

## **Compliance with the smoke-free policy in hospitals in Spain: the patients' perspective**

*Running head: Patients' insights into smoke-free hospitals*

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# Compliance with the smoke-free policy in hospitals in Spain: the patients' perspective

## ABSTRACT

**Objective:** To explore compliance with the smoke-free policy in hospitals in Catalonia, Spain, by exploring inpatients' perceptions.

**Methods:** We conducted a cross-sectional study of a random sample of 1047 inpatients from 13 public hospitals. We collected data about: a) type of information about the smoke-free policy provided by the hospital, b) patients' knowledge about the policy, c) general appreciation of the compliance with the policy, and d) specific appreciation of such compliance by noticing any sign of tobacco consumption. We described the data by several patients' and hospitals' characteristics and assessed their association with the perceived non-compliance using prevalence ratios (PR) and their 95% confidence intervals (CI).

**Results:** Few patients were informed about the smoke-free policy (4.8% orally, 6.1% in writing, 55.6% through sign postings). About 64% were aware of the regulation and 73.5% believed that it was properly obeyed. While 0.7% had never or rarely observed smoking indoors, 36.2% had seen someone smoking outdoors sometimes or many times. Signs of tobacco consumption were observed indoors and outdoors. Factors associated with the perception of non-compliance were: being <45 years old *vs* being >64 years old (adjusted PR: 2.33; 95% CI: 1.09-4.98) and currently smoking *vs* have never smoked (adjusted PR: 1.84; 95% CI: 1.02-3.34).

**Conclusion:** Compliance with the smoke-free policy in hospitals according to the patients' view is notable, although several infringements were reported, mainly outdoors. The smoke-free policy in hospitals should be reinforced by prompting continuous awareness campaigns and the exemplary role of hospital workers.

**Keywords:** smoke-free policies, hospitals, patients' view.

## 1. Introduction

Protection of the population from exposure to second-hand smoke is one of the main strategies in tobacco control. The World Health Organization Framework Convention on Tobacco Control recommends the adoption of smoke-free policies in several public places, including health care centres. These policies have demonstrated to have public health benefits in these settings going beyond the protection from second-hand smoke exposure, such as reductions in the smoking prevalence among hospital staff (Martínez et al., 2008). Despite this, tobacco control in these settings is still suboptimal. A study examining staff's opinions about a smoke-free policy in health care centres in Australia showed that while the policy was evaluated positively 15 months after its implementation non-compliance was still highly prevalent, with 40.9% of the staff being exposed to second-hand smoke, mostly at entrances to buildings and grounds (Martin et al., 2017). Other studies have also noticed some non-compliances at entrances (Ratschen et al., 2008; Shopik et al., 2012; Sureda et al., 2012). To date, smoke-free policies in outdoor areas of health care centres are uncommon and, therefore, the evidence about their impact on smoking prevalence and second-hand smoke exposure is limited (Martínez et al., 2014). This becomes of high interest in countries such as Spain, whose smoke-free legislation bans smoking in indoor and outdoor areas of acute hospitals (Martínez et al., 2014).

Several studies have assessed compliance with smoke-free policies in health care centres, most of them based on self-reported information by directives and staff, showing a high level of compliance (Martínez et al., 2016; Martin et al., 2017; McCrabb et al., 2017).

Nevertheless, considering patients' perspective is important because they may provide

evidence about how smoke-free policy has been implemented by reporting the information they receive, their knowledge about it and their insight about its compliance. To our knowledge, few studies have explored patients' perceptions in this regard (Shopik et al., 2012) and none has been conducted in Spain. Thus, the objective of this study is to explore compliance with the smoke-free policy in hospitals by exploring the perceptions of patients attending public hospitals in the province of Barcelona in Spain.

## **2. Materials and methods**

### ***2.1. Study design***

This study is part of a project aiming to evaluate tobacco consumption and the level of implementation of nursing interventions for smoking cessation in the Catalan Network of Smoke-Free Hospitals ([www.xchsf.cat](http://www.xchsf.cat)). A cross-sectional study was conducted in 2015 using a convenience sample of 13 hospitals in the province of Barcelona selected according to logistic criteria: in each hospital a random sample of patients was obtained taking into account their size, expressed as number of beds. We included adult patients admitted to non-intensive care units for at least 24 hours. The final sample included 1047 inpatients, varying from 41 to 205 patients in each hospital. More details about the sampling methods are described elsewhere (Martínez et al., 2020). This study was carried out following the Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans and was approved by the Clinical Research Ethics Committee of the Bellvitge University Hospital (PR234/11). All participating patients received information about the study and gave their consent to participate.

