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Barriers and Challenges for Tobacco Control in a Smoke-Free Hospital

KEY WORDS

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The study aimed to identify the extent of smoking, compliance with tobacco restrictions, and attitudes toward smoking and tobacco control measures among the employees in a Comprehensive Cancer Center from 2001 to 2006 where a smoke-free policy was progressively introduced. Four cross-sectional surveys were conducted from 2001 to 2006. Survey items include smoking status, smoking history, environmental tobacco exposure, and agreement with tobacco initiatives. The prevalence of smoking has declined from 34.5% in 2001 to 30.6% in 2006. The decrease was present in all professional groups: Doctors from 20.0% in 2001 to 15.2% in 2006 and administrative clerks from 56.0% in 2001 to 37.0% in 2006 reduced the most. Among nurses, the prevalence of smoking was still high with a 2-point percent reduction (from 34.0% in 2004 to 32.6% in 2006). Other changes of the pattern of smoking were apparent: a reduction on the number of cigarettes smoked, decrease of daily smokers, and increase of smoking abstinence during the hospital duty. Compliance with smoke-free areas increased. We observed a very significant decrease of the perception of exposure to environmental tobacco exposure at work. The Smoke Free project helped to achieve a healthy work environment. Tailored smoking cessation programs should be designed to help healthcare professionals to stop smoking. In addition, healthcare professionals should play a key role in promoting a healthy smoke-free lifestyle.

Surveys of healthcare providers are recommended as the base for tobacco control initiatives.¹ The health community plays a key role in the global effort to fight this epidemic. Health professionals should be an example in tobacco control initiatives. Still, in some countries, prev-

alence among health professionals is similar to the average of the population. Smoking health professionals are less likely to intervene and to deter their patients from smoking.² Thus, they are among the first targets for tobacco control.^{3,4}

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One of the most effective strategies to reduce the harm from smoking and prevent cancer is introducing “smoke-free environment” policies.⁵⁻⁷ Because in most developed countries, adults spend a considerable amount of hours in the workplace, which may have an effect on their smoking behavior.⁸⁻¹¹ This strategy, suggested by the World Health Organization, has proliferated with reasonable success in several countries that have recently launched smoking bans in workplaces, hospitals, and other public areas.¹²⁻¹⁵ Smoke-free policies have had a significant impact in the attitudes and behaviors of the smokers such as discouraging smoking, reducing cigarette consumption, and increasing the desire to quit and the likelihood of cessation.¹³

After the ratification of the Framework Convention on Tobacco Control on January 27, 2005, a new law for Prevention and Control of Smoking has been implanted in Spain. Restrictions in selling, advertising, and using tobacco in public places, workplaces and hospitals have been established.¹⁴

Hospitals should be an example in terms of controlling tobacco consumption and championing compliance with the law.¹⁵ Furthermore, health services should take the lead in implementing smoke-free policies, which promote adequate environments for patients, visitors, and employees. In addition, hospitals should ensure that patients and employees are provided with information and advice about the dangers of smoking and cessation therapies.¹⁶ In Spain, 30.0% of the population smokes. By gender, 35.8% of men and 24.3% of women are smokers.¹⁷ In the case of health professionals, among physicians, the rates have decreased in the last decades and are lower than the general population, whereas among nurses, it is still higher, with 35.1% of them being smokers.³

The Catalan Institute of Oncology (ICO), a Comprehensive Cancer Center in Barcelona, Spain, began the implementation of the “smoke-free” policy in 1997. Before the official launching, ICO gradually developed a smoke-free policy plan whose main element was to facilitate an organizational change.¹⁸ During the last 9 years, the smoke-free ICO project has been evaluated through tools such as the smoking prevalence survey, self-audit questionnaires, and observational inspections, and the smoke-free hospital model has been extended to most public hospitals over the country in the framework of the Catalan Network for Smoke-free Hospitals.¹⁹

This study reports the effects of the implementation of a progressive Smoke Free Hospital Policy at the ICO. Data from 4 cross-sectional surveys (from 2001 to 2006) are used to examine the smoking status of hospital employees, the changes in their attitudes and behaviors about smoking, and the commitment toward smoking policy.

