EVALUATING THE DIETARY RISK FACTOR ASSOCIATED WITH THE INCIDENCE OF CARDIOVASCULAR DISEASES

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Abstract:

Diminishing the incidence of the main cardiovascular diseases by increasing the population's awareness with regards to the interconnection between dietary risk factors and the prevalence of cardiovascular diseases, was the main purpose of this study.

This study represents a qualitative sociological investigation, conducted during the interval 2005-2008 upon a number of 3250 persons, who visited the consulting rooms of 10 general practitioners from Oradea. Data were extracted from questionnaires.

The largest percentage of patients is represented by the feminine population (1280 women, 53,9%), the masculine population being represented by only 1096 persons (46,1%); in terms of age groups, the elderly population outnumbered the other age categories: about 60% of the patients were over 50; 50% of the persons who answered the questionnaire have finished high-school (49,7%), while over 30% (34,1%) have graduated from higher-education institutions. 70,5% of the patients were overweight: 26% suffered from mild (degree I) obesity; 18,1% presented moderate (degree II) obesity; 12,1% presented severe (degree III) obesity (evaluated in terms of BMI). The final evaluation, achieved as a result of implementing the educational program concerning health, has indicated a weigh-loss of about 10% in the case of patients who have answered the questionnaire.

A qualitatively and quantitatively balanced diet reduces with 1,29 times the risk of cardiovascular diseases

Keyword: dietary risk factor, incidence, cardiovascular diseases

IMPORTANCE

During the transition period in Romania, a high incidence of chronic diseases (cardiovascular diseases, cancers, diabetes, mental illnesses or chronic respiratory diseases) could be observed: these diseases are considered major problems of public health (5).

At global level, the cardiovascular diseases, together with cerebral-vascular diseases, represent the main mortality cause, accounting for about a third of the total number of deceases (3). The expenses for the diagnosis and treatment of patients suffering from cardiovascular diseases are increasing constantly in the developed countries, and represent about 25% of the entire budget allocated to medical assistance.

The evaluation of the distribution and the implications of cardiovascular diseases, as well as of their evolution in time, represent the most adequate way of setting up efficient measures aimed at the prevention and control of these diseases (1). Thus, accurate information concerning the mortality and morbidity associated with these disorders is indispensable for the analysis of risk factors, for the prevention of cardiovascular diseases, for the correct monitoring of patients and for the distribution of technical and logistical means used in the action against cardiovascular diseases (4,1).

AIM: Diminishing the incidence of the main cardiovascular diseases by increasing the population's awareness with regards to the interconnection between dietary risk factors and the prevalence of cardiovascular diseases.

MATERIAL AND METHOD

Initially, a number of 3250 persons, registered on the lists of 10 general practitioners from Oradea municipality, have been monitored.

These patients have been selected in terms of the following criteria:

- They should have been over 18
- Patients in final stages of chronic, degenerative illnesses have been excluded

The clinical-static evaluation of the above-mentioned group of patients lasted for 3 years (from April 2005 to March 2008). Throughout the assessment period, a number of 874 patients did not return for the objective examination and the final questionnaire, which aimed to evaluate the patients' attitude with regards to the cardiovascular risk factors; consequently, only 2376 persons have been observed and evaluated.

RESULTS AND DISCUSSIONS

1.The distribution among the group of patients

- in terms of gender

From the number of 2376 subjects chosen for this evaluation, the largest percentage (53,9%) is made up of women - 1280 persons, and only 41,6%, respectively 1096 persons, represent the number of male patients. By comparison with the general population, where the men/women ratio is of 1:1, the ratio in the case of the evaluated group is 4:5. From the statistical point of view, no significant differences appear in comparison with the general population of Oradea municipality (p(p>0,05).

