Smoking among patients hospitalized at a university hospital in the south of Brazil: prevalence, degree of nicotine dependence, and motivational stage of change*

Tabagismo entre pacientes internados em um hospital universitário no sul do Brasil: prevalência, grau de dependência e estágio motivacional

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Abstract

Objective: To determine the prevalence and profile of smoking among hospitalized patients at a university hospital in the south of Brazil. **Methods:** This was a descriptive cross-sectional study involving patients over 18 years of age hospitalized for over 24 h at the Federal University of Santa Catarina University Hospital, located in the city of Florianópolis, Brazil. The patients were interviewed on two distinct occasions. We collected demographic data, socioeconomic data, and data regarding smoking. **Results:** We interviewed 235 patients: 44 (18.7%) were smokers; 77 (32.8%) were former smokers; 114 (48.5%) were nonsmokers; and 109 (46.7%) were passive smokers. The mean age of the smokers was 45.7 ± 15.2 years, and 29 (65.9%) were male. Among the smokers, the median age at smoking initiation was 15 years; the mean smoking history was 32 ± 30.2 pack-years; 36 (81.9%) smoked up to 20 cigarettes/day; 20 (45.4%) had a high or very high degree of nicotine dependence; 32 (72.7%) had already tried to quit smoking; 39 (88.7%) would like to quit smoking; 32 (72.7%) would accept smoking cessation treatment; 13 (29.5%) smoked during hospitalization; and 13 (29.5%) suffered withdrawal syndrome. Regarding the motivation to quit smoking, the number of patients in the "preparation" and "action" stages of change increased from admission to discharge (from 31.8% to 54.8%). **Conclusions:** The prevalence of smoking in this study was similar to that reported in other studies conducted in Brazil. The results suggest that our sample was significant regarding the population of hospitalized smokers, who are motivated to quit smoking during hospitalization and require a systematized approach for doing so.

Keywords: Smoking/epidemiology; Hospitalization; Smoking cessation.

Resumo

Objetivo: Avaliar a prevalência e o perfil do tabagismo em pacientes internados em um hospital universitário no sul do Brasil. **Métodos:** Estudo descritivo transversal com pacientes maiores de 18 anos hospitalizados há mais de 24 h no Hospital Universitário da Universidade de Santa Catarina em Florianópolis. Os pacientes foram entrevistados em duas ocasiões distintas. Dados demográficos, socioeconômicos e ligados ao tabagismo foram coletados. **Resultados:** Foram entrevistados 235 pacientes: 44 (18,7%) eram tabagistas; 77 (32,8%) eram ex-tabagistas; 114 (48,5%) eram não tabagistas e 109 (46,7%) eram tabagistas passivos. A média de idade dos fumantes foi de 45,7 ± 15,2 anos, e 29 (65,9%) eram do sexo masculino. Entre os fumantes, a mediana da idade de início do tabagismo foi de 15 anos; a carga tabágica média foi de 32 ± 30,2 anos-maço; 36 (81,9%) tinham consumo diário de até 20 cigarros; 20 (45,4%) tinham grau de dependência à nicotina elevada ou muito elevada; 32 (72,7%) já haviam tentado cessar, 39 (88,6%) gostariam de cessar, 32 (72,7%) aceitariam receber tratamento, 13 (29,5%) fumaram durante a internação, e 13 (29,5%) apresentaram síndrome de abstinência. Houve um aumento no número de pacientes nos estágios motivacionais de preparação e ação durante a internação (de 31,8% para 54,8%). **Conclusões:** A prevalência de tabagismo no estudo foi semelhante à encontrada em outros estudos no Brasil. Os resultados sugerem que nossa amostra foi significativa em relação à população de fumantes hospitalizados, que se encontra motivada à cessação do hábito tabágico durante a hospitalização, necessitando de uma abordagem sistematizada para a cessação.

Descritores: Tabagismo/epidemiologia; Hospitalização; Abandono do hábito de fumar.

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Introduction

The *Hospital Universitário da Universidade Federal de Santa Catarina* (HU-UFSC, Federal University of Santa Catarina University Hospital) is the largest teaching hospital in the state of Santa Catarina, Brazil. The HU-UFSC has greatly contributed to the Santa Catarina society, providing professional training to health care workers and health care to the population. Located in the city of Florianópolis, the HU-UFSC is a tertiary referral center for the entire state and has approximately 290 beds. However, smokers admitted to the HU-UFSC are not routinely counseled regarding smoking cessation.

