Studii şi Cercetări	Martie 2019	Biologie	28/2	47-53	Universitatea"Vasile Alecsandri" din Bacău

AN INDIRECT METHOD OF RISK ASSESSMENT OF CHILDREN'S CANCER

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***Key words**: cancer in children, risk factors, indirect evaluation, prevention*

INTRODUCTION

Cancer cases are increasing worldwide, in all age groups, the main cause being, according to experts, industrial development.

According to a national study on the impact of this disease on the Romanian society, in the last two years over one million Romanians have been diagnosed with one form or another of cancer, and another 4 million people have had at least one family member. diagnosed with this disease. Regarding the frequency of cancer in children, there are currently about 6,000 cases of children with cancer.

Knowing the risk factors and how to prevent a serious multifactorial disease such as cancer are topics of particular interest to students.

Forming a healthy eating behavior, avoiding smoking and alcohol consumption, avoiding sedentary lifestyle, avoiding the excessive use of the current technology (telephone, television, computer) emitting dangerous radiations are things that can protect the health of the present child and the future adult, who, being informed on some risks, he will be able to act consciously and responsibly, so as to minimize the risk of cancer, even in the context of living in an increasingly polluted environment.

Knowing that an unbalanced and deficient diet can cause undernutrition, overweight or obesity, which can be possible starting points for the occurrence of cancer, we conducted a brief research highlighting possible cases of students from two schools in the city of Bacau, which presents such disorders. Also, the skin type was taken into consideration, to evaluate the students' resistance to UV radiation and whether there is a potential carcinogenic risk. The students surveyed were asked about the history of cancer cases in their families, their habits and their parents' smoking or alcohol consumption, risk factors that may increase the incidence of cancer.

MATERIAL AND METHODS

The study was conducted between October 2018 - February 2019 on a sample of 53 students, all students being in the 7th grade, with ages ranging from 13-16 years, the average age being 14 years.

This sample consists of three groups of students, as follows: from the "Octavian Voicu" High School in Bacau, 7th grade A with 26 students (16 boys and 10 girls) and 7th grade B with 14 students (11 boys and 3 girls), and from School no. 9 (structure of the "Mihai Dragan" High School in Bacau) 7th grade with 13 students (9 boys and 4 girls). Following the agreement from the individuals studied and their parents, the subjects were:

- fit into one of the 4 tiny skin types of skin (after Th Fitzpatrick);
- measure with the roulette wheel and weigh with the help of the electronic scale, to calculate the BMI, index that highlights the development of the body mass;
- interview about the history of cancer cases in their families;
- interview about their or their parents' habits if they smoke or if they are alcohol dependent;

The data obtained were entered in electronic form in the form of tables and graphs.

RESULTS AND DISCUSSIONS

The interpretations were performed on classes and sexes, following if there are risks of cancer, taking into consideration the above factors (BMI, skin type, family history, toxic substance use: alcohol and / or tobacco). The study of the frequency of the 4 types of skin at the height of the two schools and the interpretation of the risk of the disease according to the type of skin (according to Thitz Fitzpatrick).

The results are presented in table 1, figure 1.

Table 1. Skin type in the investigated students

Class	Skin type (I) - very high risk	Skin type (II) - high risk	Skin type (III) - moderate risk	Skin type (IV) - very low risk
7th grade A	1	7	13	5
7th grade B	-	-	8	6
7th grade S	-	1	8	4
Total students 53	1	8	29	15

