

Epidemiological and Clinical Characteristics of Smokers with Smoking-Related Diseases Attending a Smoking Cessation Unit in Ouagadougou, Burkina Faso

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Abstract

Introduction: Smoking is a major public health problem and one of the leading preventable causes of death worldwide. Regular tobacco consumption is associated with the development of numerous somatic diseases and complications. All forms of tobacco use are harmful to health. This study aimed to describe the epidemiological and clinical characteristics of tobacco-related diseases among smokers attending the Smoking Cessation Unit of Yalgado Ouédraogo University Hospital in Ouagadougou, Burkina Faso. **Methodology:** This was a descriptive and analytical cross-sectional study with retrospective data collection conducted at the Smoking Cessation Unit of the Pulmonology Department of Yalgado Ouédraogo University Hospital over a three-year period, from May 1, 2017, to June 30, 2020. The study included all smokers with smoking-related diseases, regardless of age or sex, who had complete and analyzable medical records. **Results:** A total of 165 out of 947 smokers attending the Smoking Cessation Unit had at least one documented smoking-related disease, corresponding to a prevalence of 17.51%. The study population was predominantly male (98.78%). The mean age of smokers with smoking-related diseases was 43.82 years (range: 14 - 77 years), with the 40 - 50-year age group being the most represented. Most participants were professionally active (81.81%). The mean age at smoking initiation was 19 years (range: 11 - 41 years). The mean number of cigarettes smoked per day was 18 (range: 3 - 60), and the mean duration of smoking was 23 years (range: 2 - 56). Among

the 165 smokers with smoking-related diseases, cardiovascular diseases were present in 50.90% of cases, mainly hypertension and stroke. Respiratory diseases, particularly asthma and chronic obstructive pulmonary disease (COPD), were observed in 55.75%, while psychiatric disorders included anxiety (35.15%) and depression (32.12%). **Conclusion:** This study highlighted significant associations between smoking characteristics and the clinical profile of smokers with smoking-related diseases. The main respiratory conditions observed were chronic obstructive pulmonary disease (COPD) and asthma. Cardiovascular diseases were mainly represented by hypertension and stroke. A significant association was found between hypertension and smoking duration.

Keywords

Smoking, Smoking-Related Diseases, Smoking Cessation, COPD, Cardiovascular Diseases, Nicotine Dependence, Burkina Faso

1. Introduction

Smoking is one of the leading preventable causes of death worldwide and is associated with the development of numerous diseases, including the smoking-related conditions described in this study. Each year, it is responsible for more than 8 million deaths globally, affecting nearly one in every two smokers. More than 7 million of these deaths are attributable to direct tobacco use, while approximately 1.2 million result from exposure to secondhand smoke [1].

A high prevalence of smoking has been reported in Southeast Asia, exceeding 45% [2]. In France, tobacco use indicators show that approximately 11.4 million people, representing nearly one-third of the population (32%), smoke occasionally, while 25.4% smoke daily [2]. In Africa, smoking prevalence is estimated at 15.8%, corresponding to about 77 million smokers, including 21% of men and 3% of women, and is projected to reach nearly 39% by 2030 in the absence of effective preventive policies [3].

In sub-Saharan Africa, smoking is a major cause of preventable mortality. A study conducted in Kenya showed that 16.5% of deaths attributed to noncommunicable diseases were related to tobacco use, mainly affecting respiratory and cardiovascular diseases, as well as cancers [4].

In Burkina Faso, approximately one in five adults smokes. Smoking prevalence is estimated at 19.8% among individuals aged 25 - 65 years and 32.5% among young adults aged 25 - 34 years. Tobacco use is responsible for 71% of lung cancer deaths, 42% of chronic respiratory diseases, and 10% of cardiovascular diseases. It should be noted that non-smokers are also exposed to similar risks through secondhand smoke exposure [5].

Nicotine is not only the principal addictive component of tobacco but also exerts direct harmful effects on the cardiovascular system, including endothelial dysfunction and increased atherosclerotic risk. Recent policy statements from the World

Heart Federation emphasize that nicotine contributes significantly to cardiovascular morbidity beyond its role in dependence [6].

