ORIGINAL ARTICLE

REVISTA ENFERMAGEM ATUAL IN DERME

ELECTRONIC CIGARETTE CONSUMPTION BY UNDERGRADUATE HEALTH STUDENTS AT A PRIVATE UNIVERSITY

CONSUMO DE CIGARRO ELETRÔNICO POR GRADUANDOS EM CURSOS DE SAÚDE DE UMA UNIVERSIDADE PRIVADA

CONSUMO DE CIGARRILLOS ELECTRÓNICOS POR ESTUDIANTES UNIVERSITARIOS DE CURSOS DE SALUD EN UNA UNIVERSIDAD PRIVADA

Gabriel Nivaldo Brito Constantino[1]
Milena Maria da Silva Acioli[2]
Camila de Sousa Martins Isaiais[3]
Ane Raquel de Oliveira[4]
Emmanuelly Soares Barbosa da Silva[5]
Wanderson Alves Ribeiro[6]
Bruna Porath Azevedo Fassarela[7]
Keila do Carmo Neves[8]

[1] Nursing Student. Universidade Iguaçu. Nova Iguaçu, Brazil. ORCID: https://orcid.org/0000-0002-9129-1776
[2] Nursing Student. Universidade Iguaçu. Nova Iguaçu, Brazil. ORCID: https://orcid.org/0000-0002-4558-8333
[3] Nursing Student. Universidade Iguaçu. Nova Iguaçu, Brazil. ORCID: https://orcid.org/0009-0003-9108-6670
[4] Nurse. Universidade Iguaçu. Nova Iguaçu, Brazil. Orcid: https://orcid.org/0000-0003-0242-1856;
[5] Nurse. Universidade Iguaçu. Nova Iguaçu, Brazil. Orcid: https://orcid.org/0009-0004-2357-7205;
[6]Nurse. Mestre e Doutor pelo Programa Acadêmico em Ciências do Cuidado em Saúde da Universidade Federal Fluminense (PACCS/EEAAC). Docente da Universidade Iguaçu. Nova Iguaçu, Brazil. ORCID: https://orcid.org/0000-0001-8655-3789
[7]Nurse; Doctor. Mestre em Urgência e Emergência pela Universidade Severino Sombra. Docente da Universidade Iguaçu. Nova Iguaçu, Brazil. ORCID: https://orcid.org/0000-0002-1400-4147
[8] Enfermeira. Mestre e Doutora em Enfermagem pela Escola de Enfermagem Anna Nery da Universidade Federal do Rio de Janeiro (EEAN-UFRJ). Docente da Universidade Iguaçu. Nova Iguaçu, Brazil. ORCID: https://orcid.org/0000-0001-6164-1336

Corresponding Author
Gabriel Nivaldo Brito Constantino
Rua Dezesseis, s/n, lt 03 qd 01 – Boa Esperança, Belford Roxo – Brazil. CEP: 26.143-390 - fone: +55(21) 99999-0020 - E-mail: gnbconstantino@gmail.com

Submission: 11-12-2024
Approval: 11-03-2025

ABSTRACT

Introduction: Smoking is a chronic disease that peaked in the 1990s due to the assimilation of cigarette use into luxury. In the current context, this problem is perpetuated, however, through the use of the Electronic Cigarette (EC), a device that emerged with the intention of helping to end smoking, however, it was not the impact obtained. **Methodology:** This study was carried out using descriptive exploratory research and field research with a mixed approach. **Objective:** The aim was to evaluate the epidemiological and consumption profile of undergraduate electronic cigarette users from the health courses of a private university in Metropolitana I. **Results:** Of the 203 participants, 44% were white; 72% were female; 33% were aged between 21 and 25; 83% had never smoked; 17% had used ECs; 4% said they intended to use ECs; 40% were nursing students. **Conclusion:** Due to the low level of participation by the other courses taking part in this study, it was difficult to draw up a reliable epidemiological profile, so we decided to draw up a partial profile so that we could get a realistic picture when the study continues in 2025. In this way, the following profile was partially drawn up: The EC users at the Na Metropolitana I Private University are female, white, belong to the Nursing course and are within the 21 to 25 age group. It should be noted that these students had never used conventional cigarettes.
Keywords: University Student; Smoking; Electronic Cigarette.

RESUMO

Introdução: O Tabagismo é uma doença crônica que teve seu ápice na década de 90 devido a assimilação do uso do cigarro ao luxo. No contexto atual, esta problemática se perpetua, porém, por meio do uso do Cigarro Eletrônico (CE), dispositivo que surgiu com o intuito de auxiliar o fim do tabagismo, porém, não foi o impacto obtido. **Metodologia:** Este estudo foi realizado por meio de uma pesquisa exploratória descritiva, sendo realizada pesquisa de campo com abordagem mista. **Objetivo:** Teve-se como objetivo avaliar o perfil epidemiológico e de consumo de graduandos usuários de cigarro eletrônico dos cursos de saúde de uma universidade privada na Metropolitana I. **Resultados:** Tendo-se 203 participantes, pode-se verificar: 44% dos participantes são brancos; 72% pertencem ao sexo feminino; 33% possuem de 21 a 25 anos de idade; 83% nunca fumaram; 17% fizeram uso de CE; 4% afirmam ter a pretensão de utilizar CE; 40% são do curso de Enfermagem. **Conclusão:** Devido a baixa adesão por parte dos demais cursos participantes desta pesquisa, dificultou-se traçar um perfil epidemiológico fidedigno, logo, optou-se por traçar um parcial para que se pudesse tangenciar um verossímil na continuação da pesquisa que ocorrerá no ano de 2025. Deste modo, traçou-se, parcialmente, o seguinte perfil: Os usuários de CE da Universidade Privada Na Metropolitana I são do sexo feminino, brancos, pertencentes ao curso de Enfermagem e estão dentro da faixa etária de 21 a 25 anos. Salienta-se que estes nunca usaram cigarro convencional.
Palavras-chave: Estudante Universitário; Tabagismo; Cigarro Eletrônico.

RESUMEN

Introducción: El tabaquismo es una enfermedad crónica que tuvo su auge en la década de los 90 debido a la asimilación del uso del cigarrillo al lujo. En el contexto actual, este problema se perpetúa, sin embargo, a través del uso del Cigarrillo Electrónico (CE), un dispositivo que surgió con la intención de ayudar a acabar con el tabaquismo, sin embargo, no fue el impacto obtenido. **Metodología:** Este estudio se realizó mediante investigación exploratoria descriptiva e investigación de campo con enfoque mixto. **Objetivo:** El objetivo fue evaluar el perfil epidemiológico y de consumo de los usuarios de cigarrillos electrónicos de pregrado de los cursos de salud de una universidad privada de la Metropolitana I. **Resultados:** De los 203 participantes, 44% eran blancos; 72% eran mujeres; 33% tenían entre 21 y 25 años; 83% nunca habían fumado; 17% habían usado AE; 4% dijeron que pensaban usar AE; 40% eran estudiantes de enfermería. **Conclusión:** Debido a la escasa participación del resto de cursos participantes en esta investigación, era difícil elaborar un perfil epidemiológico fiable, por lo que optamos por elaborar uno parcial para poder tener una visión realista cuando la investigación continúe en 2025. De este modo, se elaboró parcialmente el siguiente perfil: Los usuarios de AE de la Universidad Privada Na Metropolitana I son mujeres, de raza blanca, pertenecen a la carrera de Enfermería y se encuentran dentro de la franja etaria de 21 a 25 años. Cabe señalar que estos estudiantes nunca habían consumido cigarrillos convencionales.
Palabras clave: Estudiante Universitario; Tabaquismo; Cigarrillo Electrónico.