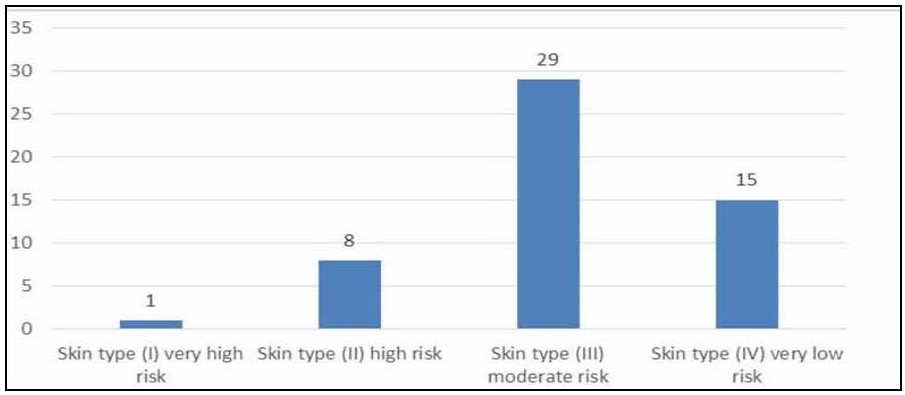

Fig. 1. Frequency of the 4 skin types in the students studied

According to American dermatologist Thomas Fitzpatrick, the risk of skin cancer depends, among other things, on the type of skin. According to his opinion, there are 6 types of leather, 4 of which are relevant in Europe.

The transitions from one type to another are fluent, but, in principle, the more the skin is lighter in color, the more sensitive it is.

- - Type I-skin striking open, with freckles, blue eyes, reddish hair. In the heat of summer it suffers sunburn after several minutes, it does not tan.
- - Type II-blonde hair, gray, blue or green eyes. Unusual skin with the sun is reddened after 10-20 minutes, but over time it tones moderately.
- - Type III-hair blond-dark, gray eyes or goats. Unburdened, it can stand in the sun for 20-30 minutes, before a sunburn occurs. After repeated exposures, intense bronze.
- - Type IV-most often appear dark in color and goat eyes. The dark-brown skin remains largely relieved by sunburn. Unusual skin with the sun turns red at the earliest after 40 minutes.

It was found that most students have type III skin (54.71%), having a moderate sensitivity to prolonged sun exposure, the next type of skin with high frequency (28.30%) is type IV, more resistant to the action of UV rays. The other two types of skin II and I have lower frequencies, 15.09%, respectively 1.88%, being rarer skin types, but also the most susceptible to prolonged action of UV radiation, with an increased risk of sunburn.

The majority of students (83.01%), belonging to the skin types III and IV, therefore, have a low risk of developing skin cancer following repeated and prolonged sun exposure. they have been advised that during the summer vacations especially do not exaggerate with the sun exposure in the interval 11-16, when the solar radiation is at a maximum level.

The minority (16.98%), represented by skin types II and I, were advised to follow the doctor's recommendations regarding sun exposure, limiting it as much as possible in the morning and evening hours, with low UV radiation, and using mandatory creams. sunscreen because these skin types are at increased risk of developing skin cancer.

Interpretation of the risk of illness of the students according to the values of the BMI

BMI is the weight (kg) divided by the height of the individual (m) squared. The calculation formula is: Weight: Height 2 = BMI (kg / m).

BMI is the scale on which the underweight, the normal weight and the overweight are determined. The results are recorded in table 2, figures 2 and 3.

Table 2. BMI values for the investigated students

Class	Degree of disease risk									
	<18.5 (Subweight) - increased risk		18.5 - 24.9 (Normal) - lowest risk		25 - 29.9 (Overweight) - increased risk		30 - 34.9 (Obesity gr. I) - high risk		35 - 39.9 (Obesity gr. II)- very high risk	
7th grade A	8		13		4		1		-	
	6 boys	2 girls	8 boys	5 girls	2 boys	2 girls	-	1 girl	-	-
7th grade B	3		7		2		1		1	
	2 boys	1 girl	5 boys	2 girls	2 boys	-	1 boy	-	1 boy	-
7th grade S	4		9		-		-		-	
	3 boys	1 girl	6 boys	3 girls	-	-	-	-	-	-
Total students	15		29		6		2		1	
	11 boys	4 girls	19 boys	10 girls	4 boys	2 girls	1 boy	1 girl	1 boy	-

