Harmful effects of tobacco and marijuana smoking on college students' voices

Efeitos deletérios do tabagismo e da maconha na voz de estudantes universitários

Efectos nocivos del tabaco y de la marihuana en la voz de estudiantes universitarios

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Abstract

Objective: *to analyze the harmful effects of tobacco and marijuana smoking on university students' voices.* ***Method:*** *cross-sectional study conducted with 571 students, who answered a questionnaire containing sociodemographic data, smoking habits and vocal symptoms. Hoarseness and low-pitched voice were considered dependent variables, while the use of tobacco and marijuana were independent.* ***Results:*** *18.4% of the students interviewed smoked cigarettes, 15.2%, other kinds of tobacco, and 30.1% smoked marijuana. The most reported vocal symptoms were: hoarseness (28%), low-pitched voice (17.2%), and voice failure (15.5%). In the multiple analysis, the factors associated to hoarseness were: being a female, smoking cigarettes and marijuana, and smoking unfiltered tobacco and marijuana; and the factors associated to low-pitched voice were: smoking tobacco and marijuana, smoking marijuana, cigarettes and unfiltered tobacco, and smoking marijuana and unfiltered tobacco.* ***Conclusions:*** *there*

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was a relationship between smoking and hoarseness and low-pitched voice, mainly when associated with marijuana use.

Keywords: *Voice; Risk factors; Smoking; Tobacco; Marijuana.*

Resumo

Objetivo: *analisar os efeitos deletérios do tabagismo e da maconha na voz de estudantes universitários.* ***Método:*** *estudo transversal realizado com 571 alunos, que responderam questionário (dados sociodemográficos, consumo de fumo e sintomas vocais). Rouquidão e voz grossa foram consideradas variáveis dependentes, e tabagismo e uso de maconha, independentes.* ***Resultados:*** *dos entrevistados, 18,4% fumavam cigarro, 15,2%, outro tipo de tabaco e 30,1%, maconha. Sintomas vocais mais referidos foram: rouquidão (28%), voz grossa (17,2%), e falhas na voz (15,5%). Na análise múltipla, fatores associados à presença de rouquidão foram: ser do sexo feminino, fumar cigarro e maconha e fumar maconha e tabaco sem filtro; e para a presença de voz grossa, o uso concomitante de tabaco e maconha, de maconha, cigarro e tabaco sem filtro e de maconha e tabaco sem filtro.* ***Conclusão:*** *houve relação entre tabagismo e sintomas de rouquidão e voz grossa, principalmente quando associado à maconha.*

Palavras-chave: *Voz; Fatores de Risco; Tabagismo; Maconha.*

Resumen

Meta*: analisar los efectos dañinos dela tabaquismo y de la marihuana en la voz de los estudiantes universitários.* ***Método****: estudio transversal realizado con 571 alumnos, que respondieron una encuesta (dados sociodemográficos, si fuma, los síntomas vocales). Ronquera y la voz gruesa fueron consideradas variables dependientes, el tabaquismo y el uso de marihuana, independientes.* ***Resultados****: 18,4% de los entrevistados fumaban cigarrillo, 15,2%, otro tipo de tabaco y 30,1% marihuana. Los síntomas vocales más presentados fueron: ronquera (28%), voz gruesa (17,2), y fallas en la voz (15,5%). En el análisis múltiple, los factores asociados a la presencia de ronquera fueron: ser del sexo femenino, fumar cigarrillo y marihuana y fumar marihuana y tabaco sin filtro; y para la presencia de voz gruesa, el uso concomitante de tabaco y marihuana, de marihuana, de cigarrillo y tabaco sin filtro y de marihuana y de tabaco sin filtro.* ***Conclusión:*** *hubo relaciones entre el tabaquismo y los síntomas de ronquera y de la voz gruesa, principalmente cuando asociado a marihuana.*

Palabras claves: *Voz; Factores de riesgo; Tabaquismo; Marihuana.*

Introduction

Tobacco is a plant of the Solanaceae family. Its main variety is the *Nicotina tabacum*, and its essential active principle is the nicotine. Nicotine determines tobacco's chemical dependency, with 80% of users becoming addicted to it. Its effects on the brain can be either stimulant or depressive, depending on the number of cigarettes smoked per day, time of use and organic response[1].

