

# Tobacco use prevalence, knowledge and attitudes among Italian hospital healthcare professionals

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**Background:** Healthcare professionals play a key role in tobacco use prevention because they are considered as model by patients. This multicenter study was aimed to evaluate smoking prevalence, knowledge and attitudes towards tobacco among Italian hospital professionals. **Methods:** A cross-sectional study was carried out using a questionnaire administered to healthcare professionals in seven Italian hospitals, to investigate personal and occupational data, knowledge, attitudes, job setting, clinical activities, smoking habits and pattern for current smokers. Potential predictors of current smoking habits were evaluated using multiple logistic regressions. **Results:** Sample population was comprised of 1082 health professionals (51.4% females; mean age was 37.3 years; 25.3% were nurses, 24.5% medical doctors, 17.1% students and 33.1% other healthcare workers). Smoking prevalence was 44%. Among responders, 67.7% considered healthcare professional as a model for citizens, 90.5% declared to see colleagues smoking cigarettes inside the hospital (47.4% in the dependents' toilets, 33.4% in the department kitchens and 4.7% in the patient room). Multivariate analysis showed that healthcare professionals working in Naples had a higher risk to be smokers in comparison to Rome [odds ratio (OR)=2.29; 95% confidence interval (CI) 1.40–3.73]. Compared to medical doctors, post-graduate students (OR=3.42; 95% CI: 1.81–6.44), nurses (OR=2.48; 95% CI 1.51–4.08), nursing students (OR=1.91; 95% CI 1.08–3.38) and auxiliary personnel (OR=2.72; 95% CI 1.51–4.88), showed a higher likelihood of smoking. **Conclusions:** Among Italian hospital personnel there is a paradoxically large prevalence of smokers, higher than in the general population. Interventions aimed for the development of an adequate culture of health promotion, among these professionals, are urgently needed.

**Keywords:** Tobacco smoking, prevalence, health personnel

## Introduction

Worldwide, tobacco use represents the second major cause of death and the main preventable cause of lifestyle-related diseases such as lung cancer, chronic obstructive pulmonary disease and coronary heart disease.<sup>1,2</sup>

According to the World Health Organization (WHO), in the 20th century the tobacco epidemic killed 100 million people all over the world and it is estimated that, during the 21st century, it could kill one billion.<sup>3</sup>

In Europe tobacco is the leading contributor to the disease burden in more than half of the Member States and it is among the three leading contributors in the majority of countries.<sup>4</sup> Consequently, this issue can be considered a critical international point for public health policy makers.<sup>5</sup>

Medical professionals can play a key role in the process of smoking cessation both as advisers and behavioural models for

the citizens; so, it is relevant to have information on their habits and attitudes towards smoking, especially concerning their role to give help to smokers who wish to quit.<sup>6</sup>

Although the damages of smoking are well known, several studies have shown a high prevalence of smokers among health professionals,<sup>7–11</sup> who do not always set a good example for their patients.<sup>12,13</sup> In fact, it is evident that health professionals could better persuade patients to stop smoking if they themselves are not smokers.<sup>14</sup> Furthermore, other studies have shown that smokers who team up with their healthcare providers have more chance to quit than trying on their own.<sup>15–17</sup>

Since physicians are widely viewed as examples by the community, their patients and their colleagues,<sup>18</sup> hospitals should represent places suitably appointed to develop a culture of health promotion.<sup>19</sup>

The aims of this study were: (i) to estimate smoking prevalence among a sample of Italian hospital professionals; (ii) to evaluate their knowledge and attitudes towards tobacco use.

## Methods

A multicenter cross-sectional investigation was conducted in seven opportunistically selected hospitals of the following Italian towns: Rome, Naples, Perugia, Chieti and Turin. In the time period between March 2006 and February 2008, questionnaires were anonymously self-administered to hospital workers.

