



Brief Communication

Smoking habits among healthcare workers in the Southern Italy: a cross-sectional study

Maria Rosaria Tumolo^{1,2}  · Pierpaolo Mincarone³  · Roberto Guarino²  · Saverio Sabina²  · Eugenio Sabato^{3,4} · Maria Veronica Palma⁴ · Carlo Giacomo Leo² 

Received: 30 August 2024 / Accepted: 15 November 2024

Published online: 04 December 2024

© The Author(s) 2024 [OPEN](#)

Abstract

Smoking is a major public health issue worldwide. The prevalence of smoking among healthcare workers is particularly concerning as they serve as role models for their patients and play a crucial role in combating the tobacco epidemic. Our survey analyzes the smoking habits, second-hand smoke exposure, attitude and support towards smoking cessation among healthcare workers in a hospital in Southern Italy. An anonymous questionnaire was completed by 179 healthcare workers. Among the participants, 36.9% were current smokers, 22.3% were ex-smokers, 8.4% were abstinent smokers, and 32.4% were never smokers. Additionally, 43.0% of smokers reported being exposed to second-hand smoke for 7 days per week, compared to 17.9% of never-smokers. Only 29.2% of current smokers are attempting to quit, while 58.5% have shown no interest in quitting. Most smokers reported not receiving any advice to quit, and only 4.9% received advice from health professionals. Our results align with previous research indicating high smoking rates; however, our findings are even more critical compared to pre-2020 studies in other regions of Europe and Italy. This could be strictly due to the known relation between burnout and COVID-19: the high levels of burnout among health workers caused by the pandemic may have contributed to the increase in smoking behavior. The smoking habits among healthcare workers highlight the urgent need to enhance anti-smoking programs also within healthcare settings.

Keywords Smoking habits · Smoking cessation · Healthcare workers · Public health

Maria Rosaria Tumolo and Pierpaolo Mincarone have contributed equally to this work.

✉ Maria Rosaria Tumolo, mariarosaria.tumolo@unisalento.it; Pierpaolo Mincarone, pierpaolo.mincarone@cnr.it; Roberto Guarino, roberto.guarino@cnr.it; Saverio Sabina, saverio.sabina@cnr.it; Eugenio Sabato, sabatoeugenio@gmail.com; Maria Veronica Palma, mariaveronicapalma7@gmail.com; Carlo Giacomo Leo, carlogiacomo.leo@cnr.it | ¹Department of Biological & Environmental Sciences & Technology, University of Salento, 73100 Lecce, Italy. ²Institute of Clinical Physiology, Branch of Lecce, National Research Council, 73100 Lecce, Italy. ³Institute for Research on Population and Social Policies, Research Unit of Brindisi, National Research Council, 72100 Brindisi, Italy. ⁴Local Health Unit "ASL Brindisi", "Antonio Perrino" Hospital, Respiratory and Critical Care Unit, Brindisi, Italy.



1 Introduction

Smoking is one of the major public health issues worldwide, as it constitutes one of the leading risk factors for the development of non-communicable chronic diseases, like cancer, and lung and heart diseases [1]. According to the World Health Organization, tobacco is responsible for the deaths of up to half of its users, with over 8 million individuals annually succumbing to both direct tobacco consumption and exposure to second-hand smoke [1].

In addition to the health burden, there are also economic and social costs associated with smoking. Recent estimates suggest that the cost of smoking consequences, considering both direct costs to treat related diseases and indirect costs from lost productive days, amounts to approximately \$1.4 trillion per year, equivalent to 1.8% of the world's gross domestic product [1].

In Italy, in 2023, according to ISTAT data, there were just over 10 million smokers among the population aged 14 and older, with a prevalence rate of 19.3%. There are significant gender differences: 23.1% of men smoke compared to 15.7% of women [2]. Moreover, it is estimated that more than 93,000 deaths are attributable to tobacco smoking, with direct and indirect costs amounting to over 26 billion euros, well over 1% of the national GDP [3].

Given the profound and well-known health consequences of smoking, healthcare professionals can significantly impact the fight against tobacco use [4] influencing the adoption of 'smoke-free' lifestyles [5], both in terms of active smoking and exposure to secondhand smoke. Based on these considerations, the presence of smoking among healthcare workers could be considered problematic because it affects their ability to advocate for tobacco cessation. In fact, when healthcare providers smoke, their advice to patients to quit may lack credibility and reduce the perceived importance of smoking cessation [6, 7]. Conversely, non-smoking providers are more credible in promoting anti-smoking interventions and serve as positive examples for patients [5, 8].

