*Original Research Article*

# Knowledge and habits of Brazilian dental students about electronic cigarettes


## ABSTRACT

**Aims:**To analyze the knowledge level and consumption habits of dental students about electronic cigarette (EC).
**Study Design:**Cross-sectional observational study.
**Place and Duration of Study:** This study was developed at the Campus VIII Dentistry Course of the State University of Paraibalocated in Araruna, Brazil, between March and December of 2022.
**Methodology:** This studyincluded students over 18 years old, who answered a questionnaire containing 38 questions. Data were analyzed using descriptive and analytical statistics (Pearson's Chi-Square and Fisher's Exact tests), considering statistical significance at $p<0.05$.
**Results:**192 Dental students participated of this research, most of them female, white, with family income above three minimum wages, coming from other cities.Most students are not smokers of any type of cigarette, nor passive smoker, they have already tried EC, but do not have it, knowing a student who has it.In addition, most students reported having low (college seniors- $5^{th}$ to $10^{th}$ periods) and intermediate/high (freshmen- $1^{st}$ to $4^{th}$ periods) knowledge about the electronic device. Students with less knowledge were statistically less prepared ($p<0.001$) to advise their patients about the EC, and less likely to have already tried it ($p<0.001$) and wanting to try it ($p<0.001$). Students were aware that EC is harmful to health, has nicotine and can cause systemic diseases, including oral cancer.However, they were unaware that the device is prohibited from sale and import in Brazil.
**Conclusion:**Although students affirmed that EC is as harmful as conventional cigarette and it can cause diseases such as cancer, their knowledge about this device is still superficial and scarce. Therefore, more advertising campaigns are needed to prevent the device use among young people and about the damage caused to the health of its users.



*Keywords: Electronic Nicotine Delivery Systems. Tobacco Products. Students, Dental.*


## 1. INTRODUCTION

Smoking remains a major impasse for global public health, being the main cause of preventable death. Tobacco use is a risk factor for the development of cancer (mouth, esophagus, larynx, lung and pancreas), in addition to being related to lung and cardiovascular diseases. Thus, smoking was the cause for around six million deaths worldwide [1,2]. In Brazil, there has been a reduction in conventional cigarette smokers in recent years. However, the scenario remains worrying, as it is estimated that around 160,000 deaths per year are from users of various types of tobacco [3].

Over time, many other ways of using tobacco have emerged, such as electronic cigarettes (EC), which are becoming increasingly common among youngers around the

world [4]. EC emerged as a variation of conventional cigarettes, being an alternative to smoking cessation [5]. However, users of these devices mistakenly consider them to be harmless when compared to conventional cigarettes, which ended up spreading their use [4,6].

EC are electronic smoking devices maintained by a battery, containing an aerosolized solution that has chemicals such as nicotine, glycerol, propylene glycol, flavoring agents and dyes [7]. Due to the absence of combustion, EC were considered less harmful than conventional cigarettes, as they do not produce the same harmful chemicals in the lungs [5,8], however, are not free from compromising the health of their users [9].

The aim of this work was to analyze the level of knowledge and consumption habits of Dentistry students at the State University of Paraiba (UEPB) about EC.

## 2. MATERIAL AND METHODS

Cross-sectional observational study, using a questionnaire adapted from Guckert et al. [10], to analyze the consequences and repercussions that the use of EC causes on the systemic and oral health. The sample comprised students of the Dentistry Course at UEPB Campus VIII who answered a questionnaire and signed the Informed Consent Form. Students above 18 years old were included and questionnaires answered incompletely were excluded. The questionnaire presented eight sociodemographic questions and 30 questions related to students' contact and knowledge about the EC. According to the period enrolled, students were divided into freshmen (P1 to P4, pre-clinical periods) and seniors (P5 to P10, clinical periods). Data were analyzed using descriptive and analytical statistics, using the Statistical Package for the Social Sciences (SPSS®) version 26.0 (SPSS Inc., Chicago, USA). Person's Chi-square and Fisher's exact tests were used, considering $p<0.05$. This study was approved by the Research Ethics Committee of UEPB (CAAE 57334222.0.0000.5187), and all bioethical principles were respected, in accordance with Resolution 466/12 of the National Health Council/Ministry of Health.

