

Smoking in hospitalized patients. A great opportunity

Tabaquismo en pacientes hospitalizados. Una gran oportunidad

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Abstract

The objective of this study is to describe the characteristics of smokers admitted to different medical and surgical services in a university hospital and the perception of patients regarding the need for a specialized intervention. The sample comprises a total of 307 patients (mean age of 59.4 years), being 40% (n = 123) non-smokers, 42.7% (n = 131) ex-smokers, and 17.3% (n = 53) smokers. The average consumption of smokers was 22.2 cigarettes / day and the severity of nicotine dependence evaluated with the Fagerström test exceeded 5 points in more than half of the sample. On the other hand, 77.7% had made at least one previous attempt to quit tobacco use. Almost the entire sample (89.9%) of smokers and ex-smokers considered it necessary to develop tobacco treatment programs during hospitalization. Finally, the importance of the hospital context is argued as an opportunity to address the cessation of smoking. The data obtained in this study will allow focusing more appropriately on the management of these patients and optimizing resources.

Keywords: Characteristics of smoking; hospital care; treatment of smoking; inpatients smokers; smoking cessation.

Resumen

El objetivo de este estudio es conocer las características de los fumadores ingresados en diferentes servicios médicos y quirúrgicos en un hospital universitario y la percepción de los pacientes respecto a la necesidad de una intervención especializada. La muestra comprende un total de 307 pacientes (edad media de 59,4 años), siendo un 40% (n = 123) no fumadores, 42,7% (n = 131) exfumadores, y un 17,3% (n = 53) fumadores. El consumo medio de los fumadores era de 22,2 cigarrillos/día y la gravedad de la dependencia a la nicotina evaluado con el test de Fagerström sobrepasaba los 5 puntos en más de la mitad de la muestra. Por otra parte, el 77,7% había realizado al menos un intento previo de abandono del consumo de tabaco. Casi la totalidad de la muestra (89,9%) de los fumadores y ex fumadores consideraba necesario desarrollar programas de tratamiento del tabaquismo en la hospitalización. Finalmente se argumenta la importancia del contexto hospitalario como oportunidad para abordar la cesación del hábito tabáquico. Los datos obtenidos en el presente estudio permitirán enfocar más adecuadamente el manejo de estos pacientes y optimizar los recursos.

Palabras clave: Características del tabaquismo; atención hospitalaria; tratamiento del tabaquismo; pacientes hospitalizados fumadores; cesación tabáquica.

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Smoking is responsible for serious illnesses, causing millions of smokers to be hospitalized every year for tobacco-related diseases (Thomsen, Villebro & Moller, 2014). These admissions could be an opportunity to implement smoking cessation programs. Indeed, treating hospitalized patients who smoke not only helps restore health, it also improves the social atmosphere and compliance with legislation, which since 1988 (RD 192/88) prohibits smoking in health centers (Royal Decree 192/1988, Law 28/2005).

Containing tobacco use is one of the criteria for hospital accreditation by the *Joint Commission on Accreditation of Healthcare Organizations (JCAHO)* and one of WHO's priorities for Europe (Fiore, Goplerud & Schroeder, 2012). The analysis of tobacco consumption trends in Spain suggests that efforts in smoking prevention and control policies should not be reduced (Leal-Lopez, Sanchez-Queija & Moreno, 2019) since the implementation of measures such as law 42/2010 have led to a reduction in smoking (Rodriguez Munoz, Carmona Torres, Hidalgo Lopezosa, Cobo Cuenca & Rodriguez Borrego, 2019).

A hospital stay could be an optimal time to quit smoking. We currently have data that indicate better withdrawal rates when treatment is initiated in patients during hospital admission (Rigotti, Clair, Munafo & Stead, 2012). With regard to the efficiency of interventions to help hospitalized patients to quit smoking, a hospital intervention consisting of advice on admission to quit smoking, pharmacological treatment plus post-discharge follow-up has a cost per year of life gained, adjusted for quality (QALY), of 1,386 Canadian dollars. It has been estimated that the provision of this type of treatment for 15,326 hospitalized smokers would cause 4,689 of them to quit and serve to avoid 116 rehospitalizations, 923 days of hospital stay and 119 deaths (Mullen et al., 2015).

