Factors Associated with Smoking Cessation in Oncological Patients at INCA

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Fatores Associados à Cessação do Tabagismo em Pacientes Oncológicos do INCA

Factores Asociados al Cese del Tabaquismo en Pacientes Oncológicos del INCA

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ABSTRACT

Introduction: Smoking in oncological patients leads to negative consequences, such as reduced survival, increased risk of surgical complications, lower therapeutic efficacy, and higher probability of recurrence. Despite this, many cancer patients continue to smoke even after diagnosis. This scenario is aggravated by the fact that many patients do not receive adequate guidance about the risks related to continuing to smoke during oncological treatment. **Objective:** To evaluate the sociodemographic and clinical factors associated with smoking cessation among oncological patients undergoing treatment for nicotine dependence, treated at the National Cancer Institute (INCA). **Method:** Retrospective cohort study using data from the electronic medical records of the Center for Studies on Nicotine Dependence Treatment at INCA. Sociodemographic, clinical, and treatment process-related variables were analyzed. **Results:** Of 211 patients analyzed, 31.8% (n=67) achieved cessation, with an adjusted odds ratio (OR) of 2.58 (95% CI 1.31-5.11) for attendance at ≥4 consultations, with a higher success rate among those who underwent surgical procedures. Self-declared Black individuals and those not living with a partner showed a lower probability of smoking cessation. **Conclusion:** The findings highlight the need to raise awareness and train health professionals in addressing smoking in the oncological context, reinforcing its relevance as an essential component of comprehensive care. It is fundamental to consider sociodemographic inequalities in planning personalized therapeutic strategies, respecting the uniqueness and vulnerability of cancer patients.

Key words: Tobacco Use Disorder; Smoking Cessation; Demography; Neoplasms.

RESUMO

Introdução: O tabagismo em pacientes oncológicos acarreta consequências negativas, como redução da sobrevida, aumento do risco de complicações cirúrgicas, menor eficácia terapêutica e maior probabilidade de recidiva. Apesar disso, muitos pacientes com câncer continuam a fumar mesmo após o diagnóstico. Agrava-se esse cenário pelo fato de muitos pacientes não receberem orientações adequadas sobre os riscos relacionados à manutenção do tabagismo durante o tratamento oncológico. **Objetivo:** Avaliar os fatores sociodemográficos e clínicos associados à cessação do tabagismo entre pacientes oncológicos submetidos ao tratamento da dependência de nicotina, atendidos no Instituto Nacional de Câncer (INCA). **Método:** Estudo de coorte retrospectiva utilizando dados do prontuário eletrônico do Centro de Estudos para Tratamento da Dependência de Nicotina do INCA. Foram analisadas variáveis sociodemográficas, clínicas e relacionadas ao processo de tratamento. **Resultados:** De 211 pacientes analisados, 31,8% (n=67) alcançaram cessação, com odds ratio (OR) ajustada de 2,58 (IC 95% 1,31-5,11) para comparecimento a ≥4 consultas, com maior taxa de sucesso entre aqueles submetidos a procedimento cirúrgico. Indivíduos autodeclarados de raça/cor negra e aqueles que não viviam com companheiro(a) apresentaram menor probabilidade de interrupção do tabagismo. **Conclusão:** Os achados evidenciam a necessidade de sensibilizar e capacitar profissionais de saúde para a abordagem do tabagismo no contexto oncológico, reforçando sua relevância como componente essencial do cuidado integral. É fundamental considerar as desigualdades sociodemográficas no planejamento de estratégias terapêuticas personalizadas, respeitando a singularidade e a vulnerabilidade dos pacientes com câncer.

Palavras-chave: Tabagismo; Abandono do Hábito de Fumar; Demografia; Neoplasias.