REVISTA ENFERMAGEM ATUAL IN DERME

INTRODUCTION

Smoking is a chronic disease caused by nicotine addiction. In the 1990s, cigarettes reached their peak, which led to their excessive use because they were associated with luxury, and this image was replicated incessantly in the cinematic universe[1]

Nowadays, we can see the return of this problem through the use of electronic cigarettes (EC) which, like their predecessor, are seen as a luxury among young people, as well as being associated with fun and entertainment1. This device is classified as an Electronic Smoking Device (ESD) and is popularly known by different names: vapes, hookah-pens, e-hookah, e-cigars and mods.[2]

This is in response to the harms and high mortality rate related to tobacco, since e-cigarettes have emerged as an alternative product for those who want to quit smoking. In addition, they have gained popularity among conventional smokers, pregnant women and even young people, as they are marketed as a therapeutic option, given that marketing exposes them as a healthier and safer alternative, and consequently they are more widely accepted by society.[2-3]

The EC was created in 1963 by Herbert A. Gilbert and patented as a "non-tobacco cigarette device" with the aim of replacing the habit of smoking by burning tobacco with safer and "cleaner" air, such as steam. However, due to the lack of technology at the time, it was never produced.[3]

In 2003, Chinese pharmacist Hon Link developed the first devices called *Ruyan*, a term that means "substitute for smoking" in Chinese. Now patented, the ECs were launched and quickly and extensively conquered the world market.[3-5]

This device has gained popularity, which has enabled it to evolve technologically in both design and function, allowing it to be classified into four generations. All the products in the different categories are available on the market today, but they are adapted to the most up-to-date standard, even the oldest ones, as far as their structure allows. The devices can be divided into open (rechargeable) or closed (non-rechargeable) systems and come in different shapes, sizes and colors.[4]

Although there are different models of Electronic Cigarette on the market, differing in design, mechanism and nomenclature, they all have the following structures in common: a mouthpiece, the battery, the atomizer and the space for the liquid.[6]

It should be noted that the solution used in electronic cigarettes - known as e-liquid or e-juice - is made up of different substances. The base consists of a combination of propylene glycol and glycerin in purified water. The typical volume fraction is 20% propylene glycol to 80% glycerin, although this varies considerably from one brand to another. During use, the user absorbs the vapor generated from the e-liquid, solvents, nicotine, water, flavorings and other additives.[7]

Unlike conventional cigarettes, which burn continuously at high temperatures for the entire duration of use, e-cigarettes go through

REVISTA ENFERMAGEM ATUAL IN DERME

thermal cycles of heating and cooling. The device starts at room temperature, while when the heating element is activated, the heat reaches the boiling point of the liquid and its release in the form of vapor.[8]

After the inhalation is complete, no energy is supplied to the heating element and the wick, so the temperature decreases progressively. At the same time, the liquid is again supplied to the heating element and the wick, which lowers its temperature even more.[8] Currently, devices can be divided into open (rechargeable) or closed (non-rechargeable) systems and come in different shapes, sizes and colors.[4]

The commercial strategy has been projecting the increasingly innovative image of electronic cigarettes, given that a series of accessories allow them to be customized according to the needs and desires of the consumer. In addition, the availability of liquids with a wide variety of flavors has attracted the attention of young people (smokers and non-smokers) who are driven by curiosity and the desire for new experiences.[4]

Smoking is a process that involves both psychosocial and environmental factors and is currently considered a major public health problem. Smoking and passive exposure to tobacco are important risk factors for the main chronic diseases that affect tobacco users, such as oral cancer, lung diseases and cardiovascular diseases. It is estimated that 8 million people die each year from diseases related to tobacco use, yet despite this indicator, approximately 1.1 billion people in the world are smokers today.[9]

In Brazil, although there has been a reduction in the number of smokers in the last ten years, the rate of smokers over the age of 18 is 9.8%, which corresponds to approximately 22 million Brazilians, with rates of 12.3% among men and 7.7% among women.[7]

On the other hand, it has been noted that the use of electronic cigarettes is increasing exponentially around the world, with an estimated 68 million people using them today[8] What's more, the global market for this product is expected to exceed 50 billion dollars by 2025.[7; 9]

Chronic exposure to the substances produced by e-cigarettes, at a much higher level than in the air, appears to pose a health risk to users, as well as to people passively exposed to the vapor.[10] Regarding their medium and long-term effects on human health, there are still no significant conclusions due to the short time the devices have been on the market.

Regarding lung diseases, the literature shows that there is still not enough data to determine whether or not e-cigarettes cause respiratory diseases in humans. It is known that mild respiratory symptoms are commonly reported by their users (such as throat/mouth irritation, headache, cough and nausea) which tend to cease with time of use.[11]

In addition, there is a possibility of lung irritation in people who are hypersensitive to certain chemicals.[8] Recent evidence has reported bronchial inflammation, lung damage,

REVISTA ENFERMAGEM ATUAL IN DERME

as well as systemic inflammation and alterations in defense cells in individuals exposed to e-cigarettes.[11] Taken together, the findings suggest that pulmonary alterations can be induced by e-cigarette use in the short term.

Thus, considering the knowledge and availability of EC among university students and the general population, it is essential to have interventions that aim to encourage healthy habits among students and inhibit the adoption of this type of device, ultimately avoiding an increase in the consumption of other products that also release inhaled nicotine, including tobacco derivatives.[12]

Therefore, this study aims to analyze the epidemiological and consumption profile of undergraduate electronic cigarette users in the health courses of a Private University in Metropolitan I so that we can propose, based on the literature, possible strategies for tackling and reducing electronic cigarette consumption by undergraduates in health courses.

METHODOLOGY

Type of Study

This is a descriptive exploratory study, using field research and a mixed approach as a source of information on "ELECTRONIC CIGAREE CONSUMPTION BY GRADUATES IN HEALTH COURSES AT A PRIVATE UNIVERSITY" and also to capture different experiences related to the proposed theme.

According to Lakatos and Marconi[13] exploratory studies are empirical research investigations whose objective is the formulation of questions or a problem, in which systematic procedures are generally employed to obtain empirical observations or to analyze data, in which both quantitative and qualitative descriptions of the object of study are often obtained.

According to Minayo[14], exploratory research should follow the following steps: choosing the topic of investigation; delimiting the problem, defining the object and objective, building the conceptual theoretical framework, data collection instruments and field exploration.

