

Smoking in the workplace in the Latium Region, Italy, after the smoking ban

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KEY POINTS:

- Tobacco smoking is still prevalent in Italy, particularly among young people and the smoking ban at work is not always respected.
- Perceived compliance with the ban of smoking at the workplace is different in current as compared to former/never smokers.
- Tobacco control policies should be more strict and severe to ensure the compliance with the ban. Support for smoking cessation offered by the company would be welcome by smokers.

ABSTRACT

Background: *In Italy, an anti-smoking law was issued in 2003, with the aim of reducing tobacco smoking inside public places. Objectives:* *The aim of the study was to assess the observance of the smoking ban in Italy, during the period 2010–2014, in several workplaces and to evaluate the perception of workers, both smokers and non-smokers, on this issue. Methods:* *This cross-sectional study analyzed data resulting from a self-administered questionnaires in 59 companies, from several working sectors (transport, healthcare and building), in the Latium Region in Italy. Results:* *Out of 7200 questionnaires, 6996 were included in the analysis: 43.7% of the employees think that the smoking ban is respected in the workplace; women are more prone to think that the ban is not observed. Smokers tend to perceive the ban to be respected (AOR: 0.69; 95% CI: 0.62–0.77) while non-smokers feel more exposed to second-hand smoke (AOR: 1.57; 95% CI: 1.39–1.77). Workers in intellectual and highly specialized professions (AOR: 1.63; 95% CI: 1.25–2.13), technical professions (AOR: 1.64; 95% CI: 1.28–2.10) and craftsmen, skilled workers and farmers (AOR: 1.42; 95% CI: 1.09–1.85) tend to perceive the smoking ban not to be observed and the last two classes are the ones who feel the most exposed to second-hand smoke (AOR: 6.68; 95% CI: 0.50–0.90; AOR: 0.52; 95% CI: 0.38–0.70). Discussion:* *The results of this study can be used as a starting point for the implementation of new strategies to reduce tobacco addiction, beginning from the compliance with the ban on smoking in the workplace and the promotion of a healthy lifestyle.*

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INTRODUCTION

Tobacco smoking is a well-known risk factor for several pathologies including lung and bladder cancer, cardiovascular diseases and chronic lung diseases, such as chronic obstructive pulmonary disease (COPD), asthma and dyspnea. In general, both active and second-hand smoking, leads to a diminished health status (6, 19) and maternal smoking has been linked to health consequences for both the mother and the newborn (e.g., low birth weight) (6, 19).

The proportion of adults who smoke daily varies dramatically in EU countries: with lowest rates in Nordic countries (11-15%) and highest rates in Bulgaria, Greece, Hungary and Cyprus (26-28%) (17).

In Italy there are 11.7 million smokers who represent 22.3% of the population; the former smokers are 12.6% and the never smokers 65.1%. There is a decreased gap between males and females with regards to the smoking habit (23.9% vs 20.8%). The age group which smokes the most is the one from 25 to 44 years (28%) but there is an increasing number of people smoking the first cigarette before they are 15 years old (12.2%). A difference in smoking habit has also been observed between different Italian areas. While in the Centre of Italy there is a high prevalence of males who smoke (26%) while in the North there are more women than men smoking (24.6% vs 22%) (8).

Since 1975 several laws aimed at controlling tobacco use have been enacted in Italy, but the main innovation in the Italian legislation for tobacco control was introduced by the a law named “*Sirchia*” (art. 51, Law No. 3 dated 16 January 2003, otherwise known as “Safeguarding the health of non-smokers”). The “*Sirchia*” law follows the official acknowledgment of the WHO Framework Convention on Tobacco Control (FCTC) by the World Health Assembly (21, 24, 28) and extends the smoking ban to all indoor public spaces and workplaces, with the exception of private houses and of reserved smoking areas (3). The ban came into effect on 10 October 2005, after an increased number of deaths related to tobacco smoking, with an expense of 6.5 billion €/year for sanitary support (24) had been reported in Italy. This law also represents one of the first smoke-free

legislation introduced in Europe, aiming at controlling smoking habits in all the public and private places such as bars and restaurants in order to protect non-smokers.

Although ever since the law came into effect there has been a significant change in the consumption and attitude of smokers, tobacco smoking remains a serious public health concern in Italy (8, 18). According to the law, in the workplace smoking is allowed only in restricted areas, yet only 2% of workplaces have smoking rooms available. A possible explanation is that the costs for such rooms are high and that meeting the tight standards on air quality as defined by the ban are challenging (16).

Surveillance of the tobacco smoking is performed by PASSI, coordinated by the Italian National Institute of Health (i.e., *Istituto Superiore di Sanità*) which is a system that provides information about risk factors for chronic diseases and adherence to preventive measures (1, 2, 5, 11, 13).

The smoking ban is well known and “No Smoking” signs are mandatory in the workplace, but the ban is not respected everywhere (Dunbar et al, 2018; Pianori et al, 2017) even though, in general, there is an increasing tendency to the enforcement of the ban, with a significant difference in perception between current and never smokers (9, 16). Nearly everyone thinks that whoever breaks the law should be penalized by the majority of people, though few face a colleague who smokes, but just say nothing or step away (20).

Worldwide, the overall adherence to the ban is controversial. In the Netherlands it is very high (28), whereas in Italy and China several studies highlight the inobservance of the ban due to lack of respect by the smoking colleagues and lack of interest about this issue by the employees (12, 20, 29). In general, there is a decreasing difference in compliance between the several working sectors (28) but despite the specific laws and precise regulations, Italian hospitals still cannot be called smoke-free, because both of healthcare personnel and of visitors (20, 22).

As smoke-free culture can be established among substantial occupational groups, as described in New Zealand (10), policy makers should provide the best possible protection for workers against exposure to second-hand smoke, in particular with enforcement

of the smoking ban and smoking cessation courses (12): actually, workplace health promotion plans are being implemented in several countries (26) and both employers and employees express their satisfaction with smoke-free workplace programs and workplace cessation support activities (14, 23, 25). Moreover, working in smoke-free workplaces is associated with increased rates of quitting smoking (15).

This study sought to investigate whether the smoking ban is respected in several workplaces and to evaluate the role of perception of the workers, both smokers and non-smokers, on this issue, in Italy.