### Study population sample

In order to calculate sample size, the following parameters were used:

- estimated prevalence of smokers was set at 33%;<sup>20</sup>
- size of population from which the sample was selected at 631 000;<sup>21</sup>
- Sample size was estimated to be 942 at 95% level of confidence, considering as worst acceptable result 30%.

### The questionnaire

A questionnaire, composed of 53 open and closed ended answers, was structured into seven sections investigating the following topics:

- (i) Personal and occupational data (gender, age, professional qualification and department). (Questions: 1–4)
- (ii) Knowledge about smoking (i.e. smoking as a risk factor for several diseases, healthcare professionals as models for citizens, main reasons to support smoke cessation in hospitals). (Questions: 5–13)
- (iii) Attitudes (i.e. opinion about no smoking policies, laws and sanctions; behaviour towards colleagues who smoke). (Questions: 14–23)
- (iv) Job setting (i.e. presence of no-smoking signs, settings where hospital staff more commonly smoke). (Questions: 24–26)
- (v) Clinical activities (i.e. patient smoking history; no-smoking policies). (Questions: 27–32)
- (vi) Smoking habits. (Questions: 33–36)
- (vii) Smoking pattern (for current smokers only) (i.e. smoking habit, willingness to stop and opinion about the most effective techniques to quit). (Questions: 37–53).

The outcome variable was current tobacco smoking status (including cigarettes, cigars, pipes or any other smoked tobacco products). Compatible with WHO, we considered current smoking including both daily and non-daily or occasional smoking.<sup>22</sup>

A pilot study was conducted in February 2006 in order to validate the questionnaire.<sup>23</sup>

### Statistical analysis

Descriptive statistics was performed using frequencies, percentages, frequency tables for categorical variables and mean  $\pm$  standard deviation (SD) for quantitative variables. In order to assess internal consistency the Cronbach's alpha was calculated.

For the univariate analysis Mann–Whitney and Chi square tests were performed to evaluate differences for quantitative and categorical variables, respectively.

To investigate potential independent predictors of current smoking, a logistic regression model was used. The dependent variable was current smoking status (yes or not), and covariates were age, gender, city, professional qualification, hospital department, considering health professionals as models, knowledge about smoking and diseases, damages caused by smoking, reasons to stop smoking in the hospitals, favouring the law banning smoking inside hospitals, favouring penalties to smokers in hospitals and attitudes towards colleagues who smoke.

Hosmer and Lemeshow procedure was used to select those covariates to include in the final model: all the variables included had a  $P$ -value  $< 0.25$  at the univariate analysis.<sup>24</sup> Results are expressed as odds ratio (OR) with 95% confidence interval (95% CI), and the goodness of fit of the model was tested with Hosmer–Lemeshow test. The level of significance was set at  $P \leq 0.05$ . Statistical analysis was performed with SPSS 12.0 software for Windows by a blinded researcher.

## Results

### Socio-demographic characteristics

Sample population was composed of 1082 health professionals (administered questionnaires were 1104, with a response rate of 98%); 51.8% of which were females. Mean age of the sample was 37.3 years (SD = 10.4) (min–max: 19–70). Among responders, 17.0% were from Rome, 34.5% from Naples, 16.5% from Chieti, 15.3% from Perugia and 16.6% from Turin.

Concerning profession: 25.3% were nurses, 24.5% medical doctors, 17.1% medical students and 33.1% other healthcare workers.

Responders from clinical departments were 38.2%; 9.7% from surgical departments and 52.1% from the other medical areas.

### Questionnaire's consistency

The internal consistency of the questionnaire used was satisfactory with the overall Cronbach alpha of 0.645.

### Prevalence of current smokers

Overall, current smokers were 44% (95%CI: 41.0–47.0) and ex-smokers were 18.5% (95%CI: 16.2–20.8). The mean age of smoking cessation was  $29.7 \pm 8.8$  years ( $30.79 \pm 0.98$  for males and  $28.58 \pm 0.88$  for females).