According to Leopardi *et al.*[15] field research is defined as research carried out in cultural settings where social interaction is practiced. When carrying out a field study, the researcher seeks to deeply evaluate the practices, behaviors, beliefs and attitudes of people or groups while they are in action in real life.

For a better understanding of this type of research, Creswell[16-17] explains that mixed methods are a combination of quantitative and qualitative research methods, seeking to answer open and closed questions. In this type of research, multiple forms of data are used, covering all possibilities, including statistical and textual analysis.

Indeed, according to Creswell e Clarck[18], in mixed methods research the researcher implements qualitative and quantitative elements at the same time, the two elements have equal emphasis and the separate results converge (QUAN+ QUAL).

In this sense, Creswell[17] informs us that the concept of bringing together different

REVISTA ENFERMAGEM ATUAL IN DERME

methods gives the researcher greater observation of the event, whether they are a multiple action of quantitative methods, or multiple qualitative methods, or the use of both.

It should be noted that the quantitative data in this research was obtained from closed questions, while the qualitative data was obtained from open questions, both from the same questionnaire.

Ethical aspects of research

In compliance with the ethical principles of National Health Council (CNS) Resolution no. 466/2012[19] which ensures the rights and duties of the scientific community and research subjects, as well as respecting the principles of justice, equity and safety, this project was submitted to the Research Ethics Council (CEP) of Iguaçu University with approval according to CAAE 75264023.0.0000.8044; and opinion number 6.492.149, on November 7, 2023.

In compliance with the legislation on research involving human beings, the research participants signed the Free and Informed Consent Form, after being informed about the objectives of the research, voluntary participation, the right to anonymity and confidentiality of the data provided, as well as the right to leave the research at any stage, if they so wished.

Procedures have been planned to ensure confidentiality and privacy, as well as image protection and non-stigmatization, guaranteeing that the information will not be used to the detriment of the individuals, including in terms of self-esteem, prestige and/or economic and financial gain. In order to preserve the identity of the participants, common but fictitious names will be used to identify them.

Research field

The research was carried out at the Iguaçu University in Nova Iguaçu, located in the Baixada Fluminense. It is worth noting that the institution has all the physical and functional structure, technology, human resources, management models and assistance needed to carry out the project.

Research participants

The participants were undergraduates from the Nursing, Physical Education, Aesthetics, Pharmacy, Physiotherapy, Medicine, Nutrition and Dentistry courses, as they met the inclusion criteria and freely and spontaneously agreed to take part in this research.

It is worth mentioning that the inclusion criteria for the participants were: Being over eighteen and belonging to one of the above-mentioned courses.

Exclusion criteria: Students whose course was suspended during the research.

Data collection

The questionnaire already applied in a previous study at UFSC[20] was used as a basis, with modifications and additional questions inserted based on the analysis of questionnaires found in the preliminary literature review.[4; 21] The questionnaire (Appendix B) was adapted to the online model of the Google Forms platform and sent via a link for participants to access.

The coordinators of the respective courses were informed about the research and

REVISTA ENFERMAGEM ATUAL IN DERME

were given access to the project and the questionnaire after signing a letter of consent. Therefore, when data collection began, they were asked to send the invitation to undergraduates via WhatsApp groups, these being class groups. The undergraduates were invited to take part in the research with a brief explanation of the subject and the objectives of the research in question.

The Informed Consent Form (ICF - Appendix A) was presented prior to the questionnaire, with a link to access and download the PDF file, and participants were advised to file the document for future reference if necessary. Participants were also asked to provide their e-mail addresses, so that a specific form could be identified (and the data excluded from the sample) in the event of any withdrawal, and a copy of the answers could be sent to the participant. Access to the questionnaire was only possible after acceptance of the ICF; in the event of disagreement, the form directed the participant to a thank-you and closing page.

As for data collection, demographic data was obtained and the semi-structured interview technique was used which, according to De Souza Minayo, Deslandes e Gomes[22], "It's the most common procedure in fieldwork. Through this technique, the researcher seeks to obtain information contained in the speech of the social actors". Gonzales, Beck and Leopardi[15] corroborate that "the interview in qualitative research is an important resource and can be constructed in different ways, but always seen as a social encounter".

In addition to demographic data, the questionnaire has twenty closed questions (multiple choice) and one open question. The variables surveyed were: course; age; gender; smoking status; electronic cigarette user; knowledge of electronic cigarettes; curiosity, intention and influence of friends on possible use; comparison between conventional and electronic cigarettes; perception of knowledge of electronic cigarettes; knowledge of device legislation in Brazil; knowledge of lung damage associated with electronic cigarette use; knowledge of device sales in Brazil; knowledge of the device as a smoking cessation method; flavors of the devices; passive smoking through e-cigarettes; annual financial cost of the device compared to conventional cigarettes; presence of carcinogenic substances and nicotine in the composition of the product; information received and opportunity for discussion on the subject during graduation; opinion on the role of health professionals in knowledge of the devices, recommendation for smokers and preparation of professionals in terms of patient orientation regarding e-cigarettes.

Treatment of the data collected

The data collected was retrieved from the Google platform and organized in a Microsoft Excel 2016® spreadsheet, and it was up to the researcher to export and save the spreadsheet. The answers were organized into groups, established by the courses in which the students were enrolled.

The questionnaire data was organized and analyzed based on the following breakdown:

REVISTA ENFERMAGEM ATUAL IN DERME

- Demographic data: age, gender, course, smoking status and e-cigarette user;
- Curiosity, intention and influence on the use of electronic cigarettes;
- Perception and knowledge about e-cigarettes (classification of their knowledge, comparison between conventional cigarettes and e-cigarettes, health risks, legislation in Brazil, smoking cessation, flavors, passive smoking and e-cigarettes, cost, presence of carcinogenic substances and nicotine);
- Survey on the knowledge received during each course and the opportunity to discuss the subject;
- Opinion on the importance of knowledge as a health professional on the subject, recommendation for use and safety in advising patients about the device.

After collecting the data, the interviews were analyzed and the results were presented and described, followed by a discussion of the study variables, in conjunction with the theoretical framework, and the analysis was carried out using frequency and percentage distribution.

The quantitative data was arranged appropriately in a spreadsheet and treated with simple statistics.

Since the research included recording the answers to the variables in the questionnaire and the interview with the respondent's free speech, the results were analyzed using a quantitative and qualitative approach.

In the quantitative approach, the descriptive analysis of the data was based on graphs, frequency distributions, cross-tabulations and the calculation of descriptive statistics, with the aim of summarizing and characterizing the profile of undergraduates who use electronic cigarettes.

As far as the qualitative data is concerned, the recorded portions of the interviews were transcribed and identified with fictitious names and, in turn, were printed out to facilitate the reading, organization and analysis of the information. Thus, a floating reading was initially carried out in order to get to know the material and make a first impression that would provide familiarity with the data.

In this sense, after the first contact with all the interviews, a more detailed reading of each interview was carried out in order to identify the emerging themes in each one. This procedure was repeated several times until the researcher was certain that the themes emerging from the statements had been identified. In view of this, Polit, Beck e Hungler[23] state that researchers who use a qualitative approach must often read their narrative data in search of meaning and a deeper understanding.