Average daily tobacco consumption contributes significantly to the development of smoking-related health complications. All forms of tobacco are harmful, and there is no safe level of exposure [4]. Given the wide spectrum of diseases associated with smoking, this study aimed to describe the epidemiological, clinical, and paraclinical characteristics of smokers presenting with at least one smoking-related disease at the Smoking Cessation Unit of Yalgado Ouédraogo University Hospital in Ouagadougou, Burkina Faso, between May 1, 2017, and June 30, 2020.

2. Materials and Methods

This was a descriptive and analytical cross-sectional study with retrospective data collection conducted at the Smoking Cessation Unit (SCU) of the Pulmonology Department of the Yalgado Ouédraogo University Hospital (CHU-YO) over a three-year period, from May 1, 2017, to June 30, 2020. The study population consisted of smokers followed at the SCU during the study period.

The inclusion criteria were:

- Smokers presenting with smoking-related diseases at the SCU, regardless of age or sex;
- Availability of complete and exploitable medical records.

The variables studied included sociodemographic data, smoking characteristics, the Fagerström Test for Nicotine Dependence used to assess the level of nicotine dependence (0 - 3: low or no dependence; 4 - 7: moderate dependence; 8 - 10: high dependence), and the Richmond test used to assess motivation to quit smoking (0 - 6: low or moderate motivation; 7 - 9: good motivation; 10: very strong motivation). Tobacco-related diseases identified during follow-up were also recorded. Anxiety and depression were identified based on information recorded in patients' medical files. These disorders were assessed during patient management at the Smoking Cessation Unit using the Hospital Anxiety and Depression Scale (HADS), a standardized screening tool for anxiety and depressive symptoms.

Data Collection and Analysis

A digital data collection form was designed to collect data from tobacco consultation records for each smoker. During the study period, all medical records of smokers attending the Smoking Cessation Unit of Yalgado Ouédraogo University Hospital were systematically reviewed. A total of 947 medical records were assessed. After screening, only patients with at least one tobacco-related disease documented in their medical records and recognized in the scientific literature as associated with tobacco use were retained. Thus, 165 patients met the inclusion criteria and were included in the final analysis.

Data were mainly extracted from medical records, including sociodemographic characteristics, smoking history, nicotine dependence, motivation to quit smoking, and tobacco-related diseases. Missing sociodemographic and smoking-related in-

formation was completed retrospectively through telephone interviews with patients when necessary.

Data entry and analysis were performed using Epi Info version 7.1 after coding and quality control of the collected information. Graphs were generated using Microsoft Excel 2007.

Data analysis focused on three main areas:

- Sociodemographic characteristics;
- Smoking characteristics;
- Smoking-related diseases.

Qualitative variables were described using percentages and their confidence intervals, whereas quantitative variables were summarized using means and standard deviations. Cross-tabulation analyses were performed to assess associations between smoking characteristics and smoking-related diseases using p-values.

Ethical Considerations

The anonymity and confidentiality of the collected data were strictly maintained throughout the study.

3. Results

During the study period, 947 smokers attended the Smoking Cessation Unit (SCU), among whom 165 presented with smoking-related diseases, corresponding to a prevalence of 17.51%. The study population was predominantly male, accounting for 98.78% of participants. The mean age of smokers with tobacco-related diseases was 43.82 years, ranging from 14 to 77 years. The most represented age group was 40 - 50 years. Most smokers were professionally active (81.81%). Nearly half had a secondary school education level (46.66%), and 40.66% were referred to the SCU by healthcare workers (**Table 1**).

The mean age at smoking initiation was 19 years (range: 11 - 41 years). The average number of cigarettes smoked per day was 18 (range: 3 - 60 cigarettes), and the mean smoking duration was 23 years (range: 2 - 56 years) (**Table 2**).

In our study, the level of nicotine dependence was high in 23.63% of participants, moderate in 49.69%, and low in 26.26% (**Figure 1**).