METHODS

Background

The “Service for Prevention and Safety at Workplace” (SPreSAL) of Latium Region in Italy, through educative and informative interventions targeting workers and prevention professionals included in the project 13_2.9.3 of the Regional Prevention Plan (Piano Regionale della Prevenzione), started to play an important role in increasing the awareness of the risk related to bad lifestyle habits, and in promoting health in the workplace. This study is mainly addressed professionals who work in sectors with a high risk for accidents at work or for the safety of third parties, in accordance to the Attachment I of the Intesa Conferenza Stato Regioni of 16th March 2006 (4, 27).

Study design and procedure

This cross-sectional study took place in Italy in the period between June 2010 and December 2014. Workers participated in a survey about smoking habits, knowledge about the risks, socio-demographic characteristics, and perception of the smoking ban in the workplace. The participation of both the workers and the companies was voluntary.

The overall aim of the survey was to investigate the reduction of tobacco consumption in the workplaces through the adoption of no smoking policies.

A total of 59 companies, from several working

sectors such as transport, healthcare and building, participated in the study. Educational meetings were held in the companies, and a self-administered questionnaire was distributed to both employers and the employees. Participation was voluntary and anonymous.

The questionnaire contained 30 questions, investigating several aspects of smoking at the workplaces.

The completed questionnaires were uploaded by the staff of the participating Local Health Units (*Azienda Sanitaria Locale*) in a database handled by the Workplace Health Promotion Center of the Latium Region. The data collected in the database were compared with the one reported in the questionnaire papers and, in case of discordance, mistakes were fixed.

Statistical analysis

The statistical analyses included descriptive statistics, univariate analysis and multivariate analysis. Sample characteristics such as gender and smoking habits are described as frequencies and percentages, and recoded into dummy variables if necessary. For gender, for example, male and female coded into ‘1’ and ‘0’. Three age groups were considered for the analyses: 18-34, 35-49, >50 years.

A multivariate logistic regression was performed to study the association between independent variables (gender, age group, smoking habits) and the dependent variables (knowledge, attitude, behavior). Odds ratio (AOR) and 95% confidence intervals (CIs) were calculated for all the categories, adjusted for age, gender, smoking status and working sector. The goodness-of-fit for the logistic regression model was assessed with Hosmer and Lemeshow’s test. Participants with missing values for one or more of the variables were excluded from the analysis.

All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) version 24.0 for Windows (SPSS Inc. Chicago, Illinois, USA).

RESULTS

In total, 7200 questionnaires were distributed, and 6996 responses were collected (response rate

97.2%). Consequently, two hundred and four questionnaires (2.8%) were excluded from the analysis. Table 1 and Table 2 show the descriptive statistics and sample characteristics.

CHARACTERISTICS OF PARTICIPANTS AND SMOKING STATUS

Overall, 46.5% of the respondents were males and 53.3% were females. The majority of respondents was aged between 35 and 49 years (3327; 47.6%). A total of 2016 workers were current smokers, of which

1030 were females and 986 were males. More than half of the participants got a high school diploma (2682; 38.3%) and a degree (2693; 38.5%). Several categories of occupations were interviewed including healthcare personnel (4073; 58.2%), manufacturing workmen (783; 11.2%) and employees in transportation and warehousing (413; 5.9%). In general, the occupation group with the higher percentage of smokers included craftsmen, skilled workers and farmers (41.5%) as well as the technical professions (24.1%).

Regarding current smokers, 61.7% of them indicated that they would like to quit smoking and

Table 1 - Descriptive analysis

Variable	Stratification	No. %
Age (y/o)	18-34	1274 (18.2%)
	35-49	3327 (47.6%)
	> 50	2395 (34.2%)
Gender	M	3253 (46.5%)
	F	3743 (53.5%)
Education	Primary school	68 (1%)
	Secondary school	842 (12%)
	High School	2682 (38.3%)
	Professional courses	668 (9.5%)
	Graduation	2693 (38.5%)
Istituto nazionale di statistica (ISTAT) Professions Classification	Legislators, entrepreneurs and senior management	115 (1.6%)
	Intellectual, scientific and highly specialized professions	1089 (15.6%)
	Technical professions	2373 (33.9%)
	Executive professions in office work	2155 (30.8%)
	Qualified professionals in commercial activities and services	3 (0.0%)
	Craftsmen, skilled workers, and farmers	975 (13.9%)
	Plant operators, stationary and mobile plant workers and vehicle drivers	1 (0.0%)
	Unqualified professions	285 (4.1%)
Sector	Manufacturing Activities	783 (11.2%)
	Water Supply; Sewerage Networks Waste Management and Rehabilitation Activities	407 (5.8%)
	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	54 (0.8%)
	Transportation and Warehousing	413 (5.9%)
	Accommodation and Catering Services Activities	265 (3.8%)
	Information and Communication Services	377 (5.4%)
	Financial and Insurance Activities	19 (0.3%)
	Professional, Scientific and Technical Activities	119 (1.7%)
	Public Administration and Defense; Compulsory Social Insurance	398 (5.7%)
	Instruction	84 (1.2%)
	Health and Social Assistance	4073 (58.2%)
	Other Service Activities	4 (0.1%)

Current smokers		
Would like to stop smoking?	Yes	1244 (61.7%)
	No	773 (38.3%)
Have you ever tried to stop smoking?	Yes	1218 (60.4%)
	No	799 (11.4%)
How many times have you tried to stop smoking?	Once	426 (46.9%)
	More than once	483 (53.1%)
How many cigarettes do you smoke a day?	1-10 cigarettes	1011 (50.1%)
	11-20 cigarettes	845 (41.9%)
	>20 cigarettes	160 (7.9%)
If the company offered to take part in a smoking cessation course. Would you agree to participate?	Yes	915 (55%)
	No	750 (45%)
Former Smokers		
How many years ago did you quit smoking?	1-5 years	414 (39.7%)
	6-10 years	240 (23%)
	11-15 years	128 (12.3%)
	16-20 years	119 (11.4%)
	21-25 years	67 (6.4%)
	26-30 years	57 (5.5%)
	>30 years	17 (1.6%)
Smokers		
When did you start smoking?	<15 years old	516 (25.8%)
	16-25 years old	1359 (68%)
	26-35 years old	99 (5%)
	>36 years old	24 (1.2%)