After identifying the themes that emerged from each interview, similar themes that appeared more frequently in the subjects' speeches were identified. At this stage, the themes were highlighted by clipping sentences

REVISTA ENFERMAGEM ATUAL IN DERME

from the speeches, identified with fictitious names, as Bardin[24] defines this action as transforming the raw text data into coded data.

Next, to analyze the information, we used thematic content analysis which, according to Bardin[24], makes it possible to discover the nuclei of meaning that make up the communication and whose frequency can mean something for the chosen analytical objective. Thus, according to Bardin[24], thematic analysis "is transversal", meaning that it cuts out all the interviews using a grid of categories projected onto the content. It does not take into account the dynamics and organization, but the frequency of the themes extracted from the sets of speeches, considered segmentable and comparable data".

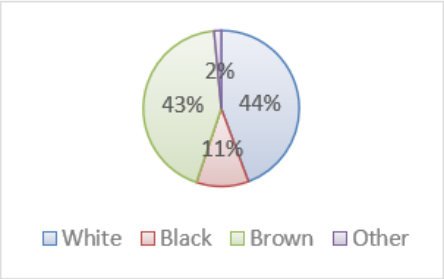
In turn, after reading the participants' reports on their level of knowledge, the themes identified were described in order to construct the results and draw up the categories of analysis.

RESULTS AND DISCUSSION

The study collected 203 interviews by filling in a form on Google Forms. In order to avoid any possibility of identifying and associating the history of the research participants, the information obtained was not identified.

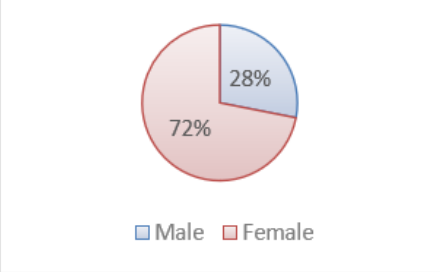
When analyzing the data collected in the interviews, the following answers were obtained:

Graph 1 - Presentation of the percentage of ethnicity of the interviewees. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

Graph 2 - Percentage of interviewees' gender. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.

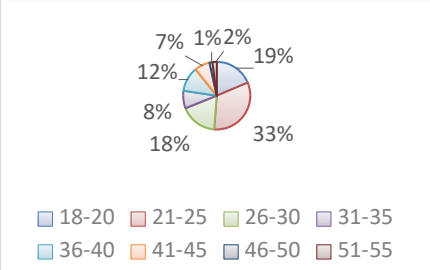


Source: Authors' production (2024).

REVISTA ENFERMAGEM ATUAL IN DERME

Analyzing the data obtained, it was found that of the 203 participants in the survey, 146 are female, while only 57 are male, which represents approximately 28% of the total. Similarly, 90 (44%) participants consider themselves to be white, 22 black (11%), 88 brown (43%) and 3 (2%) of another ethnicity, which was not an option in the answer alternatives for this question.

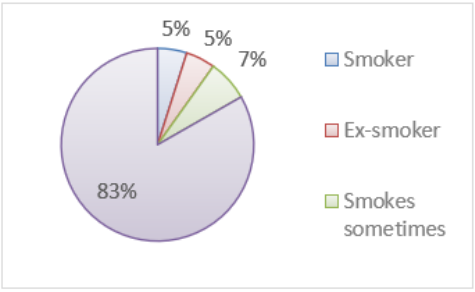
Graph 3 - Presentation of the percentage of the participants' age group. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

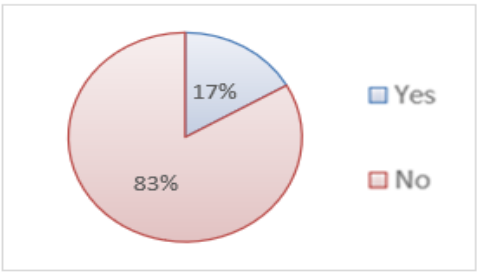
Regarding the age range of the participants in the survey, it was noted that there is a predominance of students aged between 18 and 30, totaling 104 students from the courses chosen for data collection, with a higher concentration among those aged between 21 and 25.

Graph 4 - Percentage of participants who smoke. Nova Iguaçu, Rio de Janeiro, Brazil. 2024



Source: Authors' production (2024).

Graph 5 - Percentage of participants who used electronic cigarettes. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

REVISTA ENFERMAGEM ATUAL IN DERME

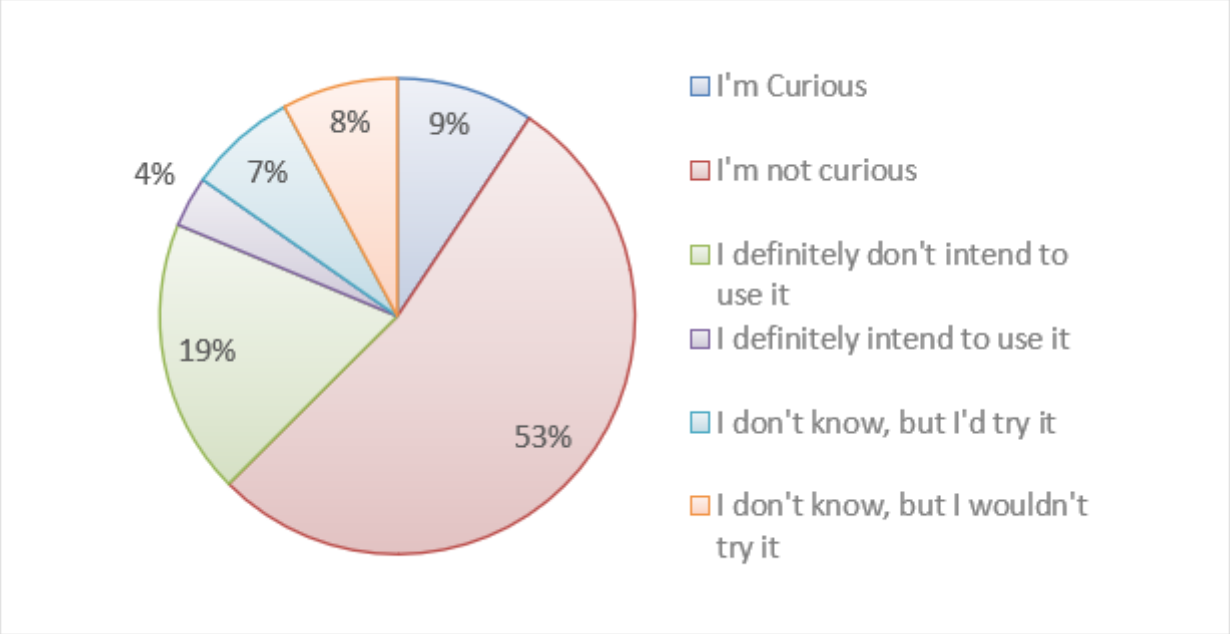
In addition, the data collected showed that 169 participants (83%) had never used cigarettes, with only 10 (5%) smokers, 10 (5%) ex-smokers and 14 (7%) claiming to smoke sometimes.