## 3. RESULTS AND DISCUSSION

### 3.1 Results

From 245 students enrolled in the Dentistry Course, 192 (78.4%) students participated. The majority were female (n=126, 65.9%), with family income above three minimum wages-MW (60.9%), concentrated in the clinical period (n=110, 57.3%), coming from other cities (n=184, 95.8%), self-declared white (n=109, 56.7%), residents with family (n=92, 47.9%) and with non-smokers (n=168, 90.8%), according to Table 1.

Most students never smoked; but they know what is EC and they know someone who has the EC,they have tried it (at least once), but doesn't have the device. The majority answered they would not try EC and that the COVID-19 pandemic could have influenced the start of EC use (Table 2).

Regarding the self-assessment of the level of knowledge about EC, most of freshmen reported having intermediate/high knowledge (52.4%), while the majority of seniors indicated low knowledge (54.5%). A slight majority of freshmen (50.7%) indicated that they prepared to provide guidance regarding the EC. Most of senior students (64.4%) do not feel qualified to guide a patient who questions them. With regard to diseases, positive answers predominated regarding the EC ability to cause both oral and systemic disease (above 80%). There was a predominance of valid answers regarding the use prohibition of EC in closed environments (but most students reported not knowing this information) and that the EC use influenced the reduction of conventional cigarettes (Table 3).

Most of students indicated that EC has a pleasant flavor and aroma, and that it contains carcinogenic and toxic substances in its composition, as well as nicotine. Furthermore, they

responded affirmatively that EC generates passive/secondhand smoke, with their annual cost being more expensive than conventional cigarettes, and their sale in Brazil is not prohibited (Table 4).

Regarding the students' self-reported level of knowledge (low or moderate/high) about EC, there were no statistically significant differences ($p>0.05$) in relation to gender, family income (up to 3MW, above 3MW) and period studied. (incoming or graduating). There was a statistically significant relationship between the level of knowledge about EC and the report of having tried it at least once ($p<0.001$), so that students with a lower level of knowledge were those who had not tried it. Regarding the level of knowledge of the EC, an association was observed with the variables of knowing a friend who has one ($p=0.041$) and trying it, if a friend offers a cigarette ($p<0.001$), so that low knowledge prevailed among those who do not know and would not try it (Table 5).

Table 6 demonstrates the association between students' self-reported knowledge regarding the use of the EC and information about it, with statistically significant associations being observed between the level of knowledge regarding the EC and the variable of preparation to guide patients ($p< 0.001$), with low knowledge predominating among those students who do not feel prepared.

## 3.2 Discussion

The Dentistry Course at UEPB Campus VIII, located in Araruna, Paraiba has 245 students, of which 78.4% (n=192) participated in this research. The vast majority were women, with the majority being more concentrated from the second half of the course onwards (completers). There was a predominance of white students, coming from other cities, with family incomes above three minimum wages. This socioeconomic profile remained similar to another study carried out nine years ago on the same Campus, with 109 Dental students, in which women also predominated (59.6%), with family income above three minimum wages (66%), coming from other cities (89.9%) [11].

Currently, EC are being quite widespread among young people, especially university students [4], so that, in Brazil, it is already being considered a public health problem [12]. Although over 90% of the students in this research are aware of EC, the vast majority have never smoked any type of cigarette, not even conventional cigarettes. However, approximately half of the students stated that they had already tried the EC. Perhaps a single experience with the device was not considered by them, in addition to the fact that this experimentation started at earlier ages, as among freshmen, this percentage was slightly higher.

Most of students had a family income above three MW, with sufficient purchasing power to buy the device. However, most students did not have an EC, nor did they live with anyone who smoked cigarettes. Furthermore, only eight (4.2%) students were from the city of Araruna, with the rest mostly coming from surrounding cities (data not shown). Perhaps this is one of the reasons why they do not start smoking, due to the fact that they live with parents and family and because of their own behavior and orientation, who are not smokers, about the harmful effects of smoking on health. Kim et al. [13], in their systematic review, observed that parental monitoring and support and the mother's higher education level reduced the likelihood of EC use.

