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EVOLUTION OF SMOKING FREQUENCY AMONG HEALTHCARE PERSONNEL IN A UNIVERSITY HOSPITAL CENTER

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Abstract

Introduction: The implementation of the smoking ban in hospitals stems from governmental initiative, in accordance with the charter of a tobacco-free hospital signed by our country. In 2008, 9.4% of the healthcare personnel in our CHU were daily smokers. What is the prevalence of this addiction after a decade? The main objective of our work is to determine the evolving trend in the frequency of smoking after a decade among the healthcare personnel of CHU Beni-Messous. The secondary objectives are to compare the level of nicotine dependence between 2008 and 2019 and to understand the steps and methods undertaken by former smokers to successfully quit smoking. **Materials and Methods**: This is a descriptive cross-sectional study conducted among healthcare personnel at CHU Beni-Messous in Algiers, involving the collection of information on smoking habits through a self-administered anonymous questionnaire. **Inclusion criteria**: Healthcare personnel present on the day of our visit. Data entry and analysis: Using EPIINFO 6 and EPIDATA software after validation and coding of the data. **Results**: A total of 604 healthcare personnel participated in the study during the first survey in 2008, and 600 individuals in 2019. The sex ratio was 0.83 and 0.5, respectively. The prevalence of smoking among the healthcare personnel at our hospital slightly increased, with the rate rising from 9.5% in 2008 to 10.83% in 2019 (DNS), which tarnishes the image of our institution. The proportion of male daily smokers increased by 60.1% over a decade (rising from 16.9% to 26.9%, $p < 0.01$). As for passive smoking, it increased by 37.5% among females (rising from 16% to 22%, $p < 0.04$). The proportion of heavy smokers (≥ 20 cigarettes per day) significantly increased between 2008 and 2019, from 6.6% to 55.2% ($p < 0.001$). Tobacco dependence assessed by the Fagerström test showed that 46% of smokers had high dependence in 2008, compared to 41% in 2019 (DNS). 53.40% consume tobacco even during working hours, compared to 73.3% in 2008 ($p < 0.02$). In the first survey in 2008, 42.2% of daily smokers had no intention of quitting smoking, compared to 31% in 2019. 49% in 2008 and 45% in 2019 of occasional and daily smokers made at least 2 to 5 attempts to quit smoking. The reasons for a potential cessation of smoking are interesting to know; ex-smokers (4.5%) reported health problems in 40.7% of cases, guilt was mentioned in 22.2% of cases, religious conviction in 14.80% of cases, as well as advice from a friend, family member, and/or doctor, while economic reasons were cited in only 11.1% of cases. **Conclusion:** Tobacco smoke is dangerous for all who inhale it (patients, hospital staff, and visitors), and the hospital should promote health. Legislative changes in recent decades have aimed to ban smoking within hospitals, but this remains insufficient. Emphasis should be placed on awareness and prevention with active support for smokers during cessation. The tobacco cessation support unit should be operational to assist candidates in their cessation efforts.

Index Terms: Smoking, Evolving Trend, Healthcare Personnel, Cessation, Level of Dependency

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I. INTRODUCTION

Smoking, considered a man-made epidemic, is entirely preventable and impacts both developed and developing nations. According to the fourth WHO global report on tobacco prevalence, published in November 2021, the number of tobacco users worldwide stands at 1.30 billion, compared to 1.32 billion in 2015[1]. Tobacco-related deaths exceed 7 million annually worldwide, compared to around 4 million at the beginning of the 21st century. Projections suggest this figure could reach 1.27 billion by 2025. Since the implementation of the MPOWER measures in 2007 to assist countries in implementing demand reduction strategies in line with the WHO Framework Convention on Tobacco Control, significant progress has been made. Currently, approximately 65% of the world's population, or five billion people, benefit from the implementation of at least one MPOWER measure at the highest level[2]. More than 70 countries, including Algeria[3], have minimal or moderate legislation banning smoking in certain public spaces and workplaces, especially in hospitals[4,5].

It has been demonstrated in the United States[6,7], Ireland[8], Scotland[9], and Italy[10] that the health and comfort of workers have improved with a total ban on smoking in the workplace. The prevalence of smoking among healthcare personnel varies between studies, ranging from 10% to 51.7%[11, 12]. These differences must be interpreted cautiously as sociodemographic structures can vary significantly by profession and region. Our healthcare personnel are certainly not exempt from this scourge; indeed, a study conducted in 2008 at our university hospital[13] showed that 9.5% of healthcare personnel were daily smokers. What is the status of this addiction after a decade?