To the best of our knowledge, few studies have addressed the habits of smoking among healthcare workers in Italy [9–11].

This study aims to analyze the habits of tobacco use and their attitude towards smoking cessation among healthcare workers from Southern Italy, contributing to a greater understanding of the tobacco landscape within healthcare environments and improve health promotion interventions.

2 Materials and methods

This cross-sectional study enrolled healthcare workers (physicians, nurses, social and health care operators and technicians), aged 18+ and coming from the *Presidio di Brindisi "Di Summa-Perrino"* involving the following departments and services: Pneumology, Vascular Surgery, Radiology, Neurosurgery, Neurology, Orthopedics and Analysis Laboratory.

The study was conducted between March and April 2024 through the administration of an anonymous questionnaire elaborated ad hoc. The questionnaire was designed as a Google form and distributed online. Data were extracted from Google Form as an Excel sheet for quality check, data cleaning, and coding.

The questionnaire was structured in 4 sections: (1) demographic data, (2) smoking profile (type of tobacco smoking, the age of starting smoking, the number of cigarettes smoked in the previous 30 days and average number of cigarettes smoked per day), (3) intention to quit and received support, and (4) second-hand smoke exposure.

All the healthcare workers were informed about the study and those interested were given full details through a cover sheet before starting the survey. Participation in the study was voluntary and all the information was anonymous and confidential.

2.1 Definitions

The "current smoker" status included both daily and occasional smokers; "abstinent smokers" are considered those who have quit no more than 12 months ago; "ex-smokers" are those who quit smoking at least 1 year ago. In our study we have also taken into consideration the category of "smokers" which is the sum of "current smokers" plus "abstinent smokers".

The exposure to second-hand smoke was defined in this study as the participant's self-reported exposure to smoke at outdoors or in a closed area.

Table 1 Prevalence of smoking among healthcare workers, by smoking status and gender

Smoking status	Men (n = 52)		Women (n = 126)		Total sample (n = 179)	
	n	%	n	%	n	%
Never smokers	13	25.0	45	35.7	58	32.4
Ex-smokers	14	26.9	26	20.6	40	22.3
Abstinent smokers	7	13.5	7	5.6	15	8.4
Current smokers	18	34.6	48	38.1	66	36.9

Data are presented as count and %. 1 subject in the abstinent smokers chose not disclose their gender

Table 2 Difference in the type of Tobacco used by current smokers between gender

	Men	Women	Total
Classic cigarettes	10 (33.3%)	25 (33.8%)	35 (33.7%)
Heated tobacco devices	7 (23.3%)	25 (23.3%)	32 (30.8%)
Hand rolled cigarettes	8 (26.7%)	12 (16.2%)	20 (19.2%)
Electronic cigarette	3 (10.0%)	12 (16.2%)	15 (14.4%)
Others	2 (6.7%)	0	2 (1.9%)

Data are presented as count and %

2.2 Statistical analysis

For descriptive analysis, categorical variables were analyzed using contingency tables (frequencies and percentages) and continuous variables were analyzed using summary statistics (mean and standard deviation). Comparative analyses were done using the χ^2 test for categorical variables. Differences were considered to be statistically significant when $p < 0.05$. Statistical analyses were conducted using the open-source software R [12].

3 Results

A total of 179 healthcare workers filled out the questionnaire; 126 (70.4%) were women and 52 (29.1%) were men (1 preferred not to respond). The average age of the participants was 34.2 years (± 14), and the median age was 28 years (IQR:21–47).

About the smoking habits, 58 (32.4%) out of 179 respondents were never smokers, 40 (22.3%) were ex-smokers, 15 (8.4%) were abstinent smokers and 66 (36.9%) were current smokers. Table 1 shows the characteristics of the participants according to smoking status and sex. Smoking prevalence did not show statistically significant differences between genders ($p > 0.05$).

The average age of starting smoking was 17.5 years (± 3.7). In the subgroup of current smokers, 37 individuals (56.1%) were occasional smokers (11 men and 26 women), while 29 individuals (43.9%) reported smoking daily (7 men and 22 women). Only 3% were heavy smokers (> 20 cigarettes per day).

Table 2 presents the types of tobacco consumed by current smokers, categorized by gender. Among healthcare workers, the predominant forms of consumption were classic cigarettes (33.7%) and heated tobacco devices (30.8%). Moreover, there is no significant difference observed in the consumption patterns of various tobacco types between men and women ($p > 0.05$).

Additionally, 42.4% of current smokers reported smoking during working hours, and 34.8% stated that they spend between 50 and 200 euros per month on smoking.