According to Spanish National Institute for Statistics (INE) data, in 2013 there were 4,637,427 hospital admissions in Spain. Cardiovascular diseases, which accounted for 13.3% of the total, and those of the respiratory system, 10.9%, are frequently caused by smoking. Between 15 and 27% of patients admitted to Spanish hospitals are smokers (Alonso-Colmenero, Diez de, Alvarez & de Oteyza, 2010; Nieto Garcia, Abdel-Kader Martin, Rosado Martin, Carriazo Perez de Guzman & Arias Jimenez, 2003) and 20.6% of hospitalized COPD cases are active smokers (Pozo-Rodriguez et al., 2010). In other countries, a prevalence of smoking in asthmatic patients of 36% has been documented (Bittner et al., 2016) and up to 54.5% in those with HIV (Fitzgerald et al., 2016). The higher prevalence of smoking in the HIV/AIDS population than in the general population affects its prognosis, and it has been recommended to start smoking treatment during hospital stays (Mussulman et al., 2018). In the area of mental health, it has been observed that patients with

severe mental disorder or with affective disorders have higher smoking prevalence than the general population and a life expectancy up to 10 years lower than that of the general population (Bobes, Arango, Garcia-Garcia & Rejas, 2010; Jimenez-Trevino et al., 2019).

The scientific literature clearly indicates the pernicious effects of tobacco use on the most vulnerable people. Thus, heart patients experience more relapses of their disease if they continue smoking (Jimenez-Trevino et al., 2019; Mohiuddin et al., 2007). There is also recognition of the relationship between smoking and the possibility of developing postoperative pulmonary complications, which double in smokers with respect to ex-smokers and non-smokers (Bluman, Mosca, Newman & Simon, 1998; Borglykke, Pisinger, Jorgensen & Ibsen, 2008; Moller, Villebro, Pedersen & Tonnesen, 2002; Regan, Viana, Reyén & Rigotti, 2012; Taylor, Houston-Miller, Killen & DeBusk, 1990). Unfortunately, concrete actions in this regard have so far been minimal (Emmons & Goldstein, 1992; France, Glasgow & Marcus, 2001), although their effectiveness and efficiency are well documented in the literature (Lightwood & Glantz, 1997; Mullen et al., 2015; Sarraimea et al., 2019a).

There are enough data in the international literature to recommend starting smoking treatment on admission to hospital and its follow-up after discharge (Jimenez Ruiz et al., 2017). The paucity of studies carried out in Spain is an important limitation when adapting the recommendations to our environment (Alonso, 2001; Jimenez Ruiz et al., 2017; Ortega et al., 2011; Roig Cutillas et al., 2001). In this regard, the recently published SEPAR Regulations (Jimenez Ruiz et al., 2017) features a literature search of studies related to aiding smoking cessation and, based on the results, indicates recommendations for the treatment of smoking in hospitalized patients. Since then the subject continues to be treated in international publications (Campos et al., 2018; Feterik et al., 2019; Vander Weg et al., 2017; Warner et al., 2016; Ylioja et al., 2017) although information regarding the Spanish population is still lacking.

The objective of the present study was to reveal the characteristics of smokers admitted to different medical and surgical services in a university hospital, as well as to assess the perception of patients regarding the need for specialized intervention, information which could be of interest in matching recommendations to the Spanish context.

Method

Descriptive cross-sectional study of a sample of patients admitted to the University Hospital of Valencia. The study variables referred to the smoking behavior of smokers and ex-smokers. The smoking questionnaire, administered by

a single interviewer, was complemented with information on epidemiological and clinical characteristics of patients.

Participants

The study sample was obtained incidentally: all patients admitted to various medical and/or surgical departments of the hospital (Cardiology, Thoracic Surgery and General and Digestive Surgery) with acute organic pathology were consecutively included for a period of time, 9 months, between January 1 and September 30, 2007. The selection of these hospital services was carried out for convenience based on their accessibility to the researchers and the agreement of the corresponding heads of department.

Sample size ($n = 307$) was calculated by applying the formula for estimating sample size when population size is unknown: $n = Z_{\alpha}^2 \times p \times q / d^2$

Where:

$Z_{\alpha}^2 = 1.96^2$ (given a desired confidence interval of 95%)

p = expected proportion (in this case 15%)

$q = 1-p$ (in this case $1-0.15 = 0.85$)

d = precision (in this case 4%)

Procedure

Interviews with smokers were conducted by a medical specialist in pulmonology, in the same room on the ward to which the patient had been admitted. An ad hoc questionnaire was used to record data and inform the patient of the type of help that could be offered to stop smoking. Depending on their stage of quitting smoking, they were given information specifying the risks of smoking and the benefits of giving up, and provided with a guide to quitting and helped to decide which day they would stop smoking. In each case the following methodology was followed.

Variables

The most relevant aspects of smoking behavior were investigated (age of onset, number of cigarettes smoked daily, whether or not they had a partner who smoked, previous attempts to quit smoking and reasons for failure), as well as other characteristics of the patient (profession and pathological background). For the purpose of this study, an "attempt to quit smoking" corresponds to "more than one day without smoking."