The main objective of our study is to determine the evolution of smoking frequency after a decade in the surveyed population. Secondary objectives include comparing nicotine dependence levels between 2008 and 2019 and understanding the steps and methods undertaken by former smokers to successfully quit smoking.

II. MATERIALS AND METHODS

This is a descriptive cross-sectional study involving healthcare personnel at the Beni-Messous University Hospital in Algiers, aimed at collecting information on smoking habits through a self-administered anonymous questionnaire.

The questionnaire consists of four sections: The first section for the identification of healthcare personnel. The second section for determining the past and current smoking status of the respondents. The third section for determining the smoking habits of smoking and ex-smoking healthcare personnel. The fourth section for assessing the tobacco dependence of healthcare personnel.

We considered: Smokers: individuals who smoke regularly or occasionally. Ex-smokers: individuals who had quit smoking for at least one year. Non-smokers: the remaining subjects studied. The same measuring instrument was used for both the 2008 and 2019 surveys.

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Inclusion criteria: Healthcare personnel present on the day of our visit.

Statistical Analysis: Data were entered and analyzed using Epi Info 6 software version 6.04 CDC, Atlanta, USA, after cleaning (errors and inconsistencies were identified through file cleaning). Appropriate statistical tests were calculated based on the nature and size of the variables. This included the Pearson's Chi-square test, Yates' corrected Chi-square test, Fisher's exact test with a significance level set at 5%, and for comparing means, the Student's t-test was used.

III. RESULTS

A total of 1200 individuals participated in the study, with 604 in the first survey in 2008 and 600 in the second survey in 2019. The average age was 36.5 ± 10 in 2008 and 37.13 ± 11.78 years in 2019, with a sex ratio of 0.83 in 2008 and 0.5 in 2019.

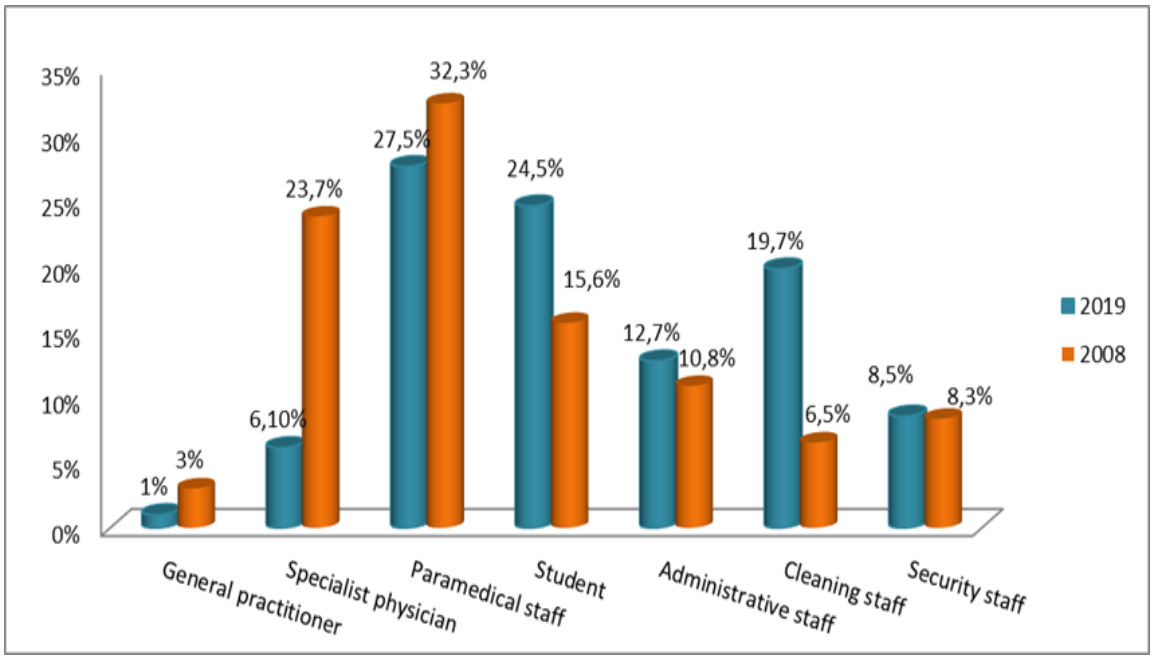

Figure 1: Distribution of healthcare personnel at BeniMessous University Hospital Centre by profession

In the first survey conducted in 2008, 604 individuals participated compared to 600 in 2019. 66.5% of the participants are female, with a sex ratio of 0.5 (1 M/2 F). The average age of the participants is 37.13 ± 11.78 years, with a range from 20 to 70 years old, and the predominant age group is 20-29 years old, accounting for 36.7%. 53.2% of the participants have less than 5 years of seniority.