Table 2 - Characteristics of the current smokers

Smoking habit	Age groups (years)			Gender		Total
	18-34	35-49	>50	Female	Male	
Yes	475	919	622	1030	986	2016 (28.8%)
	37.3%	27.6%	26.0%	27.5%	30.3%	
No	677	1988	1271	2225	1711	3936 (56.3%)
	53.1%	59.8%	53.1%	59.4%	52.6%	
Ex	122	420	502	488	556	1044 (14.9%)
	9.6%	12.6%	21.0%	13.0%	17.1%	

60.4% states to have already tried to do quit smoking at least once. Around 50% of smokers stated to smoke less than 10 cigarettes daily, 41.9% of them declared to smoke 11-20 cigarettes daily and 7.9% stated smoke more than 20 cigarettes daily. A total of 915 workers also indicated that they would take advantage of the possibility to attend smoking cessation courses if offered by their employees.

PERCEPTION OF THE SMOKING BAN IN THE WORKING PLACE

Around 44% of employers think that the smoking ban is respected within the workplace. This might be due to an increased awareness on this issue (41.6%) and self-discipline among smokers (61.3%). There is lack of confidence regarding the benefit from the

company policy (26.1%), incentives (0.5%) and active surveillance (15.2%).

Among those workers who think that the smoking ban is not respected (circa 56%), 56.8% indicated that this is due to lack of respect 55.6% stated that it is due to smoking addiction. 28.5% of workers indicate that they are exposed to second-hand smoke and 57.4% think that the introduction of the smoking ban has changed the quality of interpersonal relations.

KNOWLEDGE

In general, addiction, both physical and psychological, is well recognized by all workers (80.2%). The perception of damage caused by tobacco smoking is high (51.8%). Most participants expressed a good knowledge about possible health consequences including consequences on the respiratory system, such as the exacerbation of asthma (71.3%), chronic bronchitis (76.9%) and lung cancer (92.6%). Also awareness about the risks of myocardial infarction is also high (64.4%). The correlation between smoking habit and risk of bladder cancer is not well known (29.4%).

UNIVARIATE ANALYSIS

Table 3 shows the results for the univariate analysis. Results indicate differences among gender, age group and current/never/former smoker workers.

GENDER

Men were more likely to be smokers (30.3%) compared to women (27.5%). A significant difference was also detected for the perception of the respect of the ban: significantly more women stated that the ban is respected within the workplaces (60.1%). Furthermore, women are more conscious than men about the health damaging effects of smoking such as asthma (75.5%) and chronic bronchitis (81.4%).

AGE

Younger workers aged between 18 and 34 years, were more likely to be smokers (37.3%) compared to older workers. In general, there are not many

significant differences in the perception of the ban and its issues among different age groups.

SMOKING STATUS

Table 3 shows significant differences between current smokers, non-smokers and ex-smokers. Ex-smokers (62.4%) and non-smokers (58.0%) had a higher perception of the ban not being respected compared to current smokers (49.7%). In addition, more non-smokers than smokers indicated that an increased sensibility to this issue (66.8%) is missing.

Former smokers and non-smokers stated that a lack of respect of the smoking ban is due to either a lack of surveillance (40.5% and 42.7% vs 21.8%) or the absence of a company policy (21.3% and 18.9% vs 11.3%). The Perception of exposure to second-hand smoke also varies greatly. While 30.9% of non-smokers and 29.0% of former smokers feel exposed to second-hand smoke; only 23.9% of smokers feel exposed.

As for the damage caused by smoking, the former-smokers have a better knowledge of the health damaging effects than both current and non-smokers. Former smokers are overall more aware about the negative effects on the respiratory system such as an aggravation of asthma (74.9%), chronic bronchitis (80.4%), but also about the increased risk for a myocardial infarction (70.2%), lung cancer (94.6%) and bladder cancer (33.8%).

NATIONAL INSTITUTE OF STATISTICS (ISTAT) PROFESSIONS CLASSIFICATION

Focusing on the ISTAT Professions Classification, the ban is mostly not observed by the workers in intellectual, scientific and highly specialized professions (60.6%) and in technical professions (60.1%). Craftsmen, skilled workers and farmers are the ones who feels the most exposed to second-hand smoke (36.7%).

MULTIVARIATE LOGISTIC REGRESSION

Multivariate logistic regression analysis was conducted to explore the relationship between dependent variables (perception, knowledge, attitude) and