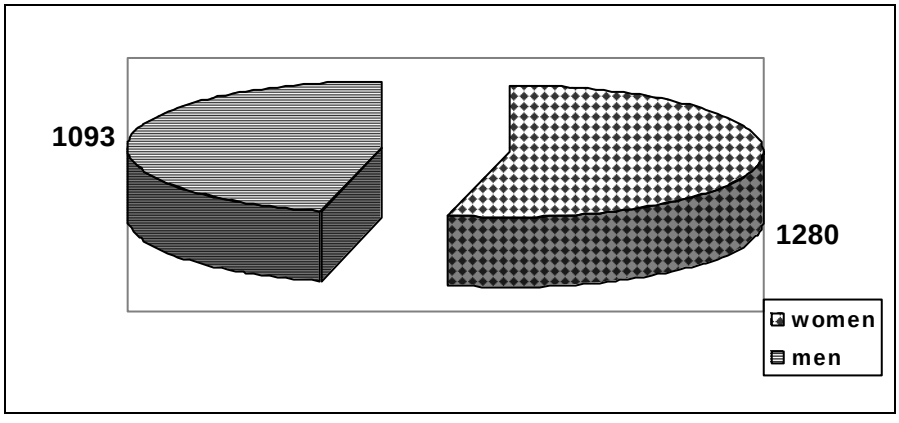

Figure 1. The distribution of subjects in terms of gender

- **in terms of age**

Table 1

The structuring of the population in terms of age groups

The age group	Total		Women		Men	
	No.	%	No.	%	No.	%
18-34 years	366	15,4	225	17,6	141	12,9
35-49 years	589	24,8	310	24,2	279	25,5
50-64 years	947	39,9	486	38,0	461	42,1
65 and over 65 years	474	19,9	259	20,2	215	19,6

The elderly persons form the most numerous group of people - about 60% of the subjects being over 50, while the group of people between 18-34 years old represents 15,4%, and the one between 35-49 years old represents 24,8%. The elderly persons are also predominant when focusing upon the general population of Oradea municipality, more than 55% of the population being included in this age group. No significant differences in relation with the distribution of the general population in terms of age groups has been observed (p>0,05).

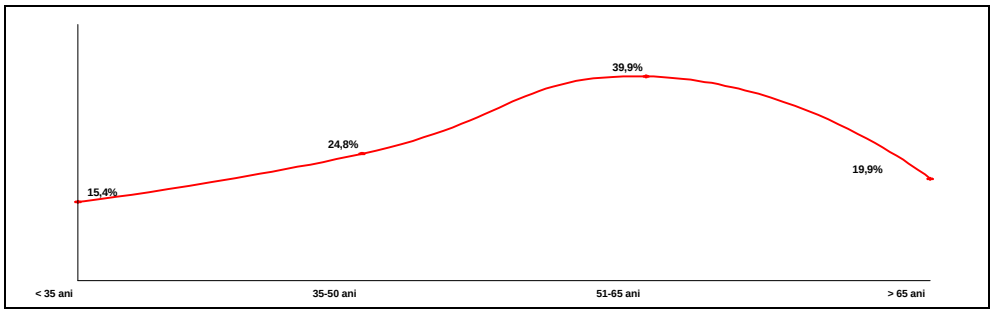

Figure 2. The distribution of subjects in terms of age groups

In terms of gender and age groups, no significant differences have been observed in case of either men or women. When selecting the subjects for this study, the aim was to evaluate a rather equal number of men and women, although women demonstrated a livelier interest in the development of the research project.

- **in terms of education**

Table 2

The distribution of subjects in terms of their education

Educational level	Total		Women		Men	
	No.	%	No.	%	No.	%
Elementary studies	385	16,2	288	22,5	97	8,9
High-school education	1181	49,7	707	55,2	474	43,3
Post-high school (Vocational) education	506	21,3	193	15,1	313	28,6
Higher education	304	12,8	92	7,2	212	19,3

Almost 50% of the subjects living in Oradea confirmed they completed their high school education (49,7%) and over 30% (34,1%) graduated from vocational or higher education institutions.

It should be mentioned here that 51,1% of the 874 persons who have been eliminated from the study (447 subjects) finished only the elementary school.