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Table 1: Distribution of surveyed personnel by gender, average age, and frequency of tobacco consumption

Statut	Male		Female		Total		Average age	
	2008	2019	2008	2019	2008	2019	2008	2019
Non-smoker	161 60%	101 50,2%	273 81.2%	307 76,9%	289 47.84%	408 68%	35.3 ± 9	36.8±11.7
Ex-smoker	36 13,4%	26 12,9%	4 1,2%	1 0,3%	40 6.6%	27 4,5%	46,3 ± 10	44.5±10.61
Daily smoker	45 16,9%	54 26,9%	0 0%	04 1%	45 7.5%	58 9,7%	40.1 ± 8	38.8±10.51
Occasional smoker	9 3.35%	6 3%	3 0.8%	1 0,3%	12 2%	7 1,16%	38.5 ± 12	44±12.46
Passive smoker	17 6.3%	14 7%	56 16.67%	86 21.6%	52 8.6%	100 16.7%	34.8±9.1	35.03±12.31
Total	268	201	336	399	604	600	36.5 ± 10	35±12.31

The frequency of daily smoking among male healthcare workers increased by 60.1% over a decade (rising from 16.9% to 26.9%, p<0.01). Women are more exposed to passive smoking than men (p<0.01). The frequency of passive smoking among women increased by 37.5% over a decade (rising from 16.67% to 21.6%, p<0.04).

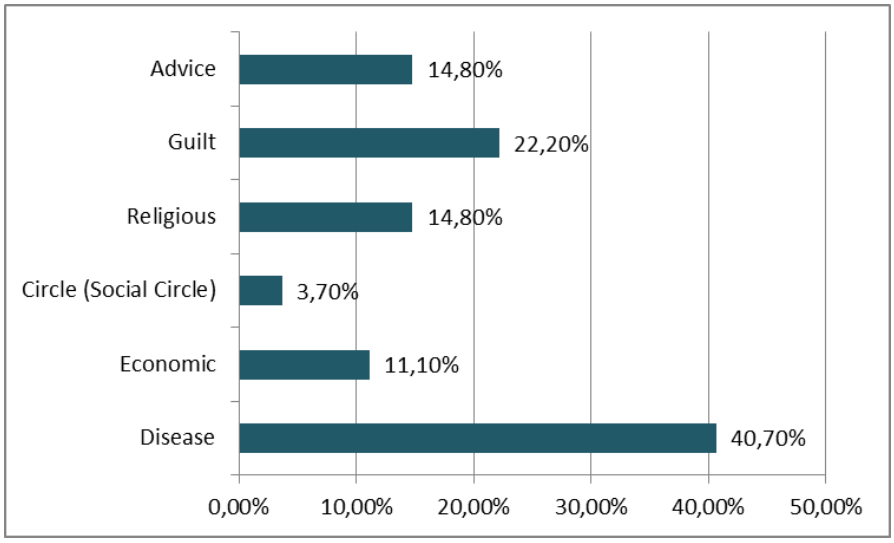

Figure 2: Reasons for Quitting Smoking among Former Smokers

Among the reasons cited for quitting smoking, illness was the primary cause mentioned in 40.7%. Among the stated causes, 22.4% (15/67) reported quitting due to cardiovascular diseases, 29.8% (20/67) due to hypertension, 23.8% (16/67) due to hypertension and diabetes, and 23.8% (16/67) due to chronic obstructive pulmonary disease (COPD).

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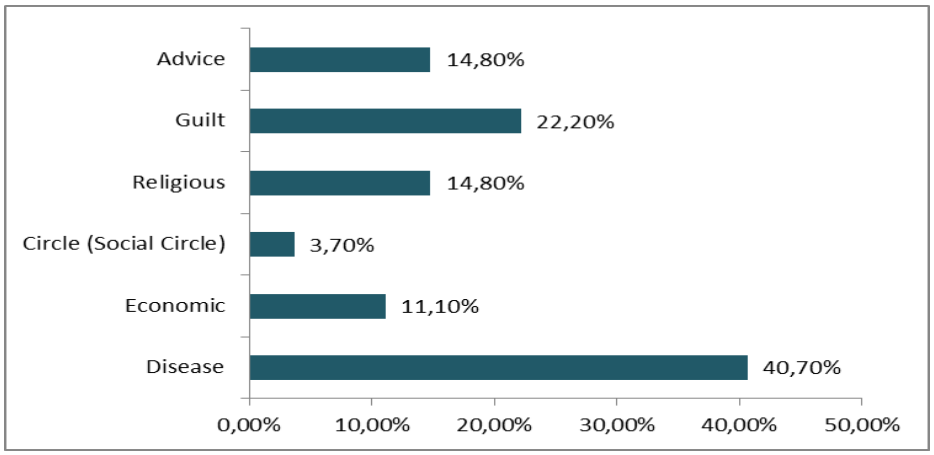