Sample characteristics by smoking status are shown in table 1. At univariate analysis, smoking prevalence was significantly different by city ( $P = 0.04$ ): highest percentage of smokers was found in Naples (49.5%). Smoking prevalence was also significantly different according to some other factors such as profession (highest prevalence in post-graduate students, 52.9%), recognizing the role of healthcare workers as models, and attitudes towards the law banning smoking and smoking colleagues.

### Knowledge

Tobacco use was considered the most preventable cause of death in Italy by 59.9% responders, with statistically significant differences by gender (51.8% males in comparison to 48.2% females;  $P = 0.014$ ). Less than half of participants (45.8%) considered tobacco use less harmful than industrial and traffic pollutions. There were nearly 98% of responders who admitted knowing laws prohibiting smoke inside public buildings.

**Table 1** Characteristics of the sample by smoking status

Variables (N)	Current smoking total percentage (95% CI)	P-value	
Gender			
Male (495)	45.1 (40.72–49.48)	<b>0.48</b>	
Female (532)	42.9 (38.69–47.11)		
City			
Rome (175)	36.0 (28.9–43.1)	<b>0.04</b>	
Chieti (157)	45.2 (37.4–53.0)		
Naples (372)	49.5 (44.4–54.6)		
Perugia (155)	41.3 (33.5–49.1)		
Turin (173)	41.6 (34.3–48.9)		
Profession			
Medical Doctor (165)	33.9 (26.7–41.1)	<b>&lt;0.01</b>	
Post graduate student (87)	52.9 (42.4–63.4)		
Technician (95)	41.1 (31.2–51.0)		
Nurse (265)	49.8 (43.8–55.8)		
Medical student (60)	35.0 (22.9–47.1)		
Nurse student (114)	48.2 (39.0–57.4)		
Auxiliary employees (139)	50.4 (42.1–58.7)		
Others (103)	33.0 (23.9–42.1)		
Operative unit			
Medical departments (354)	48.6 (43.4–53.8)		0.21
Surgical departments (92)	46.7 (36.5–56.9)		
Others (475)	42.5 (38.1–46.9)		
Behavioural model			
Yes (703)	42.5 (38.8–46.2)	<b>0.04</b>	
No (259)	50.6 (44.5–56.7)		
Don't know (60)	36.7 (24.5–48.9)		
Smoking and diseases			
Respiratory (1027)			
Yes (1002)	44.4 (41.3–47.5)	0.27	
No (25)	32.0 (13.7–50.3)		
Cardiovascular (1027)			
Yes (960)	44.0 (40.9–47.1)	0.71	
No (67)	46.3 (34.4–58.2)		
Eye (1026)			
Yes (108)	41.7 (32.4–51.0)	0.60	
No (918)	44.3 (41.1–47.5)		
Muscular (1026)			
Yes (61)	39.3 (27.0–51.6)	0.44	
No (965)	44.4 (41.3–47.5)		
Damage passive smoking			
Yes (976)	44.2 (41.1–47.3)	0.82	
No (36)	44.4 (28.2–60.6)		
Don't know (14)	35.7 (10.6–60.8)		
Favour the law banning smoking in hospital			
Yes (939)	42.0 (38.8–45.2)	<b>&lt;0.001</b>	
No (46)	71.7 (58.7–84.7)		
Don't know (36)	61.1 (45.2–77.0)		
Favour penalties for smokers in hospital			
Yes (926)	40.9 (37.7–44.1)	<b>&lt;0.001</b>	
No (98)	75.5 (67.0–84.0)		
Attitudes towards smoker colleagues			
Make sanction (16)	37.5 (13.8–61.2)	<b>&lt;0.001</b>	
Move him away (292)	47.9 (42.2–53.6)		
Admonish (57)	28.1 (16.4–39.8)		
Move away (209)	32.1 (25.8–38.4)		
Exhort to stop (195)	35.9 (29.2–42.6)		
Say nothing (239)	59.8 (53.6–66.0)		

P-value by  $\chi^2$  test. Bold indicates  $P \leq 0.05$ .