Responsible for several health problems, cigarette smoking is a determining factor for cancer and cardiovascular illnesses, the major causes of death for illnesses in the world. According to the World Health Organization (WHO), the Global Illness Burden – which aims to quantify the early mortality burden of the main illnesses – includes tobacco as one of the factors that constitute a material threat to public health. Nowadays, there are programs targeting this issue. Brazil features among the countries where tobacco control policies are at an advanced stage, and according to the Brazilian Surveillance of Risk Factors and Protection for Chronic Illnesses through Telephone Inquiry (*Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico* - VIGITEL), which conducted a survey in the capital cities of 26 Brazilian states and the Federal District, from 2006 to 2013 there was a drop in the number of smokers, from 15.7% of the population in 2006 to 11.3% in 2013. Still, from the one billion 200 million smokers worldwide, approximately 20 million are Brazilian[2].

According to the Brazilian National Survey of Alcohol and Drugs (*Levantamento Nacional de Álcool e Drogas* – LENAD), carried out by

the Alcohol and Drugs Research Unit (*Unidade de Pesquisas em Álcool e Drogas* - UNIAD) and by the Brazilian National Institute of Science and Technology for Public Policies concerning Alcohol and Other Drugs (*Instituto Nacional de Ciência e Tecnologia para Políticas Públicas do Álcool e Outras Drogas* - INPAD)[3], considering that in Brazil there are approximately four to five people per household, it may be said that today there are around 70 billion second-hand smokers, an alarming figure that deserves attention as to the development and execution of public policies. For former smokers, one of the chief reasons for stopping smoking is their concern with their health[3].

A 2009 survey carried out by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística – IBGE) showed that 93% of smokers know that cigarettes cause serious illnesses, and most of them acquired the habit between 17 and 19 years of age[4].

A study described the prevalence of tobacco smoking according to sex, age, family income and occupation of people who are 15 years old or older across different Brazilian regions. Based on data from the 2008 National Household Sample Survey (*Pesquisa Nacional por Amostra Domiciliar* – PNAD/IBGE), the study determined that 15.1% of the Brazilian population smoked cigarettes daily, and that cigarette smoking was 62% higher among males than among females[5]. It also confirmed that there was a decrease in daily tobacco consumption in Brazil. Regarding age, the study demonstrated that the number of smokers increases up to 59 years of age, decreasing after that age. As to family income, the smaller it is, the higher the daily tobacco consumption. The larger number of cigarette smokers among manual laborers and people who work in the private sector, irrespective of sex, income and age, may be associated with a stressful working environment[5].

As to university students, a study conducted with 482 students of the Federal University of Piauí State (Universidade Federal do Piauí) to determine the prevalence of tobacco smoking among these students found that 74.1% began smoking after they turned 21, 37.5% reported that curiosity was their main motivation to take up smoking, 44% received medical guidance to stop smoking, and 93% of smokers also consumed alcohol, which evidences a relationship between the habit of smoking and alcohol consumption[6]. It is worth noting that habits such as smoking and drinking alcohol harm the vocal tract and the respiratory system, cause swelling in the vocal folds, produce irritation in the throat and cough due to excessive phlegm, in addition to possibly causing laryngitis, polyps, hyperplasia, dysplasia and cancer[7].

Another study interviewed 571 students to determine their vocal symptoms and their possible causes in their own opinions, and to analyze the relationship between some of the symptoms (hoarseness, sore throat, excessive phlegm and vocal fatigue) and the causes reported by the students. The study found that 24% of interviewees believed that one of the causes for their vocal alterations was their smoking habit, coming second only to respiratory infections (39%). Cigarette smoking was mainly related to throat irritation due to phlegm[8].

Yet another study, which included 80 subjects, 40 of whom were smokers (20 males and 20 females), analyzed the association that cigarette smoking and other factors had with voice acoustic parameters. It showed that cigarette smoking decreases the fundamental frequency values (f0) of both sexes. The fact that the male voice has a lower pitch than the female voice leads to the auditory misperception that cigarettes do not affect male smokers' voices as much, which may influence these smokers' decision to continue smoking[9].

