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THE ANALYSIS OF THE LIFESTYLE-RELATED RISK FACTORS WITH AN IMPACT ON HUMAN HEALTH IN ROMANIA

POPESCU CRISTIAN GEORGE¹

Summary: *There's no doubt that the risk factors typical of a certain lifestyle which may have a negative impact on human health are numerous, especially considering that research in health (medicine, pharmacology etc) were focused on their determination, but especially on the cause-effect relationship. On the other hand, it's well known that people run a high economic risk when they don't invest in actions aiming to prevent certain diseases, especially when the disease risk grows. According to specialized studies, about 30% of all modern autoimmune diseases, among which there is cancer, are due to the eating habits. Considering that there are several risk factors, we realize the importance of studying the food factor, especially from the point of view of statistic research regarding food consumption in Romania and it's important to point out the dangers hiding behind these foods. The most important ones are: water and air, refreshments, meat and meat products, sugar, cigarettes and alcohol.*

Key words: *lifestyle, risk factors, habitats, pollution, food pollution*

MATERIAL AND METHODS

1. Water and air

Water is the basic nourishment which ensures the existence of life on Earth. Many studies have been conducted regarding the importance of water and its contribution to maintaining the health and the psychological balance in certain areas. Considering the origin of water, it may be: water coming from the subsoil layers (underground water), treated and pumped water (network water) and treated and bottled water (consumption water).

a. The water coming from the earth subsoil

According to specialized studies (Ana M. M., 2014), the pollution sources of underground water may located at the land surface or under the ground. According to the same source, the main pollution sources would be: excessive extraction from wells; the introduction of pollutants through surface waters (used water, insufficiently treated water, water polluted by solid waste, water polluted by household sewages or the treatment of used household water, the excessive use of chemicals in intensive agriculture or accidental drains); excessive salinity (in drought areas with little underground water); pollution due to defective sewage systems; pollution due to inadequately used water treatment plants.

b. Network water

The main problem of this type of water would be the excessive chlorination for the purification of water the removal of urban pollutants and the pollutants resulted from industrial and agricultural activities, according to point a. There is a series of authors (Vasilescu M., 1996) who confirm the carcinogenic effect of network water. Through a study of drinking water performed on 702 water samples during 1988-1996 (Vasilescu M., 1996), the same author shows that in most these samples the maximum admitted concentration of chlorine is exceeded, reaching 0.5 grams per cubic meter and pesticides. All this research shows that network water as well as surface water have a high degree of contamination, on one hand due to the numerous pollutants coming from industry and agriculture and on the other hand due to the treatments which are taken to the maximum level of concentration of the allowed substances, such as the chlorine from the network water.

c. Bottled water

The amount of daily water necessary for the body (Molnar I, Morar A., 2011) is 35 ml water/kilogram body weight, which means that the average for adults is 3.15 liters and considering the fact that by means of the daily diet, 1/3 of the water is provided through the consumption of foods, then there remain approx. 2 liters of water/day to be consumed by an adult.

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According to a simple calculation in order to estimate the volume of water necessary only for consumption for the Romanian population, we consider an average of 2 liters of water for adults and 1 liter of water/day for children (under 15 years of age). Considering that in 2011 the adult population was made up of 18111 thousand inhabitants and the population under 15 was made up of 3175 thousand inhabitants, through a simple calculation, we obtain approx. an amount of 14000 thousand cubic meters of water (or other liquids) necessary for the annual consumption in order to meet the water demands of the Romanian population. According to a report of the Romanian Center for the Promotion of Foreign Investment, in the year 2010 Romania had a domestic output of bottled mineral water dedicated to the domestic market which amounted to approx. 920 thousand cubic meters and, considering that in the same year, the consumption of non-alcoholic beverages per capita amounted to 163.7 liters, this means a consumption of approx. 3520 thousand cubic meters. All these calculations give us the following statistics regarding liquid consumption in 2010: the consumption of bottled water amounted to 920 thousand cubic meters and the consumption of network and well water amounted to 10,480 thousand cubic meters (only human consumption). This means that 75% of the population of the country consume network water or well water and these people are predisposed to diseases due to the pollution of these sources.