RESUMEN

Introducción: El tabaquismo en pacientes oncológicos acarrea consecuencias negativas, como reducción de la supervivencia, aumento del riesgo de complicaciones quirúrgicas, menor eficacia terapéutica y mayor probabilidad de recidiva. A pesar de ello, muchos pacientes con cáncer continúan fumando incluso después del diagnóstico. Este escenario se agrava por el hecho de que muchos pacientes no reciben orientaciones adecuadas sobre los riesgos relacionados con el mantenimiento del tabaquismo durante el tratamiento oncológico. **Objetivo:** Evaluar los factores sociodemográficos y clínicos asociados al cese del tabaquismo entre pacientes oncológicos sometidos al tratamiento de la dependencia de nicotina, atendidos en el Instituto Nacional del Cáncer (INCA). **Método:** Estudio de cohorte retrospectiva utilizando datos de la historia clínica electrónica del Centro de Estudios para el Tratamiento de la Dependencia de Nicotina del INCA. Se analizaron variables sociodemográficas, clínicas y relacionadas con el proceso de tratamiento. **Resultados:** De 211 pacientes analizados, el 31,8% (n=67) logró el cese, con *odds ratio* (OR) ajustado de 2,58 (IC 95% 1,31-5,11) para asistencia a cuatro o más consultas, con mayor tasa de éxito entre aquellos sometidos a procedimiento quirúrgico. Los individuos autodeclarados de raza/color negra y aquellos que no vivían con pareja presentaron menor probabilidad de interrupción del tabaquismo. **Conclusión:** Los hallazgos evidencian la necesidad de sensibilizar y capacitar a profesionales de salud para enfocar el tabaquismo en el contexto oncológico, reforzando su relevancia como componente esencial del cuidado integral. Es fundamental considerar las desigualdades sociodemográficas en la planificación de estrategias terapéuticas personalizadas, respetando la singularidad y vulnerabilidad de los pacientes con cáncer.

Palabras clave: Tabaquismo; Cese del Hábito de Fumar; Demografía; Neoplasias.

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INTRODUCTION

Smoking is a chronic disease and the most avoidable cause of sickness and death from cancer[1]. Additionally, smoking in oncological patients is associated with lower overall survival and higher specific mortality from cancer[2], radiotherapy side effects[3], risk of developing other primary tumors[4], chance of surgical complications[5-7], fatigue, emotional problems, pains, and worse quality of life in comparison with patients who never smoked or who quit smoking[8]. Despite that, many oncological patients smoke even after being diagnosed[9,10]. Moreover, it must be noted that many patients are not advised on the risks of continuing to smoke after a cancer diagnosis[11].

A population study found that only 51.7% of patients have been advised by health professionals to quit smoking[12]. However, oncological patients face challenges in smoking cessation, with high levels of nicotine addiction[13] and greater difficulties during treatment[14]. A low perception of the associated risks of smoking was also verified[15]. The prevalence of mental disorders, like anxiety and depression, is high in these patients[16]. Tobacco-related cancer survivors with depression symptoms are more likely to continue smoking[17]. Thus, smoking treatment results may be affected by a lack of attention to the specific needs of these patients[18], with low rates of referral to specialized services, in addition to the unavailability of cessation-aiding medication[19]. Cancer diagnosis is therefore a sensitive and timely moment for therapeutic approaches targeted at smoking cessation[20,21].

In 2002, SUS implemented smoking treatment, offering quality methods according to the Consensus on the Approach and Treatment of Smokers[22]. The 2020 Clinical Protocol and Therapeutic Guidelines (PCDT) for Smoking provides criteria for diagnosis and treatment of smoking in the National Health System (SUS), emphasizing early interventions and a combination of behavioral and medication approaches, mainly for oncological patients, with no specific strategies for this group[23].

As far as we are concerned, no study has ever assessed the treatment of smoking in SUS's oncological centers. The objective of this study was to assess sociodemographic and clinical factors associated with smoking cessation among oncological patients at the National Cancer Institute (INCA), considering treatment protocols, family support, and socioeconomic factors.

METHOD

Observational, analytical, retrospective cohort study that used data from patients assisted at the Center for Studies on Nicotine Dependence Treatment at INCA. Data was collected from the Center's electronic records, general INCA protocols, and the Hospital-based Cancer Registry. The inclusion criteria were patients with cancer in any location according to the 10th International Classification of Diseases and Related Health Problems (ICD-10)[24], in any stage according to the TNM[25], either in remission or not, regardless of diagnosis date, who sought INCA's Center for Studies on Nicotine Dependence Treatment to treat their smoking between January 1 2019 and February 28 2023 who claimed to have smoked at least one cigarette or other tobacco product over the past 30 days[26,27].