Although many self-report little knowledge about EC, the vast majority of students indicated that EC is as harmful as conventional cigarettes, and can cause oral and/or systemic diseases (above 82% positive answers for both diseases), demonstrating knowledge about the compromised health of its users. Over 91% of students were aware that EC contains carcinogenic substances, in addition to containing nicotine in its composition (over 90% of valid positive responses) and increasing the risk of oral cancer. EC has a fewer toxic products compared to conventional cigarettes, however, there are still other harmful products, in addition to nicotine, such as lead, carcinogens and volatile organic compounds [8,9,14]. Nicotine is a component of the EC that brings many harms to the

individual's general health, being responsible for smoking addiction [15]. Through its vasoconstrictive action, nicotine also causes changes in oral tissues, reducing scarring, bleeding and the flow of crevicular fluid, masking periodontal problems [1,8,16]. Daily use of EC is related to a greater chance of experiencing periodontal problems and tooth loss [16], with a statistically significant association between smoking habits (EC and conventional cigarettes) and periodontal disease [1].

EC use is associated with lung diseases; acute poisonings due to accidental or intentional ingestion of nicotine; traumatic injuries, due to explosions and fires, resulting in burns, lacerations and bruises on the lips [5]. EC is also a risk factor for respiratory problems associated with coughing in young smokers, being considered an agent of respiratory and inhalation toxicities [17]. After the American Center for Diseases Control and Prevention (CDC) issued an alert in 2019 about reports of severe lung disease related to EC use, a month later, the Brazilian National Health Surveillance Agency (ANVISA) also issued an alert about these lung diseases caused by EC, with an online electronic form being made available for reporting this type of lung disease [18].

For the vast majority of dental students, the use of EC generates passive smoke (over 90% of positive responses), denoting knowledge regarding this issue, as EC causes exposure to vapor emissions to non-smokers [19]. Passive smokers may experience eye and upper airway irritation, as well as elevations in systolic blood pressure and heart rate, these effects being milder than in active smokers [20].

Regarding the supposed benefits brought about by EC use, when students were asked about its assistance in the process of stopping conventional smoking, of the valid answers, 66.7% of freshmen and only 56.8% of seniors answered affirmatively, confirming that in the initial periods students are better informed than in more advanced periods of the course. However, 28.6% (n=55) of students marked the option 'I don't know' on this question. For Berry et al. [21], the daily EC use associated with conventional cigarettes makes smokers more likely to both reduce the use of conventional cigarettes and stop smoking, at least for 30 days. However, according to the systematic review and meta-analysis by Soneji et al. [17], EC was associated with current conventional smoking, so that those who used EC also used conventional cigarettes and were more likely to be introduced to conventional smoking than those who never smoked, using both cigarettes. The presence of nicotine in the aerosol can lead to chemical dependency among young people, making them even more likely to use conventional cigarettes. In the present work, freshmen were more interested (42.0%) in trying the EC than senior students (36.4%) and a small part (n=39, 40.2%) of the students who had already tried the EC (n=97) at least once, revealed that he intended to use it again (data not shown).

The majority (57.5% of freshmen and 51.7% of seniors) reported that the use of EC in public places was prohibited. However, in this question, a little more than half (50.6%) of the freshmen and 47.3% of the seniors said “I don't know”, so almost half (48.4%) of the students were unaware of this prohibition. In the present survey, the vast majority (68% of freshmen and 80.6% of seniors) answered negatively regarding the prohibitions on the sale and import of EC in Brazil. However, since 2009, through ANVISA Resolution of the Collegiate Board (RCB) No. 46/2009, electronic smoking devices are prohibited in Brazil, both for sale and import, as well as advertising [22]. Furthermore, 39% of students responded “I don’t know” (not valid sample), denoting a lack of information in this regard. In view of the spread of these devices in Brazil, in 2019, ANVISA began a regulatory process to debate and update technical information about EC [16]. In July 2022, ANVISA approved the technical report, confirming the permanence of the ban on EC, in addition to complementary parameters to control the irregular market for EC [23].