Alcohol and tobacco are legal drugs; therefore youngsters believe that they do not cause as many problems as illegal drugs. In the search for pleasure, cigarette smoking may lead to the consumption of other drugs such as marijuana, the most commonly used among illegal drugs for being considered the least aggressive. However, it is often a stepping stone to more damaging drugs like cocaine and crack cocaine, in an attempt to experience more intense sensations and maximize the effects of the drug[10,11].

Marijuana (dry leaves and flowers from the *Cannabis sativa* plant) is usually rolled in a joint so as to be smoked[12]. Smoking three to four marijuana joints a day corresponds to smoking more than 20 cigarettes a day. As there is no filter in the marijuana joint, the smoker's lungs receive a net load of substances that is four times as strong as the one received by a tobacco smoker; three times as much tar is released; approximately one third of inhaled particles are held in the respiratory tract[13]; and it is extremely irritating to the vocal tract, not only due to its smoke, but also by the toxins resulting from

the burning of the paper in which the marijuana is rolled. The manner in which it is smoked increases the temperature of the smoke, which damages the vocal tract tissues, and the user may present a low-pitched voice, imprecise articulation, dryness in the vocal tract, and alterations in the rhythm and fluency of speech[14].

Knowing the aforementioned damages, the Speech Language Pathology and Audiology have been trying to associate cigarette smoking with causes of voice alterations[7], even though few epidemiological studies analyze this association.

Thus, the findings of this research may contribute to the design and implementation of programs aimed at promoting health or preventing voice alterations, as well as enabling reflections on the therapeutic care provided by voice specialists.

Accordingly, this research aims to analyze the harmful effects of tobacco and marijuana smoking on the voice of university students.

Method

This observational, cross-sectional study was approved by the Ethics Committee of the Program of Graduate Studies in Speech Language Pathology and Audiology of PUC-SP, under number 0019/04.

The Humanities Schools of a private university in the city of São Paulo were selected due to the fact that they offered 19 programs, and as such, had a large number of students. Once the university director approved the study, 1,700 junior students were invited to participate. The lower age limit was set at 17 years, due to the voice changes, and the higher at 45 years, when the larynx experiences a series of alterations due to hormonal changes[15]. A total of 571 students participated in the research and answered a questionnaire with identification questions (sex, age, major, and the year when the student started attending the university), plus three blocks of questions related to smoking habit, type of smoking, vocal symptoms and perceived laryngopharyngeal sensations. At the end of the questionnaire, there was a space where students could add any further observations, if they so wished (Appendix 1).

The data were entered twice to validate them by means of the statistical software Epi-Info version 6.0 for MS-DOS.

For the statistical analysis, the two most reported symptoms were considered as the dependent variables, and the interaction between tobacco smoking and marijuana use was considered the independent variable. There were nine analysis categories: 1) non-use of marijuana and non-use of either filtered or unfiltered cigarettes (reference category); 2) non-use of marijuana and use of filtered cigarettes; 3) non-use of marijuana by former smokers; 4) non-use of marijuana and use of unfiltered cigarettes; 5) use of marijuana without using either filtered or unfiltered cigarettes; 6) use of marijuana associated with the use of filtered cigarettes; 7) use of marijuana by former smokers; 8) use of marijuana associated with use of filtered or unfiltered cigarettes; 9) use of marijuana with concomitant use of unfiltered cigarettes by former smokers. The sex and age variables were analyzed as possible control variables.

The chi-squared test was used to determine the existence of a statistical association between the presence of the two most reported vocal symptoms, and a multiple logistic regression analysis was performed for these symptoms and the independent as well as the control variables. The latter was used to determine whether the effects of smoking persisted irrespective of sex and age. The statistical program employed in the analysis was the SPSS for Windows (version 10.0), and the p-value was set at lower than or equal to 5%.

Results

The average age of participants was 21.2, with a standard deviation of 3.6 and a mean of 20. Most were females (59.9%) and studied in the evenings (56%).

As to the habit of smoking, 40% were cigarette smokers, 55.5% had never smoked, and 4.5% used to smoke cigarettes but stopped.

Table 1. Number (n) and percentage (%) breakdown of participants by sex, age and class period.

