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Article

Smoking as a Determinant of Health Status Among Patients in Acute Care Settings

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Abstract

The aim of our research was to monitor smoking habits at patients requesting medical assistance of an emergency department and to identify any connections with the health status of patients during the year 2018, in Romania. The survey included 431 patients who came to the hospital, out of which 49.88% were women and 50.12% were men. Their ages varied between 18 and 93 years, women's mean age was of 66.46 years and standard deviation (SD) of ± 12.157 , and of 62.10 years and SD of ± 14.164 in the case of men, respectively. Our working method was the cross-sectional population study. The study revealed that 14.6% of the patients smoke less than 20 cigarettes per day, while 17.4% smoke more than 20 cigarettes per day. A higher number of smoked cigarettes can be found in the case of men, with an impact of 17.4%, as well as in the case of younger people. There is a significant association between the diagnosis of acute psychiatric pathology and tobacco consumption, as this diagnosis occurs 3.57 times more frequently in the case of people who smoke more than 20 cigarettes per day, compared with non-smokers. Tobacco consumption is a risk factor for the ingravescence of digestive pathology, as digestive pathology occurs 2.3 times more frequent at people who smoke more than 20 cigarettes per day, compared with non-smokers.

Keywords: smoking; health status; patients; public health; addiction

1. Introduction

Health is influenced by the lifestyle of both individuals and human communities, combined with the limited range of choices available to individuals, but also with the wrong choices they make.

Any factor that increases a person's risk of developing a disease is called a risk factor. Any factor that decreases a person's risk of developing a disease is called a protection factor. While some factors cannot be altered and no intervention can be performed on them, other behavioral, biological, social and environmental factors can be influenced in order to reduce negative impact on health status. Intervention on risk factors has proven to be the most profitable due to its costs, accessibility and long-lasting effects in order to cope with the epidemic of chronic diseases from all over the world.

Currently, the most important risk factors for the health status are: smoking, alcohol consumption, high blood pressure, high cholesterol level, air pollution at home or at work,

overweight, unprotected sex, consumption of water from unauthorized sources, iron deficiency, underweight, poor sanitary conditions, as well as poor hygiene and housing conditions [1–4].

Smoking has a complex impact on the human body. Smoking, through its effects, leads to an increase in morbidity and mortality. Smoking has a strong connection with lung diseases, lung cancer, COPD, bronchial asthma, laryngeal cancer. Smoking is also a risk factor for cardiovascular diseases: arterial hypertension, cardiovascular ischemia (angina pectoris, acute coronary syndrome, acute myocardial infarction). It also affects cerebral blood circulation, causing cerebrovascular accidents and subarachnoid hemorrhages. It also impacts the digestive system, being one of the causes for gastric and duodenal ulcer [5–8].

Not only active smoking but also passive smoking causes these effects. There can be no distinction between smoking of the so-called light cigarettes and regular cigarettes, the effects are identical [9].

The “Tobacco epidemic” represents a current global feature of tobacco consumption. It observes the link, both in the case of men and women, between the number of smokers at a certain moment of time and the mortality rate in each country, a few decades later. Tobacco epidemic has four distinctive models in tobacco consumption among population: an abrupt growth of smoking prevalence among male population; an increase of 50% or even more in the number of female smokers, an increase in the number of male smokers; a flat line and a slow decrease in the number of male smokers, a flat line for female smokers; a flat line followed by a decrease in the number of female smokers, continuous decrease in the number of men smokers.

The number of young smokers is higher than the number of aged people who smoke. This increase in the percentage of your smokers, at even lower ages, shall generate a superior percentage of people with a higher degree of addiction as they reach adult age and an earlier occurrence of smoking-caused diseases. The number of men who smoke is higher than the number of women who smoke. Although an increasing number of women start to smoke, this situation cannot be turned around. In the smoking epidemic, there is a turnaround between the social-economic status and smoking, from a positive association to a negative association [9].

An individual approach for quitting smoking includes pharmacotherapies and behavioral therapies. They are most efficient when combined with collective interventions.

Pharmacotherapy increases long-term probability to quit smoking [10]. Only 3% of smokers are able to quit smoking by themselves, by using their willpower. Success depends in to a great extent of motivation, and a combination of pharmacotherapy and behavioral therapy generates the best output.

The therapy of replacing nicotine by patches, chewing gum, pills, inhalers and nose sprays help easing the withdrawal symptoms that prevent many smokers from quitting. This therapy contains nicotine but it does not contain other toxic substances found in cigarettes, such as tar, carbon monoxide, nitrosamines.

Non-nicotine pharmacotherapy includes various types of drugs. Two of the most promising ones are bupropion and varenicline. These medicines are approved by the national authorities from different countries in order to help patients quit smoking. Bupropion is an anti-depressing drug that reduced the withdrawal symptoms and reduces the need to smoke. Varenicline is a partial antagonist of nicotine that prevents withdrawal symptoms and eliminates the sensation of pleasure that people experience when smoking.

