Quantitative Article

Custódio CRSN, Nascimento PJC, Leal N, Fernandes MG, Ugolini VB
Smoking Among University Students in the Health Field: Profiles and Motivational Factors in an Academic Context

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Tabagismo Entre Estudantes Universitários da Área de Saúde: Perfis e Fatores Motivacionais Em Contexto Acadêmico

Tabaquismo entre Estudiantes Universitarios del Área de la Salud: Perfiles y Factores Motivacionales en el Contexto Académico

RESUMO

Objetivo: Investigar o perfil e os fatores motivacionais associados ao uso do tabaco entre estudantes de cursos da área da saúde em uma universidade brasileira. **Método:** Estudo transversal quantitativo com 431 estudantes, divididos em dois grupos: Medicina e Outros Saúde. Os dados foram coletados por questionário eletrônico, incluindo informações sociodemográficas, histórico de tabagismo e motivações para fumar pela Escala de Razões para Fumar Modificado. Os dados foram analisados por regressão logística e teste de Mann-Whitney. **Resultados:** O tabagismo foi relatado por 23,7% dos estudantes, com maior prevalência de cigarro eletrônico em Medicina. No grupo Medicina, gênero masculino e idade acima de 23 anos foram associados ao hábito, enquanto, em "Outros Saúde", a convivência com familiares fumantes foi o principal fator. Diferenças significativas nos fatores motivacionais incluíram tabagismo social e associação estreita. **Conclusão:** Estratégias específicas são necessárias para abordar o tabagismo entre universitários, considerando as diferenças nos perfis e motivações.

DESCRITORES: Tabagismo; Estudantes de Ciências da Saúde; Motivação; Saúde Pública.

ABSTRACT

Objective: To investigate the profile and motivational factors associated with tobacco use among students in health-related courses at a Brazilian university. **Method:** A cross-sectional quantitative study with 431 students, divided into two groups: Medicine and Other Health. Data were collected through an electronic questionnaire, including sociodemographic information, smoking history, and motivations for smoking using the Modified Reasons for Smoking Scale. The data were analyzed using logistic regression and Mann-Whitney test. **Results:** Smoking was reported by 23.7% of students, with a higher prevalence of e-cigarette use in the Medicine group. In the Medicine group, male gender and age over 23 years were associated with the habit, while in the "Other Health" group, living with smoking family members was the main factor. Significant differences in motivational factors included social smoking and close association. **Conclusion:** Specific strategies are needed to address smoking among university students, considering the differences in profiles and motivations.

DESCRIPTORS: Smoking; Health Science Students; Motivation; Public Health.

RESUMEN

Objetivo: Investigar el perfil y los factores motivacionales asociados al consumo de tabaco entre estudiantes de carreras del área de la salud en una universidad brasileña. **Método:** Estudio transversal cuantitativo con 431 estudiantes, divididos en dos grupos: Medicina y Otros Salud. Los datos fueron recolectados mediante un cuestionario electrónico, que incluía información sociodemográfica, historial de tabaquismo y motivaciones para fumar mediante la Escala de Razones para Fumar Modificada. Los datos fueron analizados por regresión logística y prueba de Mann-Whitney. **Resultados:** El tabaquismo fue reportado por el 23,7% de los estudiantes, con una mayor prevalencia de cigarrillos electrónicos en Medicina. En el grupo Medicina, el género masculino y la edad superior a 23 años se asociaron con el hábito, mientras que en "Otros Salud", la convivencia con familiares fumadores fue el principal factor. Las diferencias significativas en los factores motivacionales incluyeron el tabaquismo social y la asociación estrecha. **Conclusión:** Se requieren estrategias específicas para abordar el tabaquismo entre universitarios, considerando las diferencias en los perfiles y motivaciones.

DESCRIPTORES: Tabaquismo; Estudiantes de Ciencias de la Salud; Motivación; Salud Pública.