Table 3 - Univariate analysis

		Smoking habit				Gender			Age Groups					
		Smoker	No	Ex smoker	p- value	Female	Male	p- value	18-34 years	35-49 years	>50 years	p- value		
Is the smoking ban respected in all the workplaces?	Yes	1013 50.3%	1653 42.0%	392 37.6%	<0.001	1494 39.9%	1564 48.1%	<0.001	606 47.6%	1425 42.9%	1027 42.9%	0.010		
	No	1002 49.7%	2279 58.0%	651 62.4%		2247 60.1%	1685 51.9%		668 52.4%	1897 57.1%	1367 57.1%			
If yes, because of:	Increased sensitive to the issue	Yes	333 33.2%	753 46.0%	174 44.5%	<0.001	645 43.6%	615 39.7%	0.029	192 31.8%	588 41.6%	480 47.2%	<0.001	
		No	670 66.8%	885 54.0%	217 55.5%		836 56.4%	936 60.3%		411 68.2%	824 58.4%	537 52.8%		
	Self-discipline of the smokers	Yes	649 64.7%	964 58.9%	245 62.7%	0.009	929 62.7%	929 59.9%	0.110	403 66.8%	854 60.5%	601 59.1%	0.006	
		No	354 35.3%	674 41.1%	146 37.3%		552 37.3%	622 40.1%		200 33.2%	558 39.5%	416 40.9%		
	Efficient company policy	Yes	223 22.2%	464 28.3%	104 26.6%	0.002	371 25.1%	420 27.1%	0.204	168 27.9%	398 28.2%	225 22.1%	0.002	
		No	780 77.8%	1174 71.7%	287 73.4%		1110 74.9%	1131 72.9%		435 72.1%	1014 71.8%	792 77.9%		
	Rewards	Yes	5 0.5%	10 0.6%	1 0.3%	0.677	6 0.4%	10 0.6%	0.363	5 0.8%	6 0.4%	5 0.5%	0.508	
		No	998 99.5%	1628 99.4%	390 99.7%		1475 99.6%	1541 99.4%		598 99.2%	1406 99.6%	1012 99.5%		
	Active surveillance	Yes	185 18.4%	209 12.8%	66 16.9%	<0.001	196 13.2%	264 17.0%	0.004	110 18.2%	220 15.6%	130 12.8%	0.011	
		No	818 81.6%	1429 87.2%	325 83.1%		1285 86.8%	1287 83.0%		493 81.8%	1192 84.4%	887 87.2%		
	If not, where ban is not respected in	Office	Yes	279 13.8%	862 21.9%	287 27.5%	<0.001	796 21.3%	632 19.4%	0.057	166 13.0%	694 20.9%	568 23.7%	<0.001
			No	1737 86.2%	3074 78.1%	757 72.5%		2947 78.7%	2621 80.6%		1108 87.0%	2633 79.1%	1827 76.3%	
		Ward	Yes	164 8.1%	425 10.8%	117 11.2%	0.002	308 8.2%	398 12.2%	<0.001	131 10.3%	394 11.8%	181 7.6%	<0.001
			No	1852 91.9%	3511 89.2%	927 88.8%		3435 91.8%	2855 87.8%		1143 89.7%	2933 88.2%	2214 92.4%	
Toilet		Yes	345 17.1%	1160 29.5%	327 31.3%	<0.001	1038 27.7%	794 24.4%	0.002	296 23.2%	929 27.9%	607 25.3%	0.003	
		No	1671 82.9%	2776 70.5%	717 68.7%		2705 72.3%	2459 75.6%		978 76.8%	2398 72.1%	1788 74.7%		
Restroom		Yes	229 11.4%	640 16.3%	199 19.1%	<0.001	569 15.2%	499 15.3%	0.873	195 15.3%	510 15.3%	363 15.2%	0.983	
		No	1787 88.6%	3296 83.7%	845 80.9%		3174 84.8%	2754 84.7%		1079 84.7%	2817 84.7%	2032 84.8%		
Outside		Yes	763 37.8%	1544 39.2%	460 44.1%	0.003	1614 43.1%	1153 35.4%	<0.001	497 39.0%	1326 39.9%	944 39.4%	0.859	
		No	1253 62.2%	2392 60.8%	584 55.9%		2129 56.9%	2100 64.6%		777 61.0%	2001 60.1%	1451 60.6%		

They keep on smoking at workplaces because:	Lack of respect	Yes	321	1453	405		1203	976		331	1080	768	0.002
		No	642	780	234	<0.001	1000	656	0.001	322	765	569	
	Smoking is enjoyable	Yes	181	203	77		239	222		64	229	168	0.158
		No	782	2030	562	<0.001	1964	1410	0.010	589	1616	1169	
	Smoking causes addiction	Yes	591	1179	375		1290	855		370	1023	752	0.831
		No	372	1054	264	<0.001	913	777	<0.001	283	822	585	
	Lack of surveillance	Yes	210	954	259		788	635		229	705	489	0.318
		No	753	1279	380	<0.001	1415	997	0.047	424	1140	848	
	Lack of company policy	Yes	109	423	136		368	300		103	332	233	0.437
		No	854	1810	503	<0.001	1835	1332	0.176	550	1513	1104	
	Are you exposed to second hand smoke?	Yes	475	1218	303		1070	926		370	1032	594	<0.001
		No	1541	2718	741	<0.001	2673	2327	0.911	904	2295	1801	
Do you think tobacco can cause addiction both physical and psychological?	No	106	110	34		120	130		39	118	93	0.043	
	Low		302	286	92		337	343		151	289		240
		High	1497	3237	876	<0.001	3090	2520	<0.001	1004	2707		1899
	Don't know	111	303	42		196	260		80	213	163		
Perception of the damages associated with smoking habits	Insufficient		301	481	105		368	519		138	398	351	<0.001
			15.2%	12.3%	10.1%		9.9%	16.1%		10.9%	12.0%	14.8%	
	Low		302	611	145		534	524		193	479	386	
			15.2%	15.6%	14.0%		14.4%	16.3%		15.3%	14.5%	16.3%	
	Sufficient		368	843	187		797	601		260	703	435	
		18.5%	21.5%	18.0%	<0.001	21.4%	18.7%	<0.001	20.6%	21.3%	18.3%		
Good		524	953	290		1039	728		360	880	527		
		26.4%	24.3%	27.9%		27.9%	22.6%		28.5%	26.6%	22.2%		
High		489	1027	312		982	846		312	844	672		
		24.6%	26.2%	30.0%		26.4%	26.3%		24.7%	25.5%	28.3%		
Exacerbation of asthma	Yes	1358	2849	778		2807	2178		956	2375	1654	0.001	
	No	626	1066	261	<0.001	913	1040	<0.001	307	929	717		
Chronic bronchitis	Yes	1565	2979	835		3028	2351		980	2578	1821	0.552	
	No	419	936	204	0.003	692	867	<0.001	283	726	550		
		21.1%	23.9%	19.6%		18.6%	26.9%		22.4%	22.0%	23.2%		