Air

Air is a component which is specific of lifestyle which may have a devastating impact on human health, especially in the heavily polluted areas.

Air is vital for health, and it is one of the main sources for the decline of the immune system in children and elderly people (WHO, World Cancer Report, 2014), according to a study called "The quality of air in Bucharest". The impact on the health of the population living in the capital presented in a study for the year 2010 which was carried out by the Center for Sustainable Policies - Ecopolis. According to this study, the capital of the country is deeply affected by air pollution, as the admitted limits of the main pollution indicators are exceeded in almost all Bucharest areas. For instance, on 23 December 2010, the inhabitants of Bucharest breathed an air with PM10 concentrations (powders in suspension whose diameter was below 10 micro meters) which were three times over the admitted limit and PM2,5 concentrations which were 6 times more than the admitted limit. The effects of pollution on the inhabitants of Bucharest are extremely serious; if during the 5-year period of monitoring, more precisely between 2004 and 2009, the admitted limits of pollutants had been observed, then over 800 adults and approx. 230 newborn babies would have been saved. According to the same study, the state would have saved over 400 thousand lei, but the indirect costs caused by pollution could not be quantified, such as the hospitalization of the people who got ill or their retirement. The effects of the pollution of the air in Bucharest (as the most representative place of Romania with the higher incidence on a numerous population) with an economically quantifiable impact on human health, may be enumerated in the table below.

Table - The economically quantifiable effects of air pollutants on health, according to WHO.

Tip de poluant	Efecte pe termen scurt cuantificabile economic	Efecte in expunerea pe termen lung
Pulberi in suspensie (PM10 si PM2,5)	Reactii inflamatorii la nivelul plamanului	Cresterea simptomelor respiratorii
	Efecte negative asupra sistemului cardiovascular	Scaderea functiei respiratorii la copii
	Cresterea consumului de medicamente	Cresterea prevalentei bolilor respiratorii obstructive
	Cresterea numarului de internari	Scaderea capacitatii vitale la adulti
	Cresterea mortalitatii	Scaderea sperantei de viata prin cresterea patologiei cardio-pulmonare si posibil a cancerului pulmonar
Ozon (O3)	Efecte adverse asupra functiilor plamanului	Diminueaza dezvoltarea normala a plamanului
	Reactii inflamatorii respiratorii	
	Efecte negative asupra sistemului respirator	
	Cresterea consumului de medicamente	
	Cresterea numarului de internari	
Dioxid de azot (NO2)	Scaderea functiilor respiratorii, mai ales la astmatici	Scaderea functiilor normale ale plamanului
	Cresterea reactiilor alergice respiratorii	Cresterea posibilitatii dezvoltarii unor simptome respiratorii
	Cresterea numarului de internari	
	Cresterea mortalitatii	

Source: WHO Air quality guidelines for particulate matter, ozones, nitrogen, dioxide and sulfur dioxide. Global update 2005, Geneva 2006, page 19

What stands out in this table would be the effect of pollution on the occurrence and evolution of lung cancer, a risk which is also specified in the study on cancer carried out in 2014 by WHO, World Cancer Report, 2014, through worldwide research. In the previous reports, assessing the costs of the treatment for lung cancer patients, considering both direct and indirect costs, the state and the patient's family have to pay approx. 45994 lei a year. Considering that in Romania there have been approx. 8367 new cases and 9549 deaths on average in the last 6 years, the costs for the oncologic therapy of cancer patients amounts to approx. 85.5 million Euros.