Regarding smoking cessation, 29.2% of current smokers are trying to quit, while 58.5% have shown no interest in quitting, and 12.3% did not express an opinion.

We also asked the smokers if they had received advice to quit smoking. Most of them reported that they have not received any advice (46.9%). The data shows that friends play a role in providing advice (24.7%), while only 13.6% received advice from family members. Moreover, it is noteworthy that only a very small percentage of smokers received advice to quit from other health professionals (4.9%). Finally, 9.9% did not express an opinion.

In terms of exposure to second-hand smoke (SHS), it is important to note that smokers are exposed for a greater number of days compared to never-smokers; for instance, exposure of 7 days per week among smokers is at 43.0% compared to 17.9% among never smokers ($p = 0.002$). In the previous week, both smokers and never smokers reported exposure to passive smoking in various settings, including home, car, work, and outdoor areas. However, this difference was not statistically significant (Table 3).

There is a significant difference ($p < 0.05$) in how smokers and never-smokers perceive the discomfort caused by SHS. Never-smokers are significantly more likely to report strong discomfort, while smokers are more likely to report no discomfort (Table 3).

4 Discussion

Smoking behavior among healthcare workers can significantly influence the general population's habits and plays a crucial role in addressing the tobacco epidemic, both in terms of promoting and combating smoking [9].

This study aimed to describe smoking habits among healthcare workers in the Southern Italy. Among the 179 healthcare workers surveyed, 36.9% were current smokers, with a higher prevalence among women compared to men. This percentage aligns with previous research indicating high smoking rates, especially as our rates are even higher compared to studies in other regions of Europe and Italy. For instance, smoking rates among Spanish healthcare professionals were 11.1% among physicians and 13.2% among nurses [13]. In Italy, the study of Baffuno and colleagues [9] found that 17.8% of 104 healthcare professionals working in an Italian Cancer Center were current smokers, suggesting that working in such settings could enhance awareness of smoking-related harms. Additionally, the PASSI data from 2014 to 2018 indicated that 23% of Italian Health Personnel were current smokers [10].

The high prevalence of smoking among healthcare workers is extremely concerning, given their role in modeling healthy behaviors for patients. As stated in the Article 14 of the WHO Framework Convention on Tobacco Control (FCTC), healthcare workers must act as role models and abstain from tobacco use [14]. In our opinion, among the set of reasons that can encourage smoking habits, a role can be found in the important change in the work context because of COVID-19. All the cited article referred to a period before March 2020. Scientific literature has highlighted, in fact, how the high levels of burnout among health workers caused by the pandemic have contributed to the increase in smoking behavior [15, 16].

Our questionnaire examined aspects of healthcare workers' behaviors in smoking cessation and exposure to second-hand smoke.

Table 3 Smokers vs. never-smokers: second-hand smoke (SHS) exposure

SHS	Smokers	Never smokers	<i>p</i>
Day of exposure in past week			
Never	4 (5.1%)	10 (17.9%)	0.002*
1–2 days	17 (21.5%)	21 (37.5%)	
3–4 days	11 (13.9%)	11 (19.6%)	
5–6 days	13 (16.5%)	4 (7.1%)	
7 days	34 (43.0%)	10 (17.9%)	
Place of exposure in past week			
House	12 (11.8%)	10 (15.2%)	0.513
Car	13 (12.7%)	4 (6.1%)	
Work	23 (22.5%)	17 (25.8%)	
Outdoors	54 (52.9%)	35 (53%)	
It makes you uncomfortable			
Strongly	10 (14.5%)	22 (47.8%)	< 0.05*
Moderately	24 (34.8%)	20 (43.5%)	
No	35 (50.7%)	4 (8.7%)	

Data are presented as count and %

* $p < 0.05$

Smoking cessation reduces the risk of many adverse health effects, including cardiovascular diseases, chronic obstructive pulmonary disease, and cancer [17]. Despite the numerous and known benefits of quitting smoking, in our study, only 29.2% of current smokers wanted to quit, while 58.5% have shown no interest in quitting. This lack of motivation may be related to the young age of the respondents [18, 19]. The low level of chronic conditions, typical of the younger individuals, may lead to a perception that quitting smoking is still not a necessary secondary prevention strategy, thereby reducing the urgency to quit. Moreover, young healthcare personnel, possibly due to a more “idealistic” and empathic approach, experience a higher level of work-related stress [20]. This lower tendency to quit smoking underscores the need for targeted cessation programs that address the specific challenges faced by young healthcare workers.