## **2.2. Dependent variables**

We used an *ad hoc* face-to-face questionnaire administered by trained interviewers. For this analysis, we used diverse variables related to the smoke-free policy in hospitals as detailed below.

### **2.2.1. Provision of information about the smoke-free policy**

Participating patients were asked if they received information about the smoke-free policy in force, through a) oral information, and if so, who provided it: physicians, nurses, physiotherapists, other professionals, someone not identified; b) written information, including leaflets, welcoming packages, etc.; and c) sign postings seen during their stay, and if so, their locations (rooms, corridors, waiting rooms, emergency stairs, halls, outdoors, etc.).

### **2.2.2. Patients' knowledge about the smoke-free policy**

It was assessed with a multiple-choice question: "To the best of your knowledge, which is the smoking policy in the hospital you are admitted?". Answer options ranged from "Smoking is allowed everywhere" (the least restrictive) to "Smoking is prohibited in all indoor and outdoor areas of the hospital, including the garden and walking or transit areas, the car park, etc." (the most restrictive and correct answer). We dichotomised this variable as "aware of the regulation" and 'not aware of the regulation'. 'Don't know' responses were categorised as 'not aware of the regulation'.

### **2.2.3. Patients' perception of the compliance with the smoke-free policy**

It was assessed with one general question and several specific questions. a) *General assessment*: After being explained about the national smoking ban currently in place

affecting all acute health care centres, participants were asked: “The smoking ban is followed in this centre as stated by the law”. Five-point Likert scale option answers going from ‘totally agree’ to ‘totally disagree’ were categorised into ‘agree’, ‘neither agree nor disagree’ and ‘disagree’. b) *Specific questions*: Participants were asked about how frequently they had seen someone smoking in indoor and outdoor areas and who they thought they were (staff in their white coats, other staff, outpatients, inpatients, visitors, non-specific people). To assess any indirect evidence of tobacco consumption, participants were also asked if they had ever perceived tobacco smell or seen ashes and butts during their stay both indoors (rooms, corridors, waiting rooms, etc.) and outdoors (campus entrance, within the campus, in the parking or garage).

### **2.3. Covariates**

Covariates comprised patients’ and hospitals’ variables.

#### **2.3.1. Patients’ variables**

Patients’ variables included: sex (man, woman), age (<45, 45-64, >64 years old), educational level (less than primary, primary, secondary, university studies), employment (employed, unemployed, retired or with a disability, other), level of dependency (dependent, independent) (Cid-Ruzafa and Damián-Moreno, 1997), time since admission (1, 2-5, >5 days), if anyone had asked them if they smoked (yes, no), smoking status (current, former –had quit more than 6 months ago–, never smoker) and the partner’s smoking status (smoker partner, non-smoker partner, without a partner).

### *2.3.2. Hospitals' variables*

Hospitals' variables included: type of hospital (general, high technology), admission unit (surgical, medical-surgical, medical unit), hospital size ( $\leq 300$ ,  $> 300$  beds), smoking prevalence among staff ( $< 30$ ,  $\geq 30\%$ ) (Martínez et al., 2016), smoking cessation programme available for staff and patients (yes, no) and hospital's accreditation awarded by the Catalan Network of Smoke-Free Hospitals in 2014 (gold, silver, bronze, member) (Xarxa Catalana d'Hospitals Sense Fum, 2015).

### *2.4. Analysis*

We used percentages and chi-squared tests to describe the data by the main independent variables. We assessed the association between the perceived non-compliance with the smoke-free policy and several patients' characteristics with crude and adjusted prevalence rates (cPR, aPR) derived from weighted multi-level Poisson regression models with robust variance, with patients as the first level of the regression equation and hospitals as the second level. The weight for each hospital was calculated by dividing the number of beds by the number of participating patients. The weights from the sample design were applied to all calculations. All analyses were performed with IBM SPSS Statistics v.25.

## **3. Results**

### *3.1. Sample's characteristics*

Participating patients were equally distributed by sex. Most patients were  $> 64$  years old, had primary studies or less and were retired or had permanent disabilities. Most of them

(78.0%) were able to perform their activities of daily living independently and 88.7% were admitted for more than one day. Almost 60% referred to have been asked about their smoking status. Current smokers represented 20.5% of the sample and 16.3% had a partner who smoked (Table 1).