Certain statuses or day-to-day activities can have a powerful impact on the desire to smoke a cigarette. Pharmacotherapy is not a treatment for these situations that trigger the necessity to smoke. Changing habits or activities associated to smoking is benefitting for success. Besides, motivation determined to a great extent the rate of success of quitting smoking. Some studies have concluded that the integration of behavioral therapy can increase the percentage of people who quit smoking by 50-100%. There is a wide range of psychosocial treatment options available, including counseling via internet or telephone, as well as individual and group counseling [11].

The goals of our study have been to assess smoking among patients in emergency care units and to identify the connections with the health status of these patients.

2. Material And Method

Demographic and Health Particularities of the People Included in the Study

The study group included a total of 431 people who came to the hospital, 49.88% (215) women and 50.12% (216) men.

The age of patients ranged between 18 and 93 years, with an average age of 66.46 years and SD of 12.157 years in the case of women, and 62.10 years and SD of 14.164 in the case of men (Tables 1 and 2).

Table 1. Age distribution of patients.

Age group (in years)	Number of patients	%
Under 19	2	0.5
20 -29	4	0.9
30 -39	18	4.2
40 -49	36	8.4
50 -59	80	18.6
60 - 69	113	26.2
70 -79	132	30.6
80 -89	45	10.4
Over 90	1	0.2
Total	431	100.0

Table 2. Patient age and gender distribution.

Gender	Number	Age (in number of years)			
		Minimum	Maximum	Average	Standard deviation (SD)
Feminine	215	19	86	66.46	12.157
Masculine	216	18	93	62.10	14.164

A particular importance was assigned to the personal medical history of patients, since many of them suffered from multiple disorders. The association of multiple pathologies shall have an impact in the practical solution applied to each particular case in the emergency care unit, thus generating an increased difficulty in establishing an accurate diagnosis and prescribing the appropriate treatment (Table 3).

Table 3. Distribution of patients based on their personal medical history.

Previous disorders	Number	%
Cardiovascular diseases	352	81.7
Neurological diseases	79	18.3
Renal diseases	59	13.7
Lung diseases	58	13.5
Tuberculosis	4	0.9
Hepatic diseases	61	14.2
Gastric diseases	60	13.9
Diabetes	99	23.0
Dyslipidemia	104	24.1
Chronic alcoholism	44	10.2
Psychiatric diseases	13	3.0

Cardiovascular diseases are the most frequent disorders, 81.7% (352) of the cases, followed by dyslipidemia, 24.1% (104) and diabetes, 23% (99). Neurological diseases can be found on the fourth place 18.3% (79), followed by renal, lung, hepatic and gastric pathologies, each of them having a percentage of approximately 14% (59). Chronic alcoholism can be found at 10.2% (44) of the patients, whereas psychiatric pathology could be found in 3% (13) of the cases.

Both World Health Organization and many other studies conducted during longer periods of time have revealed the „supremacy“ of cardiovascular diseases, the “number one killer” in Europe and worldwide [12–14].

Our working method was the **cross-sectional population study** on a group of patients of an emergency care unit, in an urban area from Romania. The questionnaire was elaborated based on specific medical records that have been approved, validated and standardized at the national level.

The study was conducted with written approval from the management of the hospital. The questionnaire was applied to each of the participants through direct interviewing. Patients were included in the study on their freely expressed consent in this respect, while also observing individual rights and guaranteeing the principles of anonymity, confidentiality and protection against potential negative effects.

Data working and interpretation was done by using modern methods of advanced medical statistics. The data was stored in electronic format by using Microsoft Excel and analyzed with PASW 18 (SPSS 18). The value of the significance threshold $p < 0.05$ has been considered as statistically significant, whereas $p < 0.01$ was considered to be statistically highly significant. The following statistical tests have been applied: the chi-squared test, the Mann-Whitney test, the Kruskal-Wallis test and the Pearson and Kendall correlations [15,16].

3. Results

3.1. Descriptive Analysis

✓ **Smoking by patients**

Out of the 431 patients, a percentage of 67.5% (291) are non-smokers, 14.6% (63) smoke less than sub cigarettes per day, and a percentage of 17.4% (75) smoke more than 20 cigarettes per day (Table 4).

Table 4. Distribution of patients based on cigarette consumption.

Do you smoke?	Number	%
No answer	2	0.5
Yes, less than 20 cigarettes/day	63	14.6
Yes, more than 20 cigarettes/day	75	17.4
No	291	67.5
Total	431	100.0

The number of smoked cigarettes has been put into relation with the male gender, (τ)=-0.418, $p=0.01$, the size of the effect being of 17.4%.

