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FACTORS ASSOCIATED WITH TOBACCO SMOKING IN POST-BARIATRIC SURGERY PATIENTS

Fatores associados ao tabagismo em pacientes pós-cirurgia bariátrica

Factores asociados al tabaquismo en pacientes de postoperatorio de cirugía bariátrica

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ABSTRACT

Objective: To estimate the prevalence of tobacco smoking, nicotine dependence and associated factors in individuals submitted to bariatric surgery. **Methods:** A cross-sectional study with 303 bariatric patients, performed between 2015 and 2016, in Catalão, Goiás State, Brazil. A questionnaire with sociodemographic variables, health conditions and family history was used. Being currently smoker and having high nicotine dependence, with agglutination of the high and very high levels of dependence, were taken as predictor variables for the present study, variables collected from the Fargeström instrument score. The chi-square test was adopted with a significance level of $p<0.05$. **Results:** Tobacco consumption was found in 50 patients (16.5%; CI95% 12.5-20.8) within the past 30 days. The factors associated with tobacco smoking dependence were sex ($p<0.003$), anxiety diagnosis ($p<0.008$), family history of suicide ($p<0.013$), sleeping difficulties ($p<0.007$) and excessive alcohol use ($p<0.045$), with a negative correlation with religious practice ($p>0.038$). **Conclusion:** The significant prevalence of tobacco smoking found in this study was associated with factors such as sex, psychic comorbidities (depression/anxiety), family history of suicide, sleeping difficulty, and, negatively, with religious practice.

Descriptors: Bariatric Surgery; Tobacco; Risk Factors.

RESUMO

Objetivo: *Estimar a prevalência de tabagismo, dependência nicotínica e seus fatores associados em indivíduos submetidos à cirurgia bariátrica.* ***Métodos:*** *Estudo transversal com 303 pacientes bariátricos, realizado entre 2015 e 2016, em Catalão (Goiás). Utilizou-se questionário com variáveis sociodemográficas, condições de saúde e histórico familiar. Como variáveis preditoras para a presente pesquisa, considerou-se ser tabagista atualmente e ter elevada dependência nicotínica, com aglutinação dos níveis elevado e muito elevado de dependência, variáveis coletadas a partir do escore do instrumento Fargeström. Utilizou-se teste qui-quadrado, com valor de $p<0,05$.* ***Resultados:*** *Encontraram-se 50 pacientes (16,5%; IC95% 12,5-20,8) com consumo de tabaco nos últimos 30 dias. Associaram-se como fatores ao consumo dependente de cigarro: sexo ($p<0,003$), diagnóstico de ansiedade ($p<0,008$), histórico familiar de suicídio ($p<0,013$), dificuldades para dormir ($p<0,007$) e uso excessivo de álcool ($p<0,045$), com associação negativa para prática religiosa ($p>0,038$).* ***Conclusão:*** *A significativa prevalência de tabaco encontrada na população estudada associou-se a fatores como: sexo, comorbidades psíquica (depressão/ansiedade), histórico familiar de suicídio, dificuldade para dormir, e, negativamente, à prática religiosa.*