### ***3.2. Communication of the smoke-free policy by the hospital***

Overall, less than 5% of participating patients were orally informed about the smoke-free policy in force, generally by physicians or nurses. These patients were mostly from the group of <45 years old and currently smoked or had a partner who smoked. Around 6% referred to have received written information about the smoke-free policy, mainly from the youngest group of participants. Most patients (55.6%) had seen sign postings about the smoke-free policy, especially at entrances, corridors, waiting rooms and outdoor areas. Most of these patients were men, were  $\leq 64$  years old, had at least primary studies, were unemployed, functionally independent, were admitted to the hospital for one day, currently smoked and had a partner who smoked (Table 1).

### ***3.3. Knowledge of the national smoke-free regulation affecting hospitals***

About 64% of participants were aware of the national smoke-free regulation affecting hospitals, particularly men,  $\leq 64$  years old, unemployed, and current smokers (Table 1). In contrast, about 30% were not fully aware of the regulation; for example, 19.0% wrongly believed that smoking was allowed outdoors and 10.2% did not know the regulation in force ('don't know' responses).



### ***3.4. Perception of the compliance with the smoke-free policy***

Table 2 shows patients' perceptions of compliance with the smoke-free policy in hospitals.

Most patients (73.5%) believed that the regulation was properly obeyed, while 15.9% believed that it was scarcely obeyed; these people were mostly <45 years old, with secondary or university studies, functionally independent, currently smoked and had a partner who smoked. They were more frequently admitted to hospitals with the 'Gold' or 'Silver' accreditation, with smoking cessation services available and a smoking prevalence among hospital workers <30% (Table 2).

Smoking was never or rarely observed indoors (0.7%), but a greater proportion of respondents (36.2%) referred to have seen someone smoking in outdoor areas sometimes or many times. According to who they thought they were, 58.1% identified them mostly as visitors or inpatients' relatives, 45.5% as inpatients, and 35.6% as hospital workers in their white coats. These respondents were more commonly admitted to hospitals with a 'Member' level of accreditation, although 33.2% of those admitted to hospitals with a 'Gold' level referred to have seen staff smoking outdoors in their white coats and 48.6% had seen visitors smoking.

Respondents were also asked whether they had perceived any evidence of tobacco use. In indoor areas, tobacco smell was more commonly reported, mainly in the halls (8.1%), corridors (3.4%) and emergency stairs (3.1%). In outdoor areas, cigarette butts were more commonly seen, mainly in the gardens (30.4%) and at the entrances to the campuses (29.5%).

### ***3.5. Factors associated with the perceived non-compliance with the smoke-free policy***

Table 3 shows the association between the general perception of non-compliance with the smoke-free policy in the hospital and several patients' characteristics. The first multilevel model adjusted for age and sex indicates that most patients believing that the smoke-free policy was not properly complied were those aged  $\leq 64$  years compared to those  $> 64$  years old (cPR: 3.04; 95% CI: 1.57-5.88 for patients  $< 45$  years old) and those who were current smokers compared to never smokers (cPR: 2.19; 95% CI: 1.28-3.77). The model adjusted for sex, age, time since admission, smoking status and partner's smoking status showed similar results, except for age, which was statistically significant among smokers  $< 45$  years old. No second-level (hospital) variables entered the final model.

## **4. Discussion**

Our results show that less than 10% of patients were directly informed about the smoke-free policy during their stay and that less than half had seen related sign postings. Also, there is some failure in compliance with the smoke-free policy in both indoor and outdoor areas, as demonstrated by direct observation of people smoking and indirect evidence of tobacco consumption.

Awareness of the smoke-free policy in hospitals is crucial for its proper implementation and compliance. In our study, about one-third of patients did not know the national smoke-free regulation affecting hospitals properly, while 10% referred to not knowing it. These results indicate that there is still a need to strengthen the provision of information about the smoke-free policy in force in hospitals, particularly among inpatients, that might help to

improve its compliance. This is relevant since this study was conducted four years after the implementation of the national regulation, time enough for its appropriate enforcement.