Regarding students' self-assessment of their knowledge regarding EC, most of freshmen reported having an intermediate/high level (52.4%) of knowledge, with information about the device passed on to them by professors (69.5%). Most of seniors stated that they had a low level (54.5%) of knowledge about EC, with 71.8% reporting that they had not received

information about its effect on health. This could be justified by the few theoretical classes and the large workload related to clinical activities in the second half of the Dentistry Course, or even by the students forgetting the information received.

A statistically significant relationship was observed between students' low knowledge of the device and not trying the EC and also with the lower probability of wanting to try it, denoting students' fear of the new and unknown. However, it is of fundamental importance that students acquire such evidence-based knowledge, both to avoid the use of the EC itself, and to be able to guide patients regarding device damage, since this low knowledge of students in this research showed a statistically significant relationship with unpreparedness to advise patients regarding EC. This is worrying as EC has a pleasant flavor and aroma [7], making it very inviting for experimentation by those who have never smoked. According to Bertoni and Szklo [24], half of those who use or have used EC at some point in their lives had never smoked.

Despite the small sample, this work provided a profile of behavior and knowledge of Dentistry students from a public university in the interior of the state in relation to the EC, however, one of its limitations was the 'I don't know' option contained in the questionnaire, as when marked, the they were disregarded in the research, as an invalid sample. However, many students marked this option in many questions, truly denoting a lack of knowledge of the subject.

Preventive and educational government campaigns aimed at youngers who have never smoked are extremely important, reinforcing the health harm caused by the EC, as many are unaware or believe in the harmlessness of the device and also about its prohibition in Brazil, as verified in the present work. New research should also be carried out, monitoring EC users to verify its real long-term impact on the health of its users.

## 4. CONCLUSION

The sociodemographic profile of the Dentistry Course at UEPB Campus VIII was made up of the majority of female students, white, non-smokers, with a good family income (>3MW), from other cities, and more concentrated in the clinical periods of the Course.

Freshmen had self-reported intermediate/high level and senior students revealed a low level of knowledge about electronic cigarette. However, they were aware that, even with pleasant aromas and flavors, the device is as harmful as conventional cigarettes, containing toxic substances and it can cause systemic and/or oral diseases, including oral cancer.

However, most students do not feel prepared to guide a patient on the use of EC, especially students with little knowledge on the subject. Furthermore, the vast majority of students were unaware of the ban on these devices in Brazil. It was also verified that the lower the student's knowledge in relation to the EC provided significantly lower chances of future use and having already tried it, denoting that they avoided the product because they did not have a clear understanding of it.

Author D(SAM) designed the study, wrote the protocol, performed the statistical analysis and corrected the manuscript.
All authors read and approved the final manuscript.

## CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

## ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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**Table 1.** Characterization of the sample according the periods from the Dentistry Course. Araruna, PB, Brazil. 2022.

| Variables | Freshmen (P1 - P4) | | Valid sample/Missing sample | Seniors (P5 - P10) | | Valid sample /Missing sample |
|---|---|---|---|---|---|---|
| | n | % | | n | % | |
| **Gender** | | | | | | |
| Female | 50 | 61.7 | 81/1 | 76 | 69.1 | 110/0 |
| Male | 31 | 38.3 | | 34 | 30.9 | |
| **Family Income** | | | | | | |
| < 3Minimum Wage (MW*) | 35 | 44.9 | 78/4 | 38 | 34.9 | 109/1 |
| ≥ 3 MW | 43 | 55.1 | | 71 | 65.1 | |
| **City** | | | | | | |
| Araruna | 4 | 4.9 | 82/0 | 4 | 3.6 | 110/0 |
| Others | 78 | 95.1 | | 106 | 96.4 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Race/Ethnicity** | | | | | | |
| White | 47 | 57.3 | 82/0 | 62 | 56.9 | 109/1 |
| Non-White | 35 | 42.7 | | 47 | 43.1 | |
| **Home** | | | | | | |
| Alone | 37 | 45.1 | 82/0 | 23 | 20.9 | 110/0 |
| With others (family, friends) | 45 | 54.9 | | 87 | 79.1 | |
| **Passive smoker (cigarette, electronic cigarette or narguile)** | | | | | | |
| Yes | 8 | 10.1 | 79/3 | 9 | 8.5 | 106/4 |
| No | 71 | 86.6 | | 97 | 91.5 | |

*1 MW=R$1212.00.

