The Turkish Journal of Pediatrics 2025; 67: 773-775
https://doi.org/10.24953/turkjpediatr.2025.7758

Commentary

The rising epidemic of e-cigarette use among adolescents: an unpredictable threat

Demet Taş[1]

[1]*Division of Adolescent Medicine, Department of Pediatrics, Ankara Bilkent City Hospital, Faculty of Medicine, Ankara Yıldırım Beyazıt University, Ankara, Türkiye.*

E-cigarette use among adolescents is not just risky behaviour; it is a matter of concern for physicians and public health authorities because it can lead to nicotine addiction and encourage the use of conventional tobacco products, resulting in substantial and long-term health problems. In this context, the study entitled "Prevalence and predictors of e-cigarette use among adolescents in a tertiary pediatric clinic: insights from the new ECABA Scale," published in this issue of The Turkish Journal of Pediatrics by Can Oksay et al.[1], makes a substantial contribution to the international literature by evaluating e-cigarette awareness, prevalence of use, and related beliefs among adolescents.

Despite national access restrictions and legal regulations, the study demonstrated that 18.5% of adolescents had tried e-cigarettes at least once in their lifetime, while 9.2% were current users. Furthermore, adolescents who had experimented with or currently used conventional cigarettes exhibited significantly more favorable attitudes toward e-cigarettes.

According to data from the European School Survey Project on Alcohol and Other Drugs (ESPAD) 2024, the average prevalence of current e-cigarette use in the past 30 days among 15 to 16 year old students in Europe was reported to be 22%. Lifetime experience with e-cigarettes was approximately 44%.[2]

According to recent 2021 to 2022 data from the World Health Organization for the European Region, 32% of 15-year-old adolescents had tried at least one type of e-cigarette, and 20% reported use within the past 30 days, highlighting a rapid increase in use.[3]

Among adolescents, several factors contribute to the rapid increase in e-cigarette use, even in countries where sales to individuals under 18 years of age are legally restricted. These factors include widespread exposure to e-cigarette advertising on social media platforms across all age groups and the high accessibility of these products. Longitudinal studies conducted in adolescent populations have shown that adolescents who do not use any tobacco products but have experimented with e-cigarettes often transition to conventional cigarette use within a short period of time. This evidence indicates that e-cigarettes may function not as a harm reduction tool for adolescents, but rather as a gateway to nicotine dependence.[4]

Furthermore, concurrent use of e-cigarettes and conventional cigarettes, referred to as dual use, has been observed in many adolescents. In this pattern of use, adolescents are exposed not only to the toxic constituents of combustible tobacco and e-cigarettes, but also to very high levels of nicotine.[5]

E-cigarettes are devices that generate an aerosol by heating an e-liquid. These e-liquids typically

✉ Demet Taş ▪ demettas19691@hotmail.com

Received 18th December 2025, accepted 22nd December 2025.

contain nicotine, flavoring agents, propylene glycol, vegetable glycerin, and various chemical additives. Nicotine concentrations vary widely across products, and some have been reported to deliver nicotine amounts equivalent to those found in a full pack of 20 cigarettes, even with a single use. In addition, nicotine has been detected in certain e-liquids marketed as nicotine-free or labeled as containing zero percent nicotine. Substantial inconsistencies in nicotine content have also been observed even among e-cigarettes of the same brand and model, with many analyses reporting nicotine levels exceeding those declared by manufacturers.[6]

Nicotine has a very high addictive potential. In addition, due to its developmental characteristics, the adolescent brain rapidly increases dopaminergic activity in response to substances and certain behaviors, resulting in a stronger reward response. Consequently, the high nicotine content of e-cigarettes may lead to faster development of dependence in the more sensitive adolescent brain compared with adults. It is well established that adolescents remain at high risk of developing nicotine dependence even with intermittent use.[7]

Because of their developmental characteristics, adolescents tend to be more impulsive, and curiosity driven, making the flavored and colorful aromas and visual designs of e-cigarettes particularly attractive. The recent introduction of e-cigarette devices designed to resemble USB flash drives, highlighters, or other technological gadgets has further increased their popularity among adolescents and facilitated peer use. In the United Kingdom, following the market introduction in 2021 of disposable e-cigarette models that were more visually appealing and easier to use for adolescents, a striking 99% annual increase in e-cigarette use was observed, particularly among individuals aged 18 to 24 years. During the same period, the decline in conventional cigarette use remained limited.[8]