2. Refreshing drinks

The consumption of refreshing drinks in Romania has increased considerably in the last 20 years by 805%. Sodium benzoate E211 is used as an additive for the preservation of refreshing drinks in our country. This substance is prohibited in other UE states and worldwide and it is replaced by potassium sorbate E202, which is more expensive than the first one. From the point of view of the impact on the health, the specialists (Chirila P, 2010) consider sodium benzoate to be a carcinogenic substance which has other negative effects on the health, too, such as rash and it's prejudicial to bronchial asthma. This substance is on the list of powerful carcinogenic substances in some treaties on oncologic medicine (WHO, Oncology, 2015). There are also other dangerous substances which are part of the composition of refreshing drinks, such as : sugar or sugar substitutes, artificial coloring, synthetic aromas. All these substances which are found in high amounts in refreshing drinks make consumers more likely to become ill depending on the frequency of the exposure to this risk. We cannot enumerate the refreshing drinks which expose people to this risk because all of them contain these substances to a lesser or higher extent, and ecologic drinks are the only exception, for which the authorities that certify these products do not allow the use of non-ecologic harmful substances. Nevertheless, as the law of ecologic products allows up to 5% of non-ecologic substances to be introduced on the list of the products which are approved by the certification bodies through UE regulations, the interpretation of the law is abused and more similar harmful substances are introduced, with a negative impact on human health (where there are such substances in the ecologic products, they are in much lower amounts, up to 1/3 of the allowed

amount in conventional refreshing drinks). According to oncologic pathology treaties, the people who consume refreshing drinks run the risk of developing gastrointestinal cancer (liver, pancreas, colon, stomach) (WHO, Oncology, 2015). In Romania, gastrointestinal cancer has a high incidence, it's practically the second cause for disease after lung cancer; in the new cases which were diagnosed in only 5 years, between 2007 and 2012, it experienced a 10% increase.

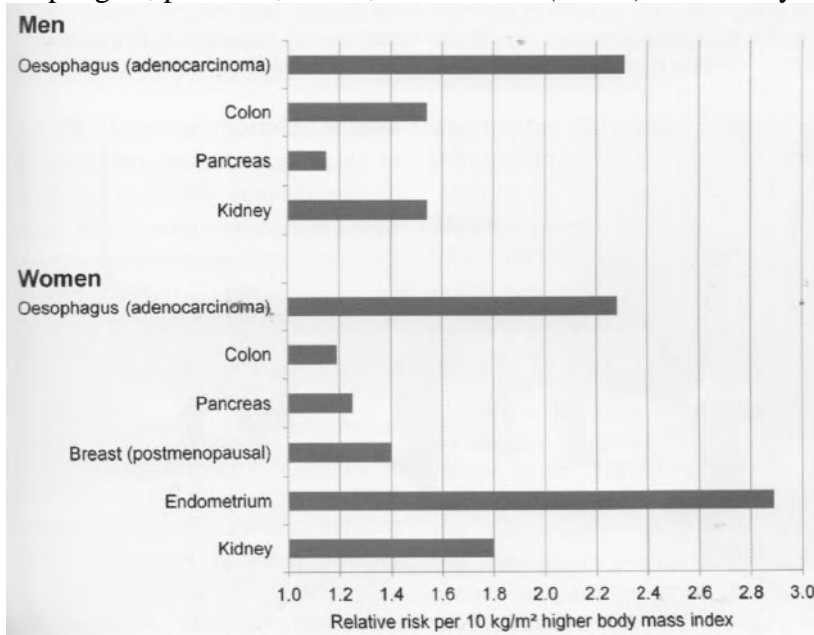
3. Meat and meat products

Even if meat in itself is considered a basic food by many specialists, as it contains nutrients which are important for children or the treatment of anemia (Fauci A.O., 2000), the abuse of meat may cause health problems. The abuse of animal fats leads to ischemic diseases and the increase of mortality due to cardiovascular diseases (Fauci A.O., 2000); this effect is recognized by specialists through studies performed in various countries. According to specialists (Fauci A.O., 2000), the abuse of meat is also responsible for other diseases, such as gout, pancreatitis, uric acid lithiasis, dermatosis and others. According to the same source, the negative effects of meat consumption do not show at once, but after longer periods of time, especially later in life when several diseases induced by this abuse may appear. Based on this fact, after a long research on the relationship between lifestyle and cancer in Brazil, Dr. Annie Sasco concluded that the incidence of this disease is high in this country, even if the diet is poor, considering that the consumption of meat is very high, 3 times a day.