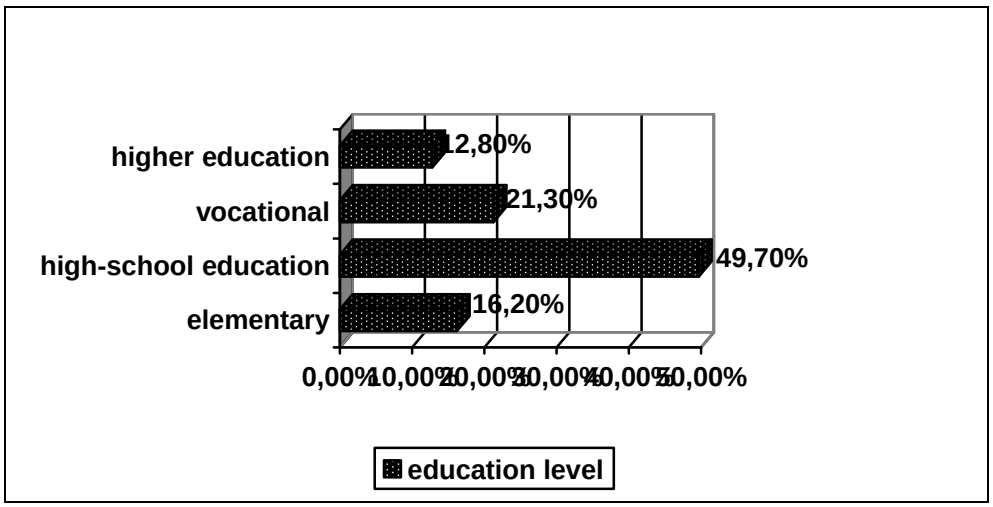

Figure 3. The distribution of subjects in terms of their education level

2. The distribution of subjects in relation with the dietary risk factor

The questionnaire aimed at evaluating of patients' level of awareness, as well as their attitudes, was meant to reveal the way in which diet is perceived as a risk factor for cardiovascular diseases. The resulted data have been related to the scale for the cumulative measuring of the risk factor and a score has been obtained. In relation with these indices, the subjects have been grouped into five categories: presenting no risk factors, presenting minor risk factors, presenting moderate risk factors, presenting high risk factors and presenting major risk factors (see Table III).

The distribution of subjects in terms of different risk factors has been achieved by means of two types of examinations, both during the initial and the final parts of the study. The first type of examination was represented by anamnesis and the objective examination of each patient in particular, while the second type of examination was associated with the questionnaire aimed at the evaluation of patients' awareness with regards to risk factors, as well as the evaluation of their attitudes; consequently the risk of incidence was obtained, in terms of the existence or the absence of risk factors.

Obesity is among the main risk factors that influence the incidence of cardiovascular diseases, being also responsible for the increase of general mortality, mainly through its negative influence upon the cardiovascular mortality. According to several studies, the increase with 10% of the body weigh amplifies incidence risk of ischaemic heart disease with 13% in the case of men and with 8 % in the case of women. Very often, when obesity is present, it can associate with other cardiovascular risk factors: HTA,

hypertriglyceridemia, hypercholesterolemia. Given the above-mentioned ideas, the study has focused predominantly upon the identification of the degree of obesity distribution among the subjects that have been chosen.

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Table 3

Questionnaire designed with the view of identifying the persons at risk of developing cardiovascular diseases

QUESTIONNAIRE

designed with the view of identifying the persons that present the risk of developing cardiovascular diseases

Age: …….. **Sex: M F** **Body weigh: …….**

Height: …….. **Occupation: ……** **Civil status: ……**

Diet:

1. Your daily dete consists of:
a. 1-2 meals/day
b. three meals/day
c. more than three meals/day

2. Do you eat at the same hours?
a. no
b. yes

3. You have dinner:
a. before getting to bed
b. 2-3 hours before you get to bed

4. Do you drink liquids during meals?
a. yes
b. no

5. Do you have a diversified diet?
a. no
b. yes

6. Where do you eat:
a. at the table
b. in other places (which are these): ……
……

7. ***What is your favourite food:***
a. potatoes/bread/pasta/cereals
b.vegetables/fruits
c. meat/fish/eggs
d. milk/cheese/cream/yogurth
- fats/oils/sugars

8. How do you like your food:
a. salty
b. less salty

9. You eat fruits:
a. daily
b. two-three times a week
c. more rarely
d.very rarely/never

10. You eat food rich in fats: fat cheese, pork, ham lard :
a. several times a day
b. once a day
c. 2-3 times a week
d. once a week

SCALE FOR THE CUMULATIVE EVALUATION OF THE DIET

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
a	2	1	1	1	1	0	0	1	0	3
b	0	0	0	0	0	1	1	0	1	2
c	1						2		2	1
d							3		3	0

TEST RESULTS

Risk level	0-3 points	4-7 points	8-10 points	11-14 points	15-17 points
Value	The absence of risk factors	Minor risk	Moderate risk	High risk	Major risk

Table 4

The distribution of subjects in terms of obesity degree

Ponderal index	Total		Women		Men	
	No.	%	No.	%	No.	%
Initial evaluation						
Normoponderal	701	29,5	295	23.05	406	37.04
Overweight	342	14,4	178	13.91	164	14.96
Mild obesity (degree I)	617	26,0	332	25.94	285	26.00
Moderate obesity (degree II)	429	18,1	320	25.00	109	9.95
Severe obesity (degreeIII)	287	12,1	155	12.11	132	12.04
Final evaluation						
Normoponderal	753	31,69	362	28,28	391	35,67
Overweight	487	20,49	251	19,60	236	21,53
Mild obesity (degree I)	490	20,62	229	17,89	261	23,81
Moderate obesity (degree II)	394	16,58	312	24,37	82	7,48
Severe obesity (degree III)	252	10,60	126	9,84	126	11,49

The overweight persons represent 70,5% of the population, of which: 26% present mild (degree I) obesity; 18,1% moderate (degree II) obesity; 12,1% severe (degree III) obesity (evaluated in terms of ICM).