Furthermore, among the 203 participants, 34 (17%) claimed to have used electronic cigarettes at least once. However, a more in-depth analysis of this data revealed that 17 (50%) participants who had used ECs had never used conventional cigarettes before.

In addition, it was noted that the lowest number of e-cigarette users was among smokers, with a total of 03 participants, while those who considered themselves ex-smokers totaled 04 and those who smoked "sometimes" totaled 10. This shows that there is a greater tendency for those who don't smoke to use e-cigarettes, which may be a reflection of what was said earlier about the use of this device as a means of leisure and socialization among young people.

Continuing the data analysis, the following question was put to the participating academics: "Are you curious about the sensation of smoking an electronic cigarette or do you want to try it?". The following data was obtained:

Graph 6 - Percentage of participants who are curious about or intend to use an electronic cigarette. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

As you can see, 108 participants (53%) are not curious about using electronic cigarettes, and 38 participants (19%) definitely do not intend to use them. In addition, 19 are curious, 15 don't know where they stand on this issue, but would use it if they had the opportunity.

REVISTA ENFERMAGEM ATUAL IN DERME

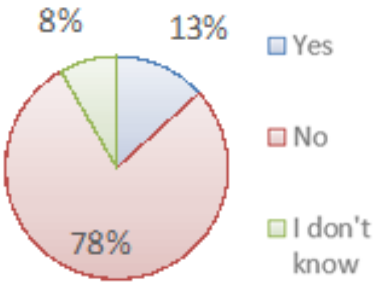
Only 7 participants (4%) intend to use electronic cigarettes. Although this figure may seem tiny, given that it consists of only 4% of those interviewed, nevertheless, as philosopher Karl Marx[25] put it, man is the fruit of the environment in which he is inserted. Therefore, these individuals who intend to use ECs at some point can influence those around them to do the same and, consequently, contribute to increasing the number of users.

In addition, this may be an indication of what was exposed by the Global State of Tobacco Harm Reduction[8], which reports an exponential increase in the use of electronic cigarettes around the world, with an estimated 68 million people using them in the current context. This fact is confirmed by Intelligence in Research and Strategic Consulting (IPEC), which published a survey stating that EC users in Brazil increased by 600% from 2018 to 2023, from 500,000 to 2.9 million[26].

Godoi *et al.*[27] reports a trend in the use of electronic cigarettes by university students in his study, since he shows that more than half of the students interviewed used this device, even though most of them had the perception that using EC is harmful to their health.

Regarding use at the invitation of a colleague, the following data was obtained:

Graph 7 - Percentage of participants who would use an electronic cigarette at the invitation of a colleague. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

According to the data collected, 159 (78%) claim that they would refuse to use an electronic cigarette even if they were invited to do so by a friend. However, as stated by Martins *et al.*[1], the use of EC is associated with fun and entertainment among young people, so refusing to use this object in an environment where there are users can lead to the exclusion of this young person. Thus, it can be seen that the use, or not, of electronic cigarettes can have a direct impact on young people's social relationships in the current context.

A fact that may complemen t what the author said above is the fact that 17 of the 34 EC users have never smoked before. Therefore, this could be an indication of both this event and what philosopher Karl Marx said above.

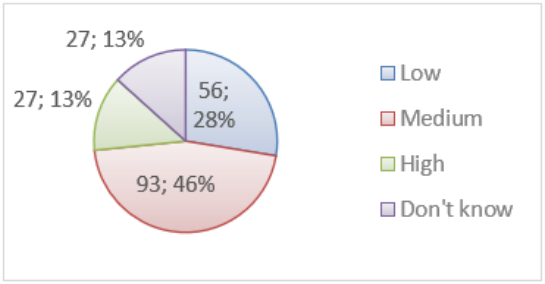
REVISTA ENFERMAGEM ATUAL IN DERME

According to Barradas et al.[28], the period from adolescence to the age of 30 is an age group in which individuals are more inclined to experimentation in general, which makes them more likely to experiment with electronic cigarettes. Thus, the incidence of using the device due to a fad is accentuated, since there is the appeal of identification and belonging in these individuals of the same age group.

It is worth noting that what was said by this author is verified in this study, since the data analysis showed that of the 34 EC users, 27 were aged between 18 and 30, which is equivalent to approximately 79% of the total.

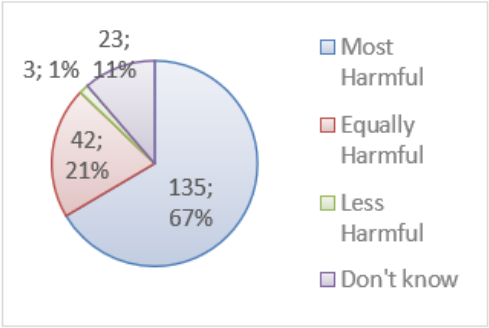
In order to analyze whether the participants had any knowledge of EC, they were asked how they considered their level of knowledge on the subject. Similarly, they were asked to compare the use of electronic cigarettes with conventional cigarettes and the impact of their use. The following data was obtained:

Graph 8 - Presentation of the percentage of level of knowledge of Electronic Cigarettes according to the participants. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

Graph 9 - Percentage of comparisons about electronic cigarettes being more harmful than conventional cigarettes. Nova Iguaçu, Rio de Janeiro, Brazil. 2024



Source: Authors' production (2024).

As seen in Graph 8, 93 participants (46%) consider their level of knowledge on the subject to be average, while 56 (28%) consider it to be low, 27 (13%) high and 27 (13%) claim to have no knowledge. Similarly, in Graph 9, 135 participants (67%) believe that the use of EC is

REVISTA ENFERMAGEM ATUAL IN DERME

more harmful than conventional EC, 42 (21%) believe that both are harmful to the same extent, 3 (1%) believe that it is less harmful and 23 (11%) claim that they don't know what they think about the impact of EC.

In addition, it was found that among the 34 EC users, 25 consider it to be more harmful than conventional EC, but they still use it. Another fact found is that among the 42 participants who are curious, want to use it and, although they don't know, but might use the EC, the majority think that this device is more harmful, which is equivalent to approximately 21% of the total interviewees.

As an affirmation of the above, Godoi *et al*.[27] also stated in their study that the majority of students who used EC had the perception that their use is harmful to health, however, they were unaware of the effects and diseases that could arise due to the substances contained in the device.

In addition to the analysis in Graph 9, according to Menezes *et al*.[29], ECs are considered less dangerous and toxic than conventional ones. However, despite being less dangerous, they are not exempt from affecting the health of their users, since the vapor generated still contains toxic products such as nicotine, lead and carcinogens, albeit in smaller quantities than conventional cigarette smoke, as well as volatile organic compounds.

Electronic cigarettes have emerged as an alternative product for those who want to quit smoking, a goal that has been highlighted since their first commercial name in 2003, *Ruyan*, which meant “substitute for smoking” in Chinese. However, they have the same components that lead to physical dependence as traditional cigarettes.[2; 4; 28]

This fact is partly explained by Godoi *et al*.[27] in their study, which states that there is a view among EC users that their use is an alternative to quitting conventional cigarettes. However, this survey is at odds with the idea of replacing conventional cigarettes with electronic cigarettes, since 118 (58%) of the participants say that this premise is false, while 26 (13%) say it is true and 59 (29%) don't know where they stand.