■ Methods

Design, Procedure, and Sample

Data were obtained from 4 cross-sectional surveys conducted in 2001, 2002, 2004, and 2006 among a representative sample of the employees of the ICO. The sample sizes were

estimated taking into account the smoking prevalence among healthcare professionals in Catalonia in 1998 (35%) and assuming a 95% confidence level and an error ± 4 . They were calculated using Statcalc in EpiInfo, version 6.0.4 (Centers for Disease Control and Prevention, Atlanta, Georgia). We gathered information from 188 participants in 2001, 184 in 2002, 234 in 2004, and 237 in 2006 interviewed face-to-face by trained interviewers. Because not all the selected participants were present at work during the days of the interviews, the interviewers tried to locate each participant a maximum of 4 times at their work post. If they were not located, we randomized other participant of the same age and sex group. This survey was run under the approval of the institutional board.

Questionnaire and Variables

A confidential and common questionnaire for all the hospitals members of the European Network of Smoke-Free Hospitals was used. This questionnaire was developed by experts’ working group from the European Network of Smoke-Free Hospitals and piloted in smoke-free hospitals in 6 countries: Belgium, France, Greece, Spain, Ireland, and Romania. No formal assessment of its psychometric properties has been carried out to date, but its feasibility has been tested.²⁰ The questionnaires in 2001 and 2002 were identical. The 2004 and 2006 questionnaires were shorter but maintained the core questions: social and demographic data, profession, smoking status (that in the second version incorporates daily smokers and occasional smokers), attitudes toward active and passive smoking, and exposure to environmental tobacco exposure (ETS) during working time. In addition, the questionnaire included employee’s agreement or disagreement toward different statements about tobacco control policies and smoking restrictions.

The survey assessed *current tobacco consumption status* as smokers either daily (at least 1 cigarette/d) or occasional smokers (<1 cigarette/d), former smokers, and never smokers. For those who were current smokers, we collected additional information such as the number of cigarettes smoked per day, years of tobacco consumption, previous attempts to quit and willing of quitting smoking, and concern about harmful effects of tobacco. For former smokers, we gathered information about the number of cigarettes smoked, smoking duration, and the number of serious attempts made to quit.

Compliance with the tobacco-free policy was evaluated by asking the employees if they smoked in 12 selected areas of the hospital such as nursing rest areas, cafeteria, offices, and lifts. In addition, *exposure to ETS* was estimated by requesting the number of hours exposed during their hospital duty.

Finally, we collected information regarding support for smoking bans in public places and tobacco control policies, as well as their agreement with some exemplary professions (healthcare providers and teachers) as role models.

Statistical Analysis

The prevalence (%) of smokers (daily and occasional), former smokers, and never smokers and 95% confidence interval

(CI) were computed. We study the tobacco dependence among smokers. In addition, we computed the proportion of participants according to their response to the other study variables such as exposure to environment tobacco smoke, attitudes toward smoking, and agreement with smoke-free policies. All procedures were implemented using the Statistical Package for Social Sciences, 11.0.

■ Results

Sociodemographic Data

During the study period, there was no difference in the distribution of the sample. Around 75% of our responders were women. The distribution of the 4 professional groups across this time has not changed. Thus, in 2006, 17.3% were doctors, 46.6% were nurses, 14.1% were administrative employees, and 22.0% were other professionals (ie, statisticians, technical assistants, informatics, and so on). Overall, hospital employees were young (75% aged 25 to 44 years).

Smoking Consumption

Smoking prevalence has slightly decreased from 34.5% (95% CI: 27.7–41.2) in 2001 to 30.6% (95% CI: 24.7–36.4) in 2006 (Table 1). A similar reduction in the prevalence of smoking was observed among women (from 34.3% in 2001 to 31.9% in 2006) and men (from 35.4% in 2001 to 27.7% in 2006). Regarding smoking consumption within employee's groups, there was a decrease in the number of smokers in all the groups. The prevalence of smokers among health employees decreased from 30.2% in 2001 to 27.8% in 2006. Smoking prevalence among doctors reduced from 20.0% in 2001 to 15.2% in 2006, and among nurses, it decreased from 34.0% to 32.6%, respectively.