Descritores: *Cirurgia Bariátrica; Tabaco; Fatores de Risco.*

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RESUMEN

Objetivo: *Estimar la prevalencia de tabaquismo, la dependencia de nicotina y sus factores asociados en individuos que realizaron la cirugía bariátrica.* ***Métodos:*** *Estudio transversal con 303 pacientes de cirugía bariátrica realizado entre 2015 y 2016 en Catalão (Goiás). Se utilizó un cuestionario con las variables sociodemográficas, las condiciones de salud y el histórico familiar. Se consideró como variables predictoras para la presente investigación el hecho de fumar tabaco actualmente y tener elevada dependencia de nicotina con aglutinación de los niveles elevado y muy elevado de dependencia que son variables recogidas a partir de la puntuación del instrumento Fargeström. Se utilizó la prueba cui-cuadrado con el valor de p<0,05.* ***Resultados:*** *Se encontró 50 pacientes (16,5%; IC95% 12,5-20,8) con el consumo de tabaco en los últimos 30 días. Se asociaron como factores al consumo dependiente del cigarro: el sexo (p<0,003), el diagnóstico de ansiedad (p<0,008), el histórico familiar de suicidio (p<0,013) las dificultades de dormir (p<0,007) y el uso excesivo de alcohol (p<0,045) con asociación negativa para la práctica religiosa (p>0,038).* ***Conclusión:*** *La prevalencia significativa de tabaco encontrada en la población estudiada estuvo asociada con factores como el sexo, las comorbilidades psíquicas (depresión/ansiedad), el histórico familiar de suicidio, la dificultad de dormir y, negativamente, con la práctica religiosa.*

Descriptores: *Cirugía Bariátrica; Tabaco; Factores de Riesgo.*

INTRODUCTION

Obesity has been regarded as a worldwide pandemic because of the growing number of overweight individuals. In Brazil, excess weight has increased in the last decades of the 21st century and tripled the number of deaths, in the past 10 years, due to obesity[1]. The high prevalence of obesity related to environmental factors such as lifestyle, dietary and genetic patterns is evidenced[2].

The literature highlights the importance of health promotion programs in the encouragement of healthy practices aimed at the prevention of several health conditions and complications, especially for morbidly obese individuals[3]. In this group, actions of health care and health promotion, such as dietary guidance, physical activity and use of medicines, present better results, in the short term. In the long term, these practices are considered inefficient, which justifies the search, by this group, for methods regarded as more promising, such as the bariatric surgery[4].

In this context, the bariatric surgery (BS) acts as a strategy for reducing body weight in morbidly obese individuals[5]. In Brazil, there was an indiscriminate increase in the number of surgical procedures between 2012 and 2015, rising from 72 thousand procedures, in 2016, to more than 93 thousand, in 2017[6].

The BS has a serious impact on the reduction of cardiovascular risk[7], but there is evidence of possible complications and limitations during the postoperative period, such as risk of hypoglycaemia and dumping (rapid gastric emptying) in the short term. In the long term, weight regaining can occur, resulting, in association, in severe protein-calorie malnutrition[8].

In the context of BS postoperative period (post-BS), tobacco abuse becomes worrisome. In this public, its consumption increases the patient's vulnerability to chronic health conditions[9]. As risk factors for tobacco use in the general population, there are: male sex, alcohol abuse, socioeconomic status and low educational attainment[10].

In respect to the factors of vulnerability to tobacco smoking and considering the possible risks to chronic conditions to which individuals submitted to BS are exposed[8], it is advisable to cease smoking at least 60 days before BS[11]. The recommendations related to smoking in the postoperative period are still scarce and limited to investigations addressing factors such as weight loss and change in the pattern of alcohol consumption during the BS postoperative period[12]. It is stated that, as concerns the smoking-related precautions, further studies during the pre- and postoperative period are required[13].

Smoking is characterized by a behavior present in the population that has been submitted to BS, and to this habit are associated, in addition to sociodemographic variables, others that corroborate chronic health conditions. In view of the above, the present investigation intends to estimate the prevalence of tobacco smoking, nicotine dependence and its associated factors in individuals submitted to bariatric surgery.

METHODS

Cross-sectional study developed in a private outpatient clinic in the municipality of Catalão (Goiás, Brazil). Because this is a municipality of economic, social and health care reference for 12 other municipalities, the individuals from this specific health region (*locoregion*) were recruited.

The population was composed of patients in the postoperative period of bariatric surgery (BS), using *Roux*-en-Y gastric bypass, sleeve gastrectomy and partial gastrectomy techniques being assisted to in an outpatient clinic for patients with health insurance plan and private resources. The study attempted to ensure that the selected sample represented the population submitted to BS. Therefore, it adopted statistical power of 80% ($\beta = 20\%$), significance level of 5% ($a = 0.05$) and design effect of 3.0. As this study was part of a matrix research project, which investigated the use of psychoactive substances, the anticipated

frequency of 6.5% was applied for the problematic alcohol use[14]. By adding 10% as predicted losses to that value, it led to the number of 303 individuals with convenience sampling.