According to the World Health Organization, smoking is the leading preventable cause of disease, disability, and early death.[1] In Brazil, the proportion of smokers is highest (19.0%: 22.5% of males and 15.9% of females) in the southern region. According to the *Sistema de Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico* (VIGITEL, Telephone-based System for the Surveillance of Risk and Protective Factors for Chronic Diseases), the prevalence of smoking in Florianópolis is 17.5%, being 20.0% in males and 15.3% in females.[2,3]

It is known that it is advisable to identify and give weight to nicotine dependence during hospitalization, given that hospitalization constitutes a good window of opportunity to approach smokers and initiate smoking cessation treatment, smoking being therefore considered a disease. However, smoking cessation, which is often imposed by hospitalization, can trigger nicotine withdrawal syndrome, which is often neglected by health care workers and requires treatment and control. Hospitalization also allows us to approach patients and monitor them more closely in order to transform this episode of "forced smoking cessation" into a successful attempt at quitting.[4-6] Therefore, information regarding the characteristics of hospitalized smokers is needed in order to provide better understanding of the dimensions of the problem, with the objective of warranting and implementing future treatment programs for smokers.

Methods

This was a descriptive cross-sectional study in which the participants were interviewed on two distinct occasions, three months apart, in 2010.

The study population consisted of patients over 18 years of age hospitalized for over 24 h at the HU-UFSC, which had 290 inpatient beds available at the time of the study. Patients in the ICU were excluded, as were those who were unable to answer the questionnaire and those who declined to participate in the study.

Data were collected by the authors and properly trained collaborators on predetermined dates, i.e., one weekend in autumn and one weekend in winter, given that the prevalence of hospitalizations is estimated to be higher in those seasons, therefore allowing us to interview a larger number of patients. The study was approved by the UFSC Human Research Ethics Committee (Ruling no. 720/10). All of the patients who participated in the present study gave written informed consent.

The survey instrument was a questionnaire comprising closed questions regarding personal, demographic, and socioeconomic data. Smokers were defined as individuals who smoked at least one cigarette per day for at least one month or who had quit smoking less than thirty days prior. Former smokers were defined as individuals who had quit smoking more than one month prior.[7] We investigated smoking-related behavioral characteristics, including interest in quitting smoking, previous attempts to quit smoking, and strategies used in order to quit smoking, as well as the motivational stage of change[8] immediately before hospitalization and at the time of the interview. We also investigated the factors that could facilitate or complicate smoking cessation, as well as the willingness of patients to accept a smoking cessation intervention during hospitalization. The level of nicotine dependence was determined by the Fagerström Test for Nicotine Dependence (FTND),[9] and the presence or absence of nicotine withdrawal syndrome was determined in accordance with the criteria established by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision.[10]

Data were analyzed with the Statistical Package for the Social Sciences, version 17 (SPSS Inc., Chicago, IL, USA). In order to evaluate the distribution of continuous variables, we used the Kolmogorov-Smirnov test. Continuous variables with normal distribution were expressed as mean and standard deviation, whereas those with non-normal distribution were expressed as median

and interquartile range. Categorical variables were expressed as frequency and proportion. The differences among categorical variables were analyzed by the chi-square test, whereas those among continuous variables were analyzed by the Student's t-test and the Mann-Whitney test, when pertinent. The level of statistical significance was set at $p < 0.05$.

Results

Data were collected on two distinct occasions. The first, on May 15-16, 2010, involved 127 inpatients. The second, on August 28-29, involved 108 inpatients. The final study population therefore comprised 235 inpatients of similar demographic characteristics (Table 1).

Smokers, former smokers, and never smokers accounted for 18.7%, 32.8%, and 48.5%, respectively, of the study population. The prevalence of passive smoking was high (46.7%). Most of the participants were female (n = 131; 55.7%) and married (n = 149; 63.4%). The mean age was 49.4 ± 18.2 years. Nearly half of the study sample consisted of individuals who were illiterate or had had less than 9 years of schooling. The median family income was 3 times the national minimum wage. Most of the patients did not perform physical activities or consume alcoholic beverages regularly (84.3% and 77.9%, respectively; Table 1).

Among the 44 smokers under study, the mean age was 45.7 ± 15.2 years, with a predominance of male individuals (65.9%) and married individuals (52.3%). Of the 44 smokers, 23 (52.3%) were illiterate or had had less than 9 years of schooling. The median monthly family income was 2.5 times the national minimum wage (Table 1). Only 7 (15.9%) of the smokers performed physical activity regularly. In addition, 19 (43.2%) consumed alcoholic beverages regularly (Table 1).