The exclusion criteria were patients with only physical records at the INCA Center for Studies, patients who died up to 180 days after their first consultation, and patients with no information on their smoking status six months after their first consultation. The patients' treatment followed the 2020 Smoking PCDT[23] and consisted of structured guidance for everyone, with medical support, as needed. All the patients were advised to quit smoking and begin treatment, regardless of their motivational stage[27]. Structured guidance was done in four weekly sessions, followed by two fortnightly and one monthly sessions, addressing nicotine dependence and strategies to quit smoking. The recommended treatment involved nicotine replacement therapy (NRT) and/or bupropion, with a discussion on adherence and side effects at each session.

The adopted outcome was the proportion of patients who self-reported smoking cessation over the past seven days, within six months of treatment, obtained from records and phone contacts[28,29]. This result was obtained from the data source records. The patients were also contacted by phone to have their outcomes known. No biochemical tests were conducted to verify abstinence from tobacco products, such as exhaled carbon monoxide or cotinine levels in body fluids[30].

The independent variables used were: a) Sociodemographic: sex, age, race/color, education, marital status, occupation, and income; b) Neoplastic history: location of tumors (ICD-10), staging, and type, with a focus on tumors associated with smoking[27], previous oncological treatment (surgery, radiotherapy, or chemotherapy); c) Clinical history: presence of comorbidities, like lung diseases (asthma, bronchitis, chronic obstructive pulmonary disease – COPD, emphysema, tuberculosis), cardiovascular diseases (hypertension, heart attack, angina), diabetes, depression, and anxiety; d) Smoking history: starting age, how long they have smoked, cessation attempts, nicotine dependence (Fagerström test), cigarettes a day, motivational stage, and presence of smokers in their home.

The Fagerström test for nicotine dependence[31] estimates how severe the dependence is and is composed

of six questions referring to the patient's smoking behavior. The sum of points indicates the degree of nicotine dependence, ranging from 0 to 10: between 0 and 2 indicates very light dependence, between 3 and 4 indicates light dependence, 5 indicates moderate dependence, 6 and 7 indicate intense dependence, and between 8 and 10 indicates very intense dependence.

The motivational stage was adapted from the Prochaska, DiClemente & Norcross model[32]. Those authors propose that overcoming dependence involves five stages: pre-contemplation, contemplation, preparation, action, and maintenance, with individuals usually going through those stages several times. The stages were defined as follows: in pre-contemplation, patients do not consider quitting smoking. Whereas in contemplation, they consider quitting eventually. In preparation, they have initiated changes or reviewed past attempts. In action, they have invested time and energy to quit smoking. In this sense, it is worth reinforcing that, in the study, the motivation stages were categorized in "pre-contemplation/contemplation" and "preparation/action"[33].

The study population was described through frequency tables. The Pearson chi-square test compared categorical variables, while the Kolmogorov-Smirnov test assessed the normality of continuous variables. Variables with a normal distribution were described by mean and standard deviation, and the non-normal by median and interquartile range. Bivariate and multivariate logistic regression analysis estimated the association between variables and outcomes, with crude and adjusted odds ratios (OR) calculation and 95% confidence interval (95%CI). Variables with $p \leq 0.20$ in the bivariate analysis were included in the final model. The variables were grouped for logistic regression: age, race/color, and attendance at consultations. The Hosmer-Lemeshow test was conducted to assess the multivariate logistic regression model adjustment. For every analysis, a significance level (α) of 5% was adopted.

Statistical analyses were done in the R software[34] (version 4.1.3). A descriptive sensitivity analysis compared the excluded patients (n=44) with the analyzed group (n=211) to verify if the losses were selective. Moreover, this study has been approved by INCA's Research Ethics Committee, report number 6606693 (CAAE (submission for ethical review): 75771623000005274), in compliance with ethical guidelines related to studies involving human beings, according to Resolution n. 466/2012[35] of the National Health Council.