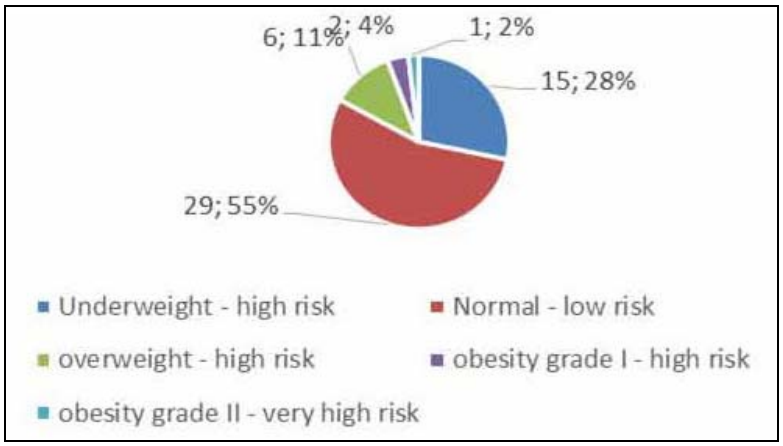

Fig. 2. The percentage of students of the students according to the BMI values

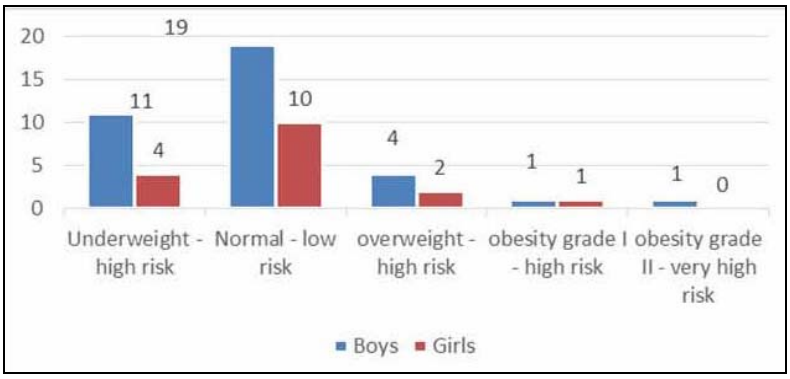

Fig. 3. Numerical representation of students according to the BMI values by sex

Analyzing the final results obtained, we find that:

- most students (54.71%) have a normal weight, presenting the lowest risk of illness;
- the next category of students, represented by a percentage of 28.30%, falls in the category of underweight children, having a slightly lower weight than the normal one, and an increased risk of illness, having a lower immunity;
- 11.3% of the students are overweight, having an increased risk of illness, due to their weight above the normal limit;
- 2 cases of students with first-degree obesity (3.77% of total students) were registered, with a high risk of illness and 1 case of second-degree obesity (1.88%), with a risk very high disease.

Summing up the cases of overweight, grade I obesity and grade II obesity, it results in a percentage of 16.98% of the total number of students studied, in which the risk of illness is high or very high.

Also, taking into account the number of cases of underweight students and cases of overweight students, it is found that there have been more cases of underweight students than overweight or obese students, both categories with increased risk of illness.

With BMI values too low or too high, the risk of illness is high or very high in 45.28% of the students studied, while in those with normal BMI values (54.71%), the risk of disease is the lowest.

The values found are an alarm signal, both for the students and for the parents of these students who, due to an unhealthy diet, both quantitative and qualitative, had values either too low or too high of BMI, with the risks of related diseases.

That is why it is necessary to correct the diet, an active lifestyle, avoiding sedentary lifestyle, and carrying out periodic medical checks, to monitor the health of children with high and very high risk of illness.

Regarding students with normal BMI values, they are advised to maintain a varied and balanced diet, preventing illnesses resulting from unhealthy eating.

Interpretation of cancer risk related to the history of cancer cases in the families of the students studied

The results are recorded in table 3, figure 4.

Table 3. Students with family history of cancer cases

Class	Number of students	Students with a history of cancer cases in the family
7th grade A	26	3
7th grade B	14	3
7th grade S	13	3
Total students	53	9

Analyzing the obtained results it is found that there is a small percentage of students in whom there have been cases of cancer disease in the family.

Out of a total of 53 students, only 9 said they had relatives with cancer (16.98%), the rest saying they had never had cases of cancer relatives.