Variable	Category	n	%
Sex	Male	229	40,1
	Female	342	59,9
Age	≤ 18	131	22,9
	≥ 19	440	77,1
Period	Morning	151	26,4
	Evening	320	56,0
	Afternoon	56	9,8
	Full-time	44	7,7
Total participants		571	100,0

Table 2. Number (n) and percentage (%) breakdown of participants by type of smoking

Variable	Category	n	%
Has never smoked filtered cigarettes	*Only	317	55.5
	Unfiltered tobacco	9	1.6
	Marijuana	55	9.6
	Marijuana and unfiltered tobacco	17	3.0
Smokes filtered cigarettes	**Only	36	6.3
	Unfiltered tobacco	6	1.1
	Marijuana	28	4.9
	Marijuana and unfiltered tobacco	35	6.1
Stopped smoking filtered cigarettes	***Only	26	4.5
	Unfiltered tobacco	5	0.9
	Marijuana	21	3.7
	Marijuana and unfiltered tobacco	16	2.8
Total		571	100

*individuals who have only never smoked filtered cigarettes
** individuals who have never smoked filtered cigarettes, but have smoked marijuana
***individuals who have never smoked filtered cigarettes, but have smoked marijuana and unfiltered tobacco

Among the 40% of smokers, 13.3% smoked only marijuana; 6.3% smoked filtered cigarettes, and 20.4% combine different types of smoking. From the 18.4% participants who said they either only smoked filtered cigarettes or combined them with other types, 19% were female and 17.5% were male.

Among the users of unfiltered tobacco, straw cigars were the most mentioned by 11.2% of participants, and the number of participants who either only smoked marijuana or combined it with other types totaled 30.1%.

Table 3. Number (n) and percentage (%) breakdown of participants by type of smoking

Other types of smoking	Cigarettes						Total	
	No, has never smoked		Yes, currently		No, but used to smoke			
	n	%	n	%	n	%	n	%
No other type of smoking	317	55.5	36	6.3	26	4.5	378	66.5
Pipes	1	0.2	-	-	-	-	1	0.2
Cigars	-	-	-	-	2	0.4	2	0.4
Straw cigars	3	0.5	2	0.4	-	-	5	0.9
Cigarillos	1	0.2	-	-	-	-	1	0.2
Hookas	2	0.4	-	-	-	-	2	0.4
Cigars and straw cigars	1	0.2	2	0.4	2	0.4	5	0.9
Cigars, straw cigars, and pipes	1	0.2	1	0.2	1	0.2	3	0.5
Cigars, straw cigars, and cigarillos	-	-	1	0.2	-	-	1	0.2
Marijuana	55	9.6	28	4.9	21	3.7	104	18.2
Marijuana and pipes	2	0.4	-	-	-	-	2	0.4
Marijuana and cigars	5	0.9	5	0.9	2	0.4	12	2.1
Marijuana and straw cigars	5	0.9	12	2.1	5	0.9	22	3.9
Marijuana, cigars, and pipes	-	-	1	0.2	2	0.4	2	0.4
Marijuana, straw cigars, and pipes	-	-	1	0.2	-	-	1	0.2
Marijuana, straw cigars, and cigars	4	0.7	3	0.5	2	0.4	9	1.6
Marijuana, straw cigars, cigars, and pipes	-	-	10	1.8	6	1.1	16	2.8
Marijuana, skunk, and hashish*	-	-	1	0.2	-	-	1	0.2
Marijuana, skunk, hashish, and straw cigars	-	-	1	0.2	-	-	1	0.2
Marijuana, skunk, hashish, straw cigars, and pipes	-	-	1	0.2	-	-	1	0.2
Total	397	69.5	105	18.4	69	12.1	571	100

* skunk and hashish = strains of *cannabis*.

As to vocal symptoms, the two most reported types were hoarseness (28.4%) and low-pitched voice (17.2%). The statistical analysis showed a significant relationship between the presence of **hoarseness** in both men and women (10.9% and 17.5%, respectively; p = 0.029) and smoking (p = 0.005). The significant risk factors for the presence of hoarseness were: being a female (OR = 1.8 and p = 0.002); smoking both tobacco cigarettes and marijuana (OR = 2.9 and p = 0.015); having stopped smoking cigarettes, but smoking both marijuana and unfiltered tobacco (OR = 7.2 and p = 0.000).