With data collected between March 2015 and March 2016, the study participants were invited via phone call, and face-to-face interviews were conducted in a private setting and under the supervision of a nutritionist with extensive experience in BS.

The study adopted as inclusion criteria being a patient submitted to BS for a period equal to or greater than two months and aged 18 years or older. Patients in the gestational period, diagnosed with oncologic diseases, and with medical diagnosis of severe mental disorder (with psychotic symptoms) were excluded. Patients in exclusion condition were selected for the pilot test, a moment intended for training and organizing the research operation. These data did were not comprised in the final analysis.

The questionnaires used addressed sociodemographic variables, pre- and postoperative conditions, health status and family history, and were designed from surveys with the same population[14,15].

The Valuation Scale for tobacco use, validated in Brazil[16]. was applied. The Fagerström Test for Nicotine Dependence (FTND) makes it possible to verify the level of nicotine dependence and indicates the individual's level of dependence on the substance from six questions, with the sum of the scores ranging from zero to 10. In low nicotine dependence, the score is less than 4; in moderate dependence, the score goes from 5 to 7; and in high dependence, the score is equal to or greater than 8.

The dependent variables of the study were: current smoker (use of at least one cigarette and derivatives in the last 30 days) and high nicotine dependence (agglutination of high and very high levels of dependence, from the FTND scores).

These variable considered as independent were: sex (female, male); marital status (lives with a partner, lives without a partner); having children (no, yes); the income of the population (> R$ 1,581.09, ≤ R$ 1,581.09); religious practice (no, yes - if regarding their own person as an assiduous religious); daily alcohol consumption (no, yes - at least one shot of alcoholic bevarege, with 200mL, per day); anxiety (no, yes - having already been treated for or received medical diagnosis of anxiety); depression (no, yes - having already been treated for or received medical diagnosis of depression); vitamin deficiency (no, yes - deficiency in routine medical examinations); body mass index (BMI) > 40 kg/cm^2 (no, yes); family history of suicide (no, yes - if you ever had a close relative who committed suicide); sleeping difficulty (no, yes - if you had sleeping probles, either difficulty to fall asleep or waking up at night); binge drinking (excessive consumption of alcohol, consuming five or more shots of alcoholic beverages on one occasion); memory loss (no, yes - after BS, there was a decrease in memory, either to remember something that was done recently, or in the past); and the use of antihypertensive medication (no, yes - if making use of antihypertensive medication).

The data were typed with use of the double checking method. For analysis, the software Statistical Package for Social Sciences (SPSS), version 22.0, was used. For the responses to the FTND, Cronbach's alpha reliability test was performed.

For bivariate and multiple statistical analysis, logistic regression was used, with odds ratio as (OR) measure of effect and 95% confidence interval (95% CI), oriented for rare events. Chi-squared and Fisher's exact tests indicated the strength of association between the variables. The variables that presented $p < 0.10$ in the bivariate analysis were included for the multiple logistic regression model, which, in turn, adopted the forced entry method, determined by the value resulting from the Hosmer-Lemeshow test. Variables with a value of $p < 0.05$ were considered associated.

This study is part of an investigation in the area of Mental Health Care in the locality, approved by the Research Ethics Committee of the Federal University of Goiás, through Approval no. 523.834. In compliance with Resolution 466/2012, the ethics standards in research involving human beings were met. All the patients signed the Informed Consent Form prior to the interview in a private place.