We also asked if they had received advice on quitting smoking, but 55.7% were negative on this. This indicates a significant gap in support systems. Our data shows that friends (24.7%) provide most of the advice, followed by family members (13.6%) and healthcare professionals (4.9%). The low percentage of advice received from healthcare professionals raises concerns about the potential barriers this group faces in providing smoking cessation advice. Possible barriers could include lack of time during consultations, insufficient training in smoking cessation counseling, a perceived lack of subject motivation, and personal smoking habits, which may reduce the perceived credibility of the advice [21–23].

Our data reveal significant differences in the frequency of SHS exposure between smokers and never smokers. Specifically, 43.0% of smokers reported being exposed to SHS seven days a week, compared to only 17.9% of never smokers. This higher exposure among smokers likely contributes to their reduced sensitivity to the discomfort caused by SHS. Furthermore, the analysis shows that “never smokers” are more susceptible to the discomfort caused by passive smoking than “smokers”. A chronic exposure, in fact, could reduce the perceived severity of SHS-related discomfort, potentially due to physiological adaptation or psychological acceptance of the smoking environment [24]. These findings could have important public health implications. The heightened sensitivity of never smokers to SHS underscores the need for stringent SHS exposure controls to protect non-smoking populations from the health risks associated with SHS [25].

Our study has several limitations. First, the relatively small sample size, limited to the employees of one institute, may restrict the generalizability of our findings, particularly considering the relatively young age of our sample, which may predominantly reflect the smoking habits of younger healthcare workers. This could limit the applicability of the results to older healthcare professionals. A further limitation is represented by the exclusion, due to privacy concerns, of some socio-demographic factors, such as professional profile, education level, and years of working experience, which are important determinants of smoking behavior. The exclusion of these variables limited our ability to assess the influence of different healthcare roles or levels of experience on smoking habits. Additionally, the absence of data on the specific department of each respondent prevented us from exploring potential differences in smoking attitudes and behaviors based on clinical specialization, which could have provided further insights, especially in departments with a stronger focus on respiratory health. These constraints may have impacted the comprehensiveness of our analysis and our ability to fully understand the determinants of smoking habits among healthcare workers.

5 Conclusion

Smoking rates among healthcare workers remain critically high despite serving as role models for the general population and knowing the negative consequences of smoking. This underscores the urgent need to enhance anti-smoking programs within healthcare settings. Implementing regular training and limiting exposure to passive smoking could be prioritized. Addressing these issues could lead to significant improvements in public health outcomes.

Author contributions M.R.T., P.M., E.S. and C.G.L. contributed to the study conception and design. Material preparation, data collection and analysis were performed by all the authors. The first draft of the manuscript was written by M.R.T., P.M. and C.G.L. and R.G., S.S. and M.V.P. commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding Not applicable.

Data availability The datasets analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate The Ethics Committee of Local Health of Brindisi has confirmed that no ethical approval is required. Verbal informed consent was obtained prior to the survey. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication Not applicable.

Competing interests The authors declare no competing interests.