From this it can be concluded that the risk of cancer disease transmitted based on a possible genetic inheritance is reduced to only 16.98% of the sample of students studied.

Interpretation of the risk of illness of students related to tobacco and alcohol consumption in their family. The results are recorded in table 4, figures 5, 6, 7, 8.

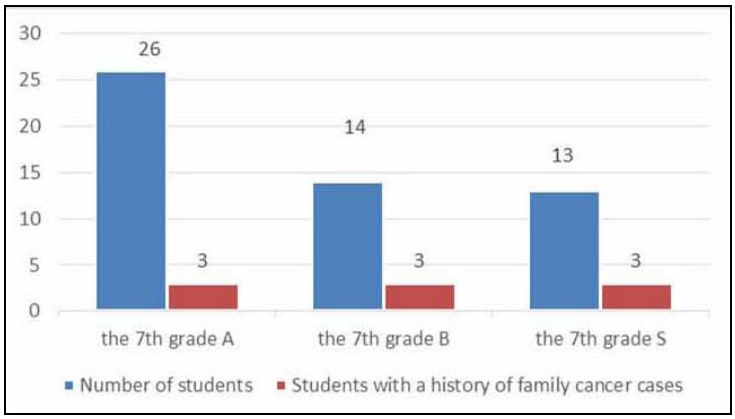

Fig. 4. Frequency of students with a history of cancer cases in the family, by class

Table 4. Students at risk of illness related to tobacco and alcohol consumption in their family

Class	Smoking students	Students who use alcohol occasionally	Students with smoking parents	Students with alcohol dependent parents
7th grade A	3	2	15	1
7th grade B	4	7	6	3
7th grade S	2	8	8	-
Total students (53)	9	17	29	4

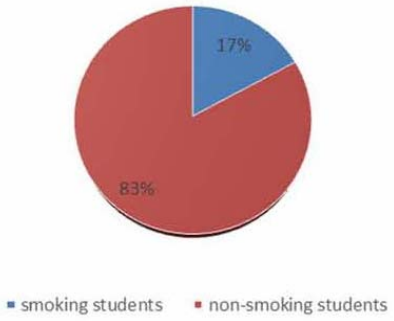

Fig. 5. The percentage of smoker students from the 7th grade - both schools

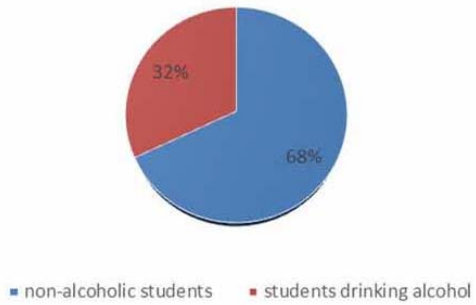

Fig. 6. The percentage of students who occasionally consume alcohol from the 7th grade - both schools

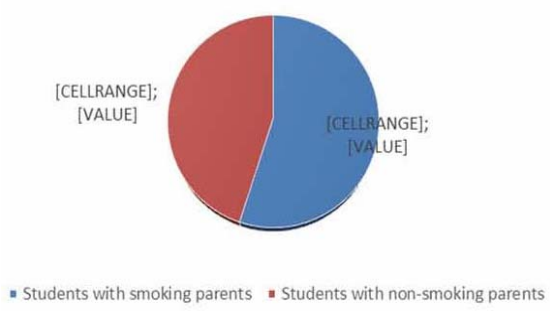

Fig. 7. The share of pupils with smoking parents from the 7th grade - both schools

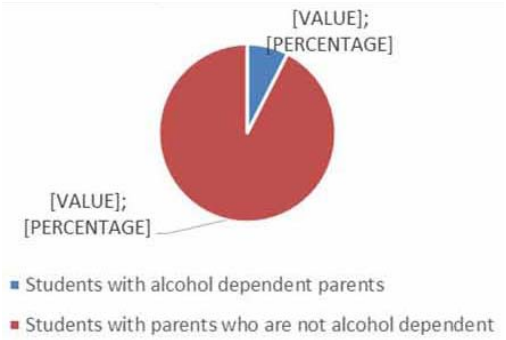

Fig. 8. The share of students who have alcohol dependent parents from the 7th grade - both schools

Based on the interviews and questionnaires given to the students it was found that:

In the 7th class A (26 students) there are 3 cases of students smoking, all boys (one of whom also consumes alcohol occasionally). 15 students have smoking parents, either only one or both. Of these students with smoking parents, one student is already a smoker and occasional alcohol user. In the same class there are also 2 cases of students who sometimes consume alcohol (a boy and a girl). Only one student has parents dependent on alcohol, but non-smokers.