Figure 3: Number of Daily Smoking Episodes among Daily Smokers between 2008 and 2019

The proportion of heavy smokers (>= 20 cigarettes per day) significantly increased between 2008 and 2019, rising from 6.6% to 55.2% (p<0.001).

Table 2: Time to First Cigarette after Waking Up

Time	2019	2008
< 5 minutes	19.0%(11)	28.9% (13)
6 to 30 minutes	15.5%(9)	31.1% (14)
31 to 60 minutes	27.6%(16)	20.0% (9)
> 60 minutes	37.9% (22)	20.0% (9)
Total	58	45

The time to first cigarette after waking up expresses the degree of dependence; it was less than 30 minutes in 60% of healthcare workers in the survey conducted in 2008 compared to 34.5% in 2019 (p<0.01), showing a significant difference.

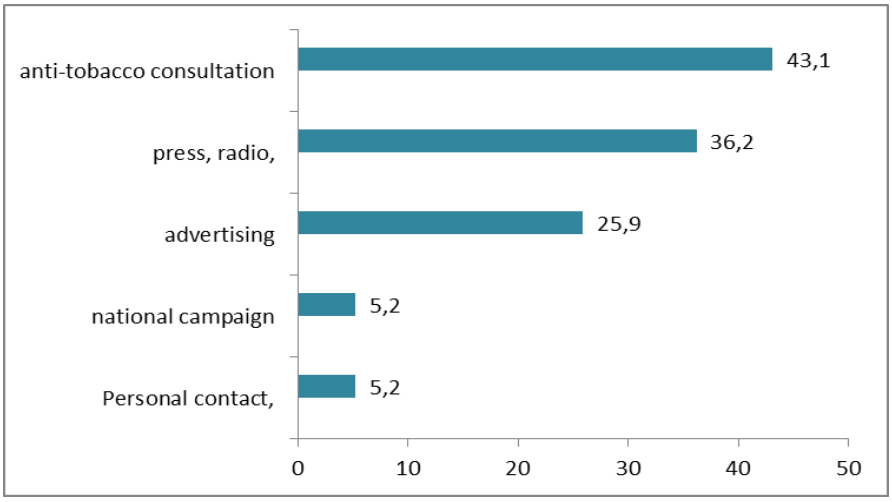

Figure 4: Awareness of methods that can help succeed in smoking cessation

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IV. DISCUSSION

Smoking in healthcare facilities is a significant health issue, particularly among hospital staff, as they play a crucial role in educating patients about the risks associated with smoking and should serve as role models.

The study population is characterized by a high proportion of females, reflecting the gender composition of our hospital staff (66.5% in 2019 and 56% in 2008). The frequency of smoking among healthcare workers at our hospital has slightly increased, with the rate rising from 9.5% in 2008 to 10.83% in 2019 (a non-significant difference), despite the absolute ban on smoking in the hospital. However, this prevalence remains lower than that of tobacco use in the general public (16.5%) [14] and even slightly lower than that found by Touré et al.[15] (11.6%). The Baromètre personnel hospitalier[16] survey conducted between 2002 and 2003 in 58 healthcare facilities across France showed a smoking prevalence among hospital staff of 31% in 2002, followed by a significant decrease in 2003 with a prevalence estimated at 24%.

The proportion of daily male smokers increased by 60.1% over a decade (rising from 16.9% to 26.9%, $p<0.01$), representing slightly over a quarter of the male population. However, for females, the rate remained unchanged (0.9% in 2008 and 1.2% in 2019, DNS). This male predominance may be explained by socio-cultural factors, where female smokers are less accepted. Internationally, the difference between the sexes is less pronounced, and in some countries, it is even higher among women[15, 17, 18]. European studies conducted among hospital staff in Lithuania in 2003 by Malakauskas et *al.*[19], and in Spain in 2001 by Fernandez et *al.*[20], reported higher rates of female smokers (13.3% and 43%, respectively). In France, according to the Hospital Smoke-Free Barometer (BHST), the rate was 24% in 2003[16].