An important fact to note is that marketing strategies make the product more attractive and popular by propagating EC as a solution designed to mitigate the dangers inherent in conventional cigarettes and, at the same time, as a therapeutic alternative for the treatment of smoking dependence and nicotine addiction[27-28].

This corroborates the increase in the prevalence of the use of this device, causing smoking habits to persist in such a way that psychological and behavioral dependence occurs, because the act of smoking is as closely linked to addiction as the substances present in cigarettes. Therefore, addiction is not only an organic issue, but also an affective, social and psychological one[27-28].

Finally, it should be emphasized, through the study by Gomes *et al*.[30], that although there is confidence in the adoption of the electronic smoking device as a therapeutic strategy,

REVISTA ENFERMAGEM ATUAL IN DERME

scientific documentation has not yet reached a definitive agreement regarding its applicability in the treatment of tobacco dependence.

In addition to the previous question, participants were asked about their knowledge of the name given to the pulmonary impairment associated with e-cigarette use. The following data was obtained:

Of the 203 participants, 120 (59%) did not know the name, while 39 (19%) pointed to it being Electronic Cigarette Induced Lung Injury (EVALI), 17 (8%) reported it as Pulmonary Emphysema, 1 as “Water Lung”, 8 as cancer, 2 as Pulmonary Fibrosis, 01 as Atelectasis (collapse of lung tissue with loss of volume), 15 as Chronic Obstructive Pulmonary Disease (COPD).

As explained by Junior e Junior[27], electronic cigarettes produce a large volume of toxic and carcinogenic substances that lead to important diseases such as lung, esophageal, mouth, pancreas and bladder cancers, among others; cardiovascular diseases that are strongly related to tobacco, including heart attacks and strokes; and lung diseases such as emphysema.

In their study Gomes *et al.*[30] emphasized the predominance of respiratory complaints and gastrointestinal complaints, suggesting that this is a possible adverse influence of the use of electronic cigarettes.

Menezes *et al.*[29] report that ECs can also cause: electronic cigarette induced lung injury (EVALI); acute poisoning due to excess nicotine (by accidental or intentional ingestion); traumatic injuries due to explosions and fires, resulting in burns, lacerations and hematomas on the lip. Finally, oral health is also compromised, through transformations in the tissues of the oral cavity, as well as a reduction in the flow of crevicular fluid, less bleeding, delayed healing, periodontal degradation, which can lead to and aggravate lesions of the oral mucosa, periodontal and peri-implant problems.

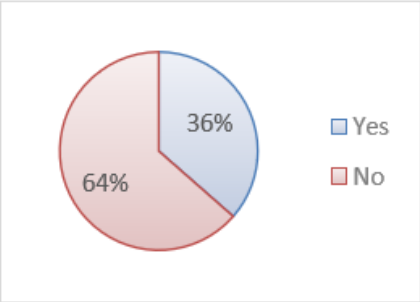
EVALI is an emerging syndrome in recent years characterized by severe lung damage, manifested by symptoms such as dyspnea, cough, fever, fatigue, chest pain and gastrointestinal symptoms, including vomiting, nausea, diarrhea and abdominal pain. This highlights the need for more comprehensive research into the health impacts of e-cigarette users, particularly on the respiratory system[30].

In this way, studies on EC should be encouraged so that knowledge about the impacts of their use can be deepened, as well as reinforcing the importance of awareness-raising measures and regulations to mitigate any risks associated with the use of these products.

With this in mind, we took the opportunity to check the interviewees' legislative knowledge of electronic cigarettes. To this end, questions were asked about knowledge of electronic cigarette legislation and whether the sale of electronic cigarettes is permitted in Brazil:

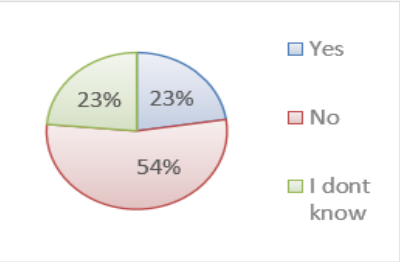
REVISTA ENFERMAGEM ATUAL IN DERME

Graph 10 - Percentage of participants' knowledge of the Electronic Cigarette Legislation. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

Graph 11 - Presentation of the percentage of knowledge about the permission to sell electronic cigarettes. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

Analyzing this data, it can be seen that more than 50% of the interview participants are aware of the ban on the use and marketing of electronic cigarettes. This is shown in the study by Junior e Junior[31], which reports that the sale, import and advertising of this product were banned in Brazil by the Resolution of the Collegiate Board of the National Health Surveillance Agency (ANVISA) number 46, of August 28, 2009. It thus became the world's forerunner in banning Electronic Smoking Devices (ESDs), which at the time received a great deal of criticism, especially from user groups.

Furthermore, Godoy[32] states in his study that current Brazilian regulations prohibit the sale of electronic cigarettes and include the adoption of additional measures to curb the illegal trade in these devices, such as increased enforcement actions and educational campaigns. However, keeping an eye on the sales ban is a difficult task, even more so because of e-commerce, and people can obtain their e-cigarettes on international trips as well as from friends or family.

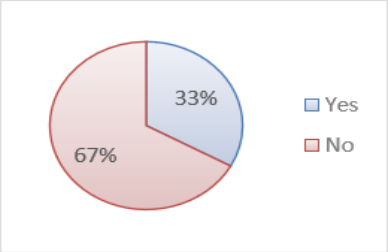
We therefore reiterate that in order to be successful, we must work together, so that efforts can be aligned and coordinated between government agencies at national, state and local level, as well as between medical organizations, educational institutions and society.

REVISTA ENFERMAGEM ATUAL IN DERME

However, even if ANVISA establishes a normative administrative act, as shown above, it is not considered a law and even if it determines regulations in a norm, no one is obliged to obey it, as it is not configured as a law. This undermines the fight against the regularization of smoking, leading consumers to believe that e-cigarettes are not harmful to health.[29]

The Brazilian Society of Pneumology and Phthisiology states that due to the existence of many brands of electronic cigarettes with varying characteristics and compositions, it is difficult to generate reliable studies that prove the safety and efficacy of electronic cigarettes, so it becomes difficult to authorize their commercialization. In addition, if this were to happen, control standards similar to those applied to cigarettes and other smoking products would be necessary[33].

Graph 12 - Percentage of people receiving information about electronic cigarettes during undergraduate studies. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

During the course of their academic training, university students face a series of challenges that transcend not only the educational sphere, but also involve emotional, social and psychological issues. Thus, these challenges can make them susceptible to adopting behaviors that are harmful to their health due to the influence of the university environment, which can be an obstacle to stopping this habit[30].

According to the data shown in Graph 12, only 67 (33%) of the 203 participants received information about e-cigarettes during their training, which may corroborate the use of this device due to a lack of information about it. This fact is demonstrated in the study by Gomes *et al.*[30], which recounts the positive influence of formal education in disseminating knowledge about the risks and benefits related to this device.