RESULTS

The sample was composed of 317 individuals, from which 14 losses were subtracted, without compromising the quality of the analysis. In the final analysis, 303 individuals participated. The mean age of the investigated population was 37.22 years (standard deviation - SD of 9.78; 95% CI 36.11-38.32), with an average of 22.51 months postoperatively (SD of 24.77; 95% CI 19.68-25.49). The prevalence of smokers in the last 30 days represented 50 patients (16.5%, 95% CI 12.5-20.8). Table I presents the associated factors.

Table I - Prevalence and factors associated with the current smoker in post-bariatric surgery patients. Catalão, Goiás, 2015-2016.

Variable		Current smoker		Crude OR *		Adjusted OR *	
		n/total	%	95 % CI	p-value	95 % CI	p-value
Gender	Female	30/231	13.0	1.0	-	1.0	
	Male	20/72	27.8	2.577 (1.355-4.900)	0.003	3.174 (1.467-6.864)	0.003
Marital status	Lives without a partner	31/215	14.4	1.0	-	-	-
	Lives with a partner	19/88	21.6	1.634 (0.823-3.048)	0.127		
Do you have children?	No	17/86	19.8	1.0	-	-	-
	Yes	33/217	15.2	0.728 (0.373-1.588)	0.335	-	-
Income †, R$	> 1,581.09	42/250	16.8	1.0	-	-	-
	≤ 1,581.09	8/53	15.1	1.136 (0.533-2.943)	0.761	-	-
Do you practice religion?	No	23/89	25.8	1.0	-	1.0	-
	Yes	27/214	12.6	0.414 (0.211-0.825)	0.005	0.470 (0.230-0.958)	0.038
Alcohol consumption	No	46/296	15.5	1.0	-	1.0	-
	Yes	4/7	57.1	7.246 (1.402-34.300)	0.016	0.627 (0.093-4.241)	0.632
Anxiety	No	17/163	10.4	1.0	-	1.0	-
	Yes	33/140	23.6	2.649 (1.444-5.539)	0.002	2.706 (1.304-5.616)	0.008
Depression	No	28/218	12.8	1.0	-	1.0	-
	Yes	22/85	25.9	2.370 (1.224-4.381)	0.006	0.829 (0.381-1.804)	0.637
Vitamin deficiency	No	10/106	9.4	1.0	-	1.0	-
	Yes	40/197	20.3	2.446 (1.275-6.058)	0.015	0.637 (0.269-1.510)	0.306
BMI > 40 before surgery	No	11/99	11.1	1.0	-	1.0	
	Yes	39/204	19.1	1.891 (0.989-4.211)	0.078	0.716 (0.318-1.613)	0.420
Family history of suicide	No	27/225	12.0	1.0	-	1.0	
	Yes	23/78	29.5	3.067 (1.637-6.003)	0.000	2.654 (1.232-5.721)	0.013
Difficulty sleeping?	No	11/137	8.0	1.0	-	1.0	
	Yes	39/166	23.5	3.518 (1.860-8.595)	0.000	3.123 (1.362-7.162)	0.007
Binge drinking	No	40/270	14.8	1.0	-	1.0	
	Yes	10/33	30.3	2.500 (1.107-5.647)	0.024	2.676 (1.022-7.004)	0.045

* Fisher's exact test; † The variable "daily drinking" was controlled, as it was confounding for the variable binge drinking. Hosmer-Lemeshow test result: 0.468. OR: odds ratio; 95 % CI: 95% confidence interval; BMI: body mass index. Binge drinking: excessive use of alcohol, consuming five or more shots of alcoholic beverages on one occasion.

Multiple analysis resulted in the following positive associations with the variable current smoker: gender ($p < 0.003$; OR = 3.174; 95% CI 1.467-6.864), having anxiety diagnosis ($p < 0.008$; OR = 2.706; 95% CI 1.304-5.616) , having a family history of suicide ($p < 0.013$; OR = 2.654; 95% CI 1.232-5.721), having difficulty sleeping ($p < 0.007$; OR = 3.123; 95% CI 1.362-7.162) and binge drinking ($p < 0.045$; OR = 2.676; 95% CI 1.022-7.004), characterized as the greatest probability. The dependent variable "do you practice religion?" ($p > 0.038$; OR = 0.470; 95% CI 0.230-0.958) was negatively associated.