Meat products contain harmful substances which are used as preservers and may be very harmful to health, especially if the frequency of their consumption increases. The food industry includes also other substances which have nothing to do with meat, such as genetically modified soya, antibiotics and other harmful substances like the E type ones. All these substances which are introduced in meat products are very harmful, but we should mention the meat preservers which are used on a large scale in the entire food industry in the whole world, called nitrates or nitrites, E 240, E 250, E 252. Due to gastric acid (Fauci A.O., 2000) and high temperature, these substances turn into nitrosamine, which is the substance that is used in the lab in order to induce hepatic cancer in guinea pigs. The higher the consumption frequency is, the higher the risk of cancer is. In America, this substance was forbidden with lactic acid bacteria. In Europe, this substance is allowed, it's even compulsory to be used in the meat industry, and in Austria its use is compulsory even in ecologic products (it is used to a lesser extent, up to 1/3 of the admitted dose for conventional products).

Red meat and especially red meat products are associated with a high risk of colorectal cancer (World Cancer Research Fund/American Institute for Cancer Research, 2007). In Romania, the consumption of red meat and meat products has risen considerably by 12% in the last 20 years, and if we look at the statistics regarding the evolution of colorectal cancer, we notice a 5% increase in the last 10 years. There are also other animal meat products, such as milk products, which were associated with a low risk of colorectal cancer (WHO, World Cancer Report, 2014). The induction of the risk of obesity may result in the occurrence of a disease with every extra 10 kilos, according to figure 4, like male esophageal, colon, kidney and pancreas cancer or female uterus, esophageal, kidney, pancreas and colon cancer.

Figure - The relationship between the Body Mass Index with the risk of development of esophageal, pancreas, breast, endometrial (uterus) and kidney cancer.



Source: World Cancer Report 2014, page 129

4. Sugar (and substitutes) and margarine

According to literature, sugar is also called "white death". This name appeared because of the serious problems it may induce through known diseases, such as diabetes or in connection with another factor such as the occurrence of fats in the blood, which increases the risk of cardiovascular (Fauci A.O., 2000) diseases or, as Dr. Schreiber (David S., 2008) would say, cancer is fed by sugar. Other risks of disease for sugar consumers would be: the increased frequency of caries (Burger G. C., 1985), the risk of microbial pollution, the rise in the number of patients with ulcero-hemorrhagic rectocolitis and Crohn disease (Gotschall E., 1994), but also obesity, involving other disease risk factors. Other substances which were invented in order to replace sugar are aspartam, saccharine, cyclamates. For the time being, due to their recent appearance, not all the effects on human health are known. The oldest product is aspartam which appeared in US in 1965, and today it is marketed all over the world, and its harmful effect is already known. According to some authors, aspartam is considered to be one of the most dangerous substances on the food market, which plays an important role in the appearance of many diseases, according to the same authors: it is responsible for the appearance of brain tumors (it's very used in chewing gums), multiple sclerosis, epilepsy, extrapyramidal syndromes, Alzheimer disease, mental retardation, lymphomas, malformations and diabetes. According to the US Food and Drug Administration (FDA), aspartam develops about 75% of the side effects of food additives. Saccharine was forbidden in USA in 1997 but subsequently it was reintroduced provided the label bore the marking "carcinogenic" and later, under the pressure of the food industry, this warning was dropped.