RESULTS

The smoking quitting rate was 31.8% (n=67). Among the 211 patients who participated in the study, 114 (54%) were female. Approximately 40% identified as white (n=90, 43.3%), 85 (40.8%) as brown, and 33 (15.9%) as black, with that characteristic being statistically related to the smoking status within six months ($p<0.001$). About half the patients were 60 years or over (n=106, 50.2%). A little over a third was married or lived with a partner (n=79, 37.6%) (Table 1).

A little over a quarter of patients presented with head and neck cancer (n=58, 27.5%). About a fifth (n=38, 18.0%) had genitourinary tumors, 30 (14.2%) presented tumors of the digestive tract, 30 (14.2%) had bronchial and lung neoplasms, 17 (8.1%) had breast cancer, and 15 (7.1%) presented hematological tumors. Over two-thirds of patients were in advanced stages of the disease (III or IV) (n=122, 67.8%). There was a statistically significant association between surgery and smoking cessation ($p=0.016$) (Table 2).

A little over a fifth of patients self-reported depression (n=45, 21.3%), and 83 (39.3%) self-reported anxiety (Table 3).

In the study, 75.5% of patients (n=157) had already tried quitting smoking; 99.1% (n=209) smoked industrial cigarettes; 45.4% (n=94) had intense nicotine dependence; 44% (n=91) smoked their first cigarette within 5 minutes of waking up; 79.6% (n=160) were in the preparation and action stages; 27.8% (n=58) lived with other smokers at home. We highlight that attending four or more consultations was associated with smoking cessation within six months ($p<0.001$). Regarding treatments, we highlight that: 47.4% (n=100) received NRT, 47.4% (n=100) received bupropion, and 5.2% (n=11) did not receive medication (Table 4).

The consultation attendance median was 2. In the bivariate analyses, the following variables are highlighted: black race/color was associated with lower cessation (crude OR 0.28; $p=0.001$), surgery to higher (OR 2.51; $p=0.018$), and ≥4 consultations to greater success (OR 3.02; $p=0.001$) (Table 5).

The income variable was excluded from the model due to a lack of data (36%). The model indicated that black patients were 63% less likely to quit smoking than white patients (OR=0.37; $p=0.003$); single patients, 54% less than married patients (OR=0.46; $p=0.030$); patients submitted to surgery and who attended four or more consultations were more likely to quit smoking (OR=2.48; $p=0.040$; OR=2.58; $p=0.006$). Living with smokers reduced this ratio, with no statistical significance (OR=0.48; $p=0.069$). The Hosmer-Lemeshow test indicated a good adjustment ($p=0.306$). The loss analysis between the 211 cases studied and the 44 excluded did not show significant differences in the assessed variables ($p \leq 0.05$).

Table 1. Distribution of oncological patients cared at the National Cancer Institute for smoking treatment, by cessation status within six months, according to sociodemographic characteristics, 2019-2023

	Smoking after 6 months		Not smoking after 6 months		
	n	%	n	%	
Characteristic	**144**	**68.2**	***67***	***32***	***p***
Sex					
Male	64	44.4	33	49.0	0.514
Female	80	55.6	34		51.0
Age (years)					
Up to 44	20	13.9	3	4.5	0.162
45-54	23	16.0	11		16.4
55-64	65	45.1	30		44.8
65 or over	36	25.0	23		34.3
Race/Color					
White	47	33.3	43	64.0	
Brown	71	50.4	14	**21.0**	**<0.001***
Black	23	16.3	10	15.0	
Education level[b]					
Up to complete elementary school	72	51.8	33	52.0	0.975
Incomplete high school and above	67	48.2	31		48.0
Marital status[c]					
Married or living with a partner	48	33.3	31	47.0	
Others	96	66.7	35		53.0
Occupational situation[d]					
Retired	38	30.6	21	33.3	0.414
Unemployed	49	39.5	23		36.5
In leave	13	10.5	11		17.5
Employed	24	19.4	8		12.7
Income[e]					
Up to 1 minimum wage	62	65.3	31	77.5	
Over 1 minimum wage	33	34.7	9		22.5

Captions: [a]No information n=3 (1.4%); [b]No information n=8 (3.8%), [c]No information n=1 (0.5%), [d]No information n=24 (11.4%); [e]No information n=76 (36.0%); *p<0.05.

