



Initial insights on vaping-associated illnesses in Colombia: evidence for action

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TO THE EDITOR:

Electronic cigarettes or electronic nicotine delivery systems (ENDS) and similar systems without nicotine (SSWN) have been some of the most trending products in recent decades. Worldwide, their successful marketing has especially been effective among the population under 30 years of age.⁽¹⁾ Much is still unknown about how e-cigarettes can affect human health.⁽²⁾ Although several authors have been outspoken against the potential risks associated with chemical products contained in ENDS or SSWN devices, some of which are considered toxic and carcinogenic,⁽³⁾ it was not until 2020 that the code U07.0 of the International Classification of Diseases, 10th revision (ICD-10) was utilized to refer to diseases associated with vaping.⁽⁴⁾

In this context, we analyzed the first data on vaping-related diseases in the Colombian population. We compiled microdata from the 2019 *Encuesta Nacional sobre Consumo de Sustancias Psicoactivas* (ENCSP, National Survey of Psychoactive Substances) and the *Sistema de Información de Prestaciones de Salud* (RIPS, Health Benefits Information System), including sex, age, location, and final condition (alive or deceased) between January of 2020 and July of 2022.⁽⁵⁾ Data from each database was analyzed separately. Associations with e-cigarette or vaping use were estimated using crude prevalence ratios (PRs) and respective 95% CIs. Adjusted PRs were obtained using Poisson regressions with the software R, version 4.2.1 (The R Foundation for Statistical Computing, Vienna, Austria). Variable selection was based on two systematic literature reviews.⁽⁶⁾

By analyzing ENCSP data, we found that the prevalence of e-cigarette usage was 4.37% (95% CI, 4.20-4.56). Regular e-cigarette consumption in the country was mainly concentrated in Bogotá, Caldas, Antioquia, Valle del Cauca, and Boyacá, which accounted for 60.1% of users. When stratifying marijuana use with tobacco smoking, it was found that 26.4% (n = 2,635/9,954) of cigarette smokers younger than or equal to 45 years of age regularly consumed marijuana. In the group over 45 years of age, the proportion of cigarette and marijuana smokers was 10% (n = 680/6,603). In the relationship between the use of vaping and cigarette analysis, it was found that, in the group younger than or equal to 45 years of age, 76.8% (n = 1,535/1,998) of vapers were also cigarette smokers. In turn, it was found that 95.0% (n = 171/180) of people over 45 years of age were vapers and cigarette smokers. A total of 42.2% (n = 845/1,998) of vapers younger than or equal to 45 years of age regularly consumed marijuana. This proportion dropped

to 27.33% (n = 49/180) in the group over 45 years of age. In the multiple analysis, it was found that age (PR = 0.932; 95% CI, 0.928-0.936; p < 0.001), male sex (PR = 1.27; 95% CI, 1.16-1.39; p < 0.001), cigarette smoking (PR = 6.42; 95% CI, 5.73-7.20; p < 0.001), and marijuana use (PR = 2.36; 95% CI, 2.15-2.59; p < 0.001) were independent variables associated with the risk of vaping (Table 1). A linear relationship was found between the socioeconomic status and the risk of vaping ($\chi^2 = 385.102$; p-trends < 0.01).

From the RIPS database we observed 245 cases of vaping-related disease. Most of the reported cases occurred in men older than 45 years (82.8%). A total of 59 deaths were reported in the period evaluated. Again, mortality mostly occurred among men (p < 0.05) older than 60 years. The departments reporting deaths due to vaping-related disease were Antioquia (69%) and Boyacá (27%), followed by Sucre (1.69%) and Tolima (1.69%). The severity rate was 24.38% (95% CI, 19.40-30.16). We found no association of the independent variables sex, age, and health insurance with mortality (p > 0.05).

Lung injury associated with the use of e-cigarettes or vaping is a reality that represents a health risk in Colombia. It was found that the prevalence of consumption of e-cigarettes was 4.37%. Recent reports from Brazil have shown that 7.3% (95% CI, 6.0-8.9) of people have used e-cigarettes or hookahs at some point in their lives, and young adults have the highest experimentation rates for e-cigarettes (19.7%; 95% CI, 15.1-17.0).⁽⁷⁾ In addition, the departments with the highest tobacco consumption coincided with those with the highest case rates of vaping-related disease. Furthermore, it was possible to determine a greater risk of e-cigarette consumption in men under 45 years of age who also regularly consumed cigarettes or marijuana. This finding is consistent with those reported in the literature, which documented higher consumption in the young adult population.⁽⁸⁾

The concomitant consumption of marijuana and e-cigarettes reported in the 2019 ENCSP data is striking. Our results are consistent with those reported in the literature.⁽⁹⁾ A meta-analysis focusing on evaluating the concomitant usage of e-cigarette and marijuana in adolescents found that those who reported e-cigarette use had 6.04 times greater odds (OR = 6.04; 95% CI, 3.80-9.60) of reporting marijuana use than did those who did not vape.⁽⁹⁾ Some authors have underscored that the current strategy of identifying lung injury associated with e-cigarettes has limitations. The announcement of the inclusion of vaping-related disease under the ICD-10-CM (Clinical Modification) U07.0 in late 2019 was

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Table 1. Factors associated with the use of e-cigarettes or vaping according to the 2019 *Encuesta Nacional sobre Consumo de Sustancias Psicoactivas* (National Survey of Psychoactive Substances).

Factor	Variable	Crude association		Multiple association	
		PR	95% CI	PR	95% CI
Sex	Male	2.304	2.113-2.514	1.278	1.169-1.397
	Female	1		1	
Age, years		0.946	0.943-0.950	0.932	0.928-0.936
Cigarette smoking	Yes	7.247	6.551-8.033	6.423	5.737-7.201
	No	1		1	
Marijuana use	Yes	8.003	7.347-8.715	2.364	2.150-2.599
	No	1		1	
Socioeconomic stratum	1 (lowest)	1		1	
	2	2.020	1.769-2.313	1.950	1.707-2.232
	3	2.766	2.423-3.166	2.650	2.320-3.035
	4	3.738	3.152-4.428	3.473	2.925-4.119
	5	3.892	3.066-4.892	3.756	2.955-4.728
	6 (highest)	4.255	3.168-5.609	4.063	3.020-5.365

PR: prevalence ratio;

overshadowed by the COVID-19 pandemic, reducing the potential for universal uptake.⁽¹⁰⁾

It is nothing new that smoking continues to be a significant risk factor for a considerable number of negative health outcomes. However, smoking is becoming less common and those users are migrating to ENDS or SSWN products. In this sense, it is imperative that Latin-American countries develop a regulatory core that allows the characterization of the supply of products that exist on the market to determine the contents of chemical substances that could have a negative effect on human health. The incorporation of flavors and odors, which might encourage the use of these products in underage populations, should also be prohibited.

An adequate interpretation of these findings should consider that the data analyzed from health service delivery records may have limitations. First, there

are aspects related to the quality of the data, and the lack of dissemination of information about the clinical presentation of vaping-related disease reduces the possibility of its identification. On the other hand, the ICD-10 U07.0 that is reported in the RIPS could have biases and even have been used incorrectly.

AUTHOR CONTRIBUTIONS

JMR, AJI, and JN: study conception and design; and drafting of the manuscript. YT, JMR, and AJI: data analysis. All authors contributed to editing and reviewing of the draft and approved the final version of the manuscript.

CONFLICTS OF INTEREST

None declared.

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