Table 1 shows the comparison between the smokers and never smokers. We found the following significant differences between the two groups of patients:

Males predominated among the smokers.

Table 1 - General characteristics of the study sample as a whole, as well as of the subgroups of smokers and never smokers.[a]

Characteristics	Study sample as a whole	Smokers	Never smokers	p*
	n = 235	n = 44	n = 114	
	(100.0%)	(18.7%)	(48.5%)	
Age, years[b]	49.4 ± 18.2	45.7 ± 15.2	47.8 ± 19.7	0.512
Gender				< 0.0001
Male	104 (44.3)	29 (65.9)	33 (28.9)	
Female	131 (55.7)	15 (34.1)	81 (71.1)	
Marital status				0.045
Single	38 (16.2)	11 (25.0)	12 (10.5)	
Married	149 (63.4)	23 (52.3)	80 (70.2)	
Widowed	18 (7.7)	2 (4.5)	9 (7.9)	
Divorced	30 (12.7)	8 (18.2)	13 (11.4)	
Years of schooling				0.0001
< 8 years	114 (48.5)	23 (52.3)	47 (41.2)	
8-10 years	53 (22.5)	18 (40.9)	25 (21.9)	
≥ 11 years	68 (29)	3 (6.8)	42 (36.8)	
Monthly family income[c,d]	3 (2-4)	2.5 (1.0-4.0)	2.7 (2.0-4.0)	0.377
Physical activity				0.654
< 3 times/week	198 (84.3)	37 (84.1)	91 (79.8)	
≥ 3 times/week	37 (15.7)	7 (15.9)	23 (20.2)	
Alcohol consumption				< 0.0001
No	183 (77.9)	25 (56.8)	102 (89.5)	
Regular	52 (22.1)	19 (43.2)	12 (10.5)	

[a]Values expressed as n (%), except where otherwise indicated. [b]Values expressed as mean ± SD. [c]In number of times the national minimum wage. [d]Values expressed as median (interquartile range). *Comparison between the groups of smokers and never smokers.

The number of individuals who had a stable relationship was lower among the smokers.

The level of education was lower among the smokers.

The number of individuals who consumed alcoholic beverages was higher among the smokers.

Figure 1 shows the distribution of inpatients in the various HU-UFSC wards by smoking status. The prevalence of smoking was highest among clinical medicine ward inpatients.

The median age at smoking initiation was 15 years. The mean length of the smoking habit was 28.1 ± 17.2 years, the mean smoking history being 32.0 ± 30.2 pack-years and the median number of cigarettes smoked per day being 20 (Table 2).

The FTND was used in order to determine the level of nicotine dependence, and the mean FTND score was 4.6 ± 2.3 (Table 2). In 20 patients (45.4% of the smokers), the level of nicotine dependence was found to be high or very high (FTND score ≥ 6).

Most patients (75.0%) started smoking because of the influence of friends or relatives. The major obstacles to smoking cessation were reported to be pleasure from smoking and fear of withdrawal syndrome (in 63.6% and 51.3%, respectively; Table 2). Of the 44 smokers interviewed in the present study, 32 (72.7%) had previously attempted to quit smoking; of those 32, 23 had attempted to quit without any assistance (Table 2).

As can be seen in Table 2, most (63.7%) of the smokers had one or more smoking-related comorbidities. The most common comorbidities were gastritis (in 22.7%), peripheral arterial insufficiency (in 22.7%), coronary artery disease (in 18.2%), COPD (in 15.9%), transient ischemic attack/stroke (in 9.1%), malignant neoplasms (in 6.8%), and interstitial lung disease (in 4.5%).

Of the 44 smokers, 81.9% had experienced one or more respiratory symptoms in the previous year (Table 2). The most common respiratory symptoms were dyspnea (in 52.3%), dry cough (in 52.3%), pharyngeal discomfort (in 43.2%), and productive cough (in 36.4%). All of the smokers smoked commercial cigarettes, and 8 also used tobacco in other forms, hand-rolled cigarettes being the most common.