In contrast, the rate of passive smoking among women increased by 37.5% (rising from 16% to 22% over a decade, $p<0.04$). A survey on smoking habits in hospitals in Faenza, Forli, and Rimini in Italy[21] found a higher number of passive smokers among women (41%) compared to men (37%).

The average age of tobacco consumption onset has not changed (18.7 ± 5.25 in the 2008 survey and 17.84 years ± 4.73 in 2019), with extremes ranging from 11 to 29 years at the University Hospital Mohammed VI, Marrakech[22].

The average duration of smoking among smokers significantly decreased, from 24.6 ± 8.3 years in 2008 to 20.9 years ± 5.1 in 2019 ($p<0.01$), although it remains slightly higher than that found in the study by Touré et *al.*[15] (16 years ± 4.6) and Ndiaye et *al.*[23] (18 years). The age of onset of smoking among our hospital staff did not change, being 18.7 ± 5.25 in the 2008 survey and 17.84 years ± 4.73 in 2019, while Touré[15] reported a slightly higher age (20.3 years ± 4.3).

Industrial cigarettes are the most consumed in our study population, with similar results reported by numerous authors.[23, 24, 25, 26,27] The assessment of tobacco dependence using the Fagerström test allowed us to assess the degree of dependence among our

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smokers. It was strong in 46% of smokers in 2008 and 41% in 2019 (DNS), while the proportion of heavy smokers (≥ 20 cigarettes per day) significantly increased from 6.6% in 2008 to 55.2% in 2019 ($p<0.001$).

The time to first cigarette after waking up was less than 30 minutes in 60% of healthcare workers surveyed in 2008 versus 34.5% in 2019 ($p<0.01$), with a significant difference. Similar results were found by Touré et al.[15] and Ndiaye et *al.*[23]

The percentage of subjects smoking during work hours significantly decreased from 73.3% in 2008 to 53.40% in 2019 ($p<0.02$), with a high percentage of 87% reported by Zanetti et *al.*[21]

In the 2008 survey, 42.2% of daily smokers had no intention of quitting versus 31% in 2019. The concept of attempting to quit smoking was found in 64% in 2008 and 69% in 2019, with attempts ranging from 2 to 5 times in 49% of occasional and daily smokers in 2008 and 45% in 2019. At the Vichy Hospital Center, France[28], healthcare staff attempted to quit smoking in 81% of cases. Touré et al.[15] reported a similar number of attempts in 45.4% and Ndiaye et al.[23] in 75% of smokers.

It is interesting to know the reasons for a potential smoking cessation. Among the reasons cited for quitting smoking, illness was the primary cause mentioned in 40.7%. Among the reasons cited, 22.4% (15/67) reported quitting due to cardiovascular diseases, 29.8% (20/67) due to hypertension, 23.8% (16/67) due to hypertension and diabetes, and 23.8% (16/67) due to chronic obstructive pulmonary disease (COPD). Ex-smokers (4.5%) reported health problems in 40.7% of cases, guilt was mentioned in 22.2% of cases, religious conviction in 14.80% of cases, as well as advice from a friend, family member, and/or doctor, while economic reasons were cited in only 11.1% of cases. In some studies[6, 29-35], the main reasons for quitting smoking were setting a good example for children or children in general, promoting health and personal discipline, with financial savings often mentioned last.

Study Bias:

There is likely a selection bias among participants in this survey, as the usual techniques for selecting a representative sample of the studied population were not used. Additionally, potential participation bias should be considered, as some individuals refused to participate in the survey, citing a lack of time during our visit.

As is often the case in surveys on sensitive subjects such as smoking behavior, there is a risk of social desirability bias (prevarication bias), where participants may respond inaccurately to conform to what they perceive as socially acceptable. This possibility is particularly significant in our survey, given that smoking behavior is a taboo subject in our society, especially for female personnel, who make up a large portion of our sample (two-thirds of the participants).

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V. CONCLUSION

Tobacco smoke remains a danger to anyone who breathes it, including patients, hospital staff, and visitors, necessitating the utmost preservation of health within hospitals. Despite political measures being taken to ban tobacco in these establishments, the rate of smoking among healthcare personnel has not declined.

There is a need to consider actions to strengthen the motivation of those who wish to quit smoking and support them in their cessation efforts. Individual cessation attempts are hindered by a lack of support, particularly active assistance to smokers during cessation, cessation support therapies, and tobacco cessation consultations.

It is justified to review the strategy for addressing this priority public health issue so that hospitals become tobacco-free environments and their personnel can serve as examples to patients.

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