Table 2. Distribution of oncological patients cared at the National Cancer Institute for smoking treatment, by cessation status within six months, according to neoplastic history characteristics, 2019-2023

	Smoking after 6 months		Not smoking after 6 months		
	n	%	n	%	
Characteristic	**144**	**68.2**	**67**	**31.8**	***p***
Tumor location					
Head and neck	34	23.6	24	35.8	
Genitourinary	29	20.1	9	13.4	
Digestive	21	14.6	9	13.4	
Trachea, bronchi, and lung	21	14.6	9	13.4	0.508
Breast	12	8.3	5	7.5	
Hematological	9	6.3	6	9.0	
Others	18	12.5	5	7.5	
Staging[a]					
0 - I - II	40	32.8	18	31.0	
III	36	29.5	18	31.0	0.966
IV	46	37.7	22	38.0	
Smoking-associated tumor[b]					
No	60	41.7	24	35.8	0.419
Yes	84	58.3	43	64.2	
Over 1 primary tumor[c]					
No	130	90.9	60	89.6	0.755
Yes	13	9.1	7	10.4	
Surgery					
No	128	88.9	51	76.1	0.016*
Yes	16	11.1	16	23.9	
Chemotherapy					
No	74	51.4	32	47.8	0.624
Yes	70	48.6	35	52.2	
Radiotherapy					
No	121	84.0	49	73.1	0.063
Yes	23	16.0	18	26.9	

Captions: [a]No information n=31 (14.7%); [b]Lung, head and neck, stomach, kidney, pancreas, liver, bladder, cervix, colorectal, and acute myeloid leukemia; [c] No information n=1 (0.5%); *p<0.05.

Table 3. Distribution of oncological patients cared at the National Cancer Institute for smoking treatment, by cessation status within six months, according to clinical history characteristics, 2019-2023

	Smoking after 6 months		Not smoking after 6 months		
	n	%	n	%	
Characteristic	**144**	**68.2**	**67**	**31.8**	***p***
Lung comorbidity[a]					
No	122	84.7	51	76.1	0.130
Yes	22	15.3	16	23.9	
Cardiovascular comorbidity[b]					
No	88	61.1	41	61.2	0.991
Yes	56	38.9	26	38.8	
Diabetes					
No	125	86.8	61	91.0	0.375
Yes	19	13.2	6	9.0	
Depression					
No	111	77.1	55	82.1	0.409
Yes	33	22.9	12	17.9	
Anxiety					
No	86	59.7	42	62.7	0.682
Yes	58	40.3	25	37.3	

Captions: [a]Asthma, bronchitis, chronic obstructive pulmonary disease, emphysema, tuberculosis; [b]Systemic arterial hypertension, acute myocardial infarction, angina pectoris.

DISCUSSION

This study analyzed factors associated with the effectiveness of smoking cessation treatment in oncological patients, a group with specific challenges. Smoking aggravates prognoses and quality of life, which makes it an essential theme. The study, based on authors who addressed the relationship between cancer and smoking, reinforces the relevancy of the theme and contributes to more effective therapeutic strategies.

The smoking cessation proportion within six months was 31.8%. White patients, who underwent surgery during treatment, lived with a spouse, and attended at least four consultations, were more prone to quit smoking. In a prospective study with 71 cancer patients that used a consistent behavioral approach in weekly counseling sessions along with drug therapy (NRT or bupropion), the observed abstinence rate within six months was 32%. As in this study, most patients had smoking-associated tumors, had already tried quitting smoking at least once, and were in the preparation or action motivational stages[36].

Table 4. Distribution of oncological patients cared at the National Cancer Institute for smoking treatment, by cessation status within six months, according to smoking history characteristics, 2019-2023