Most (70.5%) of the interviewees reported not having smoked during their hospital stay, and 13 (29.5%) presented with nicotine withdrawal syndrome. Of the smokers, 39 (88.6%) reported that they wanted to quit smoking definitively, and 32 (72.7%) reported that they were willing to undergo smoking cessation treatment during their hospital stay. As can be seen in Table 3, the principal reasons why the patients wanted to quit smoking were a concern with their current health status (in 94.9%), a concern with their future health status (in 84.6%), a desire to improve the well-being of their families (in 59.0%), and the

Table 2 - Smoking-related characteristics of the smokers under study.[a]

Characteristics	Smokers
	n = 44
Age at smoking initiation, years[b]	15 (14-20)
Length of the smoking habit, years[c]	28.1 ± 17.2
Cigarettes/day currently smoked[c]	20 (7-20)
Smoking history, pack-years[b]	32.0 ± 30.2
Fagerström score[b]	4.6 ± 2.3
Reason for smoking	
Influence of friends	20 (45.5)
Influence of relatives	13 (29.5)
Influence of co-workers	3 (6.8)
Stress relief	3 (6.8)
Does not know	2 (4.5)
Others	3 (6.8)
Obstacles to smoking cessation	
Pleasure from smoking	28 (63.6)
Fear of withdrawal syndrome	20 (51.3)
Proximity to people who smoke	15 (38.5)
Belief that cigarettes are harmless	10 (25.6)
Fear of gaining weight	7 (17.9)
Previous attempt to quit	32 (72.7)
Strategy employed	
None	23 (71.9)
Nicotine replacement therapy	4 (12.5)
Support groups	2 (6.3)
Medical assistance	1 (3.1)
Literature	1 (3.1)
Bupropion	1 (3.1)
Smoking-related comorbidities	
0	16 (36.4)
1	16 (36.4)
> 1	12 (27.3)
Respiratory symptoms	
0	8 (18.2)
1-2	9 (20.5)
> 2	27 (61.4)

[a]Values expressed as n (%), except where otherwise indicated. [b]Values expressed as mean ± SD. [c]Values expressed as median (interquartile range).

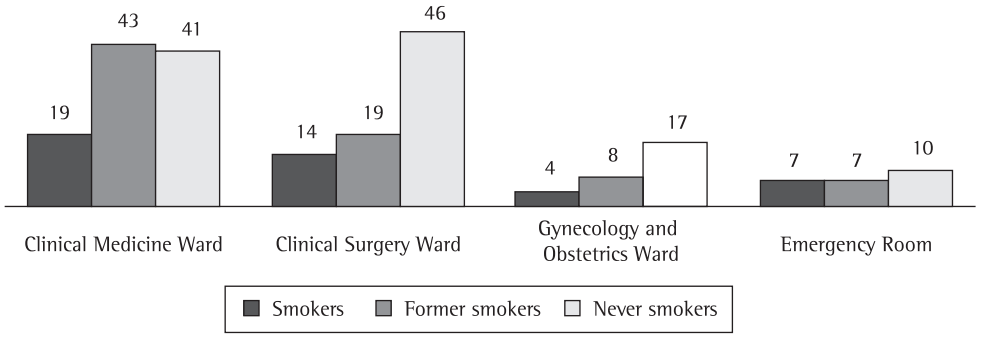

Figure 1 - Absolute number of patients by inpatient unit and smoking status.

fact that smoking sets a bad example to their children (in 56.4%).

Regarding the motivation to quit smoking, the precontemplation stage was found to be the most common motivational stage of change immediately before hospitalization (40.9%). During hospitalization, the action stage of change predominated (34.1%). Before hospitalization, only 31.8% of the smokers were in the preparation or action stages of change, whereas during hospitalization that proportion increased to 56.8% (Figure 2).

Discussion

The proportion of smokers in our study sample (i.e., 18.7%), in combination with that of former smokers (i.e., 32.8%), demonstrates the impact of smoking on hospitalized patients. The results also showed that 45.4% of the smokers presented with a high or very high level of nicotine dependence. Most of the smokers presented with respiratory symptoms and smoking-related comorbidities. Although most of the smokers reported having previously attempted to quit smoking, few had employed smoking cessation strategies. Withdrawal syndrome was found in 29.5% of the smokers. Most of the smokers would like to quit smoking and were willing to undergo smoking cessation treatment during their hospital stay. The most common reasons for quitting smoking were a concern with the current health status and a concern with the future health status. The number of patients in the preparation and action stages of change was found to be higher during hospitalization.