For analysis of nicotine dependence, Table II describes the FTND score in patients who underwent the BS. At this stage, the sample consisted of 49 individuals, with sample loss of one smoker.

The highest prevalence of dependence levels occurred in the high level of dependence (36.7%), followed by very high (30.6%), totaling 33 individuals. The prevalence of the dependent variable high nicotine dependence and associated factors are in Table III.

Table II - Levels of dependence, according to the Fargeström Test (FTND) in patients submitted to bariatric surgery. Catalão, Goiás, 2015-2016 (n = 49).

Level of addiction	n (%)	95% CI
Very low	4 (8.2)	2.0-16.3
Low	8 (16.3)	6.1-28.5
Medium	4 (8.2)	2.0-16.3
High	18 (36.7)	24.5-51.0
Very high	15 (30.6)	18.4-44.9

Cronbach's alpha FTND reliability test: 0.756.

Table III - Prevalence and factors associated with high nicotine dependence according to the Fargeström Test. Catalão, Goiás, 2015-2016.

Variable	High nicotine dependence	n/total*	%	Adjusted OR		Crude OR	
				95 % CI	p-value	95 % CI	p-value
Sex	Female	21/231	9.1	1.0		1.0	
	Male	12/72	16.7	0.500 (0.249-1.196)	0.072	1.773 (0.721-4.357)	0.212
Marital status	Lives without a partner	12/88	13.6	1.0		-	
	Lives with a partner	21/215	9.8	0.604 (0.544-2.940)	0.326	-	-
Do you have children?	No	10/86	11.6		-		
	Yes	23/217	10.6	0.901 (0.415-2.265)	0.795	-	-
Income †, R$	>1.581,09	28/250	11.2	1.0		-	
	≤ 1.581,09	5/53	9.4	1.211 (0.497-5.136)	0.708	-	-
Do you practice religion?	No	4/17	23.5	1.0		1.0	
	Yes	29/286	10.1	2.727 (0.834-8.915)	0.085	0. 237 (0.057-0.981)	0.047
Anxiety	No	10/163	6.1	1.0		1.0	
	Yes	23/140	16.4	3.008 (1.465-7.550)	0.004	2.417 (1.040-5.614)	0.040
Depression	No	19/218	8.7	1.0		1.0	
	Yes	14/85	16.5	2.065 (0.946-4.368)	0.052	1.449 (0.588-3.574)	0. 420
Memory loss	No	13/244	5.3%	1.0		1.0	
	Yes	20/59	33.9%	9.112 (4.193-8.19.806)	0.000	7.868 (3.330-18.588)	0. 000
Binge drinking	No	26/270	9.6	1.0		1.0	
	Yes	7/33	21.2	2.527 (1.000-6.387)	0.044	1.247 (0.395-3.932)	0.707
Antihypertensive medication	No	13/164	7.9	1.0		1.0	
	Yes	20/139	14.4	1.952 (0.926-4.344)	0.072	1.677 (0.699-4.021)	0.247

* Fisher's exact test; † The variables "sex" and "having diagnosis of depression" were controlled, as they were confounding for the variables "religion" and "having diagnosis of anxiety". Hosmer-Lemeshow test result: 0.715. Binge drinking: excessive use of alcohol, consuming five or more shots of alcoholic beverages on one occasion.

After the multiple analysis, the predictors were: anxiety ($p < 0.040$; OR = 2.477; 95% CI 1.040-5.614) and memory loss ($p < 0.000$; OR = 7.868; 95% CI 3.330-18.588) remained positively associated, and religious practice ($p < 0.047$; OR = 0.237; 95% CI 0.057-0.981). presented a negative association with the outcome variable.