	Smoking after 6 months		Not smoking after 6 months		
	n	%	n	%	
Characteristic	**144**	**68**	**67**	**31.8**	***p***
Age when started smoking (years)[a]					
Up to 14	56	40.0	21	31.8	0.257
Over 14	84	60.0	45	68.2	
Total smoking time (years)[a]					
Up to 39	50	35.7	19	28.8	0.326
Over 39	90	64.3	47	71.2	
Previous cessation attempts[b]					
Never tried	37	26.1	14	21.2	0.450
1 or more	105	73.9	52	78.8	
Fagerström test[c]					
Up to 5	79	55.2	34	53.1	0.777
Over 5	64	44.8	30	46.9	
Time passed before smoking the first cigarette upon waking up[c]					
Up to 5 min	64	44.7	27	42.2	
6-30 min	54	37.8	22	34.4	0.602
Over 30 min	25	17.5	15	23.4	
Cigarettes a day[c,d]					
Up to 20	109	76.2	49	76.6	0.958
Over 20	34	23.8	15	23.4	
Motivational stage[e]					
Pre-contemplation/ contemplation	31	22.3	10	16.1	0.316
Preparation/action	108	77.7	52	83.9	
Other smokers at home[f]					
No	99	69.2	52	78.8	0.152
Yes	44	30.8	14	21.2	
Consultation attendance					
1	58	40.3	13	19.4	
2-3	51	35.4	21	31.3	**<0.001***
4 or more	35	24.3	33	49.3	
Proposed treatment					
Just counseling	6	4.2	5	7.5	
Counseling + isolated/ combined NRT	70	48.6	30	44.8	0.578
Counseling + bupropion (± isolated/combined NRT)	68	47.2	32	47.7	

Captions: NRT = nicotine replacement therapy (patches, chewing gums, and/ or tablets); [a]No information n=5 (2.4%); [b]No information n=3 (1.4%); [c]No information n=4 (1.9%); [d]Exclusive use of pipe n=2 (1.0%); [e]No information n=10 (4.7%); [f]No information n=2 (1.0%); *p<0.05.

Table 5. Crude and adjusted odds ratios for smoking cessation within six months of patients cared at the National Cancer Institute, 2019-2023

Characteristic	Crude OR	(95% CI)	*p*	Adjusted OR	95% CI	*p*
Age (years)						
Up to 60	1.00	-		1.00	-	
61 or over	1.46	0.82-2.64	0.200	1.25	0.63-2.49	0.515
Race/Color						
White	1.00	-		1.00	-	
Black	0.28	0.15-0.51	**<0.001***	0.37	0.19-0.72	**0.003***
Marital status						
Married or living with a partner	1.00	-		1.00	-	
Others	0.56	0.31-1.02	0.060	0.46	0.23-0.92	0.030*
Lung comorbidity[a]						
No	1.00	-		1.00	-	
Yes	1.74	0.84-3.57	0.133	1.36	0.57-3.19	0.476
Surgery						
No	1.00	-		1.00	-	
Yes	2.51	1.16-5.43	**0.018***	2.48	1.04-5.96	**0.040***
Radiotherapy						
No	1.00	-		1.00	-	
Yes	1.93	0.95-3.89	0.065	2.05	0.92-4.56	0.077
Other smokers at home						
No	1.00	-		1.00	-	
Yes	0.61	0.30-1.18	0.154	0.48	0.21-1.03	0.069
Consultation attendance						
Up to 3	1.00	-		1.00	-	
4 or more	3.02	1.64-5.61	**<0.001***	2.58	1.31-5.11	**0.006***

Captions: OR = *odds ratio*; 95% CI = 95% confidence interval; [a]Asthma, bronchitis, chronic obstructive pulmonary disease, emphysema, tuberculosis; *$p<0.05$.

Another study with oncological patients that used phone follow-up and NRT saw a cessation proportion of 26%. In that study, only 16% of patients completed four or more consultations[37]. In this study, however, 32.2% of patients attended four or more consultations, which explains the higher proportion of cessation found.

A study done in a USA oncological center found a smoking cessation proportion of 30.5% among the treated patients. Over 60% received at least two counseling sessions, which increased their chances of quitting smoking after six months[28].

A North American study with 2,652 patients with cancer found a smoking cessation rate within six months of 45.8%. The participants received an initial consultation in person and six to eight additional consultations, mainly by phone, over 8 to 12 weeks, in addition to drug therapy for up to 12 weeks. Unlike the present study, most participants were white (82.1%) and had less nicotine dependence (Fagerström: 4.5 *vs.* 5.16) and fewer years of smoking (34.5 *vs.* 42.94). Over 90% received drug therapy. The number of consultations may have contributed to an abstinence rate higher than that of this study[14].

