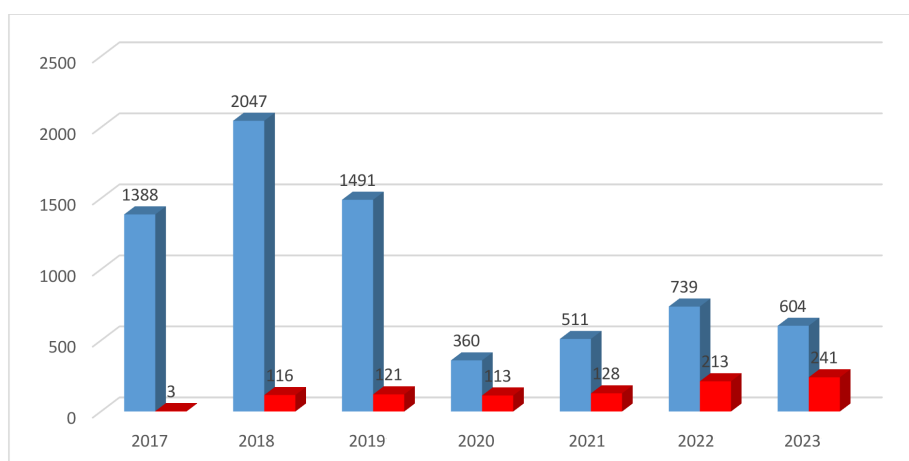


Figure 1. Annual trends in smoking cessation clinic applications and e-cigarette use between 2017 and 2023

Blue bar: Total number of patients attending the smoking cessation clinic

Red bar: Number of e-cigarette users among patients attending the smoking cessation clinic

Table 1. Annual trends in smoking cessation clinic applications and e-cigarette use between 2017 and 2023

Year	Total applications (n = 7,140)	E-cigarette users (n = 935)	Most common source of purchase	E-cigarette use rate (%)
2017	1388	3	Online shopping	0.2
2018	2047	116	Online shopping	5.7
2019	1491	121	Online shopping	8.1
2020	360	113	Online shopping	25.0
2021	511	128	Online shopping	31.4
2022	739	213	Tobacco shop	28.8
2023	604	241	Tobacco shop, street vendor	39.9

Table 2. Annual distribution of reasons for e-cigarette use between 2017 and 2023

E-cigarette Reasons for use	2017 n = 3	2018 n = 116	2019 n = 121	2020 n = 113	2021 n = 128	2022 n = 213	2023 n = 241
Curiosity	2 (66.7)	9 (7.8)	6 (5.0)	6 (5.3)	57 (44.5)	10 (4.7)	12 (5.0)
To quit smoking	1 (33.3)	39 (33.6)	56 (46.3)	53 (46.9)	-	52 (24.4)	62 (25.7)
Perception of being less harmful	-	28 (24.1)	3 (2.5)	6 (5.3)	12 (9.4)	16 (7.5)	27 (11.2)
No unpleasant odor	-	-	14 (11.6)	1 (0.9)	2 (1.6)	16 (7.5)	26 (10.8)
To reduce stress	-	9 (7.8)	8 (6.6)	4 (3.5)	41 (32.0)	15 (7.0)	17 (7.1)
To reduce cigarette consumption	-	4 (3.4)	8 (6.6)	20 (17.7)	-	28 (13.1)	17 (7.1)
Appeal of flavor options	-	9 (7.8)	14 (11.6)	5 (4.4)	10 (7.8)	22 (10.3)	16 (6.6)
Ability to use in indoor areas	-	11 (9.5)	8 (6.6)	12 (10.6)	5 (3.9)	20 (9.4)	47 (19.5)
Use by friends/family members	-	7 (6.0)	4 (3.3)	6 (5.3)	1 (0.8)	34 (16.0)	17 (7.1)

DISCUSSION

An increasing trend in e-cigarette use was observed over the years among individuals attending the clinic, rising from 0.2% in 2017 to 39.9% in 2023. The increasing trend in e-cigarette use observed in this study is consistent with findings from the international literature, which indicate a growing prevalence of e-cigarette use in recent years.^{2,3} Previous studies have shown that the widespread availability of these products, aggressive marketing strategies, and the perception of e-cigarettes as less harmful alternatives have contributed to their increased use, particularly among young individuals.^{2,11} Furthermore, evidence suggests that e-cigarettes are often used concurrently with conventional cigarettes rather than as effective cessation tools, thereby sustaining nicotine dependence.¹²

In this study, “the intention to quit smoking” emerged as an increasingly common motivation over time among the reasons for e-cigarette use. Similar trends have been reported globally, with e-cigarettes increasingly perceived not only as alternative nicotine products but also as smoking cessation tools. This shift in perception has been largely driven by the tobacco industry through harm-reduction narratives and aggressive marketing strategies, despite the lack of sufficient evidence regarding the effectiveness of e-cigarettes for smoking cessation and growing evidence indicating increased rates of smoking initiation among adolescents using e-cigarettes.