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INTRODUCTION

Smoking is one of the leading preventable causes of chronic non-communicable diseases and premature deaths worldwide. Studies indicate that approximately 100 million people died due to tobacco use in the 20th century, and the habit continues to be responsible for millions of deaths annually. [1,2] Furthermore, smoking has a significant economic impact, due to the costs related to treating diseases and the loss of productivity due to premature deaths. [3] In Brazil, public policies, such as anti-smoking laws and educational campaigns, have contributed to reducing the prevalence of smokers. [4] However, early experimentation with tobacco remains a cause for concern. Research indicates that most smokers start the habit before the age of 18, with the university environment being a critical period for the development of this behavior. [5] Among young university students, several factors are associated with tobacco use. Academic stress and the search for social acceptance are frequently reported as reasons for starting to use. [6]

Additionally, alternative products such as electronic cigarettes and hookahs have gained popularity in this age group. [7] Although they are often seen as less harmful, studies show that these devices are linked to serious health risks, including respiratory diseases, cardiovascular diseases and cancer. [5,8]

University students in the health field represent a population of interest for studies on smoking, since their behavior can influence both their own health and their future professional practice. Despite this, there are gaps in the literature that comparatively addresses tobacco use among medical students and other health field students, as well as their motivations for smoking. Thus, this study seeks to explore smoking profiles and associated motivational factors among university students in the health field, focusing on differences between medical students and those in other health fields. Our objective is to contribute to the understanding of the impact of the academic environment and individual motivations on tobacco use, offering support for targeted interventions in the university context.

METHOD

This is a cross-sectional study with a quantitative approach carried out at the Municipal University of São Caetano do Sul, involving students of in-person courses in the health area. The study included 431 students enrolled in the following courses: Medicine, Biomedicine, Nursing, Nutrition, Pharmacy, Physiotherapy, Psychology and Veterinary Medicine. The sample was divided into two groups: students of the Medicine course and students of other courses in the health area. Only students over 18 years of age, who voluntarily agreed to participate in the research and who completed the electronic questionnaire were included in the study. Data were collected through an electronic form sent to participants by institutional email. The questionnaire remained available for two weeks, allowing only one response per participant. It included sociodemographic information and data related to smoking history and habits and changes in the COVID-19 pandemic. To assess motivational factors related to smoking, the Modified Reasons for Smoking Scale was used [9], consisting of 21 items in Likert format (0 = "never" to 5 = "always") and assessing nine main dimensions: dependence, pleasure of smoking, tension reduction, automatism, handling, social smoking, weight control, close association and stimulation.

Statistical Analysis

The association between sociodemographic characteristics and smoking habits was investigated using logistic regression, considering smoking habits as a binary dependent variable, with results presented in terms of Odds Ratio (OR) and Confidence Interval (CI). To verify the differences in the scores of the factors assessed by the Smoking Reasons Scale, the Mann-Whitney test was used, establishing a statistical significance level of $p \leq 0.05$. All analyses were performed using the R program (version 4.2.2). This study was conducted in accordance with ethical prin-

ciples and the project was approved by the Research Ethics Committee of the Municipal University of São Caetano do Sul (Opinion No. 4,690,643; CAAE No. 44498921.9.0000.5510).

RESULTS

The results showed that the respondents were predominantly medical students, with 27.6%. The predominant age range among the participants was 18 to 23 years old, with the majority identifying as white, female and Catholic. Among the medical students, there was a predominance of family income above 10 minimum wages (table 1).

Table 1. Characteristics of the sampled students. "Other Health" refers to courses in the Health area excluding Medicine, while "Total" refers to all courses in the Health area, therefore including Medicine.

