

USE OF ELECTRONIC AND CONVENTIONAL CIGARETTES BY STUDENTS IN THE EXACT SCIENCES AT A PRIVATE UNIVERSITY IN ANÁPOLIS, GOIÁS

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ABSTRACT

Electronic cigarettes (EC) are seen by many young people as a less harmful alternative to traditional cigarettes, mainly due to their attractive design and variety of flavors. However, EC use can result in vaping-induced lung injury (EVALI). The growing popularity of ECs among young people and the associated risks highlight the need for awareness of their adverse effects. This observational, descriptive, and quantitative study analyzed the prevalence of EC use among university students in exact sciences. A total of 180 students were analyzed, of whom 27 used cigarettes, 13 of which were ECs and 14 were other types. Most were male, aged between 21 and 24 years, single, white, and with a monthly income between two and five minimum wages. Civil and Mechanical Engineering had the highest prevalence of EC users, while Software Engineering had the highest number of traditional cigarette smokers. In addition, CE use showed variation in dependence, with a significant proportion in the "Medium" and "Very high" levels, suggesting a higher risk of dependence compared to conventional cigarette smokers. EC use is associated with addiction and anxiety and is more frequent in public places, although most prefer to smoke alone. All EC users used essences, highlighting the importance of flavors for the device's popularity. Finally, EC use among engineering students is significant and raises concerns about the health and socialization of these young people.

Keywords: Electronic Nicotine Delivery Systems; Engineering; Lung Injury.

INTRO

Since the 1950s, the harmful effects of nicotine have been known, but disseminated through advertising (VEDOVATO et al., 2019). In 1996, Law No. 9,294 introduced restrictions on tobacco advertising and required warnings about the risks associated with their use in advertisements in Brazil (BRASIL, 1996). Electronic cigarettes (ECs) were launched in China in 2004 and arrived in the United States in 2017, where they are widely marketed online. Although some of these devices contain nicotine, many young people use them

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consider them less harmful than conventional cigarettes (ROM et al., 2014). In order to profit from this lucrative market, manufacturers use attractive designs and varied flavors to appeal to young people, promoting nicotine addiction and encouraging consumption of both traditional tobacco and electronic devices (SANTOS, 2018). In 2019, lung injury associated with the use of electronic cigarettes, known as EVALI, was identified. Although the exact mechanism of this condition is not yet fully understood, there is evidence that heating the compounds present in vaping products can generate irritating and carcinogenic substances (SOTIRIOS et al., 2020). Considering the increase in use, especially among young people, it is essential to raise awareness about the health risks.

METHODOLOGY

This is an observational, descriptive, and quantitative study conducted to assess the prevalence of CE'S use and other types among university students in the exact sciences. An online questionnaire was made available to students enrolled at a private university in Anápolis, where there were 1,181 students enrolled in 2022. After a sample calculation aimed at predicting the use of electronic cigarettes (dependent variable) in relation to areas of education (independent variable), adjusted for gender and age, with a medium effect size of 0.5, a significance level of 5%, and a sample power of 80%, in addition to 20% for losses. The calculation, performed using G*power software (version 3.1.9.7), found a minimum of 118 students who should be analyzed in the study.

The questionnaire was available via Google Forms. Men and women aged 18 years or older, with no maximum age limit, who were able to understand and answer the questions participated. Incomplete questionnaires, students from other academic fields, minors, and students who did not use electronic cigarettes were excluded. The questionnaire was designed to collect essential data on the use of electronic cigarettes and other products, covering sociodemographic aspects, academic background, and health of participants. Participants were classified based on their smoking habits

: those who did not smoke were directed to the section on the implications of electronic cigarettes, while those who smoke ECs or other types of cigarettes proceeded to specific sections. The sections related to ECs and smoking included the Fagerström Test to assess nicotine dependence. The questionnaire ended with an educational booklet to inform about the effects of electronic cigarettes.

RESULTS

This study included 180 students, of whom 153 did not smoke, 13 smoked ECs, and 14 used other types of cigarettes. Thus, 27 participants were eligible. Regarding the sociodemographic profile (Table 1).

Table 1. Sociodemographic profile of female students who smoke electronic cigarettes and other types of cigarettes.