Almost all responders recognized smoke as an important risk factor for respiratory and cardiovascular diseases (97.7% and 93.6%, respectively) and 67.7% considered healthcare professional as a model for citizens. Moreover, 95.3% considered passive smoking as harmful for health.

Regarding the reasons for reducing or completely banning tobacco use in hospitals, 77% interviewed personnel considered smoking in hospital as damage for patients, while 66.6% answered that smoking ban could be a model for patients. The answers concerning reasons to ban smoking inside hospitals are shown in figure 1.

## Attitudes

Among participants, 92.3% viewed smoke-free hospitals policy as useful and right and 90.7% would be in favour of sanctions towards smokers, but only 1.5% would punish a colleague who smokes in front of him. Moreover, 28.4% of healthcare workers, if a colleague would smoke in front of him, would make her/him move away and 24% would say nothing.

## Job setting

Among responders, 90.1% saw no smoking signs in their departments; in spite of this 90.5% declared to have seen their colleagues smoking cigarettes within the hospital: 47.4% in the dependents' toilets, 33.4% at the department kitchens and 4.7% even at the patient room (figure 2).

## Clinical activities towards smoking

Regarding no smoke policies in hospitals, 20% of responders declared that information about smoking habits were never asked to patients in their departments; while 25.4% reported smoking anamnesis was recollected in a detailed way. In the surgical departments, in comparison to clinical and others, detailed anamnesis was significantly less common (18.2 versus 27.1% and 23.3%, respectively;  $P < 0.001$ ).

Only 9.4% of the participants declared that in their hospital there was a 'no smoke' centre, while 60% reported that in their hospital a specific staff appointed to respect smoking ban was actually working.

## Current smokers

Among hospital smokers, the mean age of smoking onset was  $17.86 \pm 3.42$  years and the mean number of daily smoked cigarettes was  $12.39 \pm 7.97$ , without considerable changes in smoking habits in the last 4 years. In fact 46.4% of current smokers declared no changes in their habits; 26.2% increased number of daily cigarettes and 27.4% diminished them.

Among smokers, 36% usually smoke inside the hospital, with a statistically significant difference by gender (60.5% were women;  $P = 0.04$ ), while 82.8% smoked in the open spaces of the hospitals.

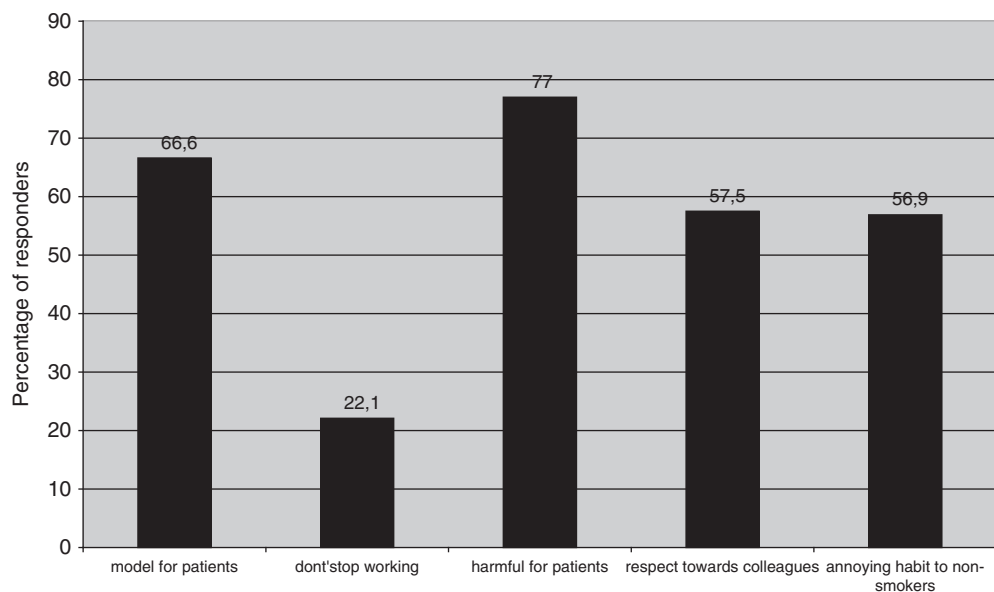
Moreover, 32.7% of participants declared to smoke wearing medical gown or other uniform and 42.6% of them felt embarrassed for this behaviour.