Myocardial infarction	Yes	1279	2496	729	0.001	2468	2036	0.007	830	2186	1488	0.024
	No	64.5%	63.8%	70.2%		66.3%	63.3%		65.7%	66.2%	62.8%	
Lung cancer	Yes	705	1419	310	<0.001	1252	1182	0.064	433	1118	883	0.006
	No	35.5%	36.2%	29.8%		33.7%	36.7%		34.3%	33.8%	37.2%	
Bladder cancer	Yes	1793	3703	983	0.004	3493	2986	0.734	1191	3105	2183	0.020
	No	90.4%	94.6%	94.6%		93.9%	92.8%		94.3%	94.0%	92.1%	
The introduction of the smoking ban has caused changes in social interaction.	Yes	191	212	56	0.020	227	232	0.643	72	199	188	0.070
	No	9.6%	5.4%	5.4%		6.1%	7.2%		5.7%	6.0%	7.9%	
Periodic checks to make workers respect the ban	Not at all	555	1152	351	<0.001	1097	961	0.518	347	961	750	<0.001
		28.0%	29.4%	33.8%		29.5%	29.9%		27.5%	29.1%	31.6%	
	1429	2763	688	2623		2257	916		2343	1621		
	72.0%	70.6%	66.2%	70.5%		70.1%	72.5%		70.9%	68.4%		
	Few	1115	2267	632		2138	1876		714	1881	1419	
		55.3%	57.6%	60.5%		57.1%	57.7%		56.0%	56.5%	59.2%	
Enough	901	1669	412	1605	1377	560	1446	976				
	44.7%	42.4%	39.5%	42.9%	42.3%	44.0%	43.5%	40.8%				
High	155	113	48	162	154	70	147	99				
	8.5%	3.0%	4.9%	4.6%	5.1%	5.7%	4.7%	4.6%				
Very high	295	358	144	433	364	187	354	256				
	16.2%	9.6%	14.6%	12.4%	12.0%	15.1%	11.3%	11.8%				
Perception of the utility of several intervention to prevent damages from smoking habits	Not at all	572	945	258	<0.001	977	798	0.020	364	827	584	<0.001
		31.4%	25.3%	26.2%		27.9%	26.2%		29.4%	26.3%	27.0%	
	512	1322	296	1124		1006	402		1037	691		
	28.1%	35.3%	30.1%	32.1%		33.1%	32.5%		33.0%	31.9%		
	289	1004	237	809		721	215		780	535		
	15.9%	26.8%	24.1%	23.1%		23.7%	17.4%		24.8%	24.7%		
Educational training	Not at all	141	236	71	<0.001	246	202	0.115	98	229	121	<0.001
		7.8%	6.5%	7.4%		7.1%	6.8%		7.9%	7.4%	5.8%	
Few	376	655	183	662		552	280		581	353		
	20.8%	18.0%	19.1%	19.2%		18.6%	22.7%		18.8%	16.9%		
Enough	538	890	217	905		740	366		764	515		
	29.8%	24.4%	22.6%	26.3%		24.9%	29.7%		24.8%	24.6%		
High	486	1062	275	919	904	308	896	619				
	26.9%	29.1%	28.6%	26.7%	30.5%	25.0%	29.0%	29.6%				
Very high	267	802	214	714	569	181	616	486				
	14.8%	22.0%	22.3%	20.7%	19.2%	14.7%	20.0%	23.2%				
Courses for smoking cessation offered by the employees	Not at all	179	326	93	0.061	246	202	0.115	130	295	173	<0.001
		9.8%	9.0%	9.6%		7.1%	6.8%		10.6%	9.5%	8.3%	
	399	773	195	662		552	317		668	382		
	21.8%	21.4%	20.2%	19.2%		18.6%	25.9%		21.6%	18.2%		
	455	968	239	905		740	338		775	549		
	24.9%	26.7%	24.8%	26.3%		24.9%	27.6%		25.1%	26.2%		
High	414	915	248	919	904	258	773	546				
	22.6%	25.3%	25.7%	26.7%	30.5%	21.0%	25.0%	26.1%				
Very high	381	638	189	714	569	183	580	445				
	20.8%	17.6%	19.6%	20.7%	19.2%	14.9%	18.8%	21.2%				

A specific company regulation	Not at all	206	163	58		207	220	77	191	159		
		11.7%	4.5%	6.0%		6.1%	7.5%	6.3%	6.3%	7.7%		
	Few	354	487	172		517	496	194	473	346		
		20.0%	13.5%	17.9%		15.2%	16.9%	15.8%	15.5%	16.8%		
	Enough	507	937	241	<0.001	906	779	0.006	371	773	541	<0.001
		28.7%	26.0%	25.1%		26.6%	26.6%		30.3%	25.4%	26.3%	
	High	419	1171	279		1005	864	374	925	570		
		23.7%	32.5%	29.1%		29.6%	29.5%	30.5%	30.3%	27.7%		
	Very high	282	843	210		765	570	210	686	439		
		16.0%	23.4%	21.9%		22.5%	19.5%	17.1%	22.5%	21.4%		

independent variables (gender, age, smoking habits and ISTAT Professions Classification). Data are presented in Table 4.

GENDER

Males have a higher perception of the smoking ban to be respected (AOR: 0.74; 95% CI: 0.675-0.825). When the ban is not respected, males are more prone to think this is caused by a lack of respect by the colleagues (AOR: 0.792; 95% CI: 0.686-0.914) and by the pleasure associated with smoking (AOR: 0.730; 95% CI: 0.593-0.898), while women are more likely to think this is related to the tobacco addiction (AOR: 1.209; 95% CI: 1.054-1.386). In general, women were more aware of the damage smoking can cause such as exasperation of asthma (AOR: 1.267; 95% CI: 1.132-1.418) and chronic bronchitis (AOR: 1.417; 95% CI: 1.255-1.599).

Age

Younger workers are more likely to perceive the ban not being respected (AOR: 1.157; 95% CI: 1.014-1.321; AOR: 1.178; 95% CI: 1.022-1.357) due to lack of self-discipline on the part of the smokers (AOR: 0.822; 95% CI: 0.679-0.994) while older employees perceive an increased sensitivity to this issue (AOR: 0.737; 95% CI: 0.598-0.908; AOR: 0.651; 95% CI: 0.521-0.813).

In general, older employees (>50 years old) feel less exposed to secondhand smoke at the workplaces (AOR: 1.199; 95% CI: 1.024-1.405).

Regarding health damages caused by smoking, younger workers are more aware of the association between smoking and exacerbation of asthma

(AOR: 1.30; 95% CI: 1.115-1.515; AOR: 1.559; 95% CI: 1.325-1.834) than older workers. In addition, older employees are also less likely to know that smoking can cause bladder cancer (AOR: 1.788; 95% CI: 1.339-2.387).