Relating the data provided by our study with the data existing in current literature, it can be observed that the two sets of information are comparable as far as the distribution of obesity among persons with a surplus of weigh of 10-20 kilos is concerned.

The final evaluation, completed after implementing the educational program for health, indicates a weigh loss of about 10% in the case of the subjects who have contributed to this study.

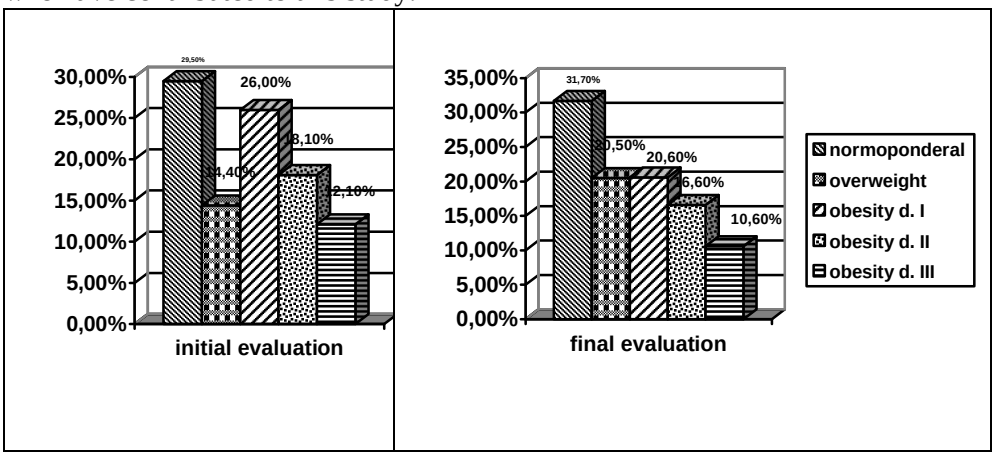

Figure 4. The distribution of subjects in terms of ponderal index

Obesity is often associated with incorrect diets and the limitation of physical activities. The correlation of these variables can contribute to the increase of cardiovascular risk for obese persons; consequently, weigh loss must be recommended to persons that present associated risk factors.

Taking into consideration the above-mentioned aspects, the questionnaires aimed at evaluating the level of patient awareness, as well as their attitudes, focused upon the way diets could represent a risk factor for the incidence of cardiovascular diseases.

Table 5

The distribution of subjects in terms of diet score

0		1		2		3		4	
0-3 points		4-7 points		8-10 points		11-14 points		14-17 points	
No risk factors		Minor risk		Moderate risk		High risk		Major risk	
No.	%	No.	%	No.	%	No.	%	No.	%
Initial evaluation									
191	8,0	223	9,4	575	24,2	903	38,0	475	20,0
Final evaluation									
223	9,4	224	9,4	771	32,4	789	33,2	369	15,5

Taking into consideration the fact that the specific diet in the western part of our country is generally rich in lipids, the evaluation of the diet score indicates that, in a proportion of almost 60%, subjects do not have a correct diet. It is worth mentioning here that the somatometric measurements indicated a decrease with 197 in the number of obese persons, while the questionnaire indicates that 220 subjects have taken into consideration the recommendations for a healthy diet and started to adopt correct norms in selecting their food; consequently the percentage of persons that presented initially a high or major risk reduced with 16,0 %, while figures related to obesity diminished with only 14,8%. We might conclude therefore that weigh loss is not always the result of adopting a healthy diet, indicated by a specialist in nutrition and metabolic diseases, since many persons make their option for a drastic reduction of daily meals or of the quantity of ingested food.