Variables	Medicine	Health - others	Total
Total number of students	685	2322	3007
Number of students sampled	189	242	431
Age			
18-23 years old	136 (72%)	163(67%)	299(69,4%)
24-28 years old	42(22%)	54(22%)	96(22,3%)
29-34 years old	9(4,8%)	13(5,4%)	22(5,1%)
35 years old or older	2 (1%)	12(4,9%)	14(3,2%)
Gender			
Female	131 (69%)	205 (84%)	336(77,9%)
Male	58(31%)	36 (16%)	94(21,8%)
Non-binary	0(0%)	0(0%)	0(0%)
Rather not say	0(0%)	1(0,4%)	1(0,2%)
Ethnicity			
Yellow	5 (2,6%)	7(2,9%)	12(2,7%)
Indigenous	1(0,52%)	1(0,4%)	2(0,4%)
White	166(87,8%)	186(77%)	352(81,7%)
Brown	16(8,5%)	36(15%)	52(12,1%)
Black	1 (0,52%)	12(5%)	13(3,0%)
Religion			
Atheist	20 (10,6%)	22 (9,1%)	42(9,7%)
Catholic	84 (44,4%)	83(34,3%)	167(38,7%)
Spiritist	31(16,4%)	34(14%)	65(15,1%)
Evangelical	24(12,7%)	56(23,1%)	80(18,6%)
African matrix religions	6 (3,2%)	12(5%)	18(4,2%)
Other	5(2,6%)	15(6,2%)	20(4,6%)
None	19(10%)	19(7,9%)	38(8,8%)
Didn't answer	0 (0%)	1(0,4%)	1(0,2%)
Income			
Up to 2 minimum wages	4(2,1%)	53(21,9%)	57(13,2%)
From 2 to 4 minimum wages	14(7,4%)	84(34,3%)	98(22,7%)
From 4 to 10 minimum wages	60(31,8%)	71(29,3%)	131(30,4%)
From 10 to 20 minimum wages	64(33,8%)	26(10,7%)	90(20,9%)
Over 20 minimum wages	43(22,7%	4(1,7%)	47(10,1%)
Didn't answer	4(2,1%)	4(1,7%)	8(1,8%)

Smoking was reported by 23.7% of respondents. Among those who reported smoking, a different pattern was observed in the consumption of electronic cigarettes and hookah. Electronic cigarettes were more prevalent among medical students (66.7%) compared to students in other health courses (35.1%), while hookah was more consumed by students in other courses (49.1%) compared to those in medicine (35.6%). The duration of smoking also varied, with most smokers reporting more than three years of consumption (table 2). Living with family members who

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smoked was reported by respondents, being more prevalent among students in other health courses (table 2).

During the pandemic, 53.9% of participants reported having changed their smoking habits, with this percentage being higher among medical students. Among those who reported changes, the following reasons were given: not being able to smoke at home, not socializing to smoke, and fear of contracting COVID-19 (Table 2).

Table 2. Characteristics of the smoking habits of the sampled students (absolute numbers). "Other Health" refers to courses in the Health area excluding Medicine, while "All Health" refers to all courses in the Health area, therefore including Medicine.

Variables	Medicine	Others Health courses	Health (all courses)
Smokes			
Yes	45(23,8%)	57(23,6%)	102(23,7%)
No	144 (76,2%)	185(73,4%)	329(76,3%)
Ever smoked?			
Just tried	62 (43,1%)	77(41,6%)	139(42,2%)
Smoked and quit	8(5,6%)	14(7,6%)	22(6,7%)
Never smoked	73(50,7%)	91(49,2%)	164(49,8%)
Didn't answer	1(0,7%)	3(1,6%)	4(1,2%)
What smokes?			
Regular cigarette	18(40%)	23(40,4%)	41(40,2%)
Electronic cigarette	30(66,7%)	20(35,1%)	50(49%)
Hookah	16(35,6%)	28(49,1%)	44(43,1%)
Tobacco	24(53,3%)	13(22,8%)	37(36,3%)
How long have you been smoking?			
Up to 1 year	10(22,2%)	8(14%)	18(17,6%)
From 1 to 2 years	13(28,9%)	14(24,6%)	27(26,5%)
From 3 to 5 years	17(37,8%)	18(31,6%)	35(34,3%)
From 6 to 9 years	3(6,7%)	6(10,5%)	9(8,8%)
More than 10 years	2(4,4%)	8(14,0%)	10(9,8%)
Didn't answer	0(0%)	3(5,3%)	3(2,9%)
Do relatives smoke?			
Yes	70(37,0%)	143(59,1%)	213(49,4%)
No	119(63%)	99(40,9%)	218(50,6%)
Have you changed your habits during the pandemic?			
Yes	30(66,7%)	25(43,9%)	55(53,9%)
No	15(33,3%)	32(56,1%)	47(46,1%)
What has changed about the habit?			
More cigarettes	9(30,0%)	10(40,0%)	19(34,5%)
Fewer cigarettes	10(33,3%)	6(24%)	16(29,1%)
Switched from regular to hookah	1(3,3%)	1(4%)	2(3,6%)
Switched from regular to electronic	9(30%)	4(16%)	13(23,6%)
Why did you change your habit?			
Fear of catching coronavirus	5(16,7%)	7(28%)	12(21,8%)
Can't smoke at home	13(43,3%)	4(16%)	17(30,9%)
Wouldn't socialize to smoke	9(30,0%)	4(16%)	13(23,6%)
Didn't answer/ Didn't change	5(16,7%)	10(40%)	15(27,3%)