There have been some weak, negative connections, but statistically significant, between age and the number of smoked cigarettes ($r=-0.348$, $p<0.01$, $r^2=0.12$). Younger patients have the tendency to smoke more cigarettes than older patients.

3.2. Correlation Analysis

✓ **Correlations between health promoting behaviors and non-smoking**

The correlation between *fruit and vegetable consumption and non-smoking* is statistically highly significant, $p=0,01$, with a correlation coefficient of -0,170.

Working activities that imply physical effort and non-smoking are beneficial to health if they are associated, this fact has been revealed from their correlation with a coefficient of -0.117, which is statistically significant, $p=0.05$.

✓ **Correlations between health-risk behaviors and smoking**

Consumption of fat meat is associated with smoking as well, the correlation is significant, $p=0.01$, whereas the correlation coefficient is of 0.171.

The correlation between *daily consumption of saturated fats and smoking* is statistically significant, $p=0.01$, with a correlation coefficient of 0.164.

✓ **Correlations between pathologies and smoking**

There is a significant association between the diagnosis of *acute psychiatric pathology and previous tobacco consumption* in large quantities, $\chi^2(2)=8.91$, $p<0.01$, the diagnosis of acute psychiatric pathology being 3.57 times more frequent among people who smoke more than 20 cigarettes/day, compared with non-consumption.

A significant association has been identified between *the diagnosis of acute digestive pathology and previous tobacco consumption* in large quantities, $\chi^2(2)=7.14$, $p<0.05$, the diagnosis of acute digestive pathology being 2.3 times higher at people who smoke more than 20 cigarettes/day, compared with non-smokers.

4. Discussions

According to WHO's statistics, in Romania, the *smokers'* percentage is between 16.3-24% of the entire population. The percentage of male smokers was between 27.2% and 35.1%, much higher than the percentage of female smokers, approximately 10.4% [17].

In Romania, there is a percentage of 58% of the girls and of 71% of the boys aged 15-16 years, whereas 26% of the girls and 43% of the boys have smoked their first cigarette at the age of 13 or less [18,19].

According to ESPAD, the age at which young people start smoking keeps decreasing, down to 13-15 years, whereas 70-80% of young people aged between 15-16 years have smoked at least once [20].

The Global Youth Tobacco survey reported that the percentage of young Europeans who smoke is twice as high as the percentage recorded in the rest of the world [21].

The CORT 2004 study conducted in Timis county among pupils and students has revealed that smoking is the second risk behavior, that the percentage of boys who smoke is always higher than the percentage of girls who smoke, independently of their group age. The age at starting smoking is much younger in the case of boys, between the interval of 8 years and 17 years or more [19,22].

Smoking is an important risk factor for most diseases. A meta-analysis including 22 studies has shown that smoking doubles the risk of ischemic cerebrovascular accident. Observational studies have shown that cigarette smoking is a risk factor for ischemic cerebrovascular accident for men and women. If any of the spouses smoke, this can be associated with an increased risk for their life partner [23].

People who quit smoking decrease their risk of cardiovascular accident by 50%. In a control case study, ex-smokers showed a relatively lower risk than occasional or moderated smokers, whereas an inversed relationship has been identified between the time passed from the last smoked cigarette and the risk of hemorrhagic stroke. A prospective study conducted on 117006 women has observed the fact that former smoking women had a relatively lower risk of subarachnoid hemorrhage than active smokers and that the time duration from the moment when they had quit smoking was associated with a decrease of this risk [24-26].

As for the smokers' risk to develop cardiovascular diseases, numerous studies have been conducted in time. Thus, Nusselder and his collaborators, starting from the Framingham study, have studied 3 healthy behaviors (non-smoking, a normal weight, an increased level of physical activity) to prevent cardiovascular diseases and to increase life expectancy, on a number of 4634 people, during 36 years. The study revealed the following data: non-smokers had an increased life expectancy by 4.3 years for men and 4.1 years for women compared to smokers, and cardiovascular diseases occurred 3.8 years later for non-smoking men and 3.4 years later for non-smoking women [27]. Smoking causes coronary arteriosclerosis, which is the main mortality cause in the world, and quitting smoking as a primary prevention method reduces the frequency of coronary diseases by 7-47%, according to studies conducted in the United States. Patients who continue to smoke after an acute myocardial infarction, have a 22-47% higher risk to develop another infarction or to die suddenly [28].

Large-scale epidemiologic studies have shown that the smokers' risk of developing cancer bronchopulmonary is 20 times higher compared with non-smokers. This risk is correlated with the cumulative dose of cigarettes (the number and type of cigarettes, the numbers of packs per year), the nicotine content, the use of cigarettes with or without filter. It is estimated that 1 out of 7 smokers shall develop bronchopulmonary cancer. Bronchopulmonary neoplasm is 3-4 times more frequent at men than at women, and this is explained through the increased prevalence of male smokers. Quitting smoking decreases the risk of bronchopulmonary neoplasm – 15 years after quitting smoking, the risk becomes almost the same as for non-smoking people [29].