Whereas a vast majority of patients believed that the smoke-free policy was properly obeyed, a non-deniable proportion believed that the regulation was scarcely followed, particularly outdoors. Although smoking is forbidden in outdoor areas of acute health care centres in Spain since 2011, smoking is still observed. In fact, smoking in outdoor areas near entrances may create exposure to second-hand smoke in indoor areas (Fu et al., 2016; Kim and Lee, 2021; Sureda et al., 2012).

Only a few studies have assessed the compliance with smoke-free policies in hospitals including their outdoor areas. One study conducted in Canada exploring patients' perspectives showed that the smoke-free policy was routinely violated and there were complains about the persistent tobacco smell at entrances, even after smoking was finished. Besides, although participants were aware of the smoke-free policy, many of them were uncertain about its specific details (Shopik et al., 2012). Other studies have assessed compliance by using direct observation of smoking or evidence of it. For example, a study assessed compliance with the Chilean smoke-free legislation affecting indoor and some outdoor areas in health care facilities through direct observation by trained fieldworkers. In that study, smoking was observed in 0.5% of semi-open areas and 6.7% of open areas assessed, and ashtrays or cigarette butts were observed in 3.2% and 19.0% of semi-open and open areas, respectively (Peruga et al., 2020). Another study assessing the impact of smoke-free policies at main building entrances of college campuses found an association between 100% smoke-free policies in outdoor areas and reduced cigarette butts near building entrances compared with campuses with partial or no restrictions (Lee et al.,

2013). The study also found an association between both lack of signage at entrances and the existence of cigarette butt receptacles in non-smoking areas and non-compliance with the smoke-free policy. These studies show that there may be some structural factors which may confound the key messages and hinder the progress into getting a smoke-free environment particularly in outdoor areas.

While non-compliance may occur more frequently during non-business hours, reinforcing the observance of the regulation during those periods is crucial to support smoke-free environments. In the same line, hospital managers should encourage their staff to avoid or diminish smoking during working hours; and when they do it, encourage them not doing so in their white coats (Martínez et al., 2016). Hospital workers should lead by example in the maintenance of a smoke-free culture, avoiding contradictory health messages (Fernández and Martínez, 2010).

Other potential barriers to the successful implementation of smoke-free policies in health care centres are the lack of support among staff, their reluctance to respond to non-compliances and enforcement issues. Another hospital-related barrier commonly identified is the poor provision of smoking cessation services to patients. These services may increase compliance (Shopik et al., 2012), although this was not clear in our study, since patients admitted to hospitals with smoking cessation programmes were the ones perceiving less compliance. Nevertheless, the provision of smoking cessation services to patients who smoke may encourage them not only to refrain from smoking during hospitalisation but also to quit smoking. In our study, about 76% of participants who smoked daily admitted to having smoked during their admission, 61% expressed sufficient or high interest in quitting smoking and 34% felt ready or were in the active smoking cessation process (Martínez et

al., 2018); thus, the hospitalisation may be an opportunity for smokers to quit smoking and improve their condition.

Increasing the enforcement of smoke-free policies by using comprehensive strategies and promoting commitment among all actors involved may contribute to communicating consistent messages. Evidence indicates that the effectiveness of implementing smoke-free policies depends on the commitment of managers, the continuous internal communication and the availability of support activities (i.e. training resources, presentations, and meetings), as well as on the willingness of individuals to implement them (Birken et al., 2015; Tucker et al., 2007).

Our study is not exempted from some limitations that should be mentioned. First, this is a cross-sectional study and thus the results can only be interpreted as associations between the studied variables. Second, the sample included 13 out of the 61 hospitals affiliated to the Catalan Network of Smoke-Free Hospitals at that time, selected by convenience attending to logistic criteria and the hospitals' willingness to participate and thus some selection bias is possible. Also, hospitals with the highest levels of accreditation awarded by the Network were more represented, with the potential for overestimation of compliance. Third, data were based on self-reported information and thus some information bias cannot be disregarded. However, the information provided is not sensitive for patients and, if any bias acting, it would likely be towards the null hypothesis, thus the differences found would be even greater. Fourth, patients may not have had the opportunity to assess non-compliance with the smoke-free policy during their stay. Nevertheless, we minimised this potential bias by random selection of patients admitted for at least 24 hours to different units, only excluding those from emergency rooms and intensive care units. Also,

substitution rates were relatively low (10-16% in all hospitals), mainly due to the unavailability of patients at the time of the survey. Fifth, time since admission might be another source of bias, although we did not find differences in the results according to this variable, except for the visualisation of sign postings.