Gender	n (%) OF ELECTRONIC CIGARETTE SMOKERS E-CIGARETTES	n (%) OF SMOKERS OF OTHER CIGARETTES
Female	3	3 (21.4)
Male	10	11
Age		
Under 18	00	00 (0.0)
18 to 20	06 (46.15)	05
21 to 24	06	0
25 to 30	00	01
Over 30	01 (7.7)	00 (0.0)
Skin color		
White	09	06
Brown	03	04
Black	00	03
Yellow	01	01 (7.1)
Marital status		
Single	05	09
In a relationship	07	04
Stable relationship	01	00 (0.0)
Divorced or separated	00 (0.0)	00 (0.0)
Married	00 (0.0)	01 (7.1)
Widowed	00 (0.0)	00 (0.0)
Income		
Up to 1 minimum wage	00	03 (21.4)
1 salary	01 (7.7)	01
2 to 3 minimum wages	05	04
4 to 5 minimum wages	02	04
6 to 7 minimum wages	0	0
More of 8 minimum wages	03 (23)	02 (14.3)
Works		

Yes	12	12
No	0	02
		N: N

Source: Author

When comparing the use of electronic and conventional cigarettes (Table 1), it was observed that engineering courses, mainly civil and mechanical engineering, had a prevalence of EC smokers. In addition, software engineering showed a significant rate of EC users at 23% and led in the consumption of conventional cigarettes at 35.7% of students who smoked other types of cigarettes. As for Architecture and Urban Planning and Accounting courses, there was consistency in the proportion of CE smokers and other types.

Table 1. Number of students interviewed, subdivided according to courses and distributed according to users of electronic cigarettes and other types.

COURSES	TOTAL NUMBER OF STUDENTS INTERVIEWED	N (OF SMOKERS OF CIGARETTE E-CIGARETTES	N (%) OF SMOKERS OF OTHER CIGARETTES
Architecture and Urban Planning	1	0	02
Accounting	24	01 (7.7)	02 (14.3)
Civil Engineering	4	04	02
Software Engineering	44	03	05
Electrical Engineering	1	0	01
Mechanical Engineering	4	04	02
		N:	N: 14

Source: Author

According to the level of dependence on CE use and other types among students, as assessed by the Fargeström Test (Table 2), it was observed that CE users showed greater variation in degrees of dependence, with a significant proportion in the "Medium" and "Very high" levels, while the majority of conventional cigarette smokers have "Very low" dependence. This suggests that ECUs are more associated with a higher risk of dependence compared to conventional cigarettes.

Table 2. Quantitative data on the level of dependence on electronic cigarettes and other types among students, assessed by the Fargeström Test.

Degree of dependence (adapted Fargeström Test)	n (%) OF ELECTRONIC CIGARETTE SMOKERS	n (%) OF OTHER CIGARETTE SMOKERS
Very low (0-2)	3	11
Low (3-4)	2	2 (14.3)
Medium (5)	4 (30.8)	0 (0.0)
High (6-7)	2 (15.4)	1 (7.1)
Very high (8-9)	2 (15.4)	0 (0.0)
	N:	N:

Source: Author

Regarding the use of CE's and socialization among academics showed that a significant portion (30.7%) of respondents resort to CE for reasons of addiction and anxiety. The third most common reason (23%) indicates that some users simply enjoy the experience. In relation to the social context, they suggest that the use of CE's is a social activity, often occurring in public places, despite the high rate of 69.3% using CE's alone, while only 30.7% do so accompanied by other people. In addition, all respondents use CE's with essence.

CONCLUSION

It was concluded that, in relation to the sociodemographic profile, most participants were male, white, single, and aged between 21 and 24 years. Regarding income, most earned between 2 and 5 minimum wages and were employed. When comparing the use of electronic and conventional cigarettes, it was found that Civil and Mechanical Engineering courses had the highest prevalence of EC use, while Software Engineering led the consumption of conventional cigarettes and had a considerable share of EC users.

In terms of the degree of dependence, the highest scores were recorded among EC users, in contrast to conventional cigarette smokers, who obtained lower scores, indicating that EC use may be associated with a higher risk of dependence. Furthermore, with regard to the impact on socialization, CE use was associated with reasons such as addiction and anxiety, suggesting that a significant portion of users may resort to CE as a coping mechanism for stress or out of habit. In addition, use is more frequent in public places, such as parties and bars, although most users prefer to smoke alone.

users prefer to smoke alone. All CE users reported using essences, which may indicate the relevance of flavor in the popularity and social acceptance of CE compared to conventional cigarettes.

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