E-cigarettes have adverse health effects not only because they contain highly addictive nicotine, but also due to the presence of numerous harmful agents. These harmful components directly challenge marketing claims that e-cigarettes are harmless or clean products. Indeed, growing evidence increasingly associates e-cigarette use with serious health conditions, particularly severe clinical entities such as e-cigarette or vaping associated lung injury (EVALI).[9]

In conclusion, industry strategies targeting adolescents, together with the continued availability of e-cigarettes in our country despite national restrictions, threaten adolescent health. It would be beneficial to incorporate information on e-cigarette bans, industry tactics targeting adolescents, and the harm of e-cigarettes into school-based tobacco prevention programs tailored to adolescents' developmental level. Implementing evidence-based preventive and therapeutic interventions that challenge the belief that e-cigarettes are less harmful, within healthcare settings that have direct contact with adolescents, is of critical importance for protecting adolescent health.

Author contribution

The author confirm contribution to the paper as follows: Conception and design: DT; literature review: DT; draft manuscript preparation and approval: DT. The author reviewed the results and approved the final version of the manuscript.

Source of funding

The authors declare the study received no funding.

Conflict of interest

The authors declare that there is no conflict of interest.

REFERENCES

1. Can Oksay S, Bilgin G, Gürler E, et al. Prevalence and predictors of e-cigarette use among adolescents in a tertiary pediatric clinic: insights from the new ECABA Scale. Turk J Pediatr 2025; 67: 776-788. https://doi.org/10.24953/turkjpediatr.2025.7284
2. European Union Drugs Agency. Key findings from the 2024 European School Survey Project on Alcohol and Other Drugs (ESPAD). 2025. Available at: https://www.euda.europa.eu/publications/data-factsheets/espad-2024-key-findings (Accessed on December 15, 2025).
3. Kiaer T, Hancock J. Alcohol, e-cigarettes, cannabis: concerning trends in adolescent substance use, shows new WHO/Europe report. 2024. Available at: https://www.who.int/europe/news/item/25-04-2024-alcohol--e-cigarettes--cannabis--concerning-trends-in-adolescent-substance-use--shows-new-who-europe-report (Accessed on December 15, 2025).
4. Chen G, Rahman S, Lutfy K. E-cigarettes may serve as a gateway to conventional cigarettes and other addictive drugs. Adv Drug Alcohol Res 2023; 3: 11345. https://doi.org/10.3389/adar.2023.11345
5. Jeon C, Jung KJ, Kimm H, et al. E-cigarettes, conventional cigarettes, and dual use in Korean adolescents and university students: prevalence and risk factors. Drug Alcohol Depend 2016; 168: 99-103. https://doi.org/10.1016/j.drugalcdep.2016.08.636
6. Raymond BH, Collette-Merrill K, Harrison RG, Jarvis S, Rasmussen RJ. The nicotine content of a sample of e-cigarette liquid manufactured in the United States. J Addict Med 2018; 12: 127-131. https://doi.org/10.1097/ADM.0000000000000376
7. Castro EM, Lotfipour S, Leslie FM. Nicotine on the developing brain. Pharmacol Res 2023; 190: 106716. https://doi.org/10.1016/j.phrs.2023.106716
8. Tattan-Birch H, Brown J, Shahab L, Beard E, Jackson SE. Trends in vaping and smoking following the rise of disposable e-cigarettes: a repeat cross-sectional study in England between 2016 and 2023. Lancet Reg Health Eur 2024; 42: 100924. https://doi.org/10.1016/j.lanepe.2024.100924
9. Amjad MA, Ocazionez Trujillo D, Estrada-Y-Martin RM, Cherian SV. E-Cigarette or vaping product use-associated lung injury: a comprehensive review. Int J Environ Res Public Health 2025; 22: 792. https://doi.org/10.3390/ijerph22050792