Despite these potential limitations, this study is the first one to explore patients' views about compliance with the smoke-free policy in health care centres in Spain using a standardised instrument. The interviewers were all trained and the interviews were conducted face-to-face during the participants' stay in the hospital, minimising recall bias.

## **5. Conclusion**

Compliance with the smoke-free policy in the hospitals studied is notable according to patients, although one third of them reported infringements in outdoor areas. Proper compliance with the smoke-free policy should be monitored to detect areas of transgressions and their reasons for infringement. This study shows a need for strengthening the information to patients about the smoke-free policy in hospitals, as most of them were not well aware of the policy in place. Also, since compliance is not fully warranted, hospital administrators should launch continuous awareness campaigns and consistent messages, promoting the exemplary role of hospital workers in tobacco control, especially among health care professionals.

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**Table 1.** Information received by patients about the smoke-free policy in hospitals and patients' knowledge of the regulation, according to several patients' and hospitals' characteristics. E-THIF Study, Catalonia, Spain, 2015.

	Communication of the smoke-free policy by the hospital						Knowledge of the regulation		
	Total n	Oral information		Written information		Sign postings		n (%)	p-value
		n (%)	p-value	n (%)	p-value	n (%)	p-value		
<b>Total</b>	1047	50 (4.8)		66 (6.1)		540 (55.6)		611 (64.2)	
<b>Patients' characteristics</b>									
<b>Sex</b>			0.116		0.086		0.026		0.041
man	527	30 (5.8)		28 (4.9)		295 (59.1)		329 (67.3)	
woman	520	20 (3.8)		38 (7.4)		245 (51.7)		282 (60.9)	
<b>Age (years old)</b>			0.001		0.012		<0.001		0.004
<45	255	20 (8.0)		26 (10.1)		144 (62.6)		165 (68.2)	
45-64	314	19 (6.3)		18 (4.0)		196 (67.9)		205 (69.4)	
>64	478	11 (2.3)		22 (5.6)		200 (44.1)		241 (58.4)	
<b>Educational level</b>			0.246		0.190		<0.001		0.530
less than primary studies	363	13 (3.7)		25 (6.9)		140 (40.8)		199 (63.7)	
primary studies	330	21 (6.7)		12 (3.9)		197 (64.6)		189 (61.8)	

secondary studies	213	11 (4.7)		18 (7.6)		122 (60.4)		136 (68.0)	
university studies	141	5 (4.0)		11 (7.3)		81 (70.7)		87 (65.7)	
<i>Employment</i>			0.002		0.367		0.001		0.001
employed	321	18 (5.8)		23 (6.7)		182 (64.2)		213 (70.6)	
unemployed	77	9 (12.7)		9 (9.9)		50 (70.6)		53 (75.4)	
retired or with a disability	532	19 (3.5)		29 (5.9)		268 (53.2)		291 (61.6)	
another situation	117	4 (3.4)		5 (3.1)		40 (35.3)		54 (52.0)	
<i>Barthel dependence index</i>			0.713		0.529		0.001		0.343
dependent	230	11 (5.4)		14 (7.2)		93 (45.1)		128 (61.3)	
independent	817	39 (4.7)		52 (5.9)		447 (58.5)		483 (65.1)	
<i>Time since admission</i>			0.294		0.113		0.033		0.292
1 day	118	3 (2.2)		5 (2.6)		70 (68.5)		68 (58.5)	
2-5 days	470	21 (4.7)		29 (5.4)		234 (55.6)		263 (63.5)	
>5 days	452	26 (5.7)		32 (7.8)		232 (53.1)		277 (66.7)	
<i>Anyone asked them if they smoke</i>									
no	425	10 (2.4)	<0.05	18 (4.3)	<0.05	204 (55.0)	0.156	213 (50.1)	<0.05
yes	610	40 (6.6)		47 (7.8)		333 (59.7)		390 (63.9)	