Another notable finding was the decline in applications to the smoking cessation outpatient clinic over the years, despite the increasing prevalence of tobacco and nicotine product use in the country. Although the reasons underlying this decline cannot be directly determined from the present study, it may reflect broader changes in the tobacco control environment. Reduced visibility of tobacco control policies and public awareness campaigns, increasing social normalization of nicotine use behaviors, and the growing perception of e-cigarettes as alternative or self-managed cessation tools may have contributed to reduced engagement with professional smoking cessation services. In addition, the widespread availability of novel nicotine products may create the misconception that medical support is unnecessary for quitting, potentially weakening motivation to seek evidence-based cessation assistance.

However, previous studies have not demonstrated the effectiveness of e-cigarettes as smoking cessation tools. Independent studies not supported by the tobacco industry have shown that e-cigarettes are not effective for smoking cessation and may even serve as a gateway to conventional cigarette use, particularly among the youth.^{11,12} Organizations such as the World Health Organization, European Respiratory Society, and Turkish Thoracic Society emphasize that e-cigarettes are not an evidence-based smoking cessation method and are associated with dual use and the persistence of nicotine dependence.¹³⁻¹⁵

The appeal and marketing strategies associated with e-cigarettes are major factors contributing to their increased use, particularly among younger individuals.¹⁶ E-cigarettes are reportedly obtained through illegal channels, such as the internet or informal markets in Türkiye, highlighting deficiencies in regulatory enforcement.⁸ Insufficient knowledge regarding product content also represents a significant public health concern and a threat to tobacco control. Such limited knowledge regarding product content may prevent users from accurately assessing their nicotine exposure, increase the risk of dependence, and lead to unintentional exposure to potentially toxic substances. Furthermore, this may reinforce the misperception that e-cigarettes are “less harmful,” thereby contributing to the continuation and spread of their use.

Approximately half of the participants were unaware of the nicotine concentration, and one-third lacked knowledge about carrier substances, such as propylene glycol and vegetable glycerin. This indicates that users consume e-cigarettes without adequate awareness of their risks.

Moreover, some participants reported risky usage patterns, such as adding plant-derived substances with unclear legal status to e-cigarette liquids. Due to their liquid-based design, e-cigarette devices can be easily manipulated with various substances, enabling nicotine delivery and the inhalation of potentially psychoactive or toxic compounds. There are reports in the literature indicating that e-cigarette liquids may contain, or can be modified to contain, a wide variety of substances, some of which are associated with significant health risks.^{13,17} Notably, the Centers for Disease Control and Prevention reported that illicit tetrahydrocannabinol-containing liquids were the primary cause of the 2019 outbreak of e-cigarette- or vaping-associated lung injury (EVALI).¹⁷

Smoking cessation outpatient clinics are structured healthcare units that provide evidence-based support for individuals aiming to quit tobacco.¹⁰ Beyond their role in addiction treatment, these clinics also serve as frontline indicators of tobacco control efforts. In 2008, the World Health Organization introduced the MPOWER tobacco control policy package, one component of which, “Offer help to quit tobacco use,” is largely implemented through smoking cessation clinics in Türkiye.¹⁸

These units should address not only conventional cigarette use but also the use of e-cigarettes, nicotine delivery systems, and tobacco products. However, in clinical practice, the failure of physicians to systematically inquire about e-cigarettes and other novel nicotine delivery systems during history taking may lead to underrecognition of their use and an underestimation of the burden of dependence. Smoking cessation outpatient clinics should not be limited to providing pharmacological treatment for cigarette dependence; they should also serve as comprehensive centers addressing all nicotine-containing and non-nicotine tobacco products. Standardized assessment tools should be developed to systematically evaluate the use of all such products (e.g., e-cigarettes and waterpipes). Users should be informed about the product contents and potential risks. Applications to smoking cessation clinics reflect both individual readiness to quit and the broader effectiveness of tobacco control policies. In our study, despite the relatively high number of applications in 2017 and 2018, a marked decline was observed thereafter. While the restricted access to healthcare services during the coronavirus disease 2019 pandemic may explain part of this decline, the sharp decrease observed between 2018 and 2019 and the lack of recovery after 2022 may reflect a weakening of tobacco control efforts beyond the direct impact of the pandemic. This situation may account for the reduced participation in smoking cessation services and could be interpreted as a potential indicator of the erosion of tobacco control initiatives.

