**SOCIODEMOGRAPHIC, CARDIOVASCULAR AND SLEEP PATTERN
DETERMINANTS ASSOCIATED WITH TOBACCO
DETERMINANTES SOCIODEMOGRÁFICOS, CARDIOVASCULARES E PADRÃO DO SONO
ASSOCIADOS AO TABAGISMO**

**DETERMINANTES SOCIODEMOGRÁFICOS, CARDIOVASCULARES Y ESTÁNDAR DEL SUEÑO ASOCIADOS
AL TABAQUISMO**

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ABSTRACT

Objective: to determine the factors associated with nicotine dependence in relation to cardiovascular morbidities and sleep behavior. **Method:** this is a quantitative, case-control, observational study with a sample of 323 smokers (case) and 322 non-smokers (control). A semi-structured questionnaire was applied with sociodemographic data and Fagerström Test For Nicotine Dependence (FTND). Results: lower schooling and income were presented by the case group when compared to the control group. In the multiple analysis, the study group was positively associated with the variables ≤ 8 years of study, had no religion, no diagnosis of ischemic heart disease, difficulties to sleep through snoring or cough more than twice a week, and did not fall asleep in 30 minutes also more than twice in the week. The case-group was negatively associated with skin color / white race and body mass index ≥ 30 . **Conclusion:** it was concluded that individuals with nicotinic dependence had a greater chance of ischemic heart disease and disturbances in sleep behavior in the studied population. The importance of greater attention to risk factors related to nicotinic dependence, which potentiate chronic health problems and should be considered in the promotion and prevention of such damages, is reinforced. **Descriptors:** Tobacco; Cardiovascular diseases; Sleep; Nicotine; Epidemiology; Public health.

RESUMO

Objetivo: determinar os fatores associados à dependência da nicotina em relação às morbidades cardiovasculares e ao comportamento do sono. **Método:** trata-se de um estudo quantitativo, caso-controle, observacional com amostra de 323 indivíduos fumantes (caso) e 322 não fumantes (controle). Aplicou-se questionário semiestruturado com dados sociodemográficos e Fagerström Test For Nicotine Dependence (FTND). **Resultados:** apresentaram-se menores escolaridade e renda pelo grupo-caso quando comparado ao controle. Associou-se positivamente, na análise múltipla, o grupo-caso com as variáveis ≤ 8 anos de estudo, não possuir religião, diagnóstico de doença isquêmica do coração, dificuldades para dormir por ronco ou tosse mais que duas vezes na semana e não adormecer em 30 minutos também mais que duas vezes na semana. Associou-se negativamente o grupo-caso com a cor de pele/raça branca e o índice de massa corporal ≥ 30 . **Conclusão:** conclui-se que indivíduos com dependência nicotínica apresentaram maior chance de doença isquêmica do coração e distúrbios no comportamento do sono na população estudada. Reforça-se a importância de maior atenção aos fatores de risco relacionados à dependência da nicotínica, que potencializam agravos crônicos à saúde e devem ser considerados na promoção e na prevenção de tais danos. **Descritores:** Tabaco; Doenças Cardiovasculares; Sono; Nicotina; Epidemiologia; Saúde Pública.

RESUMEN

Objetivo: determinar los factores asociados a la dependencia de la nicotina en relación a las morbilidades cardiovasculares y al comportamiento del sueño. **Método:** se trata de un estudio cuantitativo, caso-control, observacional con muestra de 323 individuos fumadores (caso) y 322 no fumadores (control). Se aplicó un cuestionario semiestructurado con datos sociodemográficos y Fagerström Test For Nicotine Dependence (FTND). **Resultados:** se presentaron menores escolaridades e ingresos por el grupo-caso cuando comparado al control. Se asoció positivamente, en el análisis múltiple, el grupo-caso con las variables ≤ 8 años de estudio, no poseía religión, diagnóstico de enfermedad isquémica del corazón, dificultades para dormir por ronquido o tos más que dos veces a la semana y no dormirse en 30 minutos también más que dos veces a la semana. Se asoció negativamente el grupo-caso con el color de piel / raza blanca y el índice de masa corporal ≥ 30 . **Conclusión:** se concluye que individuos con dependencia nicotínica presentaron mayor probabilidad de enfermedad isquémica del corazón y distúrbios en el comportamiento del sueño en la población estudiada. Se refuerza la importancia de mayor atención a los factores de riesgo relacionados con la dependencia de la nicotina, que potencian agravios crónicos a la salud y deben ser considerados en la promoción y la prevención de tales daños. **Descriptor:** Tabaco; Enfermedades Cardiovasculares; Sueño; Nicotina; Epidemiología, Salud Pública.