Open Access This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Tobacco. <https://www.who.int/news-room/fact-sheets/detail/tobacco>. Accessed 30 July 2024.
2. Aspetti della vita quotidiana: Abitudine al fumo—età, titolo di studio. <http://dati.istat.it/Index.aspx?QueryId=15513>. Accessed 31 July 2024.
3. Tabagismo. <https://www.salute.gov.it/portale/fumo/dettaglioContenutiFumo.jsp?lingua=italiano&id=5579&area=fumo&menu=vuoto>. Accessed 30 July 2024.
4. Mizher IY, Fawaqa SI, Sweileh WM. Prevalence and personal attitudes towards tobacco smoking among Palestinian healthcare professionals: a cross-sectional study. *Addict Sci Clin Pract*. 2018. <https://doi.org/10.1186/S13722-018-0119-Z>.
5. Stead LF, Buitrago D, Preciado N, Sanchez G, Hartmann-Boyce J, Lancaster T. Physician advice for smoking cessation. *Cochrane Database Syst Rev*. 2013. <https://doi.org/10.1002/14651858.CD000165.PUB4>.
6. Abdullah AS, Gaehde S, Bickmore T. A tablet based embodied conversational agent to promote smoking cessation among veterans: a feasibility study. *J Epidemiol Glob Health*. 2018;8:225–30. <https://doi.org/10.2991/JJEGH.2018.08.104>.
7. Duaso MJ, Bakhshi S, Mujika A, Purssell E, While AE. Nurses' smoking habits and their professional smoking cessation practices: a systematic review and meta-analysis. *Int J Nurs Stud*. 2017;67:3–11. <https://doi.org/10.1016/J.IJNURSTU.2016.10.011>.
8. Kelly M, Wills J, Sykes S. Do nurses' personal health behaviours impact on their health promotion practice? A systematic review. *Int J Nurs Stud*. 2017;76:62–77. <https://doi.org/10.1016/J.IJNURSTU.2017.08.008>.
9. Galetta D. Smoking prevalence, knowledge and perceptions on tobacco control among healthcare professionals: a survey in an Italian cancer center. *J Commun Health*. 2021;46(3):597–602. <https://doi.org/10.1007/S10900-020-00907-8>.
10. Minardi V, D'Argenio P, Gallo R, Possenti V, Contoli B, Carrozzi G, Gorini G. Smoking prevalence among healthcare workers in Italy, PASSI surveillance system data, 2014–2018. *Ann Dell'Ist Super Sanita*. 2021;57(2):151–60. https://doi.org/10.4415/ANN_21_02_07.
11. Sabato E, Carrozzi L, Nardini S, Moretti A, Angino A, Matteelli G, Bertoletti R. The AIPO target project smoke-free hospitals: results of the third phase. *Rass Patol Dell'Appar Respir*. 2004;19:247–61.
12. R Core Team. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria; 2020. <https://www.r-project.org/>. Accessed 19 Nov 2020.
13. Ramos PDL. Prevalence of and attitudes towards smoking among Spanish health professionals. *Respir Int Rev Thorac Dis*. 2015;90(6):474–80. <https://doi.org/10.1159/000441306>.
14. Guidelines for implementation of Article 14. <https://fctc.who.int/publications/m/item/guidelines-for-implementation-of-article-14>. Accessed 30 July 2024.
15. Leo CG, Sabina S, Tumolo MR, Bodini A, Ponzini G, Sabato E, Mincaroni P. Burnout among healthcare workers in the COVID 19 era: a review of the existing literature. *Front Public Health*. 2021. <https://doi.org/10.3389/FPUH.2021.750529>.
16. Bar-Zeev Y, Shauly-Aharonov M, Neumark Y, Hirshoren N. Changes in smoking behavior, stress, and sleep duration among Israeli hospital workers during the COVID-19 pandemic: a cross-sectional study. *Nicotine Tob Res Off J Soc Res Nicotine Tob*. 2023;25(2):274–81. <https://doi.org/10.1093/NTR/NTAC014>.
17. Smoking and Tobacco Use | CDC. Benefits of quitting smoking. <https://www.cdc.gov/tobacco/about/benefits-of-quitting.html>. Accessed 30 July 2024.
18. Van Minh H. Intention to quit and predictive factors among current smokers in Vietnam: findings from adult tobacco survey 2020. *Tob Use Insights*. 2022;15:1179173X2210984. <https://doi.org/10.1177/1179173X221098460>.
19. Evenhuis A, Occhipinti S, Jones L, Wishart D. Factors associated with cessation of smoking in health professionals: a scoping review. *Glob Health Action*. 2023. <https://doi.org/10.1080/16549716.2023.2216068>.
20. Wiederhold BK, Cipresso P, Pizzioli D, Wiederhold M, Riva G. Intervention for physician burnout: a systematic review. *Open Med*. 2018;13(1):253–63. <https://doi.org/10.1515/MED-2018-0039>.
21. Jørgensen CU, Løkke A, Hjorth P, Pisinger C, Farver-Vestergaard I. Barriers to implementation of smoking cessation support among healthcare professionals in the secondary healthcare sector: a qualitative and quantitative evaluation. *Tob Prev Cessat*. 2024. <https://doi.org/10.18332/TPC/183775>.

22. Grech J, Sammut R, Buontempo MB, Vassallo P, Calleja N. Brief tobacco cessation interventions: practices, opinions, and attitudes of healthcare professionals. *Tob Prev Cessat.* 2020;6:1–11. <https://doi.org/10.18332/TPC/125353>.
23. Coleman C, Ferguson SG, Nash R. Barriers to smoking interventions in community healthcare settings: a scoping review. *Health Promot Int.* 2024. <https://doi.org/10.1093/HEAPRO/DAAE036>.
24. Alzahrani SH. Levels and factors of knowledge about the related health risks of exposure to secondhand smoke among medical students: a cross-sectional study in Jeddah, Saudi Arabia. *Tob Induc Dis.* 2020. <https://doi.org/10.18332/TID/128317>.
25. Smoking and Tobacco Use | CDC. Health problems caused by secondhand smoke. <https://www.cdc.gov/tobacco/secondhand-smoke/health.html>. Accessed July 30 2024.

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.