DISCUSSION

This present research is unprecedented in the analysis of tobacco consumption as a dependent variable in post-BS individuals. When estimating the prevalence of current smokers and levels of nicotine dependence in the sample of subjects who underwent BC, a great demand for this type of procedure by means of health insurance plan and private resources was observed. The innovation of the current research stands out for investigating a specific population of bariatric patients, with emphasis on the progressive evolution of the number of surgical procedures in Brazil, by supplementary and private means. Studies in this area prioritize, more specifically, the users of the Public Health System[7], thus justifying that data on the former be considered incipient. A ten-fold increase in the number of surgeries conducted by the supplementary system is estimated, in comparison to the those by the Brazilian Unified Health System (SUS)[17].

Variables that had not been previously analyzed in association with nicotine use and dependence in the population investigated in the present study were tested, such as alcohol compulsion, depression, sleep quality and memory. The FTND instrument was used as an indicator of nicotine dependence in the current study because it is easy to apply, low-cost and recommended for practices in Health Care for Smokers[18].

The prevalence,in this research, of current smokers in post-BS subjects (16.5%) was higher when compared to the general population estimate in the Brazilian context (15.0%)[19]. However, in the absence of estimates of the smoking habit in the BS population, it is similarly discussed with findings in morbidly obese individuals, as in the case of a study with 420 BS candidates in which 11.43% were smokers, that is, smoked daily, in a total ≥ 100 cigarettes in their lifetime[20].

A larger estimate was reported in a control case study, which revealed that the group of people with morbid obesity (31.0%) presented 2.18 more chances of being smokers when compared to individuals with lower BMI, suggesting that there is an increase in the frequency of smoking with increasing body BMI[21].

Given such prevalences, it is considered that smoking estimates in post-BS subjects is incipient and requires further research, which limits the interlocution with other findings. However, the prevalence indicated in this study, when compared to the morbidly obese individual, suggests that the BS intervention may reduce smoking estimates[22].

Among the socioeconomic variables analyzed in the present study, men were associated with smoking. Even though, as seen in other studies[23], women are the prevailing sex in the sample, men smoke more[24] and reinforce the vulnerability for the sex in question.

The research in question was developed in a society with predominance of a macho behavior, in which the smoking habit, more easily among men than women, is justified by the superiority status attributed to the former, being a generator of inequality when evaluating the parameters between both sexes[25]. It is worth noting that, with the empowerment of women in search of greater freedom and independence, these rates have been changing over the years, indicating a significant increase in tobacco consumption by women and, consequently, a greater exposure to the health problems it provokes[26].

In the present research, religious practice was presented as a protective factor in relation to tobacco use[27]. Men who practice some religious manifestations have been found less likely to use psychoactive substances like tobacco[28], because of the prohibitions and limitations imposed by some religions on conducts and behaviors, including the use of psychoactive substances. This behavior promotes a decrease in tobacco use rates[29].

As for the psychic aspects, a positive association was found between current smokers with high nicotine dependence and the presence of clinical diagnosis of anxiety in the current investigation. Given the paucity of studies relating nicotine dependence in post-BS patients, such issue is discussed concomitantly with the findings of obese BS candidates, since obese smokers with a mean BMI of 45.9 kg/m² tend to present anxiety[13]. On the other hand, the constructions of the affective aspects are related to: fear, self-control, anger and capacity to express affectivity; thus suggesting a compensatory increase in smoking consumption in order to alleviate anxiety[30].

The relevance of investigating the relationship between smoking and mental diseases in post-BS patients is reinforced by the frequency with which such pathologic conditions are detected in candidates for the surgical intervention. In Spain, BS candidates had symptoms of anxiety (26%) and depression (20.9%)[31]. Such disorders have been associated with increased BMI and with all the psychosocial and pathological complexity that arises from obesity, mainly due to the social and professional isolation resulting from obesity[31].