Regarding willingness to quit smoking, 15% declared to be 'ready to stop', 71.2% sometimes thought about it, while 13.8% would not quit. About useful methods to help quitting tobacco usage, 55% answered there was no efficacy method, while other responders indicated pharmacologic therapy, group therapy, training events, and sanctions as successful (31.9, 28.7, 19.6, 9.1%, respectively).

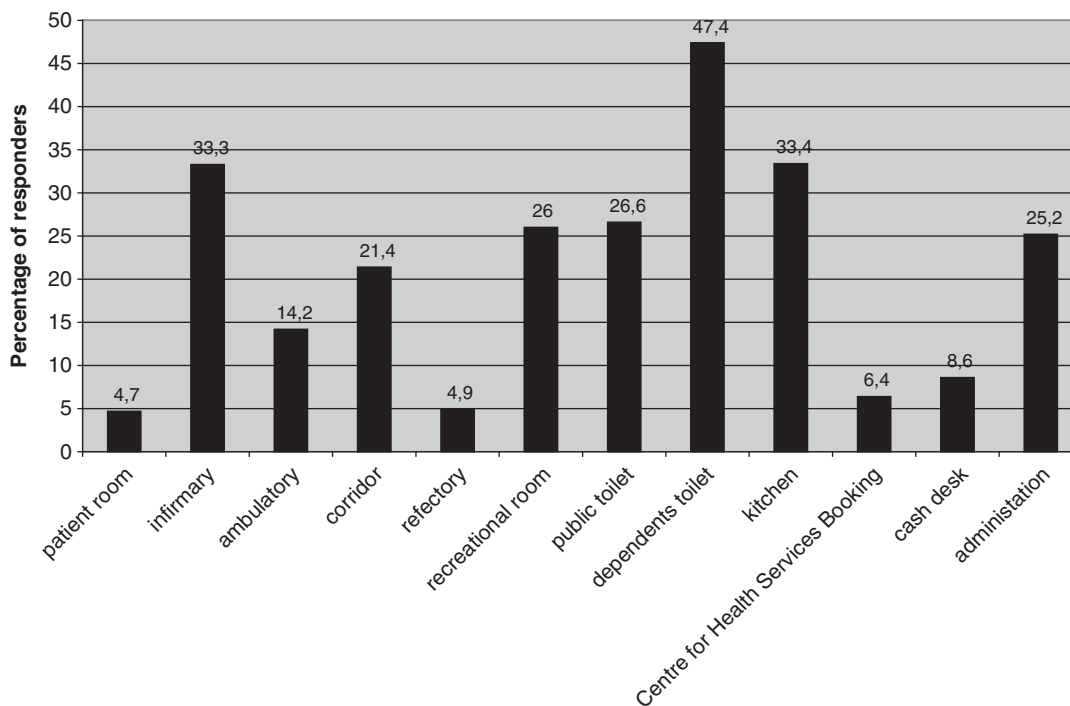
Furthermore, 40.8% of smokers declared to smoke their first cigarette within 30 min after waking and 28.5% would find very difficult to renounce.