We compared our results with those of studies involving the general population, such as the 2008 VIGITEL study[2] and the *Pesquisa Especial sobre Tabagismo* (PETab, Special Smoking Survey),[3] and found that the results were similar in terms of the prevalence of smoking: 17.5% in the city of Florianópolis (as found in the 2008 VIGITEL study) and 17.1% in the state of Santa Catarina (as found in the PETab). We also compared the results of the present study with those of other studies involving inpatients at general hospitals and found that the results were similar in terms of the prevalence of smoking, which ranged from 11.5% to 22.6%.[11-13]

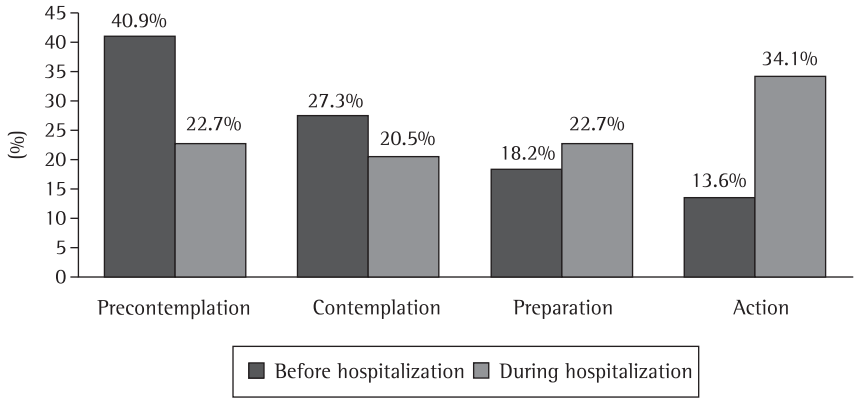

Figure 2 - Motivational stage of change before and during hospitalization.

Table 3 - Hospitalization-related characteristics of the smokers under study.[a]

Characteristics	Smokers
	n = 44
Smoked during hospitalization	
No	31 (70.5)
Yes, inside the hospital	2 (5.0)
Yes, outside the hospital	11 (24.5)
Withdrawal syndrome	
Yes	13 (29.5)
No	31 (70.5)
Smoking cessation	
Willing to quit	39 (88.6)
Unwilling to quit	5 (11.4)
Willing to undergo treatment	32 (72.7)
Unwilling to undergo treatment	12 (27.3)
Reason for quitting smoking	
Concern with current health status	37 (94.9)
Concern with future health status	33 (84.6)
Family well-being	23 (59.0)
Bad example to the children	22 (56.4)
Money	19 (48.7)
Displeasure with dependence	18 (46.2)
Smoking is socially unacceptable	17 (43.2)
Peer pressure	15 (34.1)
Smoking bans	11 (28.2)

[a]Values expressed as n (%).

We compared the population of smokers with that of never smokers, and the results obtained were found to be in agreement with those of other studies conducted in Brazil, including a lower level of education among smokers; 93.2% of the smokers had not finished high school, whereas 63.2% of the never smokers had not finished high school.

The mean age of the hospitalized smokers under study was 45.7 ± 15.2 years, which was the lowest mean age among those found in the few studies investigating in-hospital smoking (from 51.3 ± 16.8 years to 58 ± 17 years).[11-13] Although the smokers in our study sample were middle-aged individuals, the deleterious effects of the years of smoking were already evident; most of the smokers presented with smoking-related comorbidities, and 81.9% presented with at least one respiratory symptom. Such a high prevalence of respiratory symptoms is in disagreement with the results of a recent study conducted in Brazil,[11] which showed that 58% of the smokers had respiratory symptoms, a proportion that is lower than is that found in the present study, although the mean age in that study was higher.

Nearly half of the smokers under study presented with a high or very high level of nicotine dependence. A large proportion of smokers started smoking at an early age, the median number of cigarettes smoked per day being 20 at the time of the interview. Therefore, the study population had characteristics that are related to smoking cessation failure; such smokers are more likely to experience withdrawal syndrome and relapse, therefore requiring a more effective behavioral and pharmacological approach.[5] Our results clearly confirmed that; of the total of smokers, 72.7% had previously attempted to quit smoking and 71.9% had had no assistance of any type.