Margarine is a product which entered the market as a substitute for butter, but it has an extremely harmful effect on human health, as compared to butter. In order to understand better what a non-natural product is, the easiest way is to see how it's made, namely: the refined oil in combination with a nickel powder, heated at a temperature of approx. 400 degree C, are well shaken and then treated with industrial hydrogen. After cooling off, they result in margarine, to which all sort of organoleptic substances are added for taste, smell etc. The advantages of this product would be that it doesn't spoil as soon as butter, may be kept at room temperature, may be easily spread on bread and it doesn't get rancid. From the point of view of the impact on health, this food is a disaster. The negative effects manifest themselves through inflammatory processes, whose risk of occurrence is increased by the hydrogenation process (World Cancer Research Fund/American

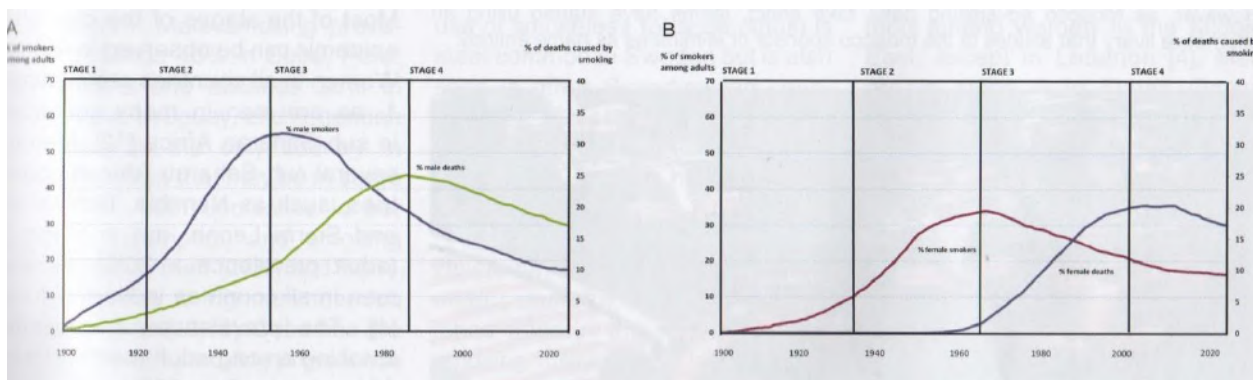
Institute for Cancer Research, 2007). According to Schreiber (quoted paper), but also other specialized studies (World Cancer Report, 2014) margarine consumers have a high risk of developing breast cancer, obesity (as we showed, it may induce an entire series of other diseases) and inflammatory syndromes.

5. Cigarettes and alcohol

There are approx. 1.3 billion people in the world using cigarettes (Glynn T., Seffrin JR, Brawley OW, 2010) under different forms by smoking. According to specialized medical studies (World Cancer Report, 2014), cigarette consumption leads to numerous causes for disease, but with a significant impact, causing death from the following diseases: cardiovascular (1.69 million people die every year), pulmonary chronic obstructions (0.97 million deaths), lung cancer (0.85 million). Smoking, just like all the other diseases caused by an inadequate lifestyle, does not appear immediately, and the body doesn't show any signs of not tolerating this vice. Figure No. 5 shows the graphics for the evolution of the diseases caused by cigarette consumption, which cause death both in men and women. These statistics shows the reason why the statistically approximate period is about 30 years, from the moment someone develops this vice until they become ill. So, the young people who start smoking at 20 years of age are fairly likely to develop a serious, incurable disease by the time they are 50, which causes their death. According to Figure 5, there is a close connection between smokers and deaths caused by smoking, with an average delayed action during the 30 years.

As to the way European citizens feel about smoking, according to a European Commission 2012 report, Romanians were the most reluctant to give up this vice in the entire EU (1 out of 10 Romanians is willing to give up smoking). According to the same study, a lot of cigarettes are used in Romania: after Bulgaria and Lithuania. Romania occupies the third place with a 93%. The most important reason why Romanians start smoking is given in 82% by the answers of the respondents who say they were influenced by their friends who smoked.