However, when analyzing the data, it was found that 13 of the 67 participants are members of the 34 EC users, which is equivalent to 38% of this group, which shows that 62% of them have used this device without having obtained adequate information about it.

It is therefore necessary to create interventions that can be applied in the academic environment in order to mitigate this problem in educational institutions. Furthermore, if it is disseminated correctly in the courses taking part

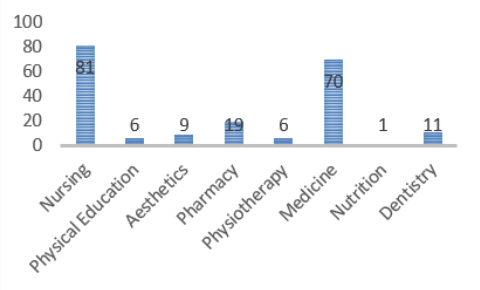
REVISTA ENFERMAGEM ATUAL IN DERME

in this study, it can also help to mitigate it in the social environment, given that health professionals, as Ceccon *et al.*[34] point out, are social actors and potential educators.

This fact exposed by the aforementioned author is something present in the perspective of most of the interviewees, since 180 (89%) of them say that, as health professionals, they should obtain knowledge about e-cigarettes and the impacts of their use and advise their patients about it.

Finally, as explained in the methodology of this study, the research was restricted to the health courses at Iguaçu University. So far, the participating courses, according to the data collected, are:

Graph 13 - Percentage of participants per course. Nova Iguaçu, Rio de Janeiro, Brazil. 2024.



Source: Authors' production (2024).

Analyzing the above data, it is worth noting that the data was not obtained satisfactorily for the Aesthetics, Physiotherapy, Physical Education, Pharmacy, Nutrition and Dentistry courses, due to the low level of participation by their students. In addition, the data collected is concentrated in the Medicine and Nursing courses, which has an impact on obtaining a reliable epidemiological profile.

In this way, a partial profile was drawn up with the data collected and the following was obtained: EC users at the Na Metropolitana I Private University are female, white, belong to the Medicine course and are in the 20 to 30 age group. They have never used conventional cigarettes.

CONCLUSION

The electronic cigarette is a recent device in today's context, given that it has only been on the market for around 30 years, although its invention dates back more than 60 years. Therefore, it is not yet possible to trace its impacts on its users in the long and medium term, a fact that is exposed not only in this study, but in others that were used for its preparation.

With regard to the epidemiological profile, due to low take-up by most of the participating courses, it was only possible to draw up a partial profile, as shown above. However, it is not yet possible to say whether or not there is a prevalence of EC use in the place where this study was carried out, since of the

REVISTA ENFERMAGEM ATUAL IN DERME

203 participants, only 34 are users or have used this device.

Despite the low take-up of this study by the majority of courses, as previously reported, Gomes *et al.*[30] e Gódoi *et al.*[32] show in their studies similar data to that presented in this study in some respects, which helps with the veracity and basis for this study, which we intend to continue in 2025.

Finally, it should be emphasized that the use of EC is a global concern, both because of the tendency for its users to increase, and also because of the lack of scientific knowledge about its impacts, given that its short existence has not yet made it possible to carry out conclusive studies.

Therefore, studies should be carried out that enable a reliable epidemiological profile to be drawn up, as well as offering a broader perspective on the impacts of the use of electronic cigarettes on their users, so that society and future health professionals can be guided on this issue and their use can be mitigated.

REFERENCE

1. Martins SR, Araújo AJD, Wehrmeister FC, Freitas BM, Basso RG, Santana ANC, Santos UDP. Prevalência de experimentação e uso atual de narguilé e cigarros eletrônicos e os fatores associados entre estudantes de medicina: estudo multicêntrico no Brasil. J Bras Pneumol [Internet]. 2023 [citado 2023 Set. 24]; 49: e20210467. Disponível em: https://www.scielo.br/j/jbpneu/a/d3KNrx5q58Q6npbVwsq9QyS/?lang=

2. Kowitt SD, Osman A, Meernik C, Zarkin GA, Ranney LM, Martin J, Goldstein AO. Vaping cannabis among adolescents: prevalence and associations with tobacco use from a cross-sectional study in the USA. BMJ open [Internet]. 2019 [Citado 2023 Set 24]; 9 (6): e028535. Disponível em: https://bmjopen.bmj.com/content/9/6/e028535.abstract

3. Rom O, Pecorelli A, Valacchi G, Reznick AZ. Are E-cigarettes a safe and good alternative to cigarette smoking? Ann New York Acad Sci [Internet]. 2015. [citado 2023 set 25]; 1340 (1): 65-74. Disponível em: https://doi.org/10.1111/nyas.12609

4. Finardi BC. Nível de conhecimento dos estudantes de graduação da área da saúde sobre cigarros eletrônicos. Trabalho de Conclusão de Curso [Graduação em Odontologia]. Universidade Federal de Santa Catarina. Santa Catarina; 2021.

5. Thirión-Romero I, Pérez-Padilla R, Zabert G, Barrientos-Gutiérrez I. Respiratory Impact of Electronic Cigarettes and Low-Risk Tobacco. Rev Investig N Cl Nica [Internet]. 2019 [citado 2023 Set 27]; 71(1). Disponível em: https://doi.org/10.24875/ric.18002616

6. Walley SC, Wilson KM, Winickoff JP, Groner J. A Public Health Crisis: Electronic Cigarettes, Vape, and JUUL. Pediatrics [Internet]. 2019 [citado 2023 Set 25];143(6):e20182741. Disponível em: https://doi.org/10.1542/peds.2018-2741

7. Associação Médica Brasileira; Aliança de Controle do Tabagismo e Promoção da Saúde; Fundação do Câncer. Comissão de Combate ao Tabagismo Cigarros eletrônicos: o que já sabemos? O que precisamos conhecer? [Internet]. [São Paulo]: AMB; 2021. [citado 2023 Set. 15]. Disponível em: https://amb.org.br/wp-content/uploads/2021/05/Afinal_o_que_sao_os_cigarros_eletronicos.pdf.