<i>Smoking status</i>			<0.001		0.050		<0.001		<0.001
current smoker	215	31 (14.4)		12 (4.2)		143 (69.1)		160 (80.7)	
former smoker	346	12 (3.6)		17 (4.7)		191 (60.0)		202 (63.3)	
never smoker	486	7 (1.3)		37 (8.1)		206 (45.4)		249 (56.6)	
<i>Partner's smoking status</i>			0.003		0.143		0.018		0.068
smoker partner	170	15 (8.4)		10 (5.1)		106 (65.6)		116 (70.5)	
non-smoker partner	563	16 (2.8)		42 (7.5)		279 (53.1)		315 (61.1)	
without a partner	312	19 (6.6)		14 (4.3)		155 (54.3)		178 (65.9)	
<b>Hospitals' characteristics</b>									
<i>Type of hospital</i>			0.175		0.273		0.045		0.629
general	245	14 (6.6)		24 (7.9)		110 (48.9)		137 (62.5)	
high technology	802	36 (4.5)		42 (5.8)		430 (57.2)		474 (64.6)	
<i>Admission unit</i>			0.131		0.505		0.131		0.026
surgical	361	12 (3.2)		19 (5.0)		180 (55.0)		183 (58.7)	
medical-surgical	127	6 (4.5)		11 (7.0)		71 (65.5)		80 (68.6)	
medical	559	32 (6.2)		36 (6.8)		289 (54.1)		348 (67.4)	

<i>Hospital's size</i>			0.373		0.357		0.154		0.556
≤300 beds	541	30 (5.5)		46 (6.9)		299 (58.1)		322 (63.2)	
>300 beds	506	20 (4.3)		20 (5.5)		241 (53.4)		289 (65.1)	
<i>Smoking prevalence among staff*</i>			0.474		0.004		<0.001		<0.001
<30%	801	37 (4.5)		47 (4.7)		431 (59.7)		441 (59.3)	
≥30%	246	13 (5.6)		19 (9.5)		109 (47.1)		170 (75.0)	
<i>Smoking cessation programme</i>			0.404		0.937		0.012		0.167
no	234	8 (3.6)		20 (6.2)		98 (46.2)		123 (59.0)	
yes	813	42 (5.1)		46 (6.1)		442 (57.4)		488 (65.2)	
<i>Hospital accreditation**</i>			0.267		<0.001		<0.001		<0.001
Gold	337	11 (2.9)		6 (1.7)		184 (60.2)		184 (58.4)	
Silver	317	19 (6.3)		26 (8.1)		198 (69.2)		153 (54.5)	
Bronze	147	7 (5.6)		15 (6.4)		49 (34.2)		104 (74.1)	
Member	246	13 (5.6)		19 (9.5)		109 (47.1)		170 (75.0)	

\* Cut-off according to the last smoking prevalence available among all hospitals from the Catalan Network of Smoke-Free Hospitals (Martínez et al., 2016).

\*\*Last accreditation awarded in 2014 (Xarxa Catalana d'Hospitals Sense Fum, 2015).

**Table 2.** Patients' perception of compliance with the smoke-free policy in hospitals according to several patients' and hospitals' characteristics. E-THIF Study, Catalonia, Spain, 2015.

	Perception of compliance			p-value
	Agree	Neither agree nor disagree	Disagree	
	n (%)	n (%)	n (%)	
<b>Total</b>	745 (73.5)	111 (10.6)	168 (15.9)	
<b>Patients' characteristics</b>				
<b>Sex</b>				0.438
man	386 (74.9)	57 (10.6)	78 (14.5)	
woman	359 (72.0)	54 (10.5)	90 (17.5)	
<b>Age (years old)</b>				<0.001
<45	146 (58.7)	34 (12.5)	68 (28.7)	
45-64	222 (71.6)	30 (10.5)	57 (18.0)	
>64	377 (82.0)	47 (9.6)	43 (8.3)	
<b>Educational level</b>				<0.001
less than primary studies	287 (81.2)	31 (8.9)	36 (9.9)	
primary studies	228 (70.8)	41 (12.2)	57 (17.1)	
secondary studies	139 (68.6)	20 (9.2)	49 (22.3)	
university studies	91 (65.7)	19 (13.7)	26 (20.5)	
<b>Employment</b>				0.001
employed	209 (66.9)	37 (11.3)	70 (21.8)	
unemployed	46 (65.7)	9 (10.1)	20 (24.1)	
retired or with a disability	395 (76.7)	58 (11.3)	64 (12.0)	
other situation	95 (81.0)	7 (5.4)	14 (13.6)	
<b>Barthel dependence</b>				0.028
dependent	180 (80.5)	19 (8.4)	25 (11.0)	
independent	565 (71.6)	92 (11.2)	143 (17.3)	