Middle aged workers think that the ban would be more respected using periodic checks (AOR: 1.172; 95% CI: 1.026-1.339; middle and older aged workers believe that educational training (AOR: 1.172; 95% CI: 1.026-1.339; AOR: 1.254; 95% CI: 1.087-1.447) and smoking cessation courses (AOR: 1.301; 95% CI: 1.135-1.492; AOR: 1.303; 95% CI: 1-127-1.508) offered by the employers/companies would be useful strategies.

SMOKING STATUS

Smokers tend to perceive the ban to be respected (AOR: 0.693; 95% CI: 0.623-0.771) while non-smokers feel more exposed to second-hand smoke (AOR: 1.565; 95% CI: 1.385-1.769). The first are more confident in the self-discipline of the smokers (AOR: 0.815; 95% CI: 0.694-0.957) while non-smokers do not perceive an increased sensitivity to the issue (AOR: 0.607; 95% CI: 0.518 - 0.712) and think there is not an efficient company policy (AOR: 1.379; 95% CI: 1.148-1.657). Smokers have a higher perception of the active surveillance (AOR: 0.733; 95% CI: 0.594-0.904) and would not welcome periodic checks on the ban by the employers (AOR: 0.513; 95% CI: 0.461 - 0.571).

Smokers have a worse knowledge of the effects of smoking on the health (asthma: AOR: 1.196; 95% CI: 1.063-1.345; lung cancer: AOR: 1.796; 95% CI: 1.475-2.187).

Table 4 - Multivariate logistic regression analysis

Questionnaire items		Age groups (years)		Gender	Smoking habitsL	
		35-49 vs 18-34*	>50 vs 18-34*	M vs F*	Current smoker vs Nonsmoker*	
		AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	
Is the smoking ban respected in all the workplaces?		y/n*	0.862 (0.756 - 0.982)	0.851 (0.742 - 0.977)	1.386 (1.260 - 1.525)	1.420 (1.278 - 1.576)
	Increased sensitive to the issue	y/n*	1.479 (1.207 - 1.812)	1.870 (1.511 - 2.314)	0.839 (0.724 - 0.972)	0.607 (0.518 - 0.712)
	Self-discipline of the smokers	y/n*	0.769 (0.629 - 0.940)	0.735 (0.595 - 0.908)	0.888 (0.767 - 1.029)	1.227 (1.048 - 1.437)
If yes. because of:	Efficient company policy	y/n*	0.995 (0.804 - 1.232)	0.708 (0.560 - 0.893)	1.145 (0.972 - 1.349)	0.722 (0.604 - 0.863)
	Rewards	y/n*	0.509 (0.154 - 1.679)	0.566 (0.162 - 1.978)	1.604 (0.580 - 4.439)	0.870 (0.300 - 2.523)
	Active surveillance	y/n*	0.852 (0.662 - 1.098)	0.665 (0.504 - 0.879)	1.358 (1.110 - 1.661)	1.406 (1.145 - 1.726)
If not. where ban is not respected in	Office	y/n*	1.674 (1.392 - 2.013)	1.974 (1.633 - 2.386)	0.896 (0.796 - 1.008)	0.558 (0.483 - 0.644)
	Ward	y/n*	1.149 (0.931 - 1.418)	0.673 (0.531 - 0.854)	1.614 (1.378 - 1.890)	0.700 (0.582 - 0.842)
	Toilet	y/n*	1.201 (1.032 - 1.399)	1.049 (0.893 - 1.232)	0.860 (0.772 - 0.959)	0.490 (0.430 - 0.559)
	Restroom	y/n*	0.961 (0.802 - 1.151)	0.940 (0.777 - 1.137)	1.024 (0.898 - 1.168)	0.629 (0.538 - 0.736)
	Outside	y/n*	1.019 (0.892 - 1.164)	1.017 (0.884 - 1.170)	0.726 (0.659 - 0.800)	0.915 (0.822 - 1.018)
		Lack of respect	y/n*	1.225 (1.015 - 1.479)	1.126 (0.925 - 1.372)	1.310 (1.144 - 1.500)
They keep on smoking at workplaces because:	Smoking is enjoyable	y/n*	1.450 (1.078 - 1.951)	1.486 (1.091 - 2.023)	1.272 (1.045 - 1.549)	2.200 (1.792 - 2.701)
	Smoking causes addiction	y/n*	0.977 (0.815 - 1.172)	1.026 (0.848 - 1.241)	0.771 (0.677 - 0.877)	1.362 (1.172 - 1.583)
	Lack of surveillance	y/n*	1.045 (0.864 - 1.265)	0.950 (0.777 - 1.160)	1.181 (1.032 - 1.351)	0.378 (0.319 - 0.449)
	Lack of company policy	y/n*	1.106 (0.867 - 1.411)	1.046 (0.810 - 1.351)	1.144 (0.966 - 1.354)	0.528 (0.424 - 0.659)
		Are you exposed to second hand smoke?	y/n*	1.062 (0.921 - 1.225)	0.773 (0.663 - 0.901)	1.019 (0.918 - 1.132)
Knowledge of damages caused by smoking:	Exacerbation of asthma	y/n*	0.793 (0.682 - 0.922)	0.727 (0.621 - 0.850)	0.687 (0.618 - 0.763)	0.785 (0.700 - 0.880)
	Chronic bronchitis	y/n*	1.026 (0.877 - 1.200)	0.985 (0.835 - 1.161)	0.619 (0.552 - 0.693)	1.135 (0.999 - 1.290)
	Myocardial infarction	y/n*	1.014 (0.884 - 1.163)	0.880 (0.762 - 1.015)	0.880 (0.797 - 0.972)	0.971 (0.870 - 1.083)
	Lung cancer	y/n*	0.879 (0.665 - 1.163)	0.650 (0.489 - 0.862)	0.860 (0.711 - 1.041)	0.526 (0.433 - 0.639)
	Bladder cancer	y/n*	1.073 (0.928 - 1.240)	1.207 (1.037 - 1.404)	1.015 (0.916 - 1.126)	0.901 (.802 - 1.011)