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INTRODUCTION

Tobacco use is recognized as a global epidemic in the 21st century. It is estimated that there are three million smokers, revealing that tobacco use is a social problem and directly affects collective health, which requires effective measures in their control.¹ It is known that the impact of this habit on the quality of health and the mortality rates of people is devastating and corresponds to one of the major causes of chronic non-communicable diseases (CNCD), besides being a factor of aggravation to other diseases.²

In Brazil, there is a reduction in the prevalence of tobacco use: the rate of 34.8% in 1989 fell to 15% in 2013, with a rate of 19.2% among men.³ Persistent groups that are associated with socio-demographic and occupational factors aggravate health quality and require more attention, such as low schooling and purchasing power, stress, no religion, gender, age marital status.⁴⁻⁵ Smoking is motivated, in large part, by social vulnerability and inequalities in access to resources, education and information.⁶⁻⁷

Smoking is one of the major avoidable causes of chronic morbidities, such as cardiovascular diseases, especially coronary diseases, when compared to data from non-smokers, independent of age.⁸⁻⁹ There are substances in tobacco that act to raise blood pressure immediately after consumption.⁵ It is also observed that sleep problems make up the pathophysiology of some diseases related to smoking. At the same time, high levels of nicotinic dependence and smoking time were associated with poor sleep quality and reduced duration of sleep.¹⁰⁻¹ Symptoms such as awakening during sleep, frequent colds, respiratory infections, as well as insomnia and elevated brain activity¹² are associated with smoking.

It is also inferred that there is evidence of a greater vulnerability to the chronic conditions of health and sleep disorders.¹⁰ It is hypothesized that the factors which pose a risk to the health of smoking groups are multifactorial and potentiate - especially social, cardiovascular and sleep disorders, irrespective of the context of approach of individuals.

In this research, we investigate and test the variables related to sociodemographic factors, cardiovascular problems and sleep patterns in the smoking population through a case-control study.

OBJECTIVE

- To determine the factors associated with nicotine dependence in relation to cardiovascular morbidities and sleep behavior.

METHOD

This is a quantitative, observational case-control study¹³ developed in the municipality of Catalão (GO), Brazil, of medium size, of relevance and economic and social reference for an area that covers 12 other municipalities, located in the central region of Brazil.

The study population was the smokers and non-smokers living in the research municipality. Therefore, the sample was divided into two distinct groups, considering, for the case, a morbidity, that is, smoking, according to the International Statistical Classification of Diseases and Related Health Problems (ICD 10), is a chronic disease (ICD F-17.2).¹⁴ Paired individuals by sex and age who did not have the condition of the case.

For the sample calculation: n1 (control) = n2 (case) was used. The prevalence of hypertension in the Brazilian population was considered as 21.4%¹⁵ because it was the most prevalent cardiovascular alteration. This change can be reached among smokers, with more than half of these values¹⁶ considering 21% for n1 and, for n2, 31%. For the statistical difference, significance level of 5% and power of the test of 80% were applied. We used the command in the Stata Software Package (STATA), version 14.0: sampsi .21 .31, power (.80) to (.05).¹⁷ There were 321 individuals for n1 and 321 for n2, totaling 642 individuals.

They were listed as inclusion criteria: age ≥ 17 years and reside in the municipality where the research was conducted; be a current smoker in the last 30 days; to have a smoking habit ≥ 12 months and to score at least one degree of possible nicotine dependence on the Fagerström Test For Nicotine Dependence (FTND) and to have cognitive conditions for comprehension and questionnaire response. Smokers who self-reported congenital cardiovascular problems without correction and psychiatric diagnosis of severe and persistent mental disorder were excluded.