In the 7th grade B (14 students) there are 4 cases of students smoking (3 boys and one girl). Out of the total of 14 students, 6 have smoking parents. Also in this class there are 7 cases of students who consume alcohol, moderately or rarely (5 boys and two girls). Three students have parents who consume tobacco and alcohol.

In the seventh grade S (13 students) there are 2 cases of students who smoke (both being boys, one of them with smoking parents). 8 of the 13 students have smoking parents. 8 students (5 boys and 3 girls) said they sometimes consume alcohol (one of the students is a smoker). None of the students has parents dependent on alcohol consumption.

Analyzing the obtained results it was found that more than half of the students surveyed had either one or both parents smoking (54.71%) and that 16.98% of the students are already smokers, most of them being boys.

On the one hand, a major risk to the health of children who are already smokers, but also a potential risk for those children whose parents smoke, being aware that passive smoking is one of the important risk factors for many diseases. parents can affect the child's behavior regarding the consumption of toxic substances, making him more receptive to their acceptance in his life.

A fairly high percentage of students, about 32%, said that sometimes they consume alcohol, which is not a good thing, because at an early age alcohol dependence settles much faster than in the case of adults.

On the other hand, this also shows the desire of children to be considered already mature, imitating a behavior that is found among adults.

Only 7.54% of the students stated that they have alcohol dependent parents, a much lower percentage compared to those of students with smoking parents. and alcohol consumption among children, the first step should be taken by their parents, by giving up smoking or excessive alcohol consumption.

CONCLUSIONS

- Referring to the skin type of students, it was found that most students have type III skin (54.71%), having a moderate sensitivity to prolonged exposure to the sun, the next type of skin with high frequency (28.30 %) is the type IV, the most resistant to the action of UV rays. The other two types of skin II and I have lower frequencies, 15.09%, respectively 1.88%, being rarer skin types, but also the most sensitive to the prolonged action of UV radiation, with an increased risk of sunburn. The highest risk of sunburn is type I skin, and the lowest risk is type IV skin.
- The BMI of the analyzed cases varies, so that in the secondary school we have predominantly normal weight individuals, but also underweight and overweight individuals. Most students (54.71%) have a normal weight, presenting the lowest risk of illness. The rest of the students (45.29%) are categories of students with high or very high risk of illness: 28.30% underweight students, 11.3% overweight students, 3.77% students with first grade obesity and 1.88% 2nd grade obese students.
- Analyzing the history of cancer cases in the students' families, it was found that the risk of cancer disease transmitted based on a possible genetic inheritance is small, being only 16.98% of the sample of students studied.

- Regarding smoking among students, it was found that 16.98% of the students are already smokers; more than half of the students surveyed (54.71%) have either one or both parents smoking, which is quite serious regarding the negative effects of passive smoking.
- A rather large percentage of students, about 32%, said they sometimes consume alcohol, which is a potential risk factor for the appearance of alcohol dependence and cancer. Only 7.54% of the students declared that they had alcohol dependent parents, a much lower percentage compared to the students with smoking parents.

ABSTRACT

Between October 2018 - February 2019, a study was conducted on the degree of risks of developing some diseases, including cancer, on a sample of 53 students, all students being in the 7th grade, aged 13-16 years, the average age being 14 years.

The interpretations were made on classes and sexes, following if there are risks of cancer, taking into consideration the following factors: BMI value, skin type, family history, consumption of toxic substances, alcohol and / or tobacco. The results show that there are a significant number of students at high risk for illness.

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