The introduction of the smoking ban has caused changes in social interaction.	y/n*	1.010 (0.886 - 1.151)	1.125 (0.980 - 1.292)	1.021 (0.928 - 1.123)	0.893 (0.804 - 0.991)
Perception of the utility of several intervention to prevent damages from smoking habits	Periodic checks to make workers respect the ban	low*/ high	1.300 (1.137 - 1.486)	1.211 (1.051 - 1.397)	1.091 (0.988 - 1.205) (0.464 - 0.579)
	Educational training	low*/ high	1.419 (1.240 - 1.624)	1.629 (1.411 - 1.881)	1.098 (0.995 - 1.213) (0.630 - 0.787)
	Courses for smoking cessation offered by the employees	low*/ high	1.387 (1.210 - 1.591)	1.611 (1.393 - 1.863)	0.903 (0.817 - 0.998)
	A specific company regulation	low*/ high	1.162 (1.016 - 1.329)	0.988 (0.856 - 1.141)	0.905 (0.819 - 1.000) (0.485 - 0.608)
					0.543

Non-smokers would welcome the introduction of a specific company regulation (AOR: 0.513; 95% CI: 0.461 - 0.571) and specific educational training to prevent damage caused by smoking (AOR: 0.701; 95% CI: 0.630 - 0.781).

NATIONAL INSTITUTE OF STATISTICS (ISTAT) PROFESSIONS CLASSIFICATION

Workers from intellectual and highly specialized professions (AOR: 1.634; 95% CI: 1.251-2.133), from technical professions (AOR: 1.641; 95% CI: 1.279-2.105) and craftsmen, skilled workers and farmers (AOR: 1.419; 95% CI: 1.086-1.854) tend to perceive the ban not to be observed and the last two classes are the ones who feel the most exposed to second-hand smoke (AOR: 6.679; 95% CI 0.501-0.904; AOR: 0.518; 95% CI: 0.382-0.701). The general knowledge of the adverse effects of smoking are well known in all the professional classes.

DISCUSSION

The present study investigated the relationship between sociodemographic factors and smoking habits among Italian workers and their perception of smoking ban in the workplace. Data were collected from a large sample of Italian workers through a survey.

Even though the existence of the smoking ban is well-known and no-smoking sign are displayed in the workplaces, more than half of the respondents declared that the ban is not respected in the workplace. In particular, this was noted by workers who deal with outdoor activities, which is referred to be related to a lack of respect by the colleagues and to

nicotine addiction, as it was previously suggested by Pianori et al and Giralaldi et al (9, 12, 20).

Younger workers seem to be more prone to smoking cigarettes even though they are more conscious of the damages caused by tobacco consumption.

The analysis showed that never and former smokers have a higher perception of the ban not being respected than current smokers. This is in line with research conducted by Minardi et al and Doruk et al (9, 16). On the contrary, never smokers think that there is an inadequate company policy to enforce respect of the ban.

The study was part of a large project, which aimed to investigate the presence of unhealthy lifestyles, particularly alcohol (27) and tobacco smoking, among workers interested in activities potentially risky towards other people, in the Latium Region in Italy. The study focused on companies that belong to the area of competence of the Local Health Unit Roma 5 and the Local Health Unit Viterbo, according to the Regional Prevention Plan. All companies participated voluntarily, and this needs to be considered with care since it could represent both one limitation of this study as well as a strength since data come from a very large group of workers.

The results of this study confirmed that Italy is not a virtuous country regarding smoke-free policies (16, 20) and, considering that the smoking ban was introduced in 2003, more than 15 years ago, this is a worrying data to take into consideration to make some changes in the future as it can be framed as a serious Public Health problem. From this point of view, it is reassuring to know that nonsmoking workers would welcome the introduction of specific regulation and educational training aimed at reducing tobacco consumption and to prevent

smoking-related damages (as the data showed that there is still ignorance about the risks of this habit), enhancing a smoking-free culture among colleagues as suggested by Edwards et al and Giraldi et al, who underlined the importance of this kind of courses and their efficacy (10, 12, 30).

Interesting is also the willingness of current smokers to try to quit smoking and the fact that they would welcome the support for smoking cessation offered by the company.

The results of this study can be used as a starting point for the implementation of new instruments to reduce tobacco addiction, beginning from promoting good habits in the workplace and, hopefully, enhancing a healthy lifestyle.

The study as strengths and weaknesses that should be taken into account. A key strength of this study is the large sample size of Italian workers who participated in the survey, though a possible selection bias limits its external validity. Other limitations related to its study design include possible recall and response bias, as data collection relied on self-administered questionnaire, which made it impossible to truthfully assess the actual smoking status. For example, the study did not evaluate the relationship between declared smoking habit and the level of urinary cotinine, which would have allowed both the identification of actual tobacco smokers and the quantification of smoking intensity.

In conclusion, given the known health risks of tobacco smoking and second-hand exposure to tobacco smoke, policy makers together with employers must provide the best possible health protection for workers. The enforcement of the smoking ban and the implementation of additional smoking cessation trainings are necessary to protect employee's health as well as to maximize potential benefits for both workers and employers.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained

from all individual participants included in the study.