The assessment of the degree of physical dependence on nicotine was performed using the modified Fagerström nicotine dependence test (Jimenez Ruiz et al., 2017). Scores equal to or greater than 6 indicate a high degree of dependence.

Statistical analysis

The appendix contains the data collection sheet (an ad hoc questionnaire), as well as the codes assigned to the variables. As can be seen, the data were scored according

to their nature, so that in the case of quantitative variables, real values were obtained, while categorical values were given in the case of qualitative variables. The results are expressed in relative frequencies.

For the descriptive analysis, the mean, standard deviation (SD) and range were calculated in the case of quantitative variables, while in the case of qualitative variables the number and percentage of subjects in each class were determined. In order to assess the existence of differences in the characteristics of smoking depending on the department in which the smoker had been hospitalized or on the main diagnostic categories (ischemic heart disease or cancer), the Kruskal-Wallis H test was performed. This is a non-parametric comparison test of three or more independent groups which allows us to decide if we can accept the hypothesis that k independent samples come from the same population or from identical populations with the same median. For statistical analysis and data exploration, a database was configured using the SPSS 18.0 program. A value of $p < 0.05$ was accepted for statistical significance.

Results

Among the 307 subjects included in the study, there were 123 non-smokers (40%), 53 smokers (17.3%) and 131 former smokers (42.7%), with a mean age of 59.4 years (SD 16.54 years, ranging from 16 to 88). All patients who were asked agreed voluntarily to answer the questionnaire. If they were not in their rooms, the researcher would come back later. Seventy percent had diseases associated with those that caused their admission, among them respiratory diseases in 17.2% and cardiovascular diseases in 27% of cases.

With regard to *employment*, 19.3% were homemakers, 3.6% public officials, 17.7% salaried employees, 6.6% business owners/self-employed persons, and 51.8% had other employment. The vast majority, 297, were of Spanish origin (97.4%), while 2.6% were immigrants or tourists.

Characteristics of smoking among smokers and ex-smokers

The *average consumption of tobacco* amounted to 22.2 cigarettes/day, SD 14.4, range 2-60 cigarettes/day. Only 16.7% of respondents smoked fewer than 10 cigarettes/day, while 66.1% smoked 20 or more cigarettes per day (Table 1). The *average age of smoking onset* was 16.1 years, SD 4.3, range 9-40 years (Table 1), and among the 290 who had a partner, 86 (28.2%) had a *partner who smoked*, while in 49 (16%) of cases the partner was an ex-smoker, and a non-smoker in 153 (50.2%).

With respect to the smoker's *process of change phase*, 37.3% were at the precontemplation stage, 28.8% at the contemplation stage, 1.7% at the stage of preparation for

Table 1. *Characteristics of the smoking habit in smokers and ex-smokers of the study.*

	Mean	Standard deviation	Limits
Tobacco use (cigarettes/day)	22.2	14.4	2-60
Age of onset (years)	16.1	4.3	9-40
Fagerström Test (score)	3.9	2.9	0-10

change and 32.2% in the action phase. The *physical dependence on nicotine, measured by the Fagerström test*, yielded an average score 3.9 points, SD 2.9 and showed that 49% of smokers had 4 points or fewer (low physical dependence on nicotine), 34% had 5-6 points (moderate physical dependence on nicotine) and the remaining 17% scored 7 or more points (high physical dependence on nicotine) (Table 1).

Evolution of smoking habit after diagnosis of illness.

At least one attempt to quit smoking was made by 77.7% of smokers and ex-smokers, while the remaining 22.2% did not remember making attempts to quit. In case of those who made unsuccessful attempts to quit, the causes of failure were the following: anxiety-nervousness 59.6%, social causes 12.8%, weight gain 23.4% and other reasons 4.3%.

In this regard, it should be noted that only 89 patients (48.4%) remembered that their doctor had advised them to quit smoking. Among the rest, 35 (18.6%) remembered the recommendation of family members or friends, while 34 patients (18.5%) did not remember any recommendation to quit smoking.

Perception of patients regarding smoking.

The vast majority (90.9%) of smokers and ex-smokers considered that smoking was very harmful to health, and 81.5% of them believed that smoking was very harmful to the health of people around them at home or in the workplace. Only 6.2% believed that it was not harmful to the health of household members or workplace colleagues. It is thus unsurprising that 89.9% of smokers and ex-smokers considered it necessary to develop smoking treatment programs, especially aimed at hospitalized patients who smoke.