Tobacco Smoking Dependence

We observed a general high smoking dependence in the 3 first surveys: with 60% of smokers consumed between 10 and

20 cigarettes per day. This pattern of consumption changed in 2006, with an increase of both those who smoked <10 cigarettes per day and those who smoked >20 cigarettes per day. In regard to the first cigarette of the day, there has been steady tendency, and around 73% of our employees smoked the first cigarette after 30 minutes of been awake (Table 2).

Attempts to Quit Smoking

In relation to the will of quitting, no substantial changes have occurred in the last 5 years. Around 60% of smokers have attempted to quit at least once, and the proportion of those who have tried more than once has decreased from 2001 (Table 2). Forty-three percent of smokers expressed their readiness to plan to quit in 2006, similar to the proportion observed in the previous surveys.

Concern of the Harmful Effects of Tobacco Consumption

Smokers' concerns on the harmful effects of tobacco have been steadily high during the last 5 years. Around 65% of smokers in 2006 were worried about their own health. Similar results about the concern of tobacco effects in nonsmokers who were in contact with tobacco smoke have been obtained. In 2006, about 64% of smokers expressed concern about the effects of their smoking consumption on others' health.

Exposure to ETS

Exposure to ETS has decreased in the last 5 years (Table 3). The percentage of employees working in a smoke-free environment has increased from 33.0% (95% CI: 26.2–39.7) in 2001 to 91.4% (95% CI: 87.3–94.6) in 2006. Compliance to ICO's smoke-free areas has increased across the study period. In 2001, few smokers affirmed to have smoked inside the nursing rooms, but in 2006, no interviewed declared so. Similarly, and since 2004, no employees interviewed affirmed to have smoked in the smoke-free

☀ **Table 1 • Tobacco Consumption, 2001–2006**

	2001 (n = 188)		2002 (n = 186)		2004 (n = 206)		2006 (n = 237)	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Tobacco consumption status at ICO hospital								
Smokers ^a	34.5	(27.7–41.2)	32.8	(26.1–39.5)	34.0	(27.5–40.4)	30.6	(24.7–36.4)
Never smokers	38.3	(31.3–45.2)	44.6	(37.4–51.7)	37.9	(31.2–44.5)	39.4	(33.1–45.6)
Former smokers	27.1	(20.7–33.4)	22.6	(16.5–28.6)	28.2	(22.1–34.3)	30.1	(24.2–35.9)
Smoking prevalence by profession								
Doctors	20.0	(6.7–33.2)	24.3	(10.4–38.1)	17.2	(3.4–30.9)	15.2	(2.9–27.4)
Nurses	34.0	(24.4–43.5)	32.3	(22.8–41.8)	30.0	(19.3–40.7)	32.6	(22.8–42.3)
Administrative employees	56.0	(36.5–75.4)	46.7	(28.8–64.5)	31.3	(15.2–47.3)	37.0	(18.7–55.2)
Other	35.3	(19.1–51.2)	30.7	(12.9–48.4)	47.8	(36.2–59.3)	35.7	(21.2–50.2)

Abbreviations: CI, confidence interval; ICO, Catalan Institute of Oncology.

^aInclude daily and occasional smokers.