Patients with acute coronary syndrome and who also smoke have a double risk of acute myocardial infarction compared to non-smokers; this fact indicates that smoking has a strong prothrombotic effect. Evidence provided by observational studies have shown that people who quit

smoking have a rate of mortality reduced by one third during the next year, compared to the people who continue to smoke. Quitting smoking is probably one of the most effective secondary prevention measures. Patients do not smoke in the acute phase of the myocardial infarction, therefore convalescence is the ideal moment for specialized medical staff to intervene and support tobacco withdrawal. Nevertheless, re-starting to smoke is frequently encountered once the patient returns home, thus there is a need for continuous support and counseling during rehabilitation. Nicotine replacement therapy, bupropion and antidepressants can be useful. Nicotine patches can be safely used in cases of acute coronary syndrome. A randomized study has proven the effectiveness of the guided assistance program. Every hospital should adopt a smoke quitting protocol [30,31].

In the field of psychiatric pathology, during a study conducted in France, it has been revealed that, in the case of depressive people or people with suicidal thoughts, smoking is twice more frequent, alcohol consumption is three times more frequent, whereas drug consumption is 4 times more frequent or even higher, compared to people not suffering from depression. A connection between depression and nicotine addiction has been highlighted. Smokers have a double risk than non-smokers to develop a major depressive episode during a year. Reversely, a depressive episode could be a risk factor for starting to smoke. This association can be explained through a common vulnerability towards these two problems of genetic origin or through their common risk factors. Tobacco consumption is also associated with behavior disorders that could become basis for conflicts, depression and suicide tentative [32,33].

It is definitely conclusive to incriminate smoking into ulcerogenesis, since smoking is associated with a higher frequency of ulcer and the frequency of ulcer at smokers has a positive correlation with the duration of smoking. Besides, studies have proven that, in the case of smokers, healing of ulcer is delayed and recurrences are more frequent than in the case of non-smokers. Smoking cancels the inhibitory mechanisms of the gastric acid secretion and causes a decrease in the pancreatic aqueous alkaline secretion.

The risk index for the anticipation of recurrences includes four parameters: smoking, alcohol ingestion, first appearance at less than 40 years of age, endoscopic evidence of a scar and/or duodenitis. Patients having only two risk factors have a rate of recurrence of 20% within a year, whereas patients with all risk factors have a 100% rate of relapse [34,35].

Smoking is associated with the risk of developing gastric cancer with a relative risk of 2.7. The fact that men smoke more can also explain the higher frequency of gastric cancer at them, since in any given population men have a double incidence compared to women; in the case of people having a lower socioeconomic status, the frequency of gastric cancer is three times higher. Associating smoking with alcohol consumption increases this risk [35].

5. Conclusions

For *tobacco consumption*, the result was that 14.6% of the patients included in the study smoke less than 20 cigarettes per day, whereas 17.4% of them smoke over 20 cigarettes per day. A higher number of smoked cigarettes is correlated with the masculine gender, with an impact of 17.4%. Younger patients tend to smoke more cigarettes than older patients.

Significant correlations have been found between health promoting behaviors. Patients with an *adequate consumption of fruit and vegetables also have a sufficiently active life, do not smoke* and do not consume alcohol, they are people with a healthy lifestyle, and a healthy behavior can attract other behaviors as well.

The tendency of consuming fat meat in excess, saturated fats, salt is associated in many cases with smoking or with alcohol consumption, a tendency specific mostly to men. An unhealthy lifestyle can also be found in the nutritional behavior (excessive consumption of saturated fats, salt), insufficient physical activity and abusive consumption of tobacco and alcohol.

There is a significant association between the *diagnosis of acute psychiatric pathology and tobacco consumption*, since the diagnosis of acute psychiatric disease is 3.57 times more frequent in the case of people who smoke more than 20 cigarettes/day, compared with non-smokers.

Tobacco consumption is a risk factor that causes digestive pathologies to become acute, *the acute digestive pathology diagnosis* being 2.3 more frequent in the case of people who smoke more than 20 cigarettes/day, compared with non-smokers.

6. Ethical Issues

The research was conducted in accordance with the declaration of Helsinki. Ethical clearance obtained from "Victor Babeș" University of Medicine and Pharmacy, Department 13th Infectious Diseases, Pneumology Discipline research support officers. The research's objectives, benefit and risks were explained to the participants before data collection and obtained written informed consent from all respondents. The research participants were assured of the attainment of confidentiality, and the information they give us will not be used for any purpose other than the research.

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