Despite the prohibition of e-cigarette sales and advertising under Law No. 4207 in Türkiye, our findings indicate that these products were primarily obtained via online shopping until 2022 and increasingly through physical outlets such as tobacco shops and informal vendors in 2022 and 2023. In 2023, 39.9% of individuals who visited the clinic reported e-cigarette use.

This suggests that illegal marketing and distribution channels remain widespread and that regulatory enforcement may be insufficient. Similar patterns have been reported globally, where e-cigarette products are widely accessible through online platforms and informal markets despite regulatory restrictions, highlighting ongoing challenges in enforcement and control.^{13,16} Illegal e-cigarette sales via digital platforms should be strictly monitored, and marketing strategies targeting youth should be restricted.

Furthermore, by 2023, 19.5% of e-cigarette users reported using these products in indoor environments, indicating noncompliance with indoor smoking bans. These findings suggest that the tobacco industry’s frequently promoted “smoke anywhere” narrative has effectively translated into real-world behavior. Unfortunately, the perception that e-cigarettes can be used freely in all settings points to a concerning trend toward the social normalization of e-cigarette use.

It is evident that this situation undermines tobacco control policies. The literature indicates that the increasing use of e-cigarettes in indoor environments is associated with violations of smoke-free policies and contributes to the social normalization of nicotine use.^{13,14} Moreover, e-cigarette aerosols have been shown to affect not only users but also bystanders; they contain nicotine, ultrafine particles, and various toxic substances, thereby posing potential health risks through secondhand exposure.^{13,16} Therefore, the increasing use of e-cigarettes in indoor settings should be regarded not merely as an individual behavior, but also as a significant public health concern and a potential indicator of regression in tobacco control.

The findings of this study suggest that smoking cessation outpatient clinics may serve not only as treatment centers but also as sentinel indicators reflecting changes in national tobacco control environments.

The increasing use of e-cigarettes, the normalization of their use in indoor settings, the diversification of nicotine products, and the decline in clinic admissions collectively suggest a weakening in the implementation and enforcement of tobacco control measures.

Study Limitations

This study has some limitations. First, it was conducted in a single smoking cessation outpatient clinic, which may limit the generalizability of the findings. Second, the data were based on self-reported information, which may be subject to recall bias. Finally, due to the descriptive design of the study, causal inferences cannot be made from the findings.

CONCLUSION

This study demonstrated a substantial increase in e-cigarette use among individuals attending a smoking cessation outpatient clinic between 2017 and 2023, together with a diversification of usage motivations over time. The findings are consistent with international evidence showing a growing prevalence of e-cigarette use, particularly among young individuals, and support concerns regarding the increasing normalization of these products. Limited knowledge regarding product contents, together with reports of risky usage patterns, further emphasizes the public health risks associated with e-cigarettes.

Despite the legal prohibition of e-cigarette sales and advertising in Türkiye, the increasing prevalence of use, widespread access through online and informal markets, and growing use in indoor environments raise serious concerns regarding the current effectiveness of tobacco control policies and regulatory enforcement. The decline in smoking cessation clinic applications over time may also reflect weakening engagement with cessation services and potentially reduced effectiveness of tobacco control efforts.

Smoking cessation outpatient clinics should not be limited to providing pharmacological treatment for conventional cigarette dependence; they should also function as comprehensive centers addressing all nicotine-containing and non-nicotine tobacco products. Standardized assessment tools should be

developed to systematically evaluate the use of these products, and healthcare professionals should routinely inquire about e-cigarette and novel nicotine product use during clinical history taking. In addition, illegal e-cigarette sales via digital platforms should be strictly monitored, and stricter measures should be implemented against marketing strategies targeting youth. Strengthening the enforcement of existing tobacco control laws and maintaining political commitment are essential for protecting public health.

Ethics

Ethics Committee Approval: The study protocol was approved by the Ethics Committee of Adana City Training and Research Hospital (approval no: 662, date: August 21, 2025). The study was conducted in accordance with the approved guidelines and adhered to the principles of the Declaration of Helsinki.

Informed Consent: As this was a retrospective study, written informed consent was not obtained from the participants.

Footnotes

Authorship Contributions

Surgical and Medical Practices: A.T., Ç.E., P.D.Ç., Concept: A.T., Ç.E., P.D.Ç., Design: A.T., Data Collection or Processing: A.T., Analysis or Interpretation: A.T., Ç.E., P.D.Ç., Literature Search: A.T., Ç.E., P.D.Ç., Writing: A.T., Ç.E., P.D.Ç.

Conflict of Interest: No conflict of interest was declared by the authors.

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Appendix 1: <https://d2v96fxpocvxx.cloudfront.net/ae7a798f-afa1-42f4-9efd-6a2ed974293f/content-images/650d3e20-ce38-4727-8549-6632462dba66.pdf>

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