Table 2 • Tobacco Dependence Among Smokers From 2001 to 2006

	2001 (n = 188)		2002 (n = 186)		2004 (n = 206)		2006 (n = 237)	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Tobacco dependence								
Daily cigarettes								
<10 cigarettes	30.8	24.8–51.19	28.3	15.9–40.1	25.0	14.0–35.9	48.8	35.3–60.7
10–20 cigarettes	61.5	47.7–74.3	62.3	48.8–75.2	68.3	56.2–79.8	37.2	24.6–49.3
>20 cigarettes	7.7	0.7–13.2	9.4	2.2–12.8	6.7	0.3–13.1	14.0	5.1–22.8
First cigarette								
<5 min	6.2	0.2–11.7	5.0	0.4–10.1	10.0	2.9–17.0	5.3	0–11.0
5–30 min	16.9	7.0–26.1	20.0	9.9–30.1	21.4	11.4–30.6	18.6	8.5–28.5
>30 min	76.9	66.7–87.2	75.0	64.1–85.6	68.6	57.1–78.9	72.9	60.5–83.4
Attempts to quit smoking								
Yes	64.6	52.0–76.0	56.7	44.0–69.0	58.6	47.0–70.0	58.6	55.4–61.8
Number of attempts to quit smoking								
1	41.5	29.0–10.53	40.0	27.7–52.3	45.7	34.1–57.4	54.5	41.8–67.2
2–3	41.5	29.0–53.0	51.4	38.8–63.9	41.4	29.8–52.9	36.3	24.0–48.5
>3	17.1	7.9–26.2	8.6	1.5–15.6	12.9	5.1–20.7	9.2	1.7–16.3
Readiness to quit smoking								
Yes	40.3	28.4–52.2	41.7	29.4–54.1	32.4	21.4–44.4	42.4	29.8–55.0

Abbreviation: CI, confidence interval.

cafeteria and the employees' rest areas. The number of those who abstained from smoking during their working time has significantly increased since 2001. As a result, abstainers passed from 12.3% (95% CI: 4.31–20.2) in 2001 to 44.1% (95% CI: 31.4–56.7) in 2006.

Attitudes Toward Smoking and Tobacco Control Measures

Employees' agreement toward the smoking ban in close public areas, hospitals, and health centers was high (Table 4). Indeed, those who think that smoking should be forbidden in hospitals have increased from 69.9% (95% CI: 62.3–75.7) in 2001 to 81.8% (95% CI: 76.0–86.8) in 2006. Most of the employees agreed that health professionals should give example to others as regards tobacco consumption. However, there has not been a positive change in the percentage of responders who agreed that health professions should give example. Finally, employees' opinions on smoking policies have remained similar during the 5 years. Most of our employees considered that tobacco advertising should be forbidden, but the proportion aiming at tobacco tax increases

was lower. As also seen in Table 4, the percentage of agreement with the smoke-free policies was systematically higher among never and former smokers.

Discussion

Surveys in our hospital have shown a reduction in overall prevalence of smoking, changes in pattern of consumption, and higher support on tobacco policies. Moreover, the compliance of smoke-free areas has improved during the study period and the percentage of employees not exposed to ETS during their working shift has substantially increased. Some studies indicate that the more restrictive the bans have been implemented, the greater effects on smoking behavior at the workplace.^{8,21}

The Catalan Institute of Oncology has introduced progressive policy bans on tobacco consumption.¹⁷ First, a tobacco control committee was established in 1997, and the hospital was declared smoke-free in 1998 (although 3 smoking rooms were maintained). In 2001, we started educational and training courses of tobacco control addressed to nurses with the aim of

Table 3 • Exposure to Environmental Tobacco Smoke in the Workplace

	2001 (n = 188)		2002 (n = 186)		2004 (n = 206)		2006 (n = 237)	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
None	33.0	(26.3–39.7)	31.2	(24.5–37.8)	55.3	(48.4–62.2)	91.4	(87.3–94.6)
<1 h	46.3	(39.1–53.4)	47.3	(40.1–54.5)	38.6	(31.8–45.4)	5.3	(2.4–8.1)
1–4 h	18.1	(12.6–23.6)	17.2	(1.86–22.7)	5.5	(2.3–8.8)	1	(0–2.2)
>4 h	2.1	(0.5–4.14)	4.3	(1.38–7.21)	0.5	(0.5–1.4)	0	—

Abbreviation: CI, confidence interval.