**Table 2.** Characterization of students regarding the Electronic cigarette use. Araruna, PB, Brazil. 2022.

| **Variables** | **Freshmen (P1 - P4)** | | **Valid sample/Missing sample*** | **Seniors (P5 - P10)** | | **Valid sample/Missing sample *** |
|---|---|---|---|---|---|---|
| | **n** | **%** | | **n** | **%** | |
| **Smoker Status (any type)** | | | | | | |
| Smoker/ex-smoker | 19 | 23.5 | 81/1 | 19 | 17.4 | 109/1 |
| Never smoked | 62 | 76.5 | | 90 | 82.6 | |
| **Do you know electronic** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **cigarette?** | | | | | | |
| Yes | 79 | 96.3 | 82/0 | 108 | 99.1 | 109/1 |
| No | 3 | 3.7 | | 1 | 0.9 | |
| **Have you tried (at least once) electronic cigarette?** | | | | | | |
| Yes | 43 | 52.4 | 82/0 | 54 | 49.1 | 110/0 |
| No | 39 | 47.6 | | 56 | 50.9 | |
| **Do you have na electronic cigarette?** | | | | | | |
| Yes | 3 | 3.7 | 82/0 | 1 | 0.9 | 110/0 |
| No | 79 | 96.3 | | 109 | 99.1 | |
| **Do you know someone from Dentistry Course who has electronic cigarette?** | | | | | | |
| Yes | 44 | 53.7 | 82/0 | 80 | 72.7 | 110/0 |
| No | 38 | 46.3 | | 30 | 27.3 | |
| **If a friend offered you na electronic cigarette, would you try it?** | | | | | | |
| Yes | 34 | 42.0 | 81/1 | 40 | 36.4 | 110/0 |
| No | 47 | 58.0 | | 70 | 63.6 | |
| **Could the Covid-19 pandemic influence the beginning of** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **electronic cigarette use?** | | | | | | |
| Yes | 56 | 83.6 | 67/15 | 64 | 71.1 | 90/20 |
| No | 11 | 16.4 | | 26 | 28.9 | |

*Missing Sample: answered "I don't know"

**Table 3.** Students' self-assessment of knowledge about cigarettes and characteristics of electronic cigarette use. Araruna, PB, Brazil. 2022.

| **Varibles** | **Freshmen (P1 - P4)** | | **Valid sample/Missing sample*** | **Seniors (P5 - P10)** | | **Valid sample/Missing sample*** |
|---|---|---|---|---|---|---|
| | **n** | **%** | | **n** | **%** | |
| **How would you rate your level of knowledge about cigarro eletrônico?** | | | | | | |
| Low knowledge | 39 | 47.6 | 82/0 | 60 | 54.5 | 110/0 |
| Intermediate/high knowledge | 43 | 52.4 | | 50 | 45.5 | |
| **Compared to conventional cigarettes, electronic cigarette is:** | | | | | | |
| Most harmfull | 14 | 17.3 | | 14 | 13.5 | |
| Equally harmfull | 42 | 51.9 | 81/1 | 62 | 56.4 | 104/6 |
| Less harmfull | 25 | 30.9 | | 28 | 25.5 | |
| **Did you receive any information during your** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **course (from a professor) about the effects of electronic cigarette use on health?** | | | | | | |
| Yes | 57 | 69.5 | 82/0 | 31 | 28.2 | 110/0 |
| No | 25 | 30.5 | | 79 | 71.8 | |
| **Do you, as a student and future dental surgeon, feel prepared to guide a patient who asks you about electronic cigarette?** | | | | | | |
| Yes | 37 | 50.7 | 73/9 | 32 | 35.6 | 90/20 |
| No | 36 | 49.3 | | 58 | 64.4 | |
| **Can electronic cigarette use cause any oral or systemic disease?** | | | | | | |
| Yes, it causes oral disease | 6 | 7.8 | | 7 | 6.8 | |
| Yes, it causes systemic disease | 5 | 6.5 | | 10 | 9.7 | |
| Yes, it causes both diseases | 66 | 85.7 | 77/5 | 85 | 82.5 | 103/7 |
| It does not cause disease | 0 | 0,0 | | 1 | 1.0 | |
| **Is it allowed to smoke electronic cigarette in places where conventional cigarettes are prohibited, such as closed and public places?** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Yes | 17 | 42.5 | 40/42 | 28 | 48.3 | 58/52 |
| No | 23 | 57.5 | | 30 | 51.7 | |