The following rules were established for control: age range (age ≥ 17 years) and sex; do not smoke; have the same geographical residence in the municipality where the research in which the subject-subjects were addressed; declare that they have never smoked for a period ≥ 30 continuous days in life; not having smokers living in the same household and presenting cognitive conditions

for understanding and responding to the questionnaire. We excluded non-smokers who self-reported congenital cardiovascular problems without correction and who presented psychiatric diagnosis of severe and persistent mental disorder (with psychotic symptoms).

The cases were recruited for convenience, according to the eligibility criteria, in environments used as teaching, extension and research of the university, namely: primary health care services (Basic Health Units and Family Health Strategy); emergency and emergency services (Emergency Care Unit); medium complexity and specialty services (hospitals and Testing and Counseling Center) and community (residences, university spaces, commerce and plazas). It was followed, for the constitution of the control group, to be representative individuals of the population that originated the case, as representatives of the population from which the cases were approached.¹⁸ It was thus selected in each environment where recruited a case, also, a control, respecting the age group, sex and the inclusion and exclusion criteria.

Before the data collection, the pilot test was performed in ten individuals, five smokers and five non-smokers not resident in the municipality. The questionnaires of interest were applied, with the objective of a test reproducing all the strategies and methods used in the study, identifying the logistic and operational aspects, with a view to the training of the field researchers, besides adjusting the data collection instruments. It turned out that these results were not used in the final analysis.

The data was collected from March to November 2016 by field researchers selected among undergraduate students linked to the Scientific Initiation. The researchers were trained for 40 hours by the researchers responsible for the project, with interdisciplinary training in health (Medicine, Nursing and Nutrition).

The face-to-face interview technique was applied in private places, provided by the managers of these services, or in the residences, with an average duration of 20 minutes. The Free and Informed Consent Term (FICT) was signed by all participants, as well as the Term of Assent, when children under 18 years of age.

Structured instruments with sociodemographic data were used elaborated by the researchers and analyzed by specialists in the health area containing variables extracted from specific reference points for the clinical history and the anamnesis of

patients, as well as specific indexes on chronic health problems in smokers.^{10-1,19}

The FTND was used to assess nicotinic dependence. This is an easy-to-use scale used to diagnose smoking and establish its severity in six items: (1) how long after waking do you smoke your first cigarette ?; (2) Do you find it difficult not to smoke in forbidden places ?; (3) Which cigarette of the day brings more satisfaction ?; (4) How many cigarettes do you smoke each day ?; (5) Do you smoke in the morning? and (6) Do you smoke even sick? Nicotine dependence scores are reported on five levels: very low (zero to two points); low (three to four points); moderate (five points); high (six to seven points) and very high (eight to ten points).²⁰

The dependent variable was the case group. A contextual variable was used as a factor in the multiple analysis, following the guidelines that the occurrences of health or morbidity can not be explained solely by individual questions, necessitating interactions between individual and context for the explanations of complex condition of the process health and illness²¹ and that, for the outcomes related to the individual, the application of effects of contextual factors may influence the health or disease condition, being relevant in the control of confusion.²² The effect was applied, contextual variable "place of approach of the individual", categorized in community versus Primary Health Care services versus hospitals and specialty services versus emergency network.

The variables age (in years), income (in Reais) and years of smoking (in years) were described. The independent variables in skin color / self-reported race (brown / mulatto versus white versus black versus yellow / indigenous) were understood; marital status (married / consensual versus single versus separated / divorced vs. widow versus other); years of study (eight years or less versus more than eight years); work (formal versus informal); religion (yes versus no); diagnosis of ischemic heart disease (self-reported or medical diagnosis, yes versus no); have a diagnosis of systemic arterial hypertension (self-referral to have medical diagnosis, yes versus no), and body mass index (BMI), measured by weight and height, by the formula:

$$BMI = \frac{\text{Weight}}{\text{Height}^2} ; BMI = \frac{\text{Weight}}{\text{Height}^2}$$

The BMI was then categorized as <30 versus ≥30; (snoring or coughing - twice or less in the week versus more than twice in the week, use of sleeping pills - twice or less in the week versus more than twice in the week) and did not fall asleep within 30 minutes (twice or less in the week versus more than twice in the week).