Table 4. Number (n) and percentage (%) breakdown of participants by sex, smoking, age and presence or absence of hoarseness

Variable	Category		Hoarseness				Total		p
			Yes		No				
			n	%	n	%	n	%	
Sex		Male	25	10.9	204	89.1	229	100	0.029*
		Female	60	17.5	282	82.5	342	100	
Smoking	No marijuana	Does not smoke cigarettes	41	12.9	276	87.1	317	100	0.005*
		Smokes cigarettes	6	15.0	34	85.0	40	100	
		Stopped smoking	5	18.5	22	81.5	27	100	
		Smokes unfiltered tobacco	3	18.8	13	81.3	16	100	
	Marijuana	Does not smoke cigarettes	6	8.5	65	91.5	71	100	
		Smokes cigarettes	9	30.0	21	70	30	100	
		Stopped smoking	2	9.1	20	90.9	22	100	
		Smokes cigarettes and unfiltered tobacco	6	18.2	27	81.8	33	100	
		Stopped smoking and smokes unfiltered tobacco	7	46.7	8	53.3	15	100	
Age		≤ 18	22	16.8	109	83.2	131	100	0.485
		≥ 19	63	14.3	486	85.1	440	100	

chi-squared test, * p < 0.005

The findings showed a significant relationship between the presence of **low-pitched voice** and tobacco smoking (p = 0.011). The significant risk factors for the presence of low-pitched voice were: smoking both tobacco cigarettes and marijuana (OR = 4.2 and p = 0.005); smoking tobacco cigarettes and marijuana associated with unfiltered tobacco (OR = 3.8 and p = 0.009); and having stopped smoking cigarettes, but smoking both marijuana and unfiltered tobacco (OR = 6.2 and p = 0.004).

Table 5. Number (n) and percentage (%) breakdown of participants by sex, smoking, age and presence or absence of low-pitched voice

Variable	Category		Low-pitched voice				Total		p
			Yes		No				
			n	%	n	%	n	%	
Sex		Male	20	8.7	209	91.3	229	100	0.915
		Female	29	8.5	313	91.5	342	100	
Smoking	No marijuana	Does not smoke cigarettes	18	5.7	299	94.3	317	100	0.011*
		Smokes cigarettes	4	10.0	36	90.0	40	100	
		Stopped smoking	2	7.4	25	92.6	27	100	
		Smokes unfiltered tobacco	1	6.3	15	93.8	16	100	
	Marijuana	Does not smoke cigarettes	5	7.0	66	93.0	71	100	
		Smokes cigarettes	6	20.0	24	80.0	30	100	
		Stopped smoking	3	13.6	19	86.4	22	100	
		Smokes cigarettes and unfiltered tobacco	6	18.2	27	81.8	33	100	
		Stopped smoking and smokes unfiltered tobacco	4	26.7	11	73.3	15	100	
Age		≤ 18	12	9.2	119	90.8	131	100	0.788
		≥ 19	37	8.4	403	91.6	440	100	

chi-squared test, * p < 0.005

Discussion

This study sought to analyze the relationship between tobacco and marijuana smoking and the presence of vocal symptoms in a young population. The larger number of women participants may be explained by the fact that the survey was conducted with students of Humanities, a field where women are majority. A survey carried out with university students to assess the job market and academic performance, when identifying participants' majors and fields, showed that 72% of humanities (also known as "soft sciences") majors were female, and only 28% were male. In the so-called "hard sciences", on the other hand, 68% of students were male, and 32% were female[16].

As to the habit of smoking, the findings showed that 55.5% of participants had never smoked and 4.5% were former cigarette smokers, which may be explained by the fact that the tobacco control policies are at an advanced stage in Brazil, by means of campaigns aimed at promoting health and preventing tobacco-related illnesses[2,17,18], in addition to national pro-voice campaigns that encourage the population to stop smoking[18].

The percentage of smokers was 40%, considering any type of smoking, either in isolation or combined with other types, including marijuana. From these 40%, 13.3% only smoked marijuana, and 20.4% combined several types of smoking. These are high figures, which is a concerning fact, as the use of both legal and illegal drugs usually begins in adolescence and during university[19]. In addition, cigarettes may be a stepping stone to marijuana, and from that to other more harmful drugs, in the search for more intense sensations, or as a way to cut down on cigarette smoking. According to the literature, mixing tobacco with marijuana in order to "soften" tobacco smoking is a common practice, which may evolve to continuous marijuana smoking[20]. This points to the need to create educational tools that discuss its implications for the physical, mental and social health of youngsters and society as a whole[10,11].