*Missing Sample: answered "I don't know."

**Table 4.** Students' self-assessment of knowledge about electronic cigarettes. Araruna, PB, Brazil. 2022.

| **Variables** | **Freshmen (P1 - P4)** | | **Valid sample/Missing sample*** | **Seniors (P5 - P10)** | | **Valid sample/Missing sample*** |
|---|---|---|---|---|---|---|
| | **n** | **%** | | **n** | **%** | |
| **Electronic cigarette can help people stop smoking conventional cigarette.** | | | | | | |
| Yes | 40 | 66.7 | 60/22 | 42 | 56.8 | 74/36 |
| No | 20 | 33.3 | | 32 | 43.2 | |
| **Electronic cigarette has a pleasent taste and aroma.** | | | | | | |
| Yes | 54 | 90.0 | 60/22 | 68 | 88.3 | 77/33 |
| No | 6 | 10.0 | | 9 | 11.7 | |
| **Electronic cigarettes have carcinogenic substances in their composition.** | | | | | | |
| Yes | 56 | 94.9 | 59/23 | 68 | 91.9 | 74/36 |

| | | | | | | |
|---|---|---|---|---|---|---|
| No | 3 | 5.1 | | 6 | 8.1 | |
| **Electronic cigarettes may contain nicotine in their composition.** | | | | | | |
| Yes | 63 | 90.0 | 70/12 | 71 | 92.2 | 77/33 |
| No | 7 | 8.5 | | 6 | 7.8 | |
| **Electronic cigarettes generate passive/secondhand smoke.** | | | | | | |
| Yes | 57 | 98.3 | 58/24 | 70 | 90.9 | 77/33 |
| No | 1 | 1.7 | | 7 | 9.1 | |
| **The annual cost of electronic cigarettes is cheaper than than conventional cigarettes.** | | | | | | |
| Yes | 9 | 23.7 | 38/44 | 8 | 16.7 | 48/62 |
| No | 29 | 76.3 | | 40 | 83.3 | |
| **In Brazil the sale and import of electronic cigarettes is prohibited.** | | | | | | |
| Yes | 16 | 32.0 | 50/32 | 13 | 19.4 | 67/43 |
| No | 34 | 68.0 | | 54 | 80.6 | |
| **Electronic cigarette increases the risk of oral cancer.** | | | | | | |
| Yes | 62 | 96.9 | 64/18 | 80 | 97.6 | 82/28 |

| | | | | |
|---|---|---|---|---|
| No | 2 | 3.1 | 2 | 2.4 |

*Missing Sample: answered "I don't know."