Table 4 • Agreement With Smoke-Free Policies and Ban Limitations

	2001		2002		2004		2006	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Smoking should be forbidden in public areas.								
Overall	81.1	(75.2–86.7)	78.9	(71.8–84.1)	80.5	(80.0–89.9)	83.8	(78.1–87.8)
Smokers	69.4	(57.5–80.5)	55.6	(42.3–68.8)	67.7	(56.3–79.1)	80.7	(70.5–90.5)
Never smokers	89.9	(82.8–97.0)	92.5	(87.4–98.6)	92.2	(86.2–98.1)	85.5	(77.6–93.4)
Former smokers	83.7	(73.3–94.0)	82.9	(72.6–95.1)	79.3	(68.9–84.7)	84.5	(75.2–93.8)
Smoking should be forbidden in hospitals and health centers.								
Overall	69.9	(62.3–75.7)	70.9	(63.2–76.7)	71.5	(64.7–77.2)	81.8	(76.0–86.8)
Smokers	57.1	(44.8–69.3)	59.9	(46.8–73.4)	60.6	(48.8–72.4)	74.1	(62.8–85.5)
Never smokers	81.4	(72.2–90.5)	82.2	(77.8–90.5)	77.9	(68.6–87.1)	88.2	(80.9–95.4)
Former smokers	70.0	(57.3–82.7)	73.2	(59.6–86.7)	75.4	(64.2–86.8)	81.0	(70.9–91.0)
Hospitals should dispose of smoking areas.								
Overall	88.5	(83.3–92.7)	83.4	(77.4–88.5)	81.3	(75.5–86.6)	61.1	(54.8–67.2) ^a
Smokers	88.7	(80.8–96.5)	90.7	(82.5–98.8)	89.4	(81.9–96.8)	79.7	(69.1–89.9)
Never smokers	90.3	(83.4–97.1)	78.3	(69.4–87.1)	77.6	(68.2–86.9)	50.0	(38.7–61.2) ^a
Former smokers	85.7	(75.9–95.5)	84.2	(72.6–95.7)	76.8	(65.7–87.8)	56.9	(44.1–69.6) ^a
Health professionals should set a good example by not smoking cigarettes.								
Overall	53.0	(45.3–60.7)	44.6	(36.0–51.9)	60.9	(53.8–68.1)	51.8	(45.3–58.3)
Smokers	45.6	(32.6–58.5)	15.6	(4.9–26.2)	35.7	(23.1–48.2)	35.6	(22.3–47.8)
Never smokers	60.0	(47.6–72.4)	61.8	(50.3–73.3)	74.6	(64.4–84.7)	57.9	(46.7–69.0)
Former smokers	53.2	(38.9–67.6)	48.6	(32.0–65.1)	69.2	(56.4–81.5)	60.3	(47.7–72.9)
Teachers should set a good example by not smoking cigarettes.								
Overall	59.0	(51.5–66.5)	49.0	(40.8–57.1)	64.0	(56.8–71.1)	53.4	(54.7–67.2)
Smokers	50.9	(37.9–63.8)	16.7	(5.4–27.9)	38.9	(25.8–51.9)	33.9	(21.8–45.9)
Never smokers	64.5	(52.6–76.4)	64.7	(53.3–76.0)	78.6	(69.3–88.4)	57.9	(46.8–69.0)
Former smokers	61.7	(47.8–75.6)	57.1	(40.7–73.5)	70.6	(58.1–83.1)	67.2	(55.1–79.3)
Tobacco advertisement should be forbidden.								
Overall	80.8	(74.8–86.7)	74.1	(67.3–80.6)	81.7	(76.1–87.2)	70.5	(71.5–85.9)
Smokers	75.4	(64.2–86.5)	69.2	(56.6–81.7)	80.7	(70.4–90.9)	76.3	(65.4–87.1)
Never smokers	86.4	(78.1–94.6)	82.7	(74.1–91.2)	85.3	(77.3–93.3)	68.4	(57.9–78.8)
Former smokers	79.5	(67.5–91.4)	62.9	(46.9–78.9)	77.8	(66.7–88.6)	67.2	(55.1–79.2)
Tobacco taxes should be increased.								
Overall	42.7	(34.7–50.6)	47.2	(39.4–54.9)	59.6	(52.4–66.7)	47.2	(36.9–57.4)
Smokers	21.8	(10.8–32.7)	26.3	(14.8–37.7)	39.7	(27.6–51.8)	19.8	(18.7–42.2)
Never smokers	53.6	(40.5–66.6)	61.1	(49.8–72.3)	73.9	(63.5–84.2)	49.5	(38.2–60.7)
Former smokers	56.4	(40.8–71.9)	53.1	(35.8–70.3)	64.7	(51.8–77.8)	30.8	(18.9–42.6)

Abbreviation: CI, confidence interval.