Research shows that drug use generates a social impact that permeates all the spheres of the user's life, such as his/her family, professional and social life[19]. Considering that this study's participants are preparing for the job market, the voice is a fundamental element in their professional lives. Professionals who rely heavily on their voices

are more impacted by dysphonia, as they depend on a specific vocal quality for their professional survival[20]. Thus, it is extremely important for these professionals to ensure the integrity of their voices, which may be damaged by tobacco smoking and other drugs, such as marijuana. The latter is an illegal drug that harms its users' overall health, besides causing irritation and lesions in the vocal tract, hoarseness, and alterations in the rhythm and fluency of speech. Studies have shown that marijuana and cigarettes are the most common drugs among youngsters, and both cause dependency and similar symptoms, such as respiratory disorders and even cancer of the respiratory tract[22-23].

This study determined that 17.2% of participants presented a low-pitched voice, with a statistically significant relationship between this symptom and smoking (p = 0.011). The habit of smoking causes swelling in the vocal folds, and, consequently, the pitch of cigarette or marijuana smokers tends to go down[13], with a lower fundamental frequency in both sexes[24].

There was also a statistical significance in the association between the presence of hoarseness and the sex (p = 0.029). The literature indicates that women are more prone to develop voice disorders, chiefly due to the laryngeal configuration and hormonal changes typical of females[24]. Women showed a 1.8 times greater likelihood of developing hoarseness than men. This may be explained by the research that demonstrated that our auditory perception of voice lowering due to cigarette smoking is smaller in men, as they tend to have a lower pitch than women to begin with. Consequently, it is assumed that, when their pitch becomes lower due to a swelling in the vocal folds, male individuals notice their own hoarseness less than females[9].

The association between hoarseness and smoking (p = 0.005) is in line with the findings related to the presence of low-pitched voice, given that the habit of smoking causes the swelling of the vocal folds, and, consequently, the pitch of the voice of cigarette or marijuana smokers tends to get lower[13].

It is worth pointing out that this research, even though it did not consider how long participants had been smoking or the number of cigarettes smoked per day, evidenced considerable diversity in smoking habits, which exposes the participants to increased risk of developing vocal symptoms or disorders.

The university students who stated that they stopped smoking filtered cigarettes, but continued to smoke marijuana and unfiltered tobacco had more chances of developing hoarseness (OR = 7.2) and low-pitched voice (OR = 6.2). The most likely explanation for this fact is that, when stopping smoking filtered cigarettes, smokers tend to increase their use of other types of smoking (unfiltered tobacco and marijuana), thus raising the likelihood of developing vocal symptoms, as the absence of the filter intensifies the inhalation of nicotine and tar. The literature shows that the mucous membrane of the vocal tract is harmed by the high temperature of the smoke and the toxicity of its chemical elements, leading the body to produce more phlegm to expel the irritating element[25].

The participants who stated that they smoked filtered cigarettes as well as marijuana also had an increased likelihood of presenting low-pitched voice and hoarseness (OR = 4.2 for low-pitched voice, and OR = 2.9 for hoarseness), while users of cigarettes in combination with marijuana and unfiltered tobacco only showed an increased likelihood of developing low-pitched voice (OR = 3.8).

These findings show how aggressive marijuana is for the vocal tract, causing vasodilation of capillaries, bronchodilation[12], and voice alterations, with a probable lesion in the vocal tract[14]. The presence of hoarseness and low-pitched voice may be explained by the use of marijuana in conjunction with tobacco cigarettes and/or unfiltered tobacco.

The results of this research may suggest a negative interference in the smokers' quality of life, in line with a study that showed that female smokers who presented vocal complaints have a low quality of life regarding voice, compatible with the figures presented by dysphonic individuals[26].

Further voice research should be carried out, in order to gather epidemiologic data that may provide a reference for the risks of voice alterations, may be reliable to build health indicators and to recognize the population's needs in the field of Speech, Language and Hearing[9-13].