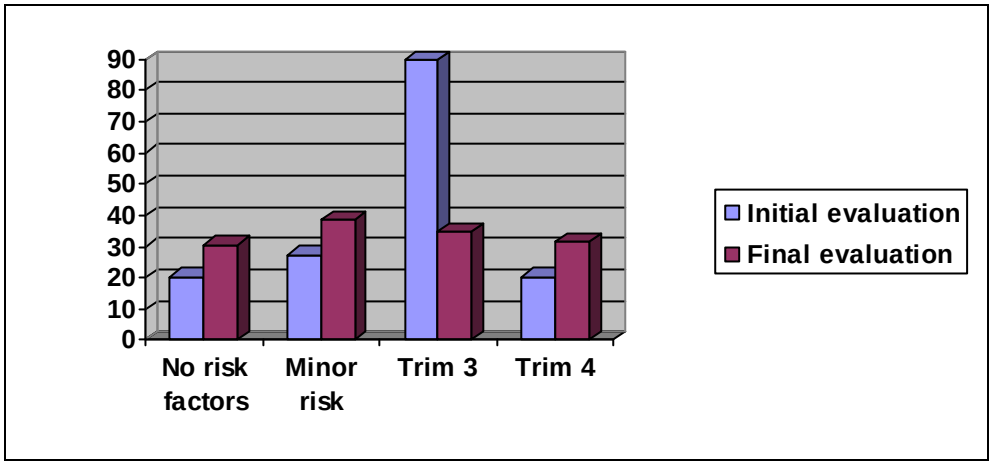

Figure 5. The distribution of subjects in terms of the diet score

By correlating the results obtained after the objective examination and the results of the questionnaires, it can be concluded that obesity represents a major risk factor for the incidence of cardiovascular diseases, all the obese patients, irrespective of the obesity degree they present (56,2%) belong to the group of people who are at major risk (58%).

3. The influence of the main risk factors for the prevalence of cardiovascular diseases

In order to quantify the intensity of risk factors in relation with the cardiovascular diseases the subjects of this study suffered from, the relative and the attributable risks have been determined.

The relative risk indicates how many times higher is the risk to develop a disease for patients presenting risk factors than for patients who are not exposed to risks, measuring the force of the epidemiologic association. When the relative risk is higher than 1, this value indicates an association between the risk factor and the disease, since the risk is higher in the case of exposed persons. The more the relative risk rises above this value (1), the stronger the association will be. If the relative risk is less than 1, it means that the studied factor is not a risk factor, but rather a protection factor, since the risk in the case of the exposed persons is weaker than in the case of persons that are not exposed.

The influence of the risk factor upon the population is measured with the help of the risk attributable in population (it indicates how high is the risk in the case of the exposed persons than in the case of persons that are not exposed). The attributable risk indicates the excess of risk in the case of exposed persons, in other words the part of the risk that is due to the risk

factor. The following results have been obtained at the end of our investigation:

Table 6

The relative and the attributable risk of the dietary risk factor in BVC

	HTA		CI		IMA		Total	
The risk factor (RF)	R_r	R_A	R_r	R_A	R_r	R_A	R_r	R_A
Ponderal status Normoponderal or Overweight Obesity d. I, II or III	1,23	0,05	1,33	0,03	1,56	0,02	1,29	0,09

Obesity represents an important risk factor for cardiovascular diseases, the risk of their incidence being 1,3 higher in the case of degree I, II, or III obesity than in the case of normoponderal or overweight subjects.

The education of people with regards to their health, together with the involvement of the general practitioner in identifying and monitoring risk factors can determine a significant decrease in the incidence of cardiovascular diseases.

CONCLUSIONS

With the help of the intensive educative measures, aimed at improving the health state of the population, which have been part of this study, the number of new patients suffering from cardiovascular diseases could be reduced.

In terms of patients' compliance, it can be concluded that, from the number of 3250 persons who have initially contributed to this study, about 26,89% gave up during the development of the investigation. This abandon was due mainly to the migration of these patients to other general practitioners (857 persons), or the decease of cardiovascular patients (17 deceases). Most patients who did not bring their contribution to the final stages of the study were over 65, or had a minimum educational level.

Although the somatometric measurements indicated a decrease with 197 in the number of obese persons, the questionnaire indicates that 220 subjects have taken into consideration the recommendations for a healthy diet and started to adopt correct norms in selecting their food; consequently the number of persons presenting initially a high or major risk reduced with 16,0 %, while obesity diminished with only 14,8%. We might conclude therefore that weigh loss is not always the result of adopting a healthy diet, indicated by a specialist in nutrition and metabolic diseases, since many

persons make an option for the drastic reduction of daily meals, or of the quantity of ingested food.

The determination of the relative and the attributable risk, in order to quantify the influence of the risk factor upon the cardiovascular diseases that the subjects we have evaluated suffered from, indicate the fact that a quantitatively and qualitatively balanced diet reduces with 1,29 times the risk of cardiovascular diseases incidence.

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