Values correspond to absolute frequencies (n) and relative frequencies (%) are represented in parentheses.
Source: Authors

The analysis of factors associated with smoking habits revealed significant relationships with the gender and age of the participants. Among medical students, male students were between 5% and 363% more likely to smoke compared to female students (Odds Ratio = 2.20; CI = 1.05 – 4.63). Similarly, students over 23 years of age were between 7% and 390% more likely to smoke than those aged 23 or younger (Odds Ratio = 2.29; CI = 1.07 – 4.90). No significant relationship was identified between income or the smoking habits of family members and the smoking behavior of medical students (Table 3).

Among students of other health courses, the habit of smoking was related to living with family members or close people who smoke (Table 3). These students had a probability between 3% and 295% greater of smoking when compared to those who do not live with smokers (Odds Ratio = 2.02; CI = 1.03 – 3.95).

Table 3. Results of logistic regression for the smoking habits of medical students.

	Coefficient estimate	Erro padrão	*p*
Medicina			
Gender (male)	0,79	0,38	*0,04**
Age (over 23 years old)	0,83	0,39	*0,03**
Income up to 4 minimum wages	-0,61	0,68	*0,36*
Income from 4 to 10 minimum wages	-0,77	0,50	*0,12*
Income from 10 to 20 minimum wages	-0,58	0,46	*0,20*
Family member smokes (yes)	0,60	0,37	*0,10*
Health courses (except Medicine)			
Gender (male)	0,64	0,41	*0,12*
Age (over 23 years old)	0,19	0,33	*0,56*
Income up to 4 minimum wages	0,60	0,63	*0,34*
Income from 4 to 10 minimum wages	0,79	0,60	*0,19*
Income from 10 to 20 minimum wages	0,32	0,62	*0,60*
Family member smokes (yes)	0,70	0,34	*0,04**

Reference categories: female gender, income greater than 20 minimum wages, family member or close person does not smoke. *p ≤ 0.05.

Source: Authors

When analyzing the specific habit of smoking electronic cigarettes (Table 4), it was found that male students had a probability between 25% and 203% higher of consuming this type of cigarette (Odds Ratio = 1.9; CI = 1.25 – 3.03), while students over 23 years old had a probability between 1% and 127% higher (Odds Ratio = 1.5; CI = 1.01 – 2.27). Living with family members who smoke was also a significant factor, with a probability between 31% and 194% higher of smoking electronic cigarettes (Odds Ratio = 1.96; CI = 1.31 – 2.94).

Table 4: Results of logistic regression for the habit of smoking electronic cigarettes among students from all areas of knowledge.