Data were typed in a double-spreadsheet by analyzing them using STATA 14.0. We used the Cronbach's alpha, whose value was 0.99, to test the reliability of the FTND responses. Quantitative variables were described with mean, median and standard deviation (SD) and categorical variables by percentage and 95% confidence interval (95% CI). For the estimation of association between the variables, the odds ratio (OR).

The univariate analysis was performed with the control versus case variables, one by one, with the independent variables, and then the crude OR and 95% CI were estimated. Variables with p <0.10 were inserted into the multiple logistic regression model to obtain the adjusted OR and 95% CI. Associated variables were those with p <0.05. In this multiple analysis, the model conditioned by the contextual factor with hierarchical input (distal, middle and proximal) of groups of independent variables totaling three models: empty (dependent variable and contextual); one (sociodemographic characteristics of individuals were added); two (sociodemographic characteristics and self-referral / diagnosis of pathologies were added) and three or complete (sociodemographic characteristics, symptoms or self-reference of the pathologies and behavioral aspects of sleep were added). For the quality of fit, the test result of *-2loglikelihood*.

The ethical principles of Resolution 466/2012 that guide human research in Brazil, with protocol 1,322,427 and CAAE 49759315.5.0000.5083.

RESULTS

The sample was composed by 322 control individuals and 323 cases, totaling 645 participants. Sample losses of the order of 10% for the case group and 7% for the control were added, with responses to guarantee the same number calculated for the two groups, with one difference for one control and two for the case, in relation to the sample calculation. The paired and sociodemographic variables are shown in Table 1.

Table 1. Sociodemographic and face description of the samples. Catalão (GO), Brazil, 2016.

Variables	Control (n=322)		Case (n=323)	
	n (%)	CI95%	n (%)	CI95%
Pairing				
Sex				
Female	175 ^a (54.9)	49.2-60.2	174 (53.9)	48.3-59.4
Male	144 (45.1)	39.8-50.8	149 (46.1)	40.6-51.7
Age				
<30	68 (21.0)	16.9-25.7	67 (20.7)	16.7-25.1
30-39	93 (29.2)	24.8-33.9	94 (29.1)	23.8-34.1
40-49	85 (26.6)	22.3-31.3	85 (26.3)	22.0-31.3
50-59	40 (12.5)	9.1-16.3	44 (13.6)	9.9-17.3
≥60	34 (10.7)	7.2-14.1	34 (10.6)	7.1-13.6
Descriptive				
Marital status				
Married/consensual union	148 (46.5)	40.9-52.2	181 (56.0)	50.2-1.0
Single	120 (37.7)	32.4-43.4	99 (30.7)	26.0-5.9
Separated/divorced	30 (9.4)	6.3-12.9	29 (9.0)	5.9-12.1
Widow	18 (5.7)	3.5-8.5	14 (4.3)	2.2-6.8
Others	2 (0.6)	0.0-1.6	-	-
Race/ethnicity				
Brown	140 (44.0)	38.7-49.4	202 (62.5)	57.6-67.5
White	125 (39.3)	34.0-44.6	63 (19.5)	15.5-23.8
Black	37 (11.6)	8.2-15.4	38 (11.8)	8.4-15.2
Yellow	15 (4.7)	2.5-7.2	18 (5.6)	3.1-8.4
Indigenous	1 (0.3)	0.0-0.9	02 (0.6))	0.0-1.5
Numeric variables	Control		Case	
	Average	Median ± SD	Average	Median ± SD
Age, years	40.22	40±14.740	40.88	39±13.212
Income, R\$	3.165.45	2.500.00± 3.030.05	2.491.67	2.000.00± 3.202.68
Years of study	11.25	12±4.003	8.12	8±4.268
Years of smoking	-	-	25.60	23±13.876

^a Valid numbers for the variable. 95% CI: confidence interval 95%.

In relation to nicotine dependence levels, the following levels of nicotinic dependence were shown by the case group: 18.89% (very low); 20.43% (low); 14.24% (average); 29.10% (high) and 17.34% (very high). This group was also shown to have lower educational level and income when compared to the non-smokers group. Table 2 shows the crude OR with independent variables between the control and case groups.

Table 2. Odds ratio (OR) between case and control with independent variables. Catalão (GO), 2016.