## Multivariate analysis

The logistic regression model showed that healthcare professionals working in Naples had a significantly higher risk to be smokers in comparison to Rome (OR = 2.29; 95% CI: 1.40–3.73, table 2). Moreover, compared to medical doctors, a higher likelihood of smoking was observed for post-graduate students (OR = 3.42; 95% CI: 1.81–6.44), nurses (OR = 2.48; 95% CI: 1.51–4.08), nursing students (OR = 1.91; 95% CI: 1.08–3.38) and auxiliary personnel (OR = 2.72; 95% CI: 1.51–4.88). Conversely, a lower risk to be a smoker was observed among those who considered healthcare personnel as a model (OR = 0.70; 95%



**Figure 1** Reasons to ban smoking in hospitals



**Figure 2** Places where hospital staff smoke

CI: 0.49–0.99), as well as those who would have a reaction against a colleague kept smoking inside the hospital. Unsurprisingly, those who declared to favour penalties for in-hospital smokers had also lower probability of smoking (OR = 0.35; 95% CI: 0.19–0.64).

## Discussion

The main finding of the present multicenter cross-sectional survey is a current smoking prevalence as high as 44% among hospital healthcare professionals from five Italian cities. Paradoxically, such smoking rate is twice the rate of the general Italian population aged 15 years or more (22%) estimated in 2008.<sup>25</sup>

As compared with previous surveys on Italian healthcare workers, we observed the highest smoking rate to date. In 2001, Muzi *et al.*, found a healthcare personnel smoking prevalence of 36.0% in males and 36.7% in females.<sup>26</sup> In 2006, Masia *et al.*, reported a prevalence of 31%,<sup>27</sup> and in 2008 Incorvaia *et al.*, found only 25.8% of smoking workers.<sup>28</sup> Regarding Incorvaia *et al.*, who did a survey in the same period of our study and found very different results, we have to consider that they carried out their study only in one hospital in Milan and the sample was smaller.

In any case, all surveys reported a healthcare professional smoking prevalence higher than that of the general population, showing a substantial failure to adhere to a healthy lifestyle by the same professionals who are in charge to support patients in improving their behaviour. As previously suggested,<sup>29–31</sup> the

**Table 2** Multivariate analysis (Logistic regression) for the outcome to be smoker

Variables	P-value	OR	95% CI
Age	0.634	0.99	0.98–1.01
Gender			
Female	0.395	0.88	0.65–1.19
Male <sup>a</sup>		1	
Departments			
Surgical Departments	0.317	0.76	0.45–1.30
Other	0.534	0.90	0.63–1.26
Medical Departments <sup>a</sup>		1	
Favour the law banning smoking in hospital			
Yes	0.935	1.06	0.24–4.80
Don't know	0.313	2.26	0.46–10.99
No <sup>a</sup>		1	
Behavioural model			
Yes	<b>0.041</b>	<b>0.70</b>	<b>0.49–0.99</b>
Don't know	0.108	0.58	0.30–1.13
No <sup>a</sup>		1	
City			
Chieti	0.054	1.65	0.99–2.75
Naples	<b>0.001</b>	<b>2.29</b>	<b>1.40–3.73</b>
Perugia	0.352	1.29	0.75–2.22
Turin	0.690	1.11	0.66–1.87
Rome <sup>a</sup>		1	
Profession			
Post graduate student	<b>&lt;0.001</b>	<b>3.42</b>	<b>1.81–6.44</b>
Technician	0.073	1.75	0.95–3.23
Nurse	<b>&lt;0.001</b>	<b>2.48</b>	<b>1.51–4.08</b>
Medical student	0.594	1.21	0.60–2.44
Nurse student	<b>0.026</b>	<b>1.91</b>	<b>1.08–3.38</b>
Auxiliary	<b>0.001</b>	<b>2.72</b>	<b>1.51–4.88</b>
Other	0.690	1.14	0.60–2.18
Medical doctor <sup>a</sup>		1	
Favour penalties to smokers in hospital			
Yes	<b>0.001</b>	<b>0.35</b>	<b>0.19–0.64</b>
No <sup>a</sup>		1	
Attitudes towards smoker colleagues			
Move him away	0.255	0.78	0.51–1.19
Admonish him	<b>0.001</b>	<b>0.29</b>	<b>0.14–0.61</b>
Move away	<b>&lt;0.001</b>	<b>0.43</b>	<b>0.27–0.67</b>
Exhort to stop	<b>&lt;0.001</b>	<b>0.44</b>	<b>0.28–0.70</b>
Make sanction	<b>0.022</b>	<b>0.24</b>	<b>0.07–0.81</b>
Say nothing <sup>a</sup>		1	

P at Hosmer and Lemeshow test = 0.61

Bold indicates  $P \leq 0.05$ .