	Coefficient estimate	Standard error	*p*
Gender (male)	0,66	0,23	*0,04**
Age (over 23 years old)	0,41	0,21	*0,03**
Income up to 4 minimum wages	-0,15	0,29	*0,36*
Income from 4 to 10 minimum wages	-0,32	0,28	*0,12*
Family member smokes (yes)	0,67	0,21	*0,20*
Course (Medicine)	0,03	0,44	*0,10*
Course (Others in the health area)	-0,004	0,42	

Reference categories: female gender, income greater than 10 minimum wages, family member or close person does not smoke, *p ≤ 0.05, **p ≤ 0.01.
Source: Authors

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The results of the Reasons for Smoking Scale (Table 5) reveal that the pleasure of smoking was the predominant motivation among students in both groups. In the Medicine group, the factors stress reduction (μ=2.8 ±1.2) and handling (μ=2.6±1.2) also stood out as frequent motivations. In addition, social smoking presented a significantly higher score in this group (μ=2.4±1.2) compared to the Other Health group (μ=1.9±1.0, p=0.0005). On the other hand, among students in the Other Health group, the factors stress reduction (μ=2.9±1.5) and dependence (μ=2.4±1.3) were more evident. The close association factor also stood out in this group, with higher scores (μ=2.0±1.2) compared to the Medicine group (μ=1.8±1.0, p=0.04).

Table 5. Scores of the nine factors of the Reasons for Smoking scale.

Factor scores	Medicine	Others Health
	μ (DP)	μ (DP)
Dependence	2,1 (1,3)	2,4 (1,3)
Stimulation	2,1 (1,0)	2,0 (1,0)
Smoking pleasure	3,6 (1,0)	3,4 (1,2)
Close association	1,8 (1,0)	2,0 (1,2)
Tension reduction	2,8 (1,2)	2,9 (1,5)
Weight control	1,6 (1,2)	1,6 (1,1)
Social smoking	2,4 (1,2)*	1,9 (1,0)
Handling	2,6 (1,2)	2,5 (1,2)
Automatism	1,4 (0,7)	1,6 (0,8)

The values represent the mean and standard deviation (between relatives) of the scores.

Source: Authors

DISCUSSION

The results showed that the respondents were predominantly medical students, representing 27.6% of the total number of students enrolled in this course. The predominant age range was 18 to 23 years old, with the majority identifying as female. Among medical students, the predominance of family income stood out, reflecting a high socioeconomic profile in this group, while students in other courses had more heterogeneous family incomes.

The prevalence of smoking among university students observed in this study was higher than that found in the general population in both groups, a finding that is in line with studies conducted in different Brazilian cities that indicate that smoking among young adults (18 to 24 years old) is associated with both individual and contextual factors, such as the Municipal Human Development Index (MHDI), and that at higher rates, the prevalence of smoking among young people also increases. [10] This relationship is particularly relevant for this study, considering that the university analyzed is located in São Caetano do Sul, a city with a high HDI, although no positive correlation was observed between income and smoking in either group.

In any case, the higher income observed among medical students may suggest that contextual factors such as greater access to tobacco products and greater exposure to electronic cigarettes. Students in other health courses use hookah and tobacco more frequently than medical students. This finding is consistent with the literature, which indicates that young adults in contexts where there is greater financial availability may be more susceptible to tobacco consumption, reflecting an emerging global pattern. [10] Although no statistically significant differences in prevalence were observed between the groups, the findings indicate a worrying change in consumption behavior.

A study that investigated the prevalence of smoking among university students in the health field revealed similar rates (23%) to those found in our study, which was concentrated in individuals between 18 and 24 years old, reflecting a worrying scenario and consistent with the patterns observed in institutions that serve audiences with similar sociodemographic characteristics. [11] This convergence suggests that, regardless of geographic location, smoking among university students in the health field is conditioned by common factors, such as high academic pressure, peer influence and early initiation of the smoking habit, often before the age of 18. The similarity of the rates reinforces the relevance of national prevention and cessation strategies that consider the specificities of this target audience.

The higher prevalence of male smokers obtained in our results reaffirms the predominance indicated in several studies. [12, 13, 14] Queiroz et al. (2021), for example, highlighted that the higher prevalence among males is associated with different contexts such as living alone or with friends. [14] Furthermore, it is clear that, even in health courses, where students are more exposed to information about the harmful effects of tobacco, smoking is still significant, which demands special attention to prevention and cessation strategies aimed at this group.