Variable	Control (n=322) n (%) ^a	Case (n=323) n (%)	brute OR ^b	CI95%	Value of p
Skin color/race					
Brown	141 (41.11)	202 (58.89)	1		
White	125 (66.49)	63 (33.51)	0.35	0.24-0.51	0.000
Black	37 (49.33)	38 (50.67)	0.71	0.43-1.18	0.193
Yellow/Indigenous	16 (44.44)	20 (55.56)	0.87	0.43-1.74	0.699
Marital status					
Married/consensual union	148 (44.98)	181 (55.02)	1		
Single	121 (55.00)	99 (45.00)	0.66	0.4-0.94	0.022
Separated/divorced	30 (50.85)	29 (49.15)	0.79	0.45-1.37	0.406
Widow	18 (56.25)	14 (43.75)	0.63	0.30-1.32	0.225
Others	2 (100.00)	-	-	-	-
Years of study					
>8	246 (62.44)	148 (37.56)	1		
≤8	74 (29.72)	175 (70.28)	3.93	2.79-5.52	0.000
Income					
<R\$2.000,00	145 (54.72)	120 (45.28)	1		
≤R\$2.000,00	175 (46.30)	203 (53.70)	1.40	1.02-1.92	0.036
Work					
Formal	155 (56.57)	119 (43.43)	1		
Informal	165 (44.72)	204 (55.28)	1.61	1.17-2.20	0.003
Has religion					
Yes	288 (53.33)	252 (46.67)	1		
No	32 (31.07)	71 (68.93)	2.53	1.61-3.97	0.000
Diagnosis of ischemic heart disease					
No	316 (51.97)	292 (48.03)	1		
Yes	4 (11.43)	31 (88.57)	8.38	2.92-24.04	0.000
Has a diagnosis of SAH					
No	269 (52.82)	240 (47.15)	1		
Yes	51 (38.06)	83 (61.94)	1.82	1.23-2.69	0.003
BMI					
<30	299 (48.38)	319 (51.62)	1		
≥30	20 (83.33)	4 (16.67)	0.18	0.06-0.55	0.002
Had difficulty sleeping due to coughing or snoring					
≤2 times/week	265 (55.21)	215 (44.79)	1		
>2 times/week	55 (33.74)	108 (66.26)	2.42	1.66-3.50	0.000
Use of sleeping pills					
≤2 times/week	294(50.69)	286(49.31)	1		
>2 times/week	24(39.34)	37(60.66)	1.58	0.92-2.71	0.094
Could not fall asleep in 30 minutes					
≤2 times/week	203 (57.67)	149 (42.33)	1		
>2 times/week	117 (40.21)	174 (59.79)	2.02	1.47-2.77	0.000

^a Valid numbers for the analysis of the variable; ^b Gross odds ratio: bivariate analysis. 95% CI: 95% confidence interval. SAH: systemic arterial hypertension; BMI: body mass index.

Table 3 shows the adjusted OR for the models and the context variable, with a factor effect between the case and control groups. We showed the complete model best fit quality in which the -2loglikelihood test was lower compared to previous models. There was a positive association, by the multiple study, with the case-group in sociodemographic variables (schooling ≤8 years, informal work and no religion), having diagnoses of ischemic heart disease and aspects such as difficulty sleeping due to coughing and / or snore more than twice in the week or do not fall asleep in 30 minutes more than twice in the week. The skin color / white race and the BMI ≥30 were negatively associated with the case group.