<sup>a</sup>Referring group.

main potential reason for the large smoking prevalence among healthcare workers might be occupational stress, which is considered a key factor in addition to addiction, enjoyment and peer influence.

The estimated prevalence of smokers in Southern Italy<sup>25</sup> is higher than in the whole country (25.2% versus 22.0%) and this reflects our findings about healthcare workers in Naples, who had more risk to be smokers (OR = 2.29, 95% CI 1.40–3.73, in comparison to Rome). Regarding the mean number of daily cigarettes, we reported a value of 12.4 versus 14.4, which is the national one found by DOXA survey.<sup>25</sup>

Our findings regarding profession, showing a highest prevalence of smokers among post-graduate students, auxiliary employees, nurses and nursing students and a lowest one among medical doctors, were similar to the results reported by the study of Nardini *et al.*<sup>20</sup>

Interestingly, compatible with Patkar *et al.*,<sup>32</sup> medical students were less addicted to smoke compared with nursing students.

In line with the Italian study conducted by Muzi *et al.*, in 2001,<sup>26</sup> there were no statistically significant differences in the smoking rate across occupational departments: clinical, surgery and others (diagnostics and administration).

The awareness to be considered as a behaviour model by citizens and in particular by patients seems to decrease the likelihood of smoking. In a similar way hospital staff who declared to favour penalties and to have a reaction towards smoker colleagues had a lower risk to use tobacco.

Concerning gender differences, it arose that among healthcare smokers in hospital, women were >60%, with a statistically significant difference. Considering primary prevention and the effectiveness of interventions, it's important to introduce training programs among these professional especially because there is a general evidence in favour of a higher effectiveness among women.<sup>33,34</sup>

In interpreting the results the main limitations of the study should be acknowledged. The main limits are related to the study design: since smoking status was self-reported (it would be important to consider that responders could find it difficult to declare to be smokers), our results could be subject to under-reporting and recall bias (in Italy underreporting of smoking has been quantified as between 25 and 35%).<sup>35,36</sup> However, to reduce information bias the questionnaire was realized by using presentation of most variables in a form designed to minimize the possibility of misclassification.<sup>37</sup>

Strength of this study is the large size of the sample and the geographic distribution of the investigated population. Indeed, the multicentric characteristic of the survey allowed evaluating possible regional differences that would have been better investigated.

Despite hospitals should be exemplary healthy workplaces and privileged settings for health promotion, among Italian hospital professionals there is a paradoxically large prevalence of smokers.

Considering also the high prevalence of smokers among medical, post-graduate and nursing students it would be important to introduce specific information and education programs in a formal way during regular courses. Furthermore it would be necessary to implement training programs among healthcare personnel in order to develop ability in smoking cessation techniques (i.e. counselling technique) for providing an active support to smokers.<sup>38</sup>

In conclusion, it is essential to propose and undertake effective interventions aimed to the implementation of an adequate culture of smoking cessation among these professionals, representing behavioural models and points of reference for patients and society.

*Conflicts of interest:* None declared.

## Key points

- This study gives update knowledge about tobacco use among health personnel through a multicenter study in Italy.
- Among Italian healthcare professionals there is a high smoking prevalence, especially in Southern Italy.
- It arose that healthcare professionals are widely considered as model by patients.
- It would be necessary to implement training programs among healthcare personnel in order to develop ability in smoking cessation techniques.

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