Among medical students, e-cigarette use was more prevalent, while students from other courses reported greater use of hookah and conventional tobacco. This difference may reflect variations in socioeconomic profile, since e-cigarettes tend to be more expensive. In addition, behavioral motivations such as curiosity and social

smoking highlighted in the literature [15,16], appear to be more prominent among medical students.

Factors associated with the use of e-cigarettes, such as male gender, age over 23 years, and living with family members who smoke, observed in the present study, reinforce the importance of social and contextual influences. Young men tend to be more exposed to environments that normalize risk behaviors, while the financial independence of older individuals may facilitate access to these devices. Additionally, the impact of the family environment is relevant, since living with family members who smoke normalizes smoking behavior and facilitates access to tobacco-related products.[17]

The results of this study showed that the COVID-19 pandemic impacted smoking behavior in more than half of the students who smoked, considering that the period of social distancing was marked by emotional challenges, worsening mental well-being, including feelings of anxiety and isolation. Among the changes, the number of cigarettes smoked and the transition from conventional to electronic cigarettes stood out. In the context of this study, these changes appear to have been more prevalent among medical students, possibly due to academic stress, specific course demands during the pandemic period, in addition to restrictions due to distancing, such as the impossibility of smoking at home or the lack of social interaction. [18] In the case of students who switched to electronic devices, factors such as greater discretion in the use of these products and the perception that they are less harmful may have contributed to this transition.

The results of the Reasons for Smoking Scale revealed that the pleasure of smoking emerged as the predominant motivation in both groups analyzed. Among medical students, this factor was followed by reduced tension and handling, highlighting both the impact of social interactions and the association of tobacco with emotional relief and practical routines. These motivations suggest that, in addition to emotional reasons, the university social context may be a determining factor in smoking behavior in this group. In the "Other Health" group, the pleasure of smoking was accompanied by reduced tension and dependence, indicating a possibly more consolidated pattern of consumption, related to the search for emotional relief and the satisfaction of an established dependence. Among the limitations presented in the present study, the cross-sectional design stands out, which prevents the determination of causal relationships. The use of self-reported questionnaires may have led to underreporting or response bias, especially in relation to behaviors considered socially undesirable. The sample, composed of students from a single institution, limits the generalization of the results to other academic contexts or regions. Future studies should include larger and more diverse samples, in addition to longitudinal investigations that explore the impact of contextual and motivational factors over time.

Despite these limitations, the study presents relevant data when investigating the motivations associated with smoking in the university context, using the Smoking Reasons Scale in a scenario that includes e-cigarettes, hookah and conventional tobacco. This aspect makes the results particularly interesting for understanding changes in contemporary motivations and consumption patterns among young university students.

Finally, the findings reinforce the need for public policies that not only inform about the harms of smoking, but also address underlying motivations, such as pleasure, stress reduction and social impact. Educational campaigns and support programs need to be more personalized, con-sidering the specificities of university populations and the central role that future health professionals play in promoting healthy habits.

CONCLUSION

This study revealed significant differences in smoking patterns between medical students and students from other health-related programs, with a focus on e-cigarette use among the former. Sociodemographic and contextual factors, such as gender, age, income, and living with family members who smoke, influenced these patterns. The COVID-19 pandemic also had a significant impact on smoking behavior, with changes in consumption and the transition to electronic devices.

In addition, the pleasure of smoking emerged as the predominant motivation in both groups, while factors such as stress reduction and social smoking were more evident among medical students. On the other hand, students from other programs showed a greater influence of dependence and the association of tobacco with consolidated routines.

The results highlight the importance of intervention strategies that take into account psychological, social, and contextual aspects. Targeted and personalized approaches that consider the specific motivations and emotional and social challenges that perpetuate the habit are essential to reach university populations. Recognizing these dynamics can contribute to more effective actions to prevent and stop smoking, aligned with the role that these future professionals will play in promoting healthy habits.

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