Table 3. Odds ration (OR) adjusted to the models and context variable with factor effect, between case and control. Catalão (GO), 2016											
Level	Empty model		Model 1			Model 2			Model 3		
	OR	SE	OR	CI95%	Value of p	OR	CI95%	Value of p	OR	CI95%	Value of p
Empty model											
First level: individuals	1.01	0.14									
Sociodemographic variable											
White / Caucasian			0.37	0.25-0.57	0.000	0.37	0.24-0.57	0.000	0.38	0.24-0.58	0.000
Single matital status			0.80	0.53-1.19	0.286	0.84	0.56-1.28	0.434	0.81	0.53-1.24	0.338
≤8 years of study			3.83	2.62-5.60	0.000	3.50	2.36-5.17	0.000	3.19	2.14-4.74	0.000
Income ≤R\$2.000,00			1.05	0.72-1.52	0.783	1.06	0.73-1.53	0.746	1.00	0.69-1.46	0.978
Informal work			1.70	1.19-2.44	0.003	1.58	1.09-2.28	0.015	1.59	1.09-2.31	0.015
Does not have a religion			3.61	2.16-6.02	0.000	3.46	2.06-5.81	0.000	3.20	1.89-5.42	0.000
Variable symptoms / morbidity											
Diagnosis of ischemic heart disease						4.26	1.41-12.9	0.010	3.14	1.01-9.79	0.048
Diagnosis of SAH						1.41	0.86-2.31	0.163	1.40	0.84-2.32	0.192
BMI≥30						0.21	0.62-0.70	0.012	0.18	0.53-0.60	0.006
Sleep variables / had difficulty sleeping											
Coughing and / or loud snoring> 2 times / week									1.59	1.02-2.48	0.015
Use of sleeping pills									1.18	0.62-2.22	0.448
Could not fall asleep in 30 minutes >2 times/week									1.72	1.18-2.51	0.021
-2 loglikelihood	-442.93275		-378.44341			-367.95413			-359.03155		
-2 loglikelihood Positive	885.8655		756.88682			735.90826			718.0631		

SE: standard error; 95% CI: 95% confidence interval; SAH; systemic arterial hypertension; BMI: body mass index.

DISCUSSION

In this investigation, important factors associated to the case-group were identified for the knowledge of the health condition of individuals exposed to the nicotinic substance in a chronic manner, indicating social, cardiovascular and sleep-related vulnerabilities. In this case, it is important to test the variables that, when concomitant in the same group, can substantially increase the chronic health problems, considering the contextual variable, which was the place of the interview. In this situation, the association between the socio-demographic condition, cardiovascular morbidity and the reduction of the ability to fall asleep due to cough / snoring symptoms in a time greater than 30 minutes.

As limits of the study, convenience sampling, which does not allow a generalization of the data, and the application of the OR effect measure, are considered as limits of the study, due to its capacity to overestimate the results obtained. The researchers used the contextual variable in the OR adjusted as factor effect to minimize the bias represented by the fact that the smokers approached in health services (hospitals, specialty and urgency) could be in health conditions more committed than those recruited from Primary Care or the community. Variations in the temporality of exposure to tobacco consumption and the different levels of nicotine dependence by the FTND among the individuals that composed the case group are also admitted as biases, which may impact differently on the appearance of chronic diseases. It is also added the bias of the interviewees' memory.

In relation to the sociodemographic characteristics of the case-group, the negative association with skin color / white race is highlighted. It is believed that, in addition to the social justifications of less tobacco exposure in this population, due to greater access to training and better economic conditions,¹ there is also the fact that tobacco consumption can be related to the higher concentrations of melanin. It is explained that smokers with more melanin pigment are more susceptible to nicotine dependence and the problems associated with their consumption because there is a biochemical affinity between nicotine and melanin. The number of cigarettes consumed per day is thus positively associated with the amount of both genetically acquired melanin and the effect of solar tanning.²³

It is revealed that there is an almost global convergence on the determinants of low schooling with smoking. In addition, there is a relation with the lower economic power, since smoking causes social inequalities⁷ in a scenario in which people would have fewer resources to cope with the related morbidities.⁸ This fact was observed also in this study when the case group reported lower income than the control group.

The economic classes most vulnerable to tobacco consumption are D (monthly income of one to three minimum wages) and E (monthly income of up to one minimum wage) when compared to class C (monthly income of three to five wages minimum).²⁴ Income is influenced by social factors such as unemployment and low level of schooling, which are also associated with tobacco use. This finding is corroborated by studies that conclude that the populations with lower purchasing power are more susceptible to tobacco use, and among the justifications is the lack of access to information.³

In this study, a lower level of education resulted in a greater chance of tobacco consumption when compared to individuals who completed high school. Such findings can be explained by the lack of access to information,²⁵ which also results in disbelief in the scientific evidence on the health effects of tobacco.⁸