The most frequent diseases were cardiovascular diseases (50.90%), mainly hypertension and stroke. Respiratory diseases, including asthma and chronic obstructive pulmonary disease (COPD), were observed in 55.75% of smokers. Psychiatric disorders included anxiety (35.15%) and depression (32.12%) (**Table 3**).

Correlation analyses showed a statistically significant association between COPD and smoking initiation before the age of 18 years ($p = 0.0003$). However, the association between asthma and early smoking initiation was not statistically significant ($p = 0.095$) (**Table 4**).

The level of nicotine dependence was significantly associated with smoking duration and the number of cigarettes smoked per day (**Table 5**).

The level of dependence was correlated with anxiety and depression, showing statistically significant associations (**Table 6**).

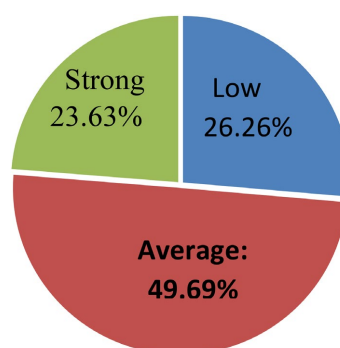


Figure 1. Population distribution by dependency level.

Table 1. Sociodemographic characteristics of participants.

Sociodemographic characteristics of participants	Frequency (N = 165)	Percentage (%)
Age group		
<20 years	14	8.48
[20 - 30 years]	23	13.94
[30 - 40 years]	34	20.61
[40 - 50 years]	36	21.82
[50 - 60 years]	29	17.58
≥60 years old	29	17.58
Gender		
Male	163	98.78
Female	2	1.21
Residence		
Ouagadougou	147	89.09
Outside Ouagadougou	18	10.90
Educational level		
Higher education	63	38.18
Secondary education	77	46.66
Primary education	14	8.48
No formal education	11	6.66
Occupation		
Retired	30	18.18
Trader	28	16.96
Student	22	13.33
Civil servant	11	6.66
Security officer	8	4.84

Continued

Healthcare worker	3	1.81
Marital status		
Married	110	66.66
Single	55	33.33
Referral source		
Healthcare worker	67	40.60
Self-referral	35	21.21
Media	19	11.51
Family/relatives	42	25.45

Table 2. Smoking characteristics.

Characteristics of tobacco use	Mean $\pm$ standard deviation	Extremes	Headcount (percentage)
Age at smoking initiation (years)			
≤ 18		11 - 41 years	89 (53.93%)
> 18			76 (46.06%)
Smoking duration (years)			
≤ 10 years		2 - 56	33 (20%)
> 10 years			132 (80%)
Cigarettes smoked/day			
≤ 20		3 - 60	119 (72.12%)
> 20			46 (27.87%)

Table 3. Distribution of smokers according to associated diseases.

Diseases	Frequency	Percentage (%)
Respiratory diseases	92	55.75
COPD	65	39.39
Asthma	27	16.36
Cardiovascular diseases	84	50.90
Hypertension	62	37.57
Stroke	12	7.27
Peripheral arterial occlusive disease	3	1.81
Venous thromboembolic disease	3	1.81
Coronary artery disease	4	2.42
Anxiety	58	35.15
Depression	53	32.12

Continued

Cancer	2	1.21
Peptic ulcer disease	1	0.60
Erectile dysfunction	2	1.21

Table 4. Correlation between smoking characteristics and associated diseases.

Variables		p-value			
		Asthma	COPD	HTA	Stroke
Age at initiation	≤18				
	>18	0.095	0.0003	0.200	0.479
Duration of smoking years	≤10				
	>10	0.0001	0.0003	0.0008	0.071
Cigarettes/day	≤20				
	>20	0.216	0.32	0.112	0.398

Table 5. Correlation between smoking characteristics and nicotine dependence level.

Smoking characteristics		Level of dependence			p-value
		Low	Moderate	High	
Age at initiation	≤18	24.71	47.06	27.06	0.8207
	>18	30.99	45.07	22.54	
Smoking duration	≤10	48.85	44.83	3.45	0.0037
	>10	22.83	46.46	29.92	
Cigarettes/day	≤20	35.96	50.88	11.40	0.0000
	>20	4.88	31.71	63.41	

Table 6. Correlation between nicotine dependence and anxiety-depressive disorders.