**Table 5.**Association between the self-reported knowledge of dentistry students regarding the use of electronic cigarettes and their experiences of using them. Araruna, PB, Brazil. 2022.

| **Variable** | **Electronic Cigarette** | |
|---|---|---|
| | **Low knowledge n (%)** | **Moderate/High knowledge n (%)** |
| **Smoker Status (any type)** | | |
| Smoker/ex-smoker | 15 (38.5) | 24 (61.5) |
| Never smoked | 83 (54.6) | 69 (45.4) |
| ***p-value*** | 0.072* | |
| **Do you know electronic cigarette?** | | |
| Yes | 95 (50.5) | 93 (49.5) |
| No | 4 (100.0) | 0 (0) |
| ***p-value*** | 0.122** | |
| **Have you tried (at least once) electronic cigarette?** | | |
| Yes | 33 (33.7) | 65 (66.3) |
| No | 67 (70.5) | 28 (29.5) |
| ***p-value*** | **<0.001** | |
| **Do you have na electronic cigarette?** | | |
| Yes | 0 (0) | 4 (100.0) |

| | | |
|---|---|---|
| No | 100 (52.9) | 89 (47.1) |
| ***p-value*** | 0.052** | |
| **Do you know someone from Dentistry Course who has electronic cigarette?** | | |
| Yes | 58 (46.4) | 67 (53.6) |
| No | 42 (61.8) | 26 (38.2) |
| ***p-value*** | **0.041*** | |
| **If a friend offered you an electronic cigarette, would you try it?** | | |
| Yes | 26 (34,7) | 49 (65,3) |
| No | 74 (63,2) | 43 (36,8) |
| ***p-value*** | **<0.001*** | |
| **Could the Covid-19 pandemic influence the beginning of electronic cigarette use?** | | |
| Yes | 54 (45,0) | 66 (55,0) |
| No | 24 (63,2) | 14 (36,8) |
| ***p-value*** | 0.051* | |

*Pearson's Chi-Square Test. **Fisher's Exact Test.

**Table 6** – Association between students' self-reported knowledge regarding the use of electronic cigarettes and information about it. Araruna, PB, Brazil. 2022.

| **Variables** | **Electronic Cigarette** | |
|---|---|---|
| | **Low knowledge n (%)** | **Moderate/High knowledge n (%)** |

| | | | |
|---|---|---|---|
| **Compared to conventional cigarettes, electronic cigarette is:** | | | |
| Most harmfull | 12 (42.9) | | 16 (57.1) |
| Equally harmfull | 57 (54.8) | | 47 (45.2) |
| Less harmfull | 27 (50.0) | | 27 (50.0) |
| ***p-valor*** | | 0.515* | |
| **Did you receive any information during your course (from a professor) about the effects of electronic cigarette use on health?** | | | |
| Yes | 39 (44.3) | | 49 (55.7) |
| No | 61 (58.1) | | 44 (41.9) |
| ***p-valor*** | | 0.056* | |
| **Do you, as a student and future dental surgeon, feel prepared to guide a patient who asks you about electronic cigarette?** | | | |
| Yes | 20 (29.0) | | 49 (71.0) |
| No | 68 (71.6) | | 27 (28.4) |
| ***p-valor*** | | **<0.001*** | |
| **Can electronic cigarette use cause any oral or systemic disease?** | | | |
| Yes, it causes oral disease | 6 (46.2) | | 7 (53.8) |
| Yes, it causes systemic disease | 7 (46.7) | | 8 (53.3) |
| Yes, it causes both diseases | 78 (51.7) | | 73 (48.3) |
| It does not cause disease | 0 (0) | | 1 (100.0) |
| ***p-valor*** | | 0.843** | |
| **It is allowed to smoke electronic cigarette in places where conventional cigarettes are prohibited such as closed and public places.** | | | |
| Yes | 19 (42.2) | | 26 (57.8) |
| No | 27 (50.9) | | 26 (49.1) |
| ***p-valor*** | | 0.389* | |

| | | | |
|---|---|---|---|
| **Electronic cigarette can help people stop smoking conventional cigarette.** | | | |
| Yes | 33 (39.8) | | 50 (60.2) |
| No | 29 (55.8) | | 23 (44.2) |
| ***p-valor*** | | 0.069* | |
| **Electronic cigarette has a pleasent taste and aroma.** | | | |
| Yes | 54 (43.9) | | 69 (56.1) |
| No | 8 (53.3) | | 7 (46.7) |
| ***p-valor*** | | 0.488* | |

*Pearson's Chi-Square Test. **Fisher's Exact Test.