REFERENCES

- Baldissera S, Campostrini S, Binkin N, et al: PASSI Coordinating Group, 2011. Features and initial assessment of the Italian Behavioral Risk Factor Surveillance System (PASSI), 2007–2008. *Prev Chronic Dis* 8, A24
- Carreras G, Battisti F, Borzoni L, et al: Decessi per patologie non trasmissibili attribuibili a stili di vita in Italia e nelle regioni italiane nel 2016. *E&P* 2019; 43, 338–346. <https://doi.org/10.19191/EP19.5-6.P338.103>
- Charrier L, Piccinelli C, Coppo A, et al: Effective laws for tobacco control: EU directives and Italian legislation. *Epidemiol Prev* 2006; 30, 366–369
- Conferenza Permanente Per I Rapporti Tra Lo Stato Le Regioni E Le Province Autonome Di Trento E Bolzano, 2006. Intesa in materia di individuazione delle attività lavorative che comportano un elevato rischio di infortuni sul lavoro ovvero per la sicurezza, l'incolumità o la salute dei terzi, ai fini del divieto di assunzione e di somministrazione di bevande alcoliche e superalcoliche, ai sensi dell'articolo 15 della legge 30 marzo 2001, n. 125. Intesa ai sensi dell'articolo 8, comma 6, della legge 5 giugno 2003, n. 131. (Repertorio atti n. 2540). (GU Serie Generale n.75 del 30-03-2006)
- Coppo A, Baldissera S, Migliardi A, et al: Quit attempts and smoking cessation in Italian adults (25–64 years): factors associated with attempts and successes. *Eur J Public Health* 2017; ckw262. <https://doi.org/10.1093/eurpub/ckw262>
- Cumberbatch MGK, Jubber I, Black PC, et al: Epidemiology of Bladder Cancer: A Systematic Review and Contemporary Update of Risk Factors in 2018. *European Urology* 2018; 74, 784–795. <https://doi.org/10.1016/j.eururo.2018.09.001>
- Doruk S, Çelik D, İnönü Köseoğlu H, et al: The opinion of catering sector about the smoking ban and the evaluation of establishments. *Tuberk Toraks* 2014; 62, 108–115
- Doxa, 2017. Fumo, quasi azzerato il divario di genere: mai così vicini uomini e donne nel consumo di bionde.
- Dunbar MS, Shiffman S, Chandra S, et al: Exposure to workplace smoking bans and continuity of daily smoking patterns on workdays and weekends. *Addict Behav* 2018; 80, 53–58. <https://doi.org/10.1016/j.addbeh.2018.01.006>
- Edwards R, Tu D, Stanley J, et al: Smoking prevalence among doctors and nurses–2013 New Zealand census data. *N Z Med J* 2018; 131, 48–57
- Ferrante G, Baldissera S, Campostrini S: Epidemiology of chronic respiratory diseases and associated factors in the adult Italian population. *European Journal of Public Health*, 2017; 27, 1110–1116. <https://doi.org/10.1093/>

- eurpub/ckx109
12. Giraldi G, Fovi de Ruggiero G, Cattaruzza MS: Perception of smoke-free policies among workers in an Italian Local Health Agency: survey of opinions, knowledge and behaviours. *Annali di Igiene: Medicina Preventiva e di Comunità*, 2013; 397–409. <https://doi.org/10.7416/AI.2013.1941>
 13. Gorini G, Carreras G, Minardi V, et al: Disuguaglianze regionali e socioeconomiche nella cessazione del fumo in Italia, 2014–2017. *E&P* 2019; 43, 275–285. <https://doi.org/10.19191/EP19.4.P275.078>
 14. Halpern MT, Taylor H: Employee and employer support for workplace-based smoking cessation: results from an international survey. *J Occup Health* 2010; 52, 375–382
 15. Kahraman H, Sucaklı MH, Atilla N, et al: The Effect of Working in a Smoke-Free Workplace on use of Smoking and Smokeless Tobacco. *Turk Thorac J* 2017;18, 14–18. <https://doi.org/10.5152/TurkThoracJ.2017.16023>
 16. Minardi V, Gorini G, Carreras G: Compliance with the smoking ban in Italy 8 years after its application. *International Journal of Public Health* 2014; 59, 549–554. <https://doi.org/10.1007/s00038-014-0543-0>
 17. OECD/EU. Health at a Glance: Europe 2018: State of Health in the EU Cycle, OECD Publishing, Paris. https://doi.org/10.1787/health_glance_eur-2018-en, n.d.
 18. Olivieri M, Murgia N, Carsin A, et al: Effects of smoking bans on passive smoking exposure at work and at home. The European Community respiratory health survey. *Indoor Air*, 2019. <https://doi.org/10.1111/ina.12556>
 19. PDQ Screening and Prevention Editorial Board. Cigarette Smoking: Health Risks and How to Quit (PDQ®): Health Professional Version, in: PDQ Cancer Information Summaries. National Cancer Institute (US), Bethesda (MD), 2002
 20. Pianori D, Gili A, Masanotti G: Changing the smoking habit: prevalence, knowledge and attitudes among Umbrian hospital healthcare professionals. *J Prev Med Hyg* 2017; 58, E72–E78.
 21. President of Ministers' Council. Ordinance of the President of Ministers' Council 2003
 22. Sacco S, Campanella F, Cavalotti A, et al: The “Smoke-free hospital” project: prevalence of smokers in a large hospital in Pavia (Italy) from 2006 to 2010. *Ig Sanità Pubbl* 2014; 70, 473–488
 23. Saulle R, Boggi R, Abetti P, et al: Can the Local Health Unit staff serve as role model for positive health behaviours? Results from an observational study in Italy. *Annali di Igiene: Medicina Preventiva e di Comunità*, 2018; 20, 3–13
 24. Sirchia G: La No – Smoking Policy in Italia: dalla Legge del 2003 ad oggi. 2018.URL <https://girolamosirchia.org/2018/03/16/la-no-smoking-policy-in-italia-dalla-legge-del-2003-ad-oggi/> (accessed 11.20.18).
 25. Syamlal G, King BA, Mazurek JM: Tobacco Use Among Working Adults - United States, 2014–2016. *MMWR Morb Mortal Wkly Rep* 2017; 66, 1130–1135. <https://doi.org/10.15585/mmwr.mm6642a2>
 26. The Lancet Public Health: Public health and the workplace: a new era dawns. *Lancet Public Health* 2018; 3, e508. [https://doi.org/10.1016/S2468-2667\(18\)30217-2](https://doi.org/10.1016/S2468-2667(18)30217-2)
 27. Valente P, Mipatrini D, Mannocci A, et al: La percezione del problema alcol fra i lavoratori in aziende dei settori trasporti, sanità ed edilizia nella regione Lazio: risultati di uno studio osservazionale. *Med Lav* 2018; 109. <https://doi.org/10.23749/mdl.v109i3.6902>
 28. Verdonk-Kleinjan WMI, Rijswijk PCP, de Vries H, Knibbe RA: Compliance with the workplace-smoking ban in the Netherlands. *Health Policy* 2013; 109, 200–206. <https://doi.org/10.1016/j.healthpol.2012.11.006>
 29. Wang MP, Li WHC, Suen YN, et al: Association between employer's knowledge and attitude towards smoking cessation and voluntary promotion in workplace: a survey study. *Tob Induc Dis* 2017; 15, 44. <https://doi.org/10.1186/s12971-017-0149-4>

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