The distributions of age ($p = 0.033$), national, immigrant or tourist origin ($p = 0.009$) and the perception of the need for a specific smoking program in hospitalized patients ($p = 0.007$) differed depending on the diagnostic category (ischemic heart disease, cancer or other diagnoses). In fact, patients in the diagnostic category “cancer” were the most likely to consider the implementation of smoking treatment programs during hospitalization, compared to those in the “ischemic heart disease” diagnostic category.

Stage of change and importance of smoking cessation

While 90.9% of smokers and ex-smokers believed that smoking is very harmful to health, 89.9% thought

that it was necessary to implement smoking treatment programs during hospitalization. Those in the diagnostic category “cancer” were the most frequent supporters of this recommendation compared to those in the “ischemic heart disease” diagnostic category. The chronicity of the underlying pathology could have contributed to these differences.

In addition, it is worth highlighting that only 33.9% of smokers were in preparation or action phases, while the rest were not be willing to attempt to quit smoking in the short term, that is, during their hospital stay.

Discussion

The high prevalence of smokers found in this study, with data comparable to others published (Rigotti et al., 2000; Regan et al., 2012), demonstrates the expediency of starting smoking treatment during hospitalization, a time in which prevention and treatment of nicotine withdrawal must necessarily be confronted. In the same vein, it has been pointed out that smoking interventions in patients admitted to *Veterans Affairs Hospitals* require substantial changes in the behavior of doctors and improve follow-up after discharge (Ortega et al., 2011). Therefore, helping smokers to quit is one of the greatest prevention efforts in which hospitals can engage, although it is true that there are some barriers. The lack of expectations due to the absence of treatment resources, for example, and the cognitive impairment associated with certain pathological conditions (Sarramea et al., 2019b) could have contributed to these results in many cases. In order to accelerate the process of change phase of pre-contemplators and contemplators, it is necessary to provide information regarding the consequences of smoking, the benefits of quitting smoking in the particular prognosis and the existence of effective therapeutic alternatives (Jaen-Moreno et al., 2019). Likewise, the difficulties and heavy workloads facing the professionals themselves, in addition to the lack of training in the use of therapeutic instruments such as motivational interviewing, are some of the main obstacles to be overcome (Jimenez-Ruiz et al., 2013; Muquebil Ali Al Shaban Rodriguez et al., 2017). It has been pointed out that most hospitals avoid implementing the set of tobacco cessation measures because they require greater effort and resources (intensive identification, treatment, follow-up of all smokers) than other sets of hospital measures

(Fiore et al., 2012). To improve this situation, new forms of intervention and more training have been studied which also contemplate the use of computer systems to improve results (Jaen-Moreno et al., 2019; Muquebil Ali Al Shaban Rodriguez et al., 2017; Ylioja et al., 2017).

Among the smoking cessation interventions for hospitalized patients, health advice to stop smoking and drug treatment, or a combination of both, have been considered. The effectiveness of advice provided in the hospital by different health professionals when prolonged for at least one month after the hospital stay is greater than the standard treatment of the disease which motivated admission without specifically differentiated anti-smoking advice. With regard to drug treatments, a meta-analysis indicates that the effectiveness of intensive health advice (counseling during hospitalization which lasts at least one month after discharge) is significantly increased when treatment with nicotine supplements is added (RR 1.54; 95% CI 1.34-1.79) (Rodriguez Munoz et al., 2019). Counseling interventions during hospitalization which include a follow-up of at least one month after discharge increase abstinence rates. No significant effects of lower intensity interventions have been documented, i.e. those implemented only during hospitalization or for less than one month.

In spite of the limitations of our study, among which we highlight the small sample size, the absence of co-oximetry measurements and the time elapsed since the completion of the field work, the data highlight the existence of smokers with serious diseases associated with smoking who frequently enter hospitals without routinely receiving specialized care to treat smoking. These data are still valid today, largely due to the absence of more recent studies in Spain.

Fortunately, the vast majority of patients are aware of the harmful effects of smoking on their health and on the health of people around them, and would consider it very appropriate to participate in smoking treatment programs aimed at hospitalized patients. Therefore, we recommend the implementation of intervention programs for smokers who need to be hospitalized for various reasons. The aim would be to take advantage of hospitalization to facilitate the diagnosis and treatment of smoking, leading to better prognoses for patients and a reduction in health care costs.

In short, hospitalization is a unique opportunity to address the problem of smoking, during which diagnostic and treatment processes could begin. The data obtained in this study will allow us to focus more adequately on the management of these patients and optimize resources.

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Conflict of interests

The authors declare that they have no conflicts of interest in this publication.