In this investigation, the variable "informal work" was associated with the group-if it was autonomous (self-employed), which corroborates a population survey that indicates higher tobacco consumption among unemployed individuals or self-employed workers. Due to the working conditions among smokers, sociodemographic data that are common to them, such as lower schooling and income, and, consequently, lower qualification and competitiveness for work can be reflected. In the same study, it is counterbalanced that, perhaps, the individuals employed smoked less because of the demands of the working environment, which deserves further investigation.²⁶ In other studies, it is pointed out that occupational stress has a strong association with tobacco use, being the autonomous occupation more prone to stress, which also points out the precision of more researches to better understand this factor. It is known that the group of autonomous professionals acts in the informality and does not benefit from policies of prevention of aggravations and social and health promotion, which makes it more vulnerable to work-related disorders.²⁷

It was related not to have a religion with smoking. By religious involvement, religious individuals are less likely to be smokers, especially among adolescents who practice religion.⁴ The differences between the nature of religion are emphasized, with a greater emphasis on smoking protection for that religion that is able to involve more faithful in their activities, thus keeping them distant from substance.²⁵ By means of this social network formed from religious practice, one prays for moral and spiritual values that promote psychosocial comfort.²⁸

In this study, ischemic disease was linked to the case group. It is influenced by nicotine and other components in the cigarette, both in cardiac muscle activity and in adjacent structures. An effect is synchronized to substances that, in acute use, may delay myocardial relaxation and, in chronic use, promote atherosclerosis and cardiovascular disease.²⁹ It is suggested through evidence that tobacco smoke has large amounts of free radicals, which promotes oxidative stress and inflammation.³⁰ The cellular level causes a decrease in mitochondrial function and DNA damage.³¹ The cardiac response is exacerbated by the presence of carbon monoxide, nicotine and other toxic agents. There is a rise in blood pressure through tachycardia and alpha-1-adrenergic-mediated vasoconstriction, vasopressin release, and direct effects on endothelial function.⁵ Smoking-related coronary diseases among young adults are also related to smoking compared to nonsmokers, which, in large part, demystify the concept that such conditions are detectable in smokers when.⁹

BMI ≥ 30 was negatively related to the case group, reinforcing other derivatives that relate lower proportions of body weight to tobacco use.³²⁻³ The relationship between nutritional status and smoking was addressed by some studies in which observed cultural and physiological issues as factors that mobilize body weight control avoiding weight gain. It is therefore adopted by people interested in maintaining body weight, smoking and those who are already smokers avoid cessation for fear of gaining weight. In principle, the satiety of hunger with the regular use of tobacco³²⁻⁴ and other physiopharmacological mechanisms triggered by the introduction of nicotine into the blood stream justifies a large part of weight maintenance. It is contributed, by the cholinergic effect of nicotine, to the increase of the cellular metabolism with energy expenditure and also it substitutes the will to eat by its compensatory effects. Cell

metabolism is increased by the effect of lipolysis, so much so that habitual nicotine use can lead the individual to lose 10% of their body weight over the course of a year as a smoker.³²

Two conditions that substantially interfere with sleep quality were corroborated by studies with this theme.^{10-1,35} It is reinforced by the difficulty of falling asleep because of coughing and / or snoring, smoking as one of the main factors for snoring and cough, especially because of nicotine, which causes irritative and excitatory effects of the muscles of the respiratory tract.⁹

It reduces the ability to fall asleep for both variables, difficulty sleeping through coughing and / or snoring and unable to fall asleep within 30 minutes, directly influencing sleep latency and duration. Sleep time is shorter for smokers when compared to nonsmokers,¹⁰ aggravated by the higher amount of cigarettes smoked per day.¹¹ The findings can be explained in addition to the aspects addressed, in part, by the stimulating action of nicotine on the release of neurotransmitters such as dopamine, acetylcholine and serotonin, which interfere with the activities of wakefulness, rest and sleep.³⁵ It is relevant, however, the concern as the loss of sleep in smokers, since it brings cognitive, emotional and social impairments with increased morbidity and even death.¹⁰

CONCLUSION

It is concluded that this research strengthens the concerns regarding the risks related to smoking. The association of the case-group with ischemic heart disease and difficulties to sleep due to coughing / snoring, as well as the time to fall asleep were indicated, factors that have been confirmed as comorbidities and potentiate the chronic health problems. When considering such factors in a group of individuals already suffering from nicotine addiction, it is suggested that more attention be paid to the political and professional devices for the promotion and prevention of health problems related to tobacco consumption.

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