^aStatistical significant ($P < 0.005$).

increasing their role in the project. In 2003, we implemented changes in the hospital environment: We allowed only 1 smoking area in the entire center, exclusively for employees. In December 2004, we conducted the third survey of this study, and in July of 2005, the Hospital became entirely smoke-free, anticipating the law on tobacco control in Spain.¹⁴ The project has promoted nonsmoking practices as the normal social pattern in a country where smoking remains a standard and accepted behavior.¹⁸

In 2006 a complete reduction in the exposure to ETS at the workplace has been achieved. The smoke-free indoor working environment has been maintained, and increased thanks to a continuous process of assessment and support. At the same time, other cultural and social factors have made this change possible.²² After the approval of the Spanish tobacco control law in December 2005, the agreement to implement tobacco control policies increased, as well as the concern

about the harmful effects of tobacco smoke. Moreover, the great majority of employees were in favor of smoking bans in public areas such as hospitals. In fact, support to tobacco control initiatives, such as smoke-free public areas and health centers, has increased over the time in our hospital. Nonetheless, to evaluate more acutely the attitudes, behaviors, and opinions of our employees about the smoke-free hospital project, we are going to use qualitative research methods. This approach might help us to know in detail how smoke-free policies affect individuals in a hospital organization.

As compared with Spanish health professionals, the prevalence of smoking in our hospital is 5 percentage points lower. In the European Region, however, smoking prevalence among physicians is lower²³ (ie, 14% in Sweden and 6.8% in the UK). Among nurses, the prevalence of smoking in Europe is similar to that of the general population (around 25%–30%) and lower than in our hospital.²⁴ In the United

States, smoking declined most rapidly among physicians, at an intermediate rate among registered nurses, and at a lower rate among licensed practical nurses.²⁵

In addition, the consumption pattern among smokers has changed in our hospital. We observe that the number of cigarettes smoked has decreased as well as the percentage of daily smokers, and hence, the percentage of occasionally smokers has increased. Other studies have reported similar consequences at the early stages of smoke-free ban projects.^{8,11} Considering that our main achievement is a change in smoking pattern and a steady high percentage of those who wish to quit, further efforts need to be made. It seems clear that a “smoke-free hospital” is an opportunity to encourage smoking cessation among its workers.²⁶

To help smokers to quit and be conscious of the particular difficulties that health professionals experience in quitting smoking,²⁷ we started in 2002 a pilot cessation support program to help smokers to give up through a mentoring tobacco cessation program.²⁸ Initially, we directed our pilot program to nurses because of their high smoking prevalence and their active role model. Some nursing associations, such as the International Society of Nurses in Cancer Care, enhance nurses as role models in tobacco control. Following their recommendations, we enrolled nurses as an instrumental partner in our project because nurses are the largest health professional group—they have extensive exposure to various populations through direct client contact in a diversity of care settings and, moreover, are trusted by the public. For this reason, our smoke-free project tries to implicate nurses and enhance their responsibilities in the hospital. Therefore, we train nurses in tobacco prevention and cessation care activities that they can perform in their daily work.^{29,30} We have tried to implicate nurses and the rest of employees in promoting tobacco cessation using brief counseling and nicotine replacement therapy as effective strategies to help smokers to quit.

There are some limitations of this study to be mentioned. We have used repeated cross-sectional and comparable surveys. Although some selection bias due to selective participation is probable, the confidentiality was assured when approaching the workers.