Fig. The evolution stages of smoking correlated with mortality caused by smoking (in men and women)



The most spread disease in Romania, caused mainly by smoking, is lung cancer (14.22% of all cancer cases). In the previous report, we made a few referrals to the statistic data concerning the evolution of lung cancer, but also the costs of treatment as compared to the costs for the early detection and prevention of lung cancer.

Few smokers know that cigarettes are dangerous especially to their chemical content including over 7000 components, many of which are considered as carcinogenic (World Cancer Report, 2014). So, these components make the body ill by many ways, including by genetic mutations which can be transmitted to the fetus, inflammations, oxidation or epigenetic changes. The specialists (World Cancer Report, quoted source) draw attention to the products people use in order to give up smoking, which contain over 3000 such chemicals, many of which are carcinogenic.

According to the latest epidemiologic studies and the above quoted source, apart from cardiovascular diseases, there are 14 different types of cancer caused by smoking, the most important of which is lung cancer and the products smokers use in order to give up smoking cause oral cavity and pancreas cancer.

Considering all these important details regarding the unquestionable negative impact of smoking on human health, approx. 30% of the Romanian respondents declare they are smokers (UE-EC report, 2012) (the questionnaire was applied on a representative sample in relation to the entire Romanian population), as opposed to the 28% average in EU. Only 12% of these smokers would give up smoking; this is the lowest rate in the EU. This fact regarding the attitude of the population of our country towards this vice which is very likely to cause an incurable disease leads us to the conclusion that, on one hand, a lot of stress should be laid on fighting against this consumption through prevention actions (which, according to report No. 1, are ineffective, both in terms of the assigned budget and especially in terms of communication with the target group) and, on the other hand, smoking must be discouraged by increasing cigarette price continuously, but also by other means which are available to government associations.

Alcohol does not have so many negative effects as smoking, but it's important due to the increased consumption of alcoholic beverages and pure alcohol in the last 20 years in Romania (as we already showed in report No. 2). The negative impact on alcoholic beverages on health is caused mainly by the adverse effects of the substances which are introduced or contained in these beverages, out of which ethanol induces a toxic effect at a genetic level due to acetaldehyde complexes, a predominant agent in the occurrence of cancer, according to Jurgen Rehm and Kevin Shield ((World Cancer Report, 2014). In a study on the connection between the average daily alcohol consumption and the relative risk of cancer, the same authors showed that the alcohol consumers' risk of becoming ill rises with the consumption dose and the patients are exposed to the following types of cancer: mouth and oropharyngeal cancer, esophageal cancer, laryngeal cancer, breast cancer (for women), liver cancer, rectal cancer and colon cancer. For instance, the risk of developing mouth and oropharyngeal cancer is 9.5% for a daily alcohol consumption of 150 grams. Nevertheless, according to several studies, there are statistics according to which the cautious and moderate consumption of alcohol is beneficial to health. According to Dean Edell (Dean E., 1999), the French men who drink two glasses of wine a day are confronted with 35% less cardiac deaths and 25% less deaths from cancer, and according to compared statistics, although French people consume more animal fats than Americans, cardiovascular mortality in France is 2.5% times less. Of all alcoholic beverages, it seems that red wine is the best beverage for people's health (World Cancer Report, 2014), as it contains the most flavonoids which prevent the formation of clots, and phenolic compounds including catechins, antocyanins and tannins which bring down cholesterol; thus, this product acts as a preventive natural drug for health. The most important thing for these products is to limit the preservatives which are put in the wine in order to preserve it for a long period of time; the most important ones are sulfites. Therefore, the less chemicals are used, the more valuable the products are to health. Stress is laid on the ecologic products belonging to this product range and solutions have already been found in order for certain sorts of ecologic wines to be made without sulfites.

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