		Level of dependence	Frequency (%)	p-value
Diseases	Low		20.45	0.026
	Moderate		41.10	
Anxiety	High		48.72	
	Low		15.91	
Depression	Moderate		38	0.013
	High		46.15	

4. Discussion

Our study had certain limitations, particularly those related to the retrospective nature of data collection, which may explain the large amount of missing data.

Consequently, telephone interviews were conducted with most of the smokers included in the study. Another limitation concerns the direct attribution of the identified diseases to smoking.

Among the 947 smokers seeking smoking cessation assistance at the Smoking Cessation Unit (SCU), 17.51% ($n = 165/947$) presented with smoking-related diseases. Smokers with associated diseases had a mean age of 43.82 years (range: 14 - 77 years) and were predominantly male (98.78%). These findings are comparable to those reported by Said Latiri *et al.* in Tunisia [7].

Regarding occupation, most smokers with tobacco-related diseases were professionally active (81.81%). This finding may be explained by the predominance of individuals in the economically productive age groups, particularly those aged 40 - 50 years, who constituted the largest proportion of our study population. Occupational stress and social factors encountered in the workplace may contribute to tobacco use and its health consequences [6].

In our population, the mean age at smoking initiation was 19 years (11 - 41). According to a survey conducted between 2010 and 2011 among school-aged youth, tobacco users reportedly smoked their first complete cigarette at around 13 years of age [8].

The mean smoking duration was 23 years (2 - 56), and nearly three-quarters of smokers had been smoking for more than 10 years. The average number of cigarettes smoked per day was 18 cigarettes/day (3 - 60), and 27% of smokers consumed more than one pack per day.

Smoking duration and the number of cigarettes smoked per day likely contribute to the development of cardiovascular and respiratory diseases.

The main respiratory diseases identified were asthma and chronic obstructive pulmonary disease (COPD). Analysis of smoking characteristics associated with these respiratory diseases showed a highly significant association between COPD and early smoking initiation (≤ 18 years), as well as smoking duration greater than 10 years. These findings are consistent with evidence from Kenya, where a substantial proportion of tobacco-attributable mortality is related to respiratory and cardiovascular diseases, highlighting the major burden of tobacco use on these systems in sub-Saharan Africa [4].

The major cardiovascular diseases identified were hypertension and stroke. Significant associations were observed between hypertension and smoking duration. Through nicotine-induced acute vasomotor changes, smoking promotes long-term atherosclerotic plaque formation, leading to vascular narrowing. Hypertension is a major cardiovascular risk factor and the leading contributor to stroke occurrence [9]. A study conducted by Napon *et al.* in Burkina Faso reported smoking as an etiological factor in ischemic stroke in 32.9% of cases [10].

Anxiety disorders were identified in 35.15% of participants, while depressive disorders were found in 32.12%. Ouedraogo *et al.* reported anxiety in 42.9% and depression in 13.7% of smokers [11].

Our study demonstrated statistically significant associations between smoking

duration and anxiety, as well as between the number of cigarettes smoked and depression. Nicotine dependence was significantly associated with smoking duration ($p = 0.003$) and the number of cigarettes smoked per day ($p = 0.026$).

Anxiety and depressive disorders were also significantly associated with the level of nicotine dependence, with significant p -values for anxiety ($p = 0.026$) and depression ($p = 0.013$). These findings are consistent with those reported by Said Latiri *et al.*, who also identified a highly significant association ($p = 0.003$) [7].

5. Conclusion

Smoking, considered a chronic disease, remains a major public health issue. Our study identified significant associations between smoking characteristics and tobacco-related diseases. The main respiratory diseases identified were chronic obstructive pulmonary disease (COPD) and asthma. Cardiovascular diseases were predominantly represented by hypertension and stroke, with a significant association between hypertension and smoking duration. The level of nicotine dependence was also associated with psychiatric disorders, particularly anxiety and depression.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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