8. Farsalinos KE, Polosa R. Safety evaluation and risk assessment of electronic cigarettes as tobacco cigarette substitutes: a systematic review. Ther Adv Drug Saf [Internet]. 2014 [citado 2023 Set 25]; 5 (2):67-86. Disponível em: https://doi.org/10.1177/2042098614524430

9. Shapiro H. Burning Issues: Global State of Tobacco Harm Reduction 2020 [Internet].

London: Knowledge-Action-Change; 2020. [cited 2023 Sep. 2023]. Available from: https://gsthr.org/resources/thr-reports/burning-issues-global-state-tobacco-harm-reduction-2020/71/en/

10. Almeida-da-Silva CL, Matshik Dakafay H, O'Brien K, Montierth D, Xiao N, Ojcius DM. Effects of electronic cigarette aerosol exposure on oral and systemic health. Biomed J [Internet]. 2020 [citado 2023 Set 27]. Disponível em: https://doi.org/10.1016/j.bj.2020.07.003

11. Lindson N, Butler AR, McRobbie H, Bullen C, Hajek P, Begh R, Theodoulou A, Notley C, Rigotti NA, Turner T, Livingstone-Banks J, Morris T, Hartmann-Boyce J. Electronic cigarettes for smoking cessation: a Cochrane review. Dent Cadmos [Internet]. 2024 [citado 2023 Set 27]; 92 (06): 466. Disponível em: https://doi.org/10.19256/d.cadmos.06.2024.05

12. Pessoa LC, Oliveira MC, Lima MB. Nível de conhecimento dos estudantes do curso de graduação em medicina de faculdade particular do Piauí sobre cigarros eletrônicos. Res Soc Dev [Internet]. 2023 [citado 2023 Out 09]; 12 (5): e9312541491. Disponível em: https://doi.org/10.33448/rsd-v12i5.41491

13. Eva Maria, Marconi Lakatos. Fundamentos de Metodologia Cientifica. [local desconhecido]: Atlas Br; 2009

14. Minayo MCS. O desafio do conhecimento: pesquisa qualitativa em saúde. São Paulo: Hucitec; Rio de Janeiro: Abrasco; 1992.

15. Leopardi MT, Beck CLC, Nietsche EA, Gonzales RMB. Metodologia da pesquisa na saúde. Santa Maria: Pallotti. 2001; 9: 187-209.

16. Creswell JW. Projeto de Pesquisa: métodos qualitativo, quantitativo e misto. trad. Luciana de Oliveira da Rocha. 2ª ed. Porto Alegre: Artmed; 2007.

17. Creswell JW. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. [Internet]: SAGE Publications, Incorporated; 2013.

18. Lorenzini E. Pesquisa de métodos mistos nas ciências da saúde. Rev CUID [Internet]. 2017; 8 (2):1549.

19. Conselho Nacional de Saúde (BR). Resolução nº 466, de 12 de dezembro de 2012. [Internet]. Brasília – DF: CNS; 2012. [citado 2023 Out 26]. Disponível em: https://www.gov.br/conselho-nacioanl-de-saude/pt-br/acesso-a-informcao/legislacao/resolucoes/2012/resolucao-no-466.pdf/view

20. Moysidou A, Farsalinos K, Voudris V, Merakou K, Kourea K, Barbouni A. Knowledge and Perceptions about Nicotine, Nicotine Replacement Therapies and Electronic Cigarettes among Healthcare Professionals in Greece. Int J Environ Res Public Health [Internet]. 2016 [citado 2023 Out 20]; 13 (5): 514. Disponível em: https://doi.org/10.3390/ijerph13050514

21. Minayo MCS, Deslandes SF, Gomes R. Pesquisa social: teoria, método e criatividade. Petrópolis-RJ: Editora Vozes Limitada; 2011.

22. Polit DF, Hungler BP, Bernadette P. Fundamentos de pesquisa em enfermagem. 3ª ed. Porto Alegre: Artes Médicas; 1995.

23. Bardin, Laurence. Análise de conteúdo 4ªed. Lisboa: Edições, v. 70, n. 1977, p. 99-120, 2011.

24. Marx K. Manuscritos econômico-filosóficos. Tradução e notas de Jesus Ranieri. São Paulo: Boitempo Editorial; 2004.

25. Inteligência em Pesquisa e Consultoria. Cigarros Eletrônicos. Brasil. 2024 [Internet]. [Apresentação]. [citado 2023 Set. 15]. Disponível em: https://static.poder360.com.br/2024/01/ipec-pesquisa-cigarros-eletronicos-2023.pdf

26. Godói AT, Oliveira HC, Figueiredo JF, Rocha LL, Silva MF, Borborema VS, Fonseca AA, Rocha JS. Prevalência e fatores associados ao uso de cigarro eletrônico por estudantes universitários. Arq Cienc Saude UNIPAR [Internet]. 2024 [citado 2024 Nov 20];28(1):160-73. Disponível em: https://doi.org/10.25110/arqsaude.v28i1.2024-9992

27. Barradas AD, Soares TO, Marinho AB, Santos RG, Silva LI. Os riscos do uso do cigarro eletrônico entre os jovens. Glob Clin Res J [Internet]. 2021 [citado 12 Maio 2024];1(1). Disponível em: https://doi.org/10.5935/2763-8847.20210008

28. Lima Menezes I, Mendes Sales J, Neves Azevedo JK, Figueirêdo Junior EC, Aparecida Marinho S. Cigarro Eletrônico: Mocinho ou Vilão? Rev Estomatol Hered [Internet]. 6 abr 2021 [citado 18 Maio 2024];31(1):28-36. Disponível em: https://doi.org/10.20453/reh.v31i1.3923

29. Prevalência do uso e experimentação de cigarro eletrônico por acadêmicos em uma faculdade de medicina do Tocantins. Rev Eletronica Acervo Saude [Internet]. 18 abr 2024 [citado 20 Nov 2024];24(4):e15106. Disponível em: https://doi.org/10.25248/reas.e15106.2024

30. Soares Junior HC. A ofensividade do cigarro eletrônico e a legislação brasileira: uma abordagem sobre a ineficácia do estado em controlar a comercialização do dispositivo e suas consequências. [Internet] [TCC] 2023. [citado 2024 Maio 18]. Disponível em: https://repositorio.unifaema.edu.br/bitstream/123456789/3353/1/HEDY%20CARLOS%20SOARES%20JUNIOR.pdf

31. de Godoy I. Better education and surveillance to approach the e-cigarette surge as a pandemic. J Bras Pneumol [Internet]. 2023 [citado 18 Maio 2024]:e20230026. Disponível em: https://doi.org/10.36416/1806-3756/e20230026

32. Silva AL, Moreira JC. A proibição dos cigarros eletrônicos no Brasil: sucesso ou fracasso? Cienc Amp Saude Coletiva [Internet]. 2019 [citado 2024 maio 18]; 24 (8): 3013-24. Disponível em: https://doi.org/10.1590/1413-81232018248.24282017

33. Ceccon RF, Oliveira KD, Rossetto MS, Germani AR. Educação em saúde: percepção de profissionais atuantes em uma Coordenadoria Regional de Saúde. Rev Gauch Enferm [Internet]. 2011 [citado 2024 Nov 10]; 32(1): 58-62. Disponível em: https://doi.org/10.1590/s1983-14472011000100007

Funding and Acknowledgements:

No funding was provided.

Authorship criteria

1. Substantially contributed to the design and/or planning of the study: Ribeiro, W.A; Fassarela, B.P.A; Neves, K.C.

2. Obtained, analyzed and/or interpreted the data: Constantino, G.N.B; Acioli, M.M.S; Isaias, C.S.M.

3. Written and/or critically reviewed the study and approved the final version: Constantino, G.N.B.

Declaration of conflict of interest:

Nothing to declare.

Scientific Editor: Ítalo Arão Pereira Ribeiro. Orcid: https://orcid.org/0000-0003-0778-1447