Having a family history of suicide increases the likelihood of being a current smoker. This is a variable that is discussed with similar findings, since it is not comprised in related studies. Thus, it was verified that smoking dependence significantly increases the risk of suicidal ideation[32] and, when associated with abusive alcohol use, the risk becomes more robust[33]. Suicidal behavior, associated with severe tobacco dependence, occurs by means of common biological mechanisms, and may be potentiated. Laboratory studies in animals have shown that contact with tobacco reduces serotonin levels[34]. It is suggested that such reduction is due to the action of serotonin on the nervous system and the release of hormones that regulate sleep and mood[35].

The decrease in serotonin also affects the quality of sleep, justifying, in parts, the association of sleeping difficulty to current tobacco use. This result is similar to that of a study conducted with university students in the United States, where current tobacco use was directly associated with sleep disorders, when compared to other factors such as: use of illegal drugs, excessive workload, high alcohol consumption, obesity and the male sex. In depressed and anxious individuals, the difficulty to sleep is even greater, with tobacco consumption being largely related to sleep disturbances[36].

Another suggestion is that the use of tobacco also potentiates the emergence of airway-related disorders, such as obstructive sleep apnea. This association occurs through the stimulation of nicotine in the muscles of the respiratory system, complicating the inflammation of the upper respiratory pathways[37] and causing irritation that reaches the uvula[38]. It is also a fact that the regular use of nicotine, since this is a stimulant substance, is related to signs of insomnia, reduced sleep capacity and increased sleepiness during the day. In addition to that, changes caused by abstinence are also detected in individuals who have been smokers for a long time and who have the habit of waking at night, stimulated by the desire to smoke[39].

The present study investigated the behavior of tobacco use concomitant to the use of alcoholic beverage. This habit has been already described in a prospective study that revealed that the sample studied continued to use alcoholic beverages after BS (35.1%)[40]. The positive association found between binge drinking and being a current smoker corroborates the results of a French study conducted with 3,286 university students. In that study, the student behavior of binge drinking presented 5.89 times greater association with the smoking habit. This mechanism is justified by the fact that nicotine acts as a trigger in relation to alcohol intake, which leads to a greater frequency of consumption, as well as a progressive increase in the amount consumed[10].

The effects of concomitant use of alcohol and tobacco are interactive. Although these two substances have different mechanisms of action, together they reinforce the sensation of pleasure[39], becoming the trigger for each other. In this simultaneous action, it is also observed the influence exerted by nicotine on the sedative implication of alcohol[41], which leads the individual to ingest more of the two substances at the same time. Attention is drawn to the evidence that the concomitant consumption of these two substances also potentiates health conditions such as increased acidity in the stomach, resulting in the development of gastritis and ulcers[42], as well as chronic noncommunicable diseases[43].

Reports of memory loss are more likely to occur among smokers, which may be explained by the effect of nicotine, which, when consumed in a chronic way, causes impairment in the immediate memory capacity, cognitive function, and attentional mechanisms[41,44]. Nicotine is frequently associated with cognitive function, sometimes as a momentary stimulant, sometimes with impairment in this ability resulting from chronic use[45].

The present study did not detect an association between tobacco use and cognitive impairment in post-BS subjects. Despite this, the effect on cognitive improvement after BS, when compared to the pre-surgical period, should be considered. The mechanisms of this association refer to a better post-surgical glycemic control, neuroprotection[44,45]and a significant reduction in the BMI within the first years after surgery[44]. Nevertheless, there is some concern about this improvement in cognitive quality over time after BS, which is still inconclusive as to the causality of such promising effects, coupled with the lack of longitudinal studies with biological markers and neuroimaging that generate more robust evidence[44, 45].

As limitations of the current research, one can point out the cross-sectional method and the sampling, which was obtained by convenience in a given population and therefore limits its generalization.

CONCLUSION

The significant prevalence of tobacco smoking in the study population was associated with factors such as: sex, psychic comorbidities (depression/anxiety), family history of suicide, and difficulty sleeping, in addition to being negatively associated with religious practice.

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