At the time of the interview, 29.5% of the smokers reported that they had smoked during their hospital stay. Of those, 5% had smoked on the HU-UFSC premises, i.e., in the infirmary or restrooms, which should be 100% smoke-free. These data are in agreement with those from another study,[14] which involved 602 hospitalized smokers and reported that 25% of the smokers smoked during their hospital stay, 4% having

smoked inside the hospital, predominantly in the restrooms (71%). One study involving 358 hospitalized smokers demonstrated that 24% smoked during their hospital stay.[15] The two studies highlighted that the length of hospital stay and withdrawal syndrome are determining factors for smoking during hospitalization.

In the present study, withdrawal syndrome was identified by the presence of four or more symptoms,[10] and the prevalence of withdrawal syndrome among the hospitalized smokers under study was found to be nearly one third. None of the patients who were identified as having withdrawal syndrome was under treatment for it. A large population-based study conducted in the United States[14] reported that 89% of the smokers had at least one withdrawal symptom within the first 48 h after admission. This is important because withdrawal syndrome is an obstacle to smoking cessation and therefore should be identified and treated.[5]

Although hospitalization can be an obstacle to smoking cessation because it generates stress, insecurity, and anxiety, it can induce cessation by making smoking difficult and allowing patients to reflect on their lifestyle. The fact that 88.6% of the smokers under study reported that they would like to quit smoking and 72.7% reported that they were willing to undergo smoking cessation treatment corroborates the concept that hospitalization is a good window of opportunity to approach smokers.[16]

Although hospitalization might or might not raise the awareness of patients, 94.9% of the smokers under study reported a concern with their current and future health status as one of the principal reasons for quitting smoking. Further studies involving hospitalized patients in Brazil are needed in order to evaluate the impact of motivation-based approaches, the objective of which is long-term smoking cessation.

Figure 2 shows further data confirming that hospitalization is a good opportunity to initiate smoking cessation treatment. Before hospitalization, 68.2% of the smokers were in the precontemplation or contemplation stages, which are the motivational stages of change that are furthest from effective smoking cessation. A study conducted in the United States and involving the general population investigated the distribution of individuals by motivational stage of change and found that 40% were in the precontemplation stage, 40% were in the contemplation stage, and 20% were in the preparation stage.[17] The action stage of change was not taken into account, because the study involved only individuals who were daily smokers at the time of the interview. If we excluded the action stage of change from the present study, the proportion of patients in the precontemplation and contemplation stages before hospitalization would reach 78.9%. Nevertheless, during hospitalization, 56.8% were already in the preparation or action stages, which are motivational stages of change that are significantly closer to smoking cessation. Some of the smokers were already in the action stage of change before hospitalization, meaning that they were classified as smokers only because they had quit smoking less than 30 days prior. After hospitalization, that proportion increased significantly (250%). The results of the present study indicate that hospitalization has an impact on the motivational stage of change, the smokers under study being therefore characterized as being closer to smoking cessation.

Because we employed a self-report questionnaire (with the exception of a few items, the answers to which had to be found in medical charts), it is possible that the data obtained were biased by the Hawthorne effect, whereby individuals participating in a given survey provide the answers that they believe that the researcher would like to hear. In order to determine the motivational stage of change, we used the model proposed by Prochaska & DiClemente. Although the model is considered inaccurate, it is the most widely used in Brazil because it has previously been validated. Although the model proposed by Richmond[18] has been used in some studies as a specific instrument to evaluate the motivation to quit smoking, it has yet to be validated for use in Brazil. Another limitation of the present study is that we did not measure exhaled carbon monoxide levels, a recent biological marker that is used in order to verify the smoking status and therefore avoid underestimation of the prevalence of smoking. In addition, our statistical analysis did not address whether the possibility of a surgical procedure or whether the ward in which patients were hospitalized (clinical medicine ward, clinical surgery ward, gynecology/obstetrics ward, or emergency room) had any influence on the motivational stage of change.

In summary, the present investigation revealed that although smoking is prevalent during hospitalization, it is often neglected. As occurs in other health care facilities, smokers admitted to the HU-UFSC are not routinely approached for smoking cessation treatment. Because hospitalized smokers present with high levels of nicotine dependence, high tobacco intake, early age at smoking initiation, and high number of cigarettes smoked per day, they require a systematized approach to smoking cessation during hospitalization in order to guarantee successful smoking cessation. In order to optimize such an approach, a comprehensive program should be developed in the institution, focusing on the following:

- training physicians, nurses, and other health care workers who have close contact with patients
- providing medication to assist in smoking cessation
- implementing strategies aimed at smokers, with special attention to hospitalized smokers

Such a program should continue after discharge in order to prevent recidivism.

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