Even within the topic proposed by this research, other studies should be designed with the aim of verticalizing the frequency and the amount of marijuana smoked by users, as well as the relationship between tobacco and alcohol, given that, when interviewing this study's participants, it became evident that smoking and alcohol are often

associated, and are both common habits among university students.

One limitation of this study is the fact that the data were collected considering only the participants' self-references. Other studies may be more conclusive if they also include the assessment of a speech therapist and/or otolaryngologist.

It is worth mentioning how important it is for each country to conduct a survey into the impact of smoking on its population. Brazil has proven to be a benchmark for the control of tobacco's impact indices, contributing to strategies designed to promote public heath, as well as fostering further research in this field.

Regarding Speech Language Pathology and Audiology, this study's findings may help expand the scope of future campaigns against smoking to include the planning and implementation of more effective programs for prevention of vocal disorders.

The findings also warn voice care specialists as to the possible impacts of smoking on the vocal tract of young people, who are seldom included in educational campaigns or specific health care services. A lot is said about children, teenagers and the elderly, but little attention is paid to the demands of young adults, who are exposed to a series of appeals and challenges associated with the paths to be taken and that will determine their professional and personal futures.

Conclusion

The study showed, within the population studied, a relationship between smoking and the vocal symptoms of hoarseness and low-pitched voice, when associated with the use of marijuana. Further studies on this topic may provide better support to speech therapists' actions regarding young adults.

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Appendix 1

Prezado (a) aluno (o),

Você foi escolhido (a) para responder as questões a seguir.

Trata-se de uma pesquisa de Mestrado que pretende conhecer o perfil dos alunos do primeiro anos de 2004.

É muito importante que você responda corretamente a todas as questões, pois certamente, além de estar contribuindo para um estudo de grande proporção dentro da nossa Universidade, você estará caracterizando os alunos presentes [redacted].

Cabe ressaltar que **TODOS** os dados de identificação serão mantidos em sigilo **TOTAL** entre a pesquisadora/orientadora e você.

Contamos e agradecemos sua colaboração!

I. DADOS PARA CARACTERIZAÇÃO DO ALUNO

1	**Data de nascimento:** / /	**Idade:** anos
2	**Curso:**	
3	**Ano que ingressou na faculdade:**	
4	**Data de preenchimento do questionário:** / /	

II. QUESTIONÁRIO

1-	**Você fuma?**	
1-1	( ) sim, fumo atualmente	1-1
1-2	( ) não, mas já fumei.	1-2
1-3	( ) não, nunca fumei.	1-3
2-	**Você faz uso ou já fez de algum outro tipo de fumo?**	
2-1	( ) sim	2-1
	2-1-1 Se sim, qual(ais)? (marque uma ou mais alternativas)	
	2-1-1-1 ( ) cachimbo	2-1-1-1
	2-1-1-2 ( ) charuto	2-1-1-2
	2-1-1-3 ( ) maconha	2-1-1-3
	2-1-1-4 ( ) cigarro de palha	2-1-1-4
	2-1-1-5 ( ) outro(s):.....	2-1-1-5
2-2	( ) não	2-2

3-	**Das sensações relacionadas abaixo, qual você tem notado ocorrer com você no último mês?** (marque uma ou mais alternativas)	
3-1	( ) rouquidão	3-1
3-2	( ) tosse com secreção	3-2
3-3	( ) falta de ar	3-3
3-4	( ) voz grossa	3-4
3-5	( ) voz fina	3-5
3-6	( ) voz variando em fina e grossa	3-6
3-7	( ) voz fraca	3-7
3-8	( ) voz forte	3-8
3-9	( ) cansaço ao falar	3-9
3-10	( ) perda da voz	3-10
3-11	( ) tosse seca	3-11
3-12	( ) pigarro / secreção	3-12
3-13	( ) ardor na garganta	3-13
3-14	( ) garganta seca	3-14
3-15	( ) boca seca	3-15
3-16	( ) dificuldade para engolir	3-16
3-17	( ) falhas na voz	3-17
3-18	( ) esforço ao falar	3-18
3-19	( ) dor ao falar	3-19
3-20	( ) nenhum deste	3-20

Se você quiser fazer qualquer observação, anote aqui: _____