The use of self-reported smoking status can cause errors in classification in intervention studies of smoking cessation, but it is an adequate form of classifying smokers in observational studies.³¹ Furthermore, the questionnaire was interviewer administered, and this methodology has shown higher estimates of sensitivity and specificity than self-administered questionnaires.³²

Changing a smoking hospital into a smoke-free hospital is a hard but not impossible task and necessitates long-term effort and commitment. We have observed steady reductions in ETS exposure, variations in smoke's attitudes and behaviors, and changes in tobacco consumption patterns progressively when more restrictive bans were applied. However, some challenges need to be faced. Promotion of smoking cessation should be an integral part of our smoke-free policy because one of the major aims of any policy must be to reduce the burden of disease caused by smoking.

Moreover, almost 75% of smokers wish to quit, and the decision to embrace a smoke-free policy may propel them to quit.³³ Healthcare professionals have the responsibility to give example, and only after adopting a smoke-free lifestyle can they assume an active role in tobacco control.

Eight years after starting systematic actions aimed to control tobacco in our hospital, we are able to identify the barriers and the challenges for the future. The main barriers recognized are, first, the starting high smoking prevalence rates in our employees (particularly among nurses) and, second, the low awareness of health professionals of being a role model in tobacco control at hospitals. We have also identified some challenges for the future: appropriate training and education in tobacco control activities should be provided to assist staff, efficient cessation support for employees willing to quit should be offered, and smoking cessation programs for hospitalized patients should be provided.

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References

1. Samet JM, Taylor CE, Becker KM, Yach D. Research in support of tobacco control. *BMJ*. 1998;316:321–322.
2. Willaing I, Jorgensen T, Iversen L. How does individual smoking behaviour among hospital staff influence their knowledge of the health consequences of smoking? *Scand J Public Health*. 2003;31:149–155.
3. Servei Català de la Salut. Enquesta de Salut de Catalunya 2002. Barcelona: Servei Català de la Salut. Departament de Sanitat i Seguritat Social. Generalitat de Catalunya; 2002.
4. Nardini S, Bertolotti R, Rastelli V, Ravelli L, Donner CF. Personal smoking habit and attitude toward smoking among the health staff of a general hospital. *Monaldi Arch Chest Dis*. 1998;53:74–78.
5. Artazcoz L, Brotons M, Brotons A. Impacto de la implantacion de una politica de trabajo libre de humo en una empresa [Impact of implementation of a smoke free policy in the worksite in a company]. *Gac Sanit*. 2003;17:490–493.
6. Smokefree Europe Partnership. Smoke Free Europe makes economic sense: a report on the economic aspects of smoke-free policies. 2005. www.smokefreeeurope.com/economic_report.htm. Accessed June 5, 2006.
7. Scientific Committee on Tobacco and Health. Secondhand smoke: review of evidence since 1998. Update of evidence on health effects of secondhand smoke. London: Department of Health; 2004. www.advisorybodies.doh.gov.uk/scoth/PDFS/scothnov2004.pdf. Accessed January 12, 2006.
8. Anderson P, Hughes JR. Policy interventions to reduce the harm from smoking. *Addiction*. 2000;95(suppl 1):s9–s11.
9. Fichtenberg CM, Glantz SA. Effect of smoke-free workplaces on smoking behaviour: systematic review. *BMJ*. 2002;325:188–191.