<i>Time since admission</i>				0.188
1 day	72 (64.1)	16 (13.7)	26 (22.2)	
2-5 days	347 (75.8)	47 (10.3)	68 (14.0)	
>5 days	321 (73.1)	48 (10.4)	72 (16.6)	
<i>Smoking status</i>				<0.001
current smoker	119 (57.0)	32 (15.4)	62 (27.6)	
former smoker	262 (77.8)	34 (9.5)	44 (12.7)	
never smoker	364 (78.3)	45 (9.0)	62 (12.7)	
<i>Partner's smoking status</i>				<0.001
smoker partner	105 (62.5)	18 (10.8)	44 (26.7)	
non-smoker partner	426 (77.8)	60 (10.1)	70 (12.1)	
without a partner	213 (72.4)	33 (11.3)	53 (16.3)	
<b>Hospital's characteristics</b>				
<i>Type of hospital</i>				0.067
general	191 (79.5)	23 (9.7)	25 (10.8)	
high technology	554 (72.2)	88 (10.8)	143 (17.1)	
<i>Admission unit</i>				0.366
surgical	259 (74.2)	36 (9.5)	56 (16.3)	
medical-surgical	78 (65.5)	20 (14.4)	26 (20.1)	
medical	408 (74.6)	55 (10.6)	86 (14.8)	
<i>Hospital's size</i>				0.626
≤300 beds	385 (72.7)	62 (11.6)	79 (15.7)	
>300 beds	360 (74.2)	49 (9.7)	89 (16.1)	
<i>Smoking prevalence among staff*</i>				0.006
<30%	548 (70.8)	89 (11.1)	143 (18.1)	
≥30%	197 (79.6)	22 (9.3)	25 (11.1)	
<i>Smoking cessation programme</i>				0.018
no	184 (81.2)	23 (10.3)	20 (8.6)	
yes	561 (72.1)	88 (10.6)	148 (17.3)	
<i>Hospital accreditation**</i>				0.021



Gold	230 (70.9)	30 (9.2)	70 (19.9)
Silver	208 (69.3)	43 (13.5)	54 (17.2)
Bronze	110 (74.1)	16 (12.0)	19 (13.9)
Member	197 (79.6)	22 (9.3)	25 (11.1)

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\* Cut-off according to the last smoking prevalence available among all hospitals from the Catalan Network of Smoke-Free Hospitals (Martínez et al., 2016).

\*\*Last accreditation awarded in 2014 (Xarxa Catalana d'Hospitals Sense Fum, 2015).

ACCEPTED VERSION

**Table 3.** Factors associated with the patients' perception of non-compliance with the smoke-free policy in hospitals. E-THIF Study, Catalonia, Spain, 2015.

	Perception of non-compliance			
	cPR	95% CI	aPR	95% CI
<b>Sex</b>				
man	1.00		1.00	
woman	1.04	0.81 - 1.33	1.13	0.98 - 1.31
<b>Age (years old)</b>				
<45	3.04	1.57 - 5.88	2.33	1.09 - 4.98
45-64	2.07	1.46 - 2.94	1.58	0.98 - 2.53
>64	1.00		1.00	
<b>Educational level</b>				
less than primary studies	1.00		-	
primary studies	1.25	0.87 - 1.78		
secondary studies	1.22	0.92 - 1.62		
university studies	1.13	0.60 - 2.11		
<b>Occupation</b>				
employed	1.00		-	
unemployed	1.03	0.64 - 1.65		
retired or with a disability	1.29	0.92 - 1.82		
other situation	1.03	0.58 - 1.83		
<b>Barthel dependence index</b>				
dependent	1.00		-	
independent	1.08	0.67 - 1.74		
<b>Time since admission</b>				
1 day	0.83	0.61 - 1.12	0.86	0.63 - 1.17
2-5 days	0.80	0.53 - 1.22	0.80	0.52 - 1.23
>5 days	1.00			
<b>Smoking status</b>				
current smoker	2.19	1.28 - 3.77	1.84	1.02 - 3.34
former smoker	1.17	0.91 - 1.51	1.10	0.85 - 1.43
never smoker	1.00		1.00	
<b>Partner's smoking status</b>				
smoker partner	1.35	0.91 - 1.99	1.24	0.78 - 1.98
non-smoker partner	0.75	0.51 - 1.09	0.80	0.56 - 1.15
without a partner	1.00			

cPR: Crude prevalence ratio adjusted for age and sex.

aPR: Multi-level adjusted prevalence ratio.