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Appendix. Data collection sheet

Department 1. General and digestive surgery; 2. Thoracic surgery; 3. Cardiology

Diagnosis DIAGNOSTIC CATEGORY

1. Ischemic heart disease; 2. Others; 3. Cancer

NAME TEL.
CLINICAL HISTORY No
DAY AGE

EMPLOYMENT

1. Unemployed
2. Homemaker
3. Public official
4. Salaried employee
5. Business owner/Self-employed
6. Other

OTHER PATHOLOGICAL BACKGROUND

1. None
2. Respiratory diseases
3. Cardiovascular diseases
4. Depression
5. Other

ORIGEN

1. Spanish
2. Immigrant (...)
3. Other (tourist, etc.)

PARTNER WHO SMOKES

1. Yes
2. Yes, but quit
3. No
4. No partner

If you have never been a smoker, TICK HERE ____

If you are or have been a smoker,
COMPLETE THE FOLLOWING PAGES:

HOW OLD WERE YOU WHEN YOU STARTED TO SMOKE?

HOW MANY CIGARETTES DO YOU SMOKE PER DAY?

Since you were diagnosed with your illness,
HOW HAS YOUR SMOKING HABIT CHANGED?

1. I stopped smoking completely
2. I cut down on smoking
3. No change
4. I smoked more
5. I didn't smoke

Since your illness was diagnosed, HAS ANYONE
RECOMMENDED STOPPING SMOKING COMPLETELY?

1. No
2. Yes, my physician or specialist
3. Yes, my spouse or other relative
4. Yes, my friends

Since you were diagnosed with your illness,
HAVE YOU MADE ANY ATTEMPT TO QUIT SMOKING?

1. No
2. Yes

If yes, WERE YOU GIVEN ANY MEDICATION
TO HELP YOU QUIT SMOKING?

1. No
2. Yes, nicotine gum
3. Yes, nicotine patches
4. Yes, Zyntabac ®
5. Yes, Champix ®

If yes, WHO RECOMMENDED THIS TREATMENT?

1. The chemist
2. My physician
3. A doctor at the Addictive Behavior Unit (ABU)
4. The pulmonologist
5. Other doctor or specialist
6. The patient him/herself

If yes, WHY DO YOU THINK YOU DIDN'T MANAGE TO QUIT?

1. Anxiety-nervousness
2. Social reason
3. Greater weight gain than desired
4. Other reasons (...)

DO YOU BELIEVE THAT SMOKING IS HARMFUL TO PATIENTS?

1. Yes, greatly
2. Yes, a little
3. No
4. Don't know

DO YOU BELIEVE THAT SMOKING IS HARMFUL TO THOSE
WHO YOU LIVE OR WORK WITH?

1. Yes, greatly
2. Yes, a little
3. No
4. Don't know

DO YOU THINK IT IS NECESSARY TO IMPLEMENT SMOKING
TREATMENT PROGRAMS FOR HOSPITALIZED PATIENTS?

1. Yes
2. No
3. Don't know

Diagnosis of quitting stage

If you are currently a smoker,

ARE YOU PLANNING TO QUIT WITHIN THE NEXT SIX MONTHS?

1. Yes
2. No

ARE YOU PLANNING TO QUIT WITHIN THE NEXT MONTH?

1. Yes
2. No

ARE YOU PLANNING TO QUIT NOW?

1. Yes
2. Yes, but I will need medical help
3. No

Fagerström Test

HOW MANY CIGARETTES DO YOU SMOKE DAILY?

0. Fewer than 10 cigarettes
1. Between 11 and 20 cigarettes
2. Between 21 and 30 cigarettes
3. More than 30 cigarettes

HOW LONG AFTER YOU GET UP DO YOU SMOKE YOUR FIRST CIGARETTE?

0. Más de 60 minutos
1. More than 60 minutes
2. Between 31 and 60 minutes
3. Between 6 and 30 minutes
4. Less than 6 minutes

WHICH OF ALL THE CIGARETTES YOU SMOKE DURING THE DAY IS THE ONE YOU NEED MOST?

0. None in particular
1. The first of the morning

DO YOU SMOKE MORE DURING THE FIRST HOURS OF THE MORNING THAN DURING THE REST OF THE DAY?

0. No
1. Yes

DO YOU FIND IT DIFFICULT NOT TO SMOKE IN PLACES WHERE IT IS PROHIBITED (HOSPITAL, CINEMA, LIBRARY, TRAIN...)?

0. No
1. Yes

DO YOU SMOKE EVEN THOUGH YOU ARE SO ILL THAT YOU HAVE TO STAY IN BED MOST OF THE DAY?

0. No
1. Yes