10. Bauer J, Hyland A, Steger C, Cummings M. A longitudinal assessment of the impact of smoke-free worksite policies on tobacco use. *Am J Public Health*. 2005;95:1024–1029.
11. Longo D, Johnson J, Kruse R, Hewett J. A prospective investigation of the impact of smoking bans on tobacco cessation and relapse. *Tob Control*. 2001;10:267–272.
12. Framework Convention on Tobacco Control. Development of an evidence based global public health treaty. *BMJ*. 2003;327:154–157.
13. Bauer J, Hyland A, Steger C, Cummings M. A longitudinal assessment of the impact of smoke-free worksite policies on tobacco use. *Am J Public Health*. 2005;95:1024–1029.
14. LEY 28/2005, de 26 de diciembre, de medidas sanitarias frente al tabaquismo y reguladora de la venta, el suministro, el consumo y la publicidad de los productos del tabaco [Health tobacco policy and regulation of the selling, consumption and advertising of tobacco products]. *BOE*. 2005;309:42241–42250.
15. Méndez E. La Red de Hospitales libres de Humo [Smoke-free Hospitals Network]. In: Salvador Llivina T, ed. *Espacios laborales libres de humo*. Madrid: Comité Nacional sobre Prevención del Tabaquismo; 2006.
16. West R, McNeill A, Raw M. Smoking cessation guidelines for health professionals: an update. *Thorax*. 2000;55:987–999.
17. Encuesta Nacional de Salud 2006 [National Health Interview Survey 2006]. Madrid: Ministerio. de Salud y Consumo; 2007.
18. Méndez E, García M, Margalef M, Fernández E, Peris M. Iniciativas para el control del tabaquismo: la Red Catalana de Hospitales Libres de Humo [Tobacco control initiatives: the Catalan Network of Smoke-free Hospitals]. *Gac Sanit*. 2004;18:150–152.
19. García M, Méndez E, Martínez C, Peris M, Fernández E. Implementing and complying with the Smoke Free Hospitals Project in Catalonia, Spain. *Eur J Cancer Prev*. 2006;15:446–452.
20. Ouranou A. A European view of smoking habits among health care workers. *Eur New Smoke-free Hosp Newslett*. 2005;8:6.
21. Longo DR, Feldman M, Kruse R, Brownson C, Hewett Petroski G. Implementing smoking bans in American hospitals: results of a national survey. *Tob Control*. 1998;7:47–55.
22. Fernandez E. Spain: going smoke free. *Tob Control*. 2006;15:80–81.
23. Saltó E, Jané M, Pardell H, Taberner JL, Tresserras R, Salleras L. Prevalencia y actitudes de los profesionales sanitarios de Cataluña respecto al tabaquismo: últimos datos (2002) [Prevalence and tobacco actitude of Catalan health professionals]. II Congreso Nacional sobre la Prevención y Tratamiento del tabaquismo. *Prev Tab*. 2002;4(suppl 1):30.
24. Health professionals and Tobacco Control report 2005: World No Tobacco Day. Geneva: World Health Organization; 2005. http://www.euro.who.int/document/tob/TOB_factsheet.pdf. Accessed February 7, 2007.
25. Nelson DE, Giovino A, Emon L, et al. Trends in cigarette smoking among US physicians and nurses. *JAMA*. 1994;271:1273–1275.
26. US Department of Health and Human Services. The health benefits of smoking cessations: a report of the Surgeon General. Rockville, MD: Centers for Diseases Control, Office on Smoking and Health, Department of Health and Human Services; 1990.
27. McKenna H, Paul S, McCance T, Bunting B, Spiers A, McElwee G. Qualified nurses' smoking prevalence: their reasons for smoking and desire to quit. *J Adv Nurs*. 2001;35:769–775.
28. Martínez C, García M, Mendez E. Nuevas estrategias de cesación tabáquica: Programa Mentoring para profesionales sanitarios [New strategy of tobacco cessation: mentoring for health professionals]. *Prev Tab*. 2005;7:285–291.
29. Sarna L. Prevention: tobacco control and cancer nursing. *Cancer Nurs*. 1999;22:21–28.
30. Rose MA. Intervention strategies for smoking cessation: the role of oncology nursing. *Cancer Nurs*. 1991;14:225–231.
31. Hatzianreou E, Pierce JP, Fiore MC, Grise V, Novotny TE, Davis RH. The reliability of self-reported cigarette consumption in the United States. *Am J Public Health*. 1989;79:1020–1023.
32. Patrick DL, Cheadle A, Thompson DC, Diehr PH, Koepsell TS, Kinne S. The validity of self-reported smoking: a review and meta-analysis. *Am J Public Health*. 1994;84:1086–1093.
33. Neubeck L. Smoke-free hospitals and the role of smoking cessation services. *Br J Nurs*. 2006;15:248–251.