A North American study with cancer patients observed that white race/color patients presented a higher chance of quitting smoking[38]. Other studies in oncological populations did not observe an association between race/color and smoking cessation[28,39,40]. A systematic review observed that, compared to the white race, black race individuals presented worse levels of communication and shared decision-making with health professionals[41]. It has been described in non-oncological populations that black individuals have been less encouraged to quit smoking[42], were less present at the initial consultation and clinical trials for smoking cessation[43], and had more chances of suffering discrimination from healthcare professionals[44,45] when compared to white patients, which may impact treatment adherence. Individuals who suffer discriminatory practices in and out of the healthcare systems may react with anxiety and avoid stressful situations, even generating the under-utilization of healthcare systems.

The marital situation is a variable related to social support. Smoking patients' partners can play a fundamental role in the process of behavioral change of patients who try to quit smoking[40]. The results from this study are in line with other studies that revealed that oncological patients who live with a spouse were more likely to quit smoking[39,40]. Spouse-less patients are considered at high risk for continuing to smoke and must receive special care during smoking treatment[39].

Undergoing surgery increased smoking cessation chances. This association has already been demonstrated by

Hawari et al. in a work with 350 patients in an oncological center in Jordan, where undergoing surgery reduced the probability of patients continuing to smoke after receiving a cancer diagnosis[46]. In another study, patients submitted to surgery had 70% less chance of quitting smoking[10]. Carroll et al. found no association between the cancer treatment and the smoking treatment outcome[38]. Possible explanations are that patients submitted to surgery are strongly encouraged to quit smoking by the multiprofessional team, given the greater occurrence of post-surgical complications in patients who smoke[5], or that they do not smoke when hospitalized or due to a temporary incapacity to smoke after the procedure[47].

The intensity and frequency of smoking cessation interventions have been described as essential to increase abstinence rates[29,39]. Previous studies observed that attending a higher number of smoking cessation consultations increased their odds of quitting smoking[28,38]. In lung cancer patients submitted to surgical treatment, attending a greater number of pre-surgical consultations increased the odds of smoking cessation[48].

The smoking treatment protocol starts with four intensive weekly sessions, where the patient defines a date to quit smoking and receives medication support, if necessary. Attending less than four sessions can compromise results. However, during cancer treatment, which can include hospitalization and concomitant therapies, attending weekly sessions is challenging. Flexing the gap between consultations and providing teleconsultations may increase treatment adherence.

This study has limitations. The first is the fact that this is a retrospective cohort study, and a classification bias may have occurred due to errors in the records. The cessation rates were self-reported, and no biochemical validation of smoking cessation has been done. However, a study revealed that 91.9% of patients who claimed quitting smoking in self-filled questionnaires had really quit smoking according to biochemical validation. Thus, biochemical validation demonstrates that self-reported rates may be slightly overestimated[49].

The intention of the oncological treatment, if healing or palliative, was not investigated, which could influence program engagement[50] and, consequently, cessation rates[31]. The possible association between hospitalization during smoking treatment and its outcome was not investigated either. A study showed that patients who have been hospitalized presented a greater chance of ceasing to smoke. Possibly, the patients have fewer opportunities of smoking during hospitalization and may not feel well enough to do so. Additionally, they are more in touch with healthcare professionals during hospitalization, which can stimulate them to remain without smoking[37].

Moreover, INCA is an oncological institution linked to SUS, whose results apply to similar populations. The reduced number of patients may have hidden statistically significant differences. Therefore, studies with larger populations are needed to better estimate associations between variables and smoking cessation in patients with cancer.

CONCLUSION

The study identified factors associated with smoking cessation in oncological patients. Spouse-less black individuals were less prone to ceasing to smoke, while those who underwent surgery and attended more sessions presented a higher probability of quitting smoking.

The results highlight the importance of health professionals referring and supporting oncological smoking patients in adhering to the treatment, since attendance at sessions was decisive. It is also essential to consider sociodemographic inequalities that affect access, adherence, and prognosis for these patients.

CONTRIBUTIONS

All the authors have substantially contributed to the study design and planning, data acquisition, analysis, interpretation, wording, and critical review. They approved the final version for publication.